# Enhancing Neurorehabilitation for Adults with Acquired Brain Injury: Integrating Wellbeing Science for Whole Health

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Submitted to Swansea University in fulfilment of the requirements for the Degree of Doctor of Philosophy

**Swansea University**

2025

# Abstract

Living with acquired brain injury necessitates significant personal adjustment. While holistic neurorehabilitation aims to support recovery, clinical practice remains largely deficit-focussed, prioritising recovery and functional gains as opposed to promoting wellbeing in its fullest sense. Current interventions often focus on isolated aspects of health rather than addressing them integrally, compounded by a lack of transdisciplinary frameworks to guide intervention design. Through the systematic application of the transdisciplinary, metatheoretical GENIAL framework, this thesis highlights how wellbeing science may add value to holistic neurorehabilitation by building foundations for wellbeing at multiple levels of scale.

Using primarily qualitative methodologies and reflexive thematic analysis situated within a critical realist perspective, this work unpacks interview and focus group data from 75 participants (aged 18-86 years old) involved in group-based interventions delivered by holistic neurorehabilitation units in South Wales. Interventions included an adapted-Acceptance and Commitment Therapy programme designed to foster psychological adjustment, and, in partnership with community interest companies, an immersive, nature-based surf therapy programme and a sustainable construction ecotherapy programme that promoted meaningful environmental engagement. Using the GENIAL framework as an analytical lens through which participant insights were critically unpacked, this thesis retrospectively evaluates the potential of each intervention to support wellbeing across individual, social, and environmental domains, offering a nuanced understanding of the mechanisms through which wellbeing can be facilitated in clinical practice.

The results illustrate how holistic neurorehabilitation can synergistically build foundations for wellbeing by supporting connection across multiple levels, including to the self (enhancing self-connectedness through emotional regulation and identity reconstruction), others (fostering social connections through shared experiences, group identification and belonging), and the environment (promoting nature connectedness and pro-environmental attitudes through meaningful environmental engagement). This work exemplifies how rehabilitation, informed by wellbeing science, can transcend beyond domain-specific deficit reduction and instead cultivate the conditions to support individuals, community and planetary wellbeing.

# Declarations

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Signed: [redacted]

Date: 25th September 2025

This thesis is the result of my own investigations, except where otherwise stated. Other sources are acknowledged by footnotes giving explicit references. A bibliography is appended.

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I hereby give consent for my thesis, if accepted, to be available for photocopying and for inter-library loan, and for the title and summary to be made available to outside organisations.

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The University’s ethical procedures have been followed and, where appropriate, that ethical approval has been granted.

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Date: 25th September 2025

This thesis represents the candidate's original research conducted as part of a collaborative partnership between Swansea University and local health boards in South Wales. Grounded in clinical practice, the work reflects the candidate’s leadership in the conceptualisation, design, analysis, and interpretation of studies, supported by the valuable expertise of professionals from the Regional Neuropsychology and Community Brain Injury Service, part of Swansea Bay University Health Board, which also co-funded the candidate’s scholarship. Chapters published during the PhD candidacy include co-authorships to acknowledge specific contributions from collaborators, as detailed in each publication. Together, this thesis stands as a cohesive and original body of work, demonstrating the candidate’s expertise, academic rigour, and ability to integrate multidisciplinary insights into impactful research.

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# Author Contributions

**Manuscript 1: *Riding the Wave Into Wellbeing: A Qualitative Evaluation of Surf Therapy for Individuals Living With Acquired Brain Injury***

Located in Chapter Six

The candidate (KG) contributed the conceptualisation of the evaluation, literature review, data collection tools (final topic guide development), methodology, data analysis, writing of the manuscript, review and editing, and final amendments following receipt of peer-review feedback (65%).

Author 1 (AK) contributed towards the conceptualisation of the evaluation, provided methodological and analytical guidance, reviewed and edited the initial manuscript and subsequent iterations, submitted the manuscript for peer-review, and provided supervision throughout (10%).

Author 2 (ZF) contributed towards the conceptualisation of the evaluation, provided methodological and analytical guidance, reviewed and edited the initial manuscript and subsequent iterations and provided supervision throughout (10%).

Author 3 (LW) contributed towards delivery of the intervention, data collection (topic guide finalisation, interviewing and transcription), and final review prior to submission (5%).

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**Manuscript 2:** ***Constructing the conditions for wellbeing: A qualitative evaluation of group-based ecotherapy for adults living with acquired brain injury***

Located in Chapter Eight

The candidate (KG) contributed the conceptualisation of the evaluation, literature review, methodology, data analysis, writing of the manuscript, review and editing, and final amendments following receipt of peer-review feedback (75%).

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Author 6 (KD) contributed towards the review of the manuscript prior to its first submission to the Journal of Rehabilitation, providing information and clarification on the nature of the intervention where necessary (5%)

We, the undersigned, agree with the above stated 'proportion of work undertaken' for each of the above published peer-reviewed manuscripts contributing to this thesis:

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# Ethical Considerations and the Use of Service Evaluation Data in This Thesis

This thesis draws upon pre-existing service evaluation data from two group-based interventions delivered through a partnership between a holistic neurorehabilitation setting in South Wales and local community interest companies. These interventions, examined in Chapters Six and Eight, were implemented as part of service users' standard rehabilitation, and qualitative service evaluation data was collected to refine clinical practice based on patient feedback and inform theoretical development. This practice ensures that rehabilitation approaches remain responsive to patient needs and avoids the inefficient allocation of resources to ineffective treatments while fostering co-created, patient-informed care.

While evaluations of service user experience following healthcare interventions are not automatically exempt from ethical review, the Health Research Authority (HRA) Decision Tool confirmed that these evaluations fell under the category of service evaluation rather than research. This classification was independently verified by the NHS Research & Development (R&D) department affiliated with the Community Neurorehabilitation Service, who reviewed the work presented in Chapter Eight for example and confirmed that it met the criteria for service evaluation. As such, NHS Research Ethics Committee (REC) approval was not required for the following reasons:

1. Participants were not randomised into different groups: the intervention was part of routine care, and participants self-selected based on perceived benefit.
2. 'Treatment as usual' was not altered, with participants continuing to receive standard care (holistic rehabilitation delivered by an interdisciplinary team) alongside the interventions.
3. The evaluations were not designed to generate generalisable findings, instead focussing on evaluating routine practices within the Community Neurorehabilitation Service.

Although this thesis is being completed at Swansea University, seeking ethical approval from the university was not appropriate, as the data remains within NHS governance structures. Participation in the evaluations was voluntary, with informed consent obtained from all individuals. Participants were made aware of their right to withdraw at any time, and all identifiable information was anonymised during transcription to protect confidentiality.

Publishing and disseminating service evaluations are critical for informing clinical practice, providing valuable insights that may inspire innovation in rehabilitation. Opportunities for learning and transferability are strengthened by rigorous and transparent articulation of the qualitative process employed, which serves to further contextualise the insights generated, enabling clinicians and researchers to critically assess, adapt, and implement similar strategies within their own services. The publication of the work in this thesis aligns with broader disseminate efforts, including multiple presentations across academic, clinical, patient and public-facing platforms. These efforts aim to not only enhance clinical service development and recognise the innovative contributions of clinical teams and organisations involved, but also contribute to broader discussions on embedding holistic, salutogenic and person-centred approaches into healthcare, thus outlining opportunities for systems improvement.

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# Acknowledgements

Firstly, I would like to express my heartfelt thanks to my supervisors, Professor Andrew Kemp and Dr. Zoe Fisher, for their unwavering support and guidance throughout this journey. Andrew, your constructive critiques and encouragement to approach complexity with an open and curious mind have been invaluable in shaping my thinking and this work. Zoe, your genuine care, personal touch in supervision, and willingness to step in during the final stages (and at unsociable hours) to offer crucial support mean more to me than words can express. I am deeply inspired by your shared dedication to advancing research that benefits individual wellbeing, local communities, and the planet. Thank you for every opportunity you have entrusted me with along the way. I sincerely hope that the submission of this thesis is not the conclusion but rather the foundation for continued collaboration and contributions to these critical endeavours. You are both truly exceptional, and I am profoundly grateful to have had the privilege of working with you.

I extend my heartfelt gratitude to Swansea Bay University Health Board and the team at Morriston Hospital for their sponsorship, which provided me the opportunity to engage in such meaningful work. I am profoundly thankful to the brain injury survivors who participated in this research; their courage and willingness to share their experiences have been central to this thesis. Although I did not have the privilege of witnessing their journeys firsthand, learning about their resilience and ability to find personal strength and meaning through adversity has been deeply inspiring.

On a personal note, I wish to acknowledge my own source of strength throughout this journey, Jessica Mead. Your unwavering support, cheer, and belief in me have been instrumental in carrying me forward during this challenging but rewarding process. I am also sincerely grateful to Katie Retallick from Swansea University for her unwavering support, for always keeping my best interests in mind, and for guiding me through the submission process.

Finally, this acknowledgments section would be incomplete without recognising the constant source of love and light in my life: Daisy, my beautiful, wonderful, and delightfully crazy Dalmatian. You’ve taught me what it means to connect deeply - with others, with the world around me, and with myself. Your boundless energy, innocent curiosity, and unwavering loyalty have transformed even the hardest days into meaningful adventures. You’ve not only brought me joy but also given me a profound sense of purpose, reminding me to face life with an open and grateful heart. From sleepless nights to moments of triumph, you’ve been there, offering love in its purest form. Thank you for never giving up on me, for lifting me in my darkest moments, and for showering me with unconditional love, dog hair, and sloppy kisses. I am endlessly proud of the incredible being you are and will always strive to give you as many positive and extraordinary experiences as this world has to offer. You deserve nothing less. You are, and always will be, my brightest light, my greatest comfort, and my truest companion.

# List of Tables and Figures

# Abbreviations

| | |
|---|---|
| **ABI** | Acquired Brain Injury |
| **ACT** | Acceptance Commitment Therapy |
| **CBT** | Cognitive Behavioural Therapy |
| **CNS** | Community Neurorehabilitation Service |
| **COVID-19** | Coronavirus-19 |
| **GENIAL** | Genomics-Environment-vagus Nerve-social Interaction-Allostatic regulation-Longevity |
| **IDGs** | Inner Development Goals |
| **MDT** | Multidisciplinary Team |
| **NICE** | National Institute for Health and Care Excellence |
| **NHS** | National Health Service |
| **PERMA** | Positive emotions-Engagement-positive Relationships-Meaning-Achievement |
| **PTG** | Post-traumatic Growth |
| **PTMF** | Power Threat Meaning Framework |
| **RCT** | Randomised Controlled Trial |
| **SDGs** | Sustainable Development Goals |
| **TA** | Thematic Analysis |
| **TBI** | Traumatic Brain Injury |
| **QALYs** | Quality-adjusted Life Years |

# 1 Chapter One: Understanding the Multifaceted Impact of Acquired Brain Injury Through the Lens of Psychological Theory and Wellbeing Science: Implications, Adjustment and Pathways to Post-traumatic Growth

The first objective of this chapter is to offer a comprehensive overview of key theoretical frameworks in health and wellbeing, focussing on the dynamic interactions between psychological, biological, and social factors. It then introduces the GENIAL framework, a transdisciplinary metatheoretical framework that integrates various dimensions, theories, and concepts of wellbeing into a unified understanding of its key components. This model provides a holistic perspective, incorporating diverse wellbeing theories that account for a range of factors, from personal characteristics and behaviours to societal and environmental influences. The chapter next explores the challenges associated with acquired brain injury (ABI), emphasising the impact of brain injury on wellbeing at multiple levels, in line with a holistic view of these effects. Throughout, it highlights the complex, interrelated nature of these challenges and their influence on wellbeing, emphasising the dynamic interplay across different scales. The chapter stresses the need for an integrated approach that not only considers psychological, biological, and social perspectives but also addresses the broader socio-structural determinants that influence an individual’s ability to thrive after injury. By linking theoretical frameworks to real-world challenges, this chapter will lay the groundwork for appreciating the unique struggles, emotional turbulence, and the often life-altering shifts in identity and functionality faced by those living with ABI. These insights are essential for comprehending the processes of adjustment and transformation that will be explored in subsequent chapters.

## 1.1 From Hedonism to Whole Health: Integrating Psychological and Biological Perspectives in Wellbeing Science

Health and wellbeing are dynamic and multifaceted concepts, and our understanding of them can influence individual health behaviours, local policies, and the structures of global health systems (Kennedy, 2002; Moorman & Matulich, 1993). Traditional perspectives, such as the biomedical model, have historically viewed health as the absence of disease, assessed in terms of ill health, and defined in terms of the physical condition of individuals (Larson, 1999; Tinetti & Fried, 2004). While effective for addressing acute illnesses, such approaches stem from and reinforce emphasis on extreme mind-body dualism (Kemp & Fisher, 2022), ignoring the complex interplay of psychological, biological and social factors that contribute to health and wellbeing. The landmark definition of health provided by the World Health Organisation was, in comparison, a positive advance, characterising health as a "state of complete physical, mental, and social wellbeing, not merely the absence of disease or infirmity." Whilst this conceptualisation represented a paradigmatic shift in the right direction (Saracci, 1997), the utopian standard imposed by the advocacy for 'complete' health can be criticised for embodying materialistic monism (Kemp & Fisher, 2022), proposing unattainable health standards for the average adult (Leonardi, 2018), let alone those who face chronic health difficulties (Huber et al., 2011). More inclusive perspectives emphasise adaptability rather than perfection, proposing that health should be seen as an ongoing, iterative and dynamic process (Leonardi, 2018), and one which is determined by one's capacity to adapt to social, emotional, and physical challenges (Canguilhem, 1943). These dynamic definitions align with the growing focus on resilience and personal agency, rejecting an 'all or nothing approach' to health ideologies.

Wellbeing, much like health, is a multifaceted construct that resists a singular definition, reflecting its complexity and diversity. Crucially, it is now widely accepted that physical health and psychological wellbeing are inextricably linked (Kemp et al., 2018), with wellbeing being influenced by a bidirectional relationship between the two (Prince et al., 2007). Regarding psychological or subjective wellbeing, conceptualisations from psychological science typically fall into two primary paradigms: hedonic and eudaimonic approaches (Ryan & Deci, 2001). Hedonic theories focus on happiness and define wellbeing in terms of pleasure attainment and pain avoidance, with the Tripartite Model of Subjective Wellbeing (Diener, 1984) outlining the importance of life satisfaction (encompassing a cognitive evaluation of the degree to which one's life is viewed as satisfactory of close to ideal), increased positive affect (joy, interest, contentment), and reduced negative affect (sadness, anxiety, anger and despair). Such approaches hereby distinguish between pleasant and unpleasant aspects of the subjective human experience, while placing particular emphasis on those that contribute to happiness. Emphasising the importance of positive emotions in building wellbeing, Fredrickson's Broaden-and-Build Theory (Fredrickson, 1998, 2001; Fredrickson, 2004) theorises that positive emotions, ranging from contentment to joy and amusement, broaden thought-action repertoires, prompting individuals to engage in a wider range of thoughts and emotions than is typical, such as play, explore, savour, and integrate. Positive emotions thereby facilitate approach behaviours, enabling individuals to build resources that can bolster wellbeing both immediately and over time. These may include physical resources, such as physical skills and physical health, in addition to social resources (e.g., social support networks), intellectual resources (e.g., knowledge and theory of mind), further to psychological resources, such as optimism, coping and creativity. Indeed, research has demonstrated that positive emotions enhance cognitive flexibility, problem-solving abilities, and creativity (Isen, 2008), as well as promote social connection, resilience, and adaptive coping in response to chronic stress (Folkman & Moskowitz, 2000; Fredrickson & Joiner, 2002). Studies have also shown that frequent experiences of positive emotions contribute to the development of long-term resources, such as improved mental health, stronger social bonds, and even physiological benefits, including better cardiovascular health (Kok et al., 2013). These findings substantiate the transformative role of positive emotions in enhancing immediate affective states but also fostering personal resources that sustain wellbeing over time (Fredrickson, 2001).

The Broaden-and-Build Theory has forefronted the adaptive value of positive emotions for broadening and building individual wellbeing. However, in doing so, this theory oversimplifies emotional experience by dichotomising emotions as either broadening (positive) or narrowing (negative) scopes of attention, cognition, and action, proposing that negative emotions have short-lived adaptive value. While this may apply to emotions such as fear or anxiety, research suggests that negative emotions can also play adaptive and resource-building roles. Sadness, for example, can aid in processing loss, motivating meaningful action and strengthening social bonds (Tamir, 2009). Moreover, the binary framing neglects the complexity of human emotions, particularly ambivalent states such as nostalgia, or the paradoxical dynamics of post-traumatic growth (PTG), which defy classification as 'positive' or ‘negative’ categories. For instance, nostalgia, though tinged with sadness, has been shown to bolster social bonds, increase positive self-regard, and generate positive affect (Wildschut et al., 2006). Similarly, in PTG, adversity and distress are not erased but coexist with heightened gratitude, a deeper appreciation of life, and a reorientation of values (Tedeschi & Calhoun, 2004). These examples illustrate that even painful or negative emotions or experiences carry broadening and building potential, with enduring implications for wellbeing. Emphasising the value of such emotions and experiences, Paul Wong’s dual-factor model of mental health emphasises that suffering, far from being antithetical to wellbeing, can co-occur *with* it, offering opportunities for growth and purpose (Wong, 2011, 2013). Wong’s meaning-centred approach posits that amidst adversity, individuals can derive purpose, a critical determinant of eudaimonic wellbeing that fails to be accounted for by the hedonic theories proposed by Diener (1984) and Fredrickson (1998, 2001, 2004).

Eudaimonic theories emphasise that wellbeing is not redundant with ill-being, and that they are two related but distinct constructs (Ryff & Keyes, 1995). These theories focus on human potential, encompassing meaning, purpose, self-realisation and actualisation and human flourishing (Seligman, 2011) as opposed to transient feelings of happiness. Eudaimonic perspectives are grounded in conceptual and theoretical formulations from clinical, developmental, existential, and humanistic psychology (Ryff et al., 2021), including the seminal work of Frankl (1959, 1988), Rogers (1962) and Maslow (1968). From such formulations, Ryff and Keyes (1995) considered wellbeing in the context of ‘challenged thriving’ and proposed a six-factor multidimensional model of eudaimonic wellbeing that articulates different challenges through which individuals navigate as they strive to function positively. This captures wellbeing not as a static state but as an ongoing, adaptive process that requires negotiation across multiple life domains. These include autonomy (encompassing self-determination, personal authority and living in accordance with one’s personal convictions), environmental mastery (managing one’s surroundings and making use of opportunities), developing and maintaining positive relations with others (warm and trusting interpersonal relationships), having a sense of purpose (direction in life), personal growth (striving for personal development), and self-acceptance (acknowledging and embracing one’s strengths and limitations). Each domain provides a unique contribution to wellbeing. For example, autonomy is related to higher levels of positive affect and vitality (Reis et al., 2000), purpose with longevity and improved mental health (Boyle et al., 2009), and positive relationships with a host of positive mental and physical health outcomes

(Dijkers, 2004). Environmental mastery has been found to contribute to a sense of resilience during life transitions (Clarke & Smith, 2011), which, according to Ryff (2013), encompasses the capacity to maintain or regain wellbeing in the face of adversity. Self-acceptance may reduce depression and boost self-esteem while paving the way for growth, which in turn has been linked to lifelong learning and psychological flexibility (Ryff, 2014). Together, these dimensions advocate for a multifaceted and dynamic understanding of wellbeing, highlighting the interplay of internal growth and external adaptation in navigating eudaimonia. Importantly, the model proposed by Ryff and Keyes (1995) represents one of the first to explicitly recognise the role of social dynamics in wellbeing, remaining distinctive in its acknowledgement that the quality or valence of relationships matters. By emphasising that warm, trusting interpersonal relationships are those that most reliably contribute to wellbeing, the model avoids a romanticised view of social connection and relationships as inherently positive. This contrasts to Fredrickson's Broaden-and-Build Theory, which largely conceptualises the expansion of social repertoires as unequivocally beneficial. Despite this important conceptual advantage, however, such eudaimonic theories underplay the contributions of hedonic aspects of wellbeing, such as the experience of pleasure, positive emotional states and satisfaction of desires. Whilst hedonic and eudaimonic wellbeing are related but distinct aspects of what it means to be psychologically well (Keyes et al., 2002), they are not mutually exclusive. Instead, they are complementary functions that may co-occur (Huta, 2015): the co-occurrence of which is linked to improved and more 'holistic' wellbeing and better mental health (Huta & Ryan, 2010; Keyes et al., 2002; Peterson et al., 2005).

Expanding on the eudaimonic principles while incorporating hedonic perspectives, Seligman's (2011) PERMA Model emphasises the importance of Positive emotions, Engagement, (positive) Relationships, Meaning, and Accomplishment as essential building blocks for optimal psychological wellbeing, which Seligman termed 'human flourishing'. Key additions to constructs already described include engagement, characterised by psychological flow (Csikszentmihalyi et al., 2014) or the enjoyment of deep absorption in what one is doing (Nakamura et al., 2019), and accomplishment, which, in pursuit of goal achievement, boosts self-efficacy (Bandura & Wessels, 1997). These constructs have a neurocognitive basis (van der Linden et al., 2021) and highlight the importance of a match between a person's skills and task requirements (Moneta, 2012; Peifer et al., 2014). This is particularly true when tasks are intrinsically motivating, meaningful and enjoyable and also challenging (Csikszentmihalyi & Nakamura, 2010), as such conditions can contribute to wellbeing, including improved mood and sense of meaningfulness (Csikszentmihalyi et al., 2014; Demerouti, 2006; Fullagar & Kelloway, 2009). A focus on meaning is key to this model. The search for meaning has been proposed by some as the core motivation for humanity (Frankl, 1985), serving as a defining aspect of personhood and self-identity by offering direction, values, and continuity across the lifespan. Indeed, meaning in life contributes significantly to health and wellbeing (Steger, 2012) and can foster resilience - i.e., the capacity to maintain or regain wellbeing in the face of adversity (Ryff, 2013).

The PERMA framework (Seligman, 2011) has provided a highly influential and organising model that has shaped the field of positive psychology: a field concerned with the scientific study of strengths, virtues, and conditions that enable individuals and communities to flourish. Yet, PERMA has received extensive criticism. Some have argued that it is not a genuine theory of wellbeing but rather a descriptive list of factors correlated with wellbeing, while lacking theoretical justification for their inclusion (Wong & Roy, 2018; Donaldson et al., 2022). Others have questioned whether it adds any explanatory power beyond existing models, noting its redundancy within general wellbeing frameworks such as Diener’s (1984) Tripartite Model of Subjective Wellbeing (Goodman et al., 2018). However, as later highlighted by Seligman (2018), PERMA was intended not as a theory of what wellbeing is, but as a pragmatic framework of elements that can facilitate wellbeing, suggesting that wellbeing is construed by growth, fulfilment and flourishing - in line with Canguilhem’s conceptualisation of health as a capability (Canguilhem, 1943).

Despite the many elements that can facilitate wellbeing, capacities for achieving health, wellbeing and human fulfilment are profoundly influenced by the surrounding contexts of people’s lives, such that opportunities for self-realisation (or human flourishing) are not equally distributed (Ryff & Singer, 2008). This highlights a key limitation of the theories and frameworks discussed thus far. Although they illuminate important interpersonal processes that contribute to subjective wellbeing, they largely overlook the structural, social, and environmental conditions that shape whether individuals possess the resources and opportunities needed to engage in such processes. For example, while the work Ryff (1989) and Ryff and Keyes (1995) frames wellbeing as an outcome of personal agency and mastery, and Seligman’s (2011) PERMA model highlights the importance of accomplishment, these models or frameworks pay limited attention to broader structural and cultural determinants that enable or constrain individuals’ capacities to achieve these ideals. For instance, autonomy, environmental mastery and the development of trusting positive relationships may be difficult to realise for individuals living with poverty, disability, or social marginalisation.

A substantial body of research highlights the profound influence of sociostructural determinants on health and wellbeing, with stark inequalities in life expectancy and health outcomes consistently documented across populations (Marmot, 2020; Stringhini et al., 2017). These determinants, including socioeconomic status, education, employment, and access to healthcare fundamentally shape individuals' opportunities to thrive and achieve self-fulfilment. Overlooking these factors risks presenting a narrow, individualistic understanding of wellbeing that disregards the systemic constraints and enablers influencing health outcomes. For instance, there is compelling evidence linking sociostructural factors with the adoption of health behaviours. Adverse social conditions, such as poverty or lack of access to nutritious food, increase the likelihood of engaging in adverse health behaviours, including smoking, excessive alcohol consumption, and sedentary lifestyles (Stringhini et al., 2017). These behaviours, in turn, exacerbate health disparities by contributing to chronic illnesses, mental health challenges, and reduced life expectancy. Conversely, individuals in more advantaged socio-structural contexts often have greater access to resources, education, and supportive environments that facilitate healthier choices and behaviours (Phelan et al., 2010). The interplay between socio-structural determinants and health behaviours thus underpins the need for a multifaceted approach to wellbeing that considers not only the individual, but the communities and environments within which they live and their socio-structural context. In this regard, the Power Threat Meaning Framework (PTMF) introduced by Johnstone and Boyle (2018) offers a crucial lens for understanding how broader societal structures, such as power imbalances, systemic inequality, and social stigma, shape individuals' experiences and outcomes. PTMF emphasises that distress, adversity, and poor health outcomes are not merely the result of individual shortcomings but are often influenced by social and political forces that limit opportunities, distort meaning-making, and perpetuate harm. By incorporating PTMF into wellbeing frameworks, we can better understand how these sociostructural factors contribute to disparities in health and wellbeing, and create more equitable, context-sensitive interventions that address both individual and collective needs.

Thus far, this chapter has discussed key models and frameworks that propose various dimensions of wellbeing. Whilst not comprehensive, this overview highlights a vast and informative body of literature on what it means to live well. However, the proliferation of definitions and models (along with diverse measures used to assess them) has contributed to substantial terminological and conceptual confusion (Goodman et al., 2018), confounded by the limited dialogue across broader theoretical traditions and between specific conceptual propositions. Theorists in the field seldom engage directly with one another's empirical evidence or conceptual refinements yet claim to advance wellbeing science while overlooking the integration of existing foundations. Goodman et al. (2018) highlights that the incremental value of a new model derives not from re-labelling familiar dimensions, but from offering a theoretically meaningful combination of facets or novel constructs where groupings of components have been described and rationalised. Seligman's (2011) PERMA framework, for instance, has been criticised for lacking a strong theoretical or empirical rationale for privileging its five facets (positive emotions, engagement, positive relationships, meaning, and accomplishment) at the neglect of many possible variables that are positively related to wellbeing. Many dominant theories and frameworks have been critiqued for emphasising the importance of positive states and resources at the detriment to negative or difficult emotions, which have both adaptive and developmental value. Such omissions risk presenting a partial view of wellbeing that neglects the complex, dynamic processes through which individuals build resilience, meaning, and social connection in the face of challenge. Notwithstanding, Goodman et al. (2018) argues that scientific progress is made when frameworks extend the field by integrating justified facets in theoretically coherent ways, adding novel dimensions, or illuminating distinct types of wellbeing. Models that achieve this are likely to move beyond redundancy to offer important contributions to a coherent understanding of a life well lived (Goodman et al., 2018).

Integrating the work discussed so far into a unified 'meta' framework for wellbeing is the GENIAL framework (Kemp et al., 2017; Kemp & Edwards, 2022; Kemp & Fisher, 2022; Mead et al., 2021). A metatheoretical wellbeing framework comprises a high-level, integrative model that attempts to integrate various dimensions, theories, and concepts of wellbeing into a unified understanding. The authors of this model have proposed an interpretive framework on the wellbeing literature spanning psychological to epidemiological science to capture the dynamic, interrelated processes that shape individual wellbeing across the lifespan. Unlike frameworks which have been critiqued for comprising a descriptive list of facilitative factors, GENIAL proposes a logically coherent framework that maps the interdependencies between biological, psychological, social, and environmental influences on health and wellbeing. Rather than simply cataloguing factors, it provides both a definition of wellbeing (conceptualising it as a sense of connection) and a conceptually rich organising structure, grounded in existing evidence spanning diverse disciplines and methodologies, to help elucidate the complex, dynamic pathways through which wellbeing emerges. Specifically, GENIAL captures the interconnectedness between one's Genomics and their interaction with the Environment through to health outcomes, highlighting a major regulatory role for the vagus Nerve over social Interaction and Allostatic regulation, subsequently leading to premature mortality or Longevity (see Kemp, Arias & Fisher 2017 for a full review). The GENIAL framework goes beyond specific or individual approaches to wellbeing, aiming to capture the broader, overarching factors that contribute to an individual's or a community's overall wellbeing. The GENIAL framework does not aim to focus on a single aspect of wellbeing but rather incorporates multiple interrelated domains. This provides a holistic view that brings together diverse wellbeing theories that consider various factors from personal characteristics and behaviours to societal and environmental influences into an integrative whole.

Within this framework, individual wellbeing is conceptualised as the integration of a healthy body, shaped by positive health behaviours such as physical activity, balanced nutrition, and sufficient sleep, drawing on extensive evidence demonstrating their irrefutable physiological and psychological benefits (Warburton et al., 2006). It also proposes that individual wellbeing is generated and sustained through the cultivation of a balanced mind. Extending upon foundational contributions from scholars such as Ryff (1989); Ryff and Keyes (1995), Diener (1984), Fredrickson (2004) Seligman (2011), and Wong (2011), the individual domain of this metatheoretical framework emphasises the dual role of positive and negative emotions in fostering resilience, building personal resources, and promoting psychological growth (Mead, 2023). This addresses a key limitation of many of the frameworks mentioned, as it recognises that mental wellbeing is not the *absence* of negative affect or distress, but rather the dynamic balance of both positive and negative experiences. This aligns with the view of Bradburn (1969), who emphasised that happiness (a key focus of hedonia) results from a balance between positive and negative affect (albeit, a higher ratio of positive to negative emotions is considered ideal), and complements dual-factor and meaning-centred approaches (e.g., Wong, 2011, 2013). The vagus nerve is introduced as a critical structural link between body and mind, mediating a wide range of psychological and physiological processes (Kemp, Aras & Fisher, 2017). For example, research highlights its involvement in stress regulation, emotional stability, and social bonding - factors that significantly influence health and wellbeing outcomes (Porges, 2007). Moreover, the GENIAL framework also recognises that opportunities for wellbeing and positive change are shaped by broader sociostructural factors, which are typically beyond individual control and can constrain or facilitate individuals' ability to engage in health-promoting behaviours, maintain a healthy body, form meaningful social connections, and access other resources essential for wellbeing (Marmot, 2020). This is an example of how the GENIAL framework offers a holistic and dynamic 'Meta' theoretical framework of wellbeing, connecting biological, psychological, and social determinants. It elucidates pathways to whole health and longevity while identifying risk factors for premature mortality, providing a comprehensive approach to understanding and promoting wellbeing across diverse populations.

That said, the metatheoretical framework is not without limitations. While GENIAL presents a compelling transdisciplinary synthesis of factors that support wellbeing, it is also important to acknowledge the potential 'dark side' of determinants typically assumed to be beneficial. Social connectedness, central to the community domain, is not universally positive. Relationships characterised by conflict, inequality, or coercion can undermine both mental and physical health (Umberson & Karas Montez, 2010). Evidence indicates that the quality of connections is as important as their presence, with negative social ties often being more predictive of distress and adverse health outcomes than the absence of connections altogether (Rook & Charles, 2017). Similarly, the wellbeing literature cautions again 'toxic positivity,' in which the relentless pursuit of optimism risks silencing distress, delegitimising suffering, or constraining adaptive coping (Coyne & Tennen, 2010). While GENIAL acknowledges both the beneficial and detrimental effects of health behaviours and their social determinants, it is less explicit about the potential dark sides of other influential pathways, risking the inadvertent romanticisation of some determinants. Despite this shortcoming, GENIAL remains a valuable metatheoretical framework for understanding wellbeing. By offering a holistic understanding of the interconnected biological, psychological, and social determinants of wellbeing, it provides an organised and conceptually robust platform for exploring how certain populations face heightened challenges in achieving and sustaining wellbeing due to restricted capacities and external constraints. For individuals facing such barriers and requiring substantial adaptability to achieve good health, transdisciplinary models rooted in wellbeing science offer valuable, evidence-based frameworks from which to consider their unique, often unmet needs.

The focus of the present thesis is on individuals living with ABI; a population that experiences considerable adversity and restricted opportunities for wellbeing yet also demonstrates substantial potential for personal growth and adaptation. By considering ABI through the lens of wellbeing theory, we can move beyond the limitations of a reductionist, medicalised model of health and better understand how these individuals navigate their recovery. This holistic perspective, which considers the individual in context, aligns with the growing shift in psychology towards recognising the importance of understanding individuals within the broader social, cultural, and power structures that shape their experiences. For instance, consistent with the GENIAL framework, the PTMF challenges the idea that distress or difficulty, including that experienced after ABI, is simply an individual problem. Instead, it frames adversity as often being shaped by external social and political factors, which influence how people experience, interpret, and respond to their challenges. Wellbeing theory, when applied in this way, facilitates the development of tailored interventions that address not only the medical needs of individuals with ABI but also their broader psychosocial and existential needs, leading to a more holistic, empowering, and person-centred recovery process. Accordingly, the following section provides an overview of the unique challenges inherent to life with ABI.

## 1.2 Acquired Brain Injury: Causes and Consequences

ABI is an overarching term referring to any post-natal damage to the brain (Teasell et al., 2007). Typically dichotomised according to how this damage is sustained, ABI includes traumatic and non-traumatic sub-types. Traumatic brain injury (TBI) results in focal or diffuse brain damage caused by external biomechanical forces, often resulting from falls, road traffic accidents and assaults. Injuries that occur from a non-traumatic nature are typically those that result in neuronal death or damage following a lack of oxygenated blood supply such as that following stroke, anoxia or hypoxia, or following viral infection and inflammation such as encephalitis. Infarcts in this regard can damage the neural circuits involved in a variety of processes, causing an array of neurological complaints, particularly for those with moderate to severe injury (Fordington & Manford, 2020). For example, TBI is associated with an increased risk of epilepsy that remains for decades after the initial trauma and worsens with repeated insult (Lolk et al., 2021; Lowenstein, 2009). Chronic headaches, sensory loss, sleep disturbances (Cantor et al., 2008; Rauchman et al., 2023) and pathological fatigue are common, with up to 70% of individuals with TBI reporting persistent symptoms (Cantor et al., 2012; Castriotta & Murthy, 2011; Ponsford et al., 2012). These symptoms often interact and reinforce one another, creating a self-perpetuating cycle (Beaulieu-Bonneau & Ouellet, 2017). The consequences of ABI vary from person to person depending on the nature, location, and severity of the injury. However, it can have wide-ranging and often pervasive effects across physical, cognitive, behavioural, social and emotional domains (Milders et al., 2003), with significant implications for an individual's wellbeing. Among the challenges that are more apparent to others, physical impairments are typically the most immediate and overt consequences of ABI.

## 1.3 Physical Impairments: Movement and Mobility

Physical impairments following ABI stem from the death or damage of neurons within specific brain regions or pathways which contribute uniquely to the complex process of motor functions and movement, such as the primary motor cortex, premotor cortex, cerebellum, basal ganglia and the brain stem. Neuronal damage in these areas also interrupts the communication between different areas of the brain involved in planning, initiating, and controlling movement, as well as between the brain and the spinal cord, which relays motor signals to the muscles. Motor impairment can be conceptualised as the loss or limitation of function in muscle control or movement, resulting in reduced mobility (Wade, 1992) and manifesting as weakness, balance problems, paralysis, or coordination difficulties (Todhunter-Brown et al., 2014). Approximately 80% of individuals experience some form of motor impairment post-stroke, such as hemiparesis, where weakness and paralysis affect one side of the body (Langhorne et al., 2009). Similarly, individuals with TBI frequently experience impairments related to balance, coordination, and fine motor skills, making activities of daily living, such as walking or grasping objects, significantly more difficult. This is exacerbated by cardiorespiratory dysfunction (Hamel & Smoliga, 2019) amongst other physiological difficulties. Duly, engagement in physical activity declines, and discontinuation of recreational physical activities (e.g., sports participation) in exchange for sedentary behaviours is observed (Hamel & Smoliga, 2019; Wise et al., 2010). Overall, individuals living with ABI demonstrate reduced engagement in physically demanding activities (Goverover et al., 2017) and insufficient levels of physical activity (Hamilton et al., 2016) than that required for good physical health. Prolonged inactivity places individuals with ABI at increased risk of physical health complications such as cardiovascular disease, hypertension, obesity, and diabetes; subsequently increasing the risk of premature mortality (Warburton et al., 2006). Given the links between physical and mental health and the mediatory role of vagal function, prolonged inactivity can also have a negative downstream effect on psychological wellbeing, placing sedentary individuals at increased risk of poor mental health. Meanwhile, the loss of functional mobility and independence experienced secondary to physical limitations can restrict participation in social and recreational activities, particularly when access to transport and community spaces is challenging. These environments provide key contexts for social engagement, amongst other determinants critical for wellbeing. The cumulative effects of mobility limitations, therefore, extend into various aspects of the individuals' life, demonstrating how deeply intertwined physical challenges are with broader wellbeing after brain injury. It is these broader but often invisible implications that present the greatest burden to individuals and their families following brain injury (Ponsford et al., 2003). These include cognitive, behavioural, psychosocial and emotional changes.

## 1.4 Hidden Challenges: Cognitive and Behavioural Difficulties

Cognitive difficulties and associated behavioural challenges are amongst the most challenging aspects of life post-ABI – for both the individual and their families (Ponsford et al., 2003). Brain injury, particularly that of a traumatic nature, predominantly causes damage to the frontal and temporal regions (Stuss, 2011), located at the front and innermost sides of the brain. The frontal lobes are critically involved in human emotional and social behaviours, with distinctive regions such as the ventral prefrontal cortex defining components of human individuality, including one's emotional reactions and responsiveness, self-regulation and awareness, emotional aspects of decision making and social behaviour (Stuss & Levine, 2002). Accordingly, the presentation of deficits in these areas may include impulsivity and motivational or energisation difficulties. Meanwhile, the dorsolateral pre-frontal cortex is involved in language, attention and memory processes, such that lesions in this area are associated with a range of difficulties in the encoding, organisation and retrieval of memories (Stuss & Levine, 2002), further to problems with attention control, rule-learning, planning and problem solving (Szczepanski & Knight, 2014). Individuals may therefore exhibit deficits in responding to novel stimuli compared to their non-injured counterparts (Daffner et al., 2000) and may present with apathy and behavioural slowness, amongst other difficulties (Szczepanski & Knight, 2014). Collectively, the areas of the prefrontal cortex and its neural circuitry govern executive functions: defined as higher-order cognitive abilities involved in the control, direction and regulation of lower-level cognitive operations (Stuss & Levine, 2002). Executive function deficits are particularly common after TBI, affecting individuals even with mild injuries (Konrad et al., 2011). Deficits in this area are not only persistent but may also be more predictive of functional disability than demographic or injury-related factors, affecting an individual's ability to engage in everyday tasks and goal-directed behaviours (Rabinowitz & Levin, 2014), such as cooking, shopping, driving and managing finances. These behaviours are crucial for functional independence, affecting job performance and personal relationships. Moreover, challenges such as slowed information processing, reduced motivation, and impulsivity can significantly alter social behaviour (Rochat et al., 2009), while communicative impairments, including speech and language difficulties, often hinder an individual’s ability to engage in conversations after ABI. Moreover, cognitive impairment can deeply affect one’s willingness and ability to meaningfully engage with social networks, leading to prolonged and persistent loneliness that triggers a cascade of consequences for psychological, physiological and emotional wellbeing.

## 1.5 The Psychological Impact: Self-Identity After ABI and Dealing with Personal and Social Disruptions

The psychological impact of ABI is profound, particularly regarding self-identity and social disruption. Identity can be understood as how an individual perceives themselves within the context of their world (Versace et al., 2024), and for those with ABI, this perception is often dramatically altered. Research indicates that up to 72% of individuals with ABI experience some form of identity disturbance (Levack et al., 2014). This disturbance manifests on a spectrum, from a vague sense of no longer being the person one was, to a complete loss of personhood (Levack et al., 2010), with some individuals describing feeling as though they ‘no longer feel like a person’ (Kuenemund et al., 2016). Studies have identified key factors contributing to this disruption, such as memory loss (which impedes access to one's self-history), changes in ability and function, and the inability to perform previously valued roles (Villa et al., 2021). These shifts are often accompanied by overwhelming changes in daily life and self-perception (Muenchberger et al., 2008; Roscigno & Van Liew, 2008). The emotional distress that follows can include feelings of being “broken inside” as individuals come to terms with the trauma of their injury and the ensuing physical, cognitive, and emotional changes (Lowe et al., 2021).

Social Identity Theory (Tajfel, 1979) provides insight into how disruptions in social networks further compound identity disruption. The theory suggests that one's sense of self is shaped by social group memberships, which help define and reinforce identity. For individuals with ABI, the loss of social connections results in a dual loss: not only do they lose tangible support, but their sense of self also diminishes (Haslam et al., 2008). Social relationships are essential in maintaining continuity and belonging, both of which are vital for wellbeing. Disruption in these networks leaves individuals feeling isolated and disconnected, further undermining their identity (Haslam et al., 2008). Additionally, the loss of occupational and leisure roles exacerbates identity disturbance, as identity is also shaped through occupational engagement (Brown et al., 2024). ABI often prevents individuals from returning to work or engaging in hobbies that once provided meaning and structure to their lives (Rauchman et al., 2023). Studies show that a significant percentage of individuals with ABI experience changes in their work or leisure activities long after the injury, with less than half returning to previous roles even years after the injury (McKevitt et al., 2011; Ponsford et al., 2014). This loss of meaningful roles not only impacts economic stability but also strips individuals of opportunities for self-fulfilment (Donker-Cools et al., 2016; van Velzen et al., 2009), which is crucial for overall wellbeing (Seligman, 2011). Many individuals feel grief over unfulfilled aspirations and disrupted life goals (Gracey et al., 2009), with qualitative research capturing how brain injury survivors often feel left behind, watching peers advance in life while they struggle to reclaim their own path (Lowe et al., 2021).

A sense of belonging and community is central to eudaimonic wellbeing, with meaningful social connections providing emotional support and opportunities for personal growth (Ryff, 1989). Participation in a community creates opportunities for individuals to contribute, feel valued, and experience mutual support, reinforcing a sense of purpose and self-worth (Hagerty et al., 1992). However, individuals with ABI face significant challenges in reintegrating into their communities. Cognitive impairments, physical disabilities, and emotional challenges such as anxiety and depression make it difficult to re-establish social networks and engage in community activities (Turner et al., 2008). Societal stigma and inaccessibility further hinder inclusion (Ownsworth et al., 2024). Loss of roles, such as employment or family responsibilities, diminish opportunities for community participation and the sense of meaning and purpose that comes from engagement (Levack et al., 2010). This lack of engagement can worsen emotional dysregulation, increasing the risk of mood disorders, such as depression and anxiety, and reducing opportunities for adaptation (Rabinowitz & Levin, 2014).

## 1.6 The Emotional Sequalae of ABI: The Consequences of Change, Identity Loss and Social Isolation

The emotional sequelae of ABI are considerable, with individuals often experiencing profound psychological distress (Ayerbe et al., 2014; Hackett et al., 2005). ABI is associated with much higher rates of depression than the general population, with post-stroke depression linked to worse rehabilitation outcomes and increased risk of mortality and suicide (Ayerbe et al., 2013; Gillen et al., 2001). Those with ABI and concurrent depression face a significantly higher risk of suicidal ideation (Teasdale & Engberg, 2001), and the risk remains elevated for years after the injury (Perrin et al., 2022). The biopsychosocial model helps explain this elevated risk, highlighting the interaction of biological, psychological, and social factors (Molina, 1983; Osborn et al., 2014). Neuroanatomical and neurochemical changes after ABI affect mood regulation (Jorge & Starkstein, 2005), while identity loss, diminished self-worth, and deteriorating interpersonal relationships contribute to depression (Douglas, 2020). The shift in self-concept caused by ABI is linked to increased depression and suicidality (Knight et al., 2020). Survivors of ABI face the challenge of reconstructing their sense of self in the face of profound life changes, often redefining their values, beliefs, and life goals in the process.

## 1.7 Adjustment to Life Post-ABI: Identity (Re)construction and Self-Reflective Meaning-Making

Given the profound and often permanent changes associated with ABI, returning to a pre-injury status is nearly impossible. While the term ‘recovery’ is commonplace when discussing the personal journey post-ABI, the concept of recovery as a return to pre-injury functioning is not only unrealistic but also potentially unhelpful. Instead, the personal journey should be conceptualised as one of ‘rebuilding’ - a process of constructing new meaning and purpose within the altered context of life post-injury (Park, 2022). This reframing allows individuals to embrace change, cultivating a fulfilling life rather than attempting to recreate a past version of themselves. Emphasising the inherently personal process of transformation over restoration, Morris (2004) aptly likens this journey to a phoenix rising from its ashes, as opposed to the gluing of pieces of a shattered mirror back together. Hutton and Ownsworth (2019) and Hjelmblink et al. (2007) note that this adjustment is about reconstructing identity, which can be challenging when individuals struggle to integrate their pre- and post-injury selves. Gracey et al. (2009) introduce the ‘Y-shaped model’ of ABI adjustment, in which individuals blend old strengths with new capabilities to create a realistic and adaptive self-concept. This process of meaning-making, supported by activities such as community participation and peer support, is non-linear and involves multiple, sometimes conflicting challenges. However, for individuals to navigate a sense of self that incorporates both past capabilities and present realities, acceptance of oneself (including one's injury) is necessary.

Acceptance is a pivotal component of psychological adjustment after ABI. It encompasses two key dimensions: acceptance of oneself (including one's injury) and acceptance of one's mental experiences, characterised by a non-judgmental attitude toward thoughts and emotions. Self-acceptance involves acknowledging the changes in abilities and identity without excessive self-criticism, which supports the development of an adaptive self-concept (Gracey et al., 2009). However, many individuals with ABI experience negative self-perceptions, rejecting their altered identity or the injured aspects of themselves (Beadle et al., 2016; Lowe et al., 2021). Adjustment theories often describe a staged journey where individuals grieve their past self before reaching acceptance, allowing them to reconcile their new identity and regain a sense of hope for the future (Vaghela et al., 2021). Acceptance of oneself is crucial for reconnection with others, as it underpins the ability to engage in meaningful social interactions and rebuild relational roles (Lowe et al., 2021). Similarly, non-judgmental acceptance of mental experiences - central to approaches like Acceptance and Commitment Therapy (ACT) - helps individuals respond constructively to emotional distress (Hayes et al., 1999). Studies suggest that this form of acceptance reduces emotional reactivity and fosters resilience, perhaps because acceptance helps individuals to experience less negative emotion in response to stressors (Ford et al., 2018). How individuals respond to or cope with stress is a key part of psychological adjustment.

Effective post-ABI adjustment involves altering cognitive, emotional, and behavioural responses to challenges. Lazarus and Folkman's (1987) transactional model of stress and coping emphasises that the way individuals appraise their situation and their perceived ability to cope are crucial in managing stress (Lazarus & Folkman, 1987). In the context of ABI, adaptive coping strategies, such as a balance of problem-focussed and emotion-focussed coping, are essential. Avoidance strategies, such as denial, has been linked to poorer psychological outcomes and hindered recovery (Anson & Ponsford, 2006). A flexible combination of problem-solving approaches, alongside emotion regulation, fosters better outcomes (Malia et al., 1995). Moreover, social support plays a critical role in psychological adjustment. Studies show that individuals who receive support from family and peers navigate the adjustment process more effectively, helping them integrate their new self-concept and achieve resilience (Fadyl et al., 2019; Kessler et al., 2014). Social support networks facilitate acceptance by reinforcing adaptive changes and helping individuals integrate their new self-concept into their broader social identity, with the findings of one meta-analysis of 14 studies suggesting that external validation can expedite acceptance, ultimately promoting psychological resilience (Vaghela et al., 2021). Thus, psychological adjustment to ABI is a dynamic and multifaceted process shaped by personal, social, and contextual influences. It requires individuals to navigate grief and loss, develop self-acceptance, employ adaptive coping strategies, and leverage social resources. The interplay of these factors determines the extent to which individuals can rebuild their lives and achieve a meaningful and fulfilling post-injury identity. Notably, some scholars suggest that the process of successful psychological adjustment post-injury both precedes and is evidenced by post-traumatic growth (Vaghela et al., 2021).

## 1.8 Post Traumatic Growth: Making Meaning from Adversity

Post-traumatic growth (PTG) is a psychological concept that refers to positive psychological change resulting from the navigation of highly challenging life experiences (Tedeschi & Calhoun, 1995). Unlike resilience, which reflects ‘bouncing back’ to baseline functioning, PTG suggests a transformation that leads to a higher level of functioning, with this being characterised by a greater appreciation for life, stronger relationships, and a deeper sense of personal strength following stress or trauma (Tedeschi & Calhoun, 1995). There is strong evidence of PTG in adults with mixed severity and aetiologies of ABI, including TBI and stroke, with individuals reporting positive changes in outlook years post-injury, including an increased appreciation of life and meaningful relationships within it (Hawley & Joseph, 2008; Kuenemund et al., 2016). Reviews of the literature also highlight the role of self-discovery, overcoming obstacles and finding inner strength as key pathways through which PTG may be cultivated in ABI populations, in addition to finding strength in connection and an increased appreciation for the present moment (Arroyo et al., 2024; Lyon et al., 2021). While a longer time since injury has typically been associated with PTG via meta-analyses (Grace et al., 2015), qualitative evidence suggests that positive psychological changes indicative of PTG can emerge in stroke survivors as early as six months post-event (Gillen, 2005).

According to Tedeschi and Calhoun’s (2004) functional descriptive model of growth, PTG emerges as individuals attempt to make sense of their trauma and integrate the experience into their lives in a meaningful way. Growth arises from a process involving the shattering of core beliefs, emotional distress, deliberate rumination, and the eventual development of new cognitive schemas, which enable individuals to reframe their traumatic experiences in a positive manner and integrate the experience of their injury into their personal narrative (Tedeschi & Calhoun, 2004). As stated by Prati and Pietrantoni (2009), this reframing does not entail denial of the effects of the trauma, but rather helps to reveal pathways, following trauma, from which one may see “light at the end of the tunnel” (Almedom, 2005). Various factors have been linked to PTG, including adaptive coping and the use of positive reappraisals, optimism, spirituality and acceptance (Helgeson et al., 2006; Joseph & Linley, 2006; Linley & Joseph, 2004; Powell et al., 2012; Prati & Pietrantoni, 2009; Versace et al., 2024). For example, research has found that letting go of negative feelings towards one’s new identity and accepting and embracing one’s post-injury self can pave the way for PTG (Allen et al., 2022). Meanwhile, research has highlighted the role of spirituality in meaning-making following ABI, with this comprising “the way individuals seek and express meaning and purpose and the way they experience their connectedness to the moment, to the self, to others, to nature, and to the significant” (Puchalski et al., 2009). In this way, spirituality can be found through a connection to communities, meditation, nature, and the self (Davis et al., 2015), with connection being at the core of pathways to wellbeing (Kemp & Fisher, 2022; Mead et al., 2021). An external factor proposed to contribute to experiences of PTG is social support, which plays a crucial role in shaping coping behaviours and facilitating adaptation to life crises (Schaefer & Moos, 1998). However, the reality is that many individuals living with brain injury experience significant barriers to accessing meaningful social connections, often facing profound loneliness and social isolation.

## 1.9 The Social Impact of ABI: Stigma, Social Isolation, and Pervasive Loneliness

Loneliness has been described as a silent plague of epidemic proportions in modern society, affecting a wide range of populations across the globe (Gil, 2014; Holt-Lunstad et al., 2015), as predicted a decade ago (Linehan et al., 2014). Whilst the terms loneliness and social isolation are often used interchangeably, persistent loneliness encompasses the qualitatively subjective feeling that one's social needs are unmet - or a dissatisfaction with the discrepancy between desired and actual social relationships (Peplau & Perlman, 1982). It is highly differentiable to social isolation, which refers to a reduced *quantity* of social relations and can thus be quantified in terms of the size of one’s social network, its composition, and the frequency and length of interactions (Zavaleta et al., 2014). Living alone, having few social network ties, and having infrequent social contact are all markers of social isolation (Holt-Lunstad et al., 2015). While social isolation concerns the objective aspect of social interactions, loneliness is a deeply personal internal experience and subjective emotional state that can persist despite the size of one’s social network (Holt-Lunstad et al., 2015; Lowe et al., 2021). A person with a small social network may feel satisfied if their emotional and social needs are being met, while someone with a larger network may feel profoundly lonely if their connections lack depth and support, despite frequent contact (Byrne et al., 2021; Salas et al., 2022). Whilst having a reduced social circle may be considered to contribute to feelings of loneliness, the two constructs are not significantly correlated (Coyle & Dugan, 2012; Perissinotto & Covinsky, 2014), though individuals may experience both simultaneously. Models of psychological and individual wellbeing place significant emphasis on the importance of social connections for good health and wellbeing. This is in recognition of the harrowing effect of loneliness on health and wellbeing.

Loneliness has emerged as one of the strongest predictors of depression, emotional wellbeing, and overall quality of life for individuals with ABI living in community settings (Salas et al., 2022), with loneliness itself being more prevalent in this population than depression (31%) and anxiety (20%) respectively (Schöttke & Giabbiconi, 2015). Social isolation not only exacerbates feelings of loneliness but also correlates directly with poorer health outcomes and wellbeing. Studies have demonstrated a clear relationship between social networks and mental health among individuals with ABI. For example, Finset et al. (1995) found that the frequency and quality of social interactions were strongly related to depression levels two years post-injury. Similarly, Gomez-Hernandez et al. (1997) documented that impaired social relationships correlated with increased depression at 6-, 9-, and 12-months post-injury. Social isolation and loneliness contribute to a notable decline in life satisfaction among those with brain injuries, irrespective of injury severity (Koskinen, 1998), demonstrating the critical role that meaningful social connections play in determining one’s quality of life. Crucially, loneliness and social isolation not only affect the individual's subjective emotional and psychological state; they are also robustly linked to objective health outcomes.

It is well-known within fields of health and human sciences that loneliness can have a deleterious effect on one’s physical and psychological wellbeing, with much research demonstrating positive correlations between loneliness and increased morbidity and mortality

(Cacioppo & Patrick, 2008; Holt-Lunstad et al., 2015). Large meta-analytical reviews of data from 70 independent prospective studies, with 3,407,134 participants followed for an average of 7 years have demonstrated that individuals who are socially isolated, lonely, and/or live alone have a 26–32% increased risk of mortality, with social deficits being more predictive of mortality in middle aged adults (i.e., those below 65 years of age). Whilst health status had some influence in this regard, effects were consistent across gender and geographical location and significant whether measured objectively (i.e., social isolation, living alone) or subjectively (i.e., in terms of loneliness), hereby adding substantial predictive evidence for the impact of a dearth of social connection on physical health (Holt-Lunstad et al., 2015). In fact, the mortality risk associated with being or feeling lonely is comparable to well-established risk factors for mortality such as smoking and exceeds that for physical inactivity, obesity and high cholesterol (Flegal et al., 2013; Holt-Lunstad et al., 2010; Pantell et al., 2013). Individuals facing both high levels of loneliness and social isolation often experience the worst health and wellbeing outcomes (Pressman et al., 2005). Unfortunately, the chronic experience of both social isolation and loneliness is the reality for many individuals living with ABI (Morton & Wehman, 1995).

Australian research into the long-term effects of ABI has highlighted that a significant decrease in the quantity and quality of meaningful relationships and friendships is one of the major long-term consequences of injury (Douglas, 2020), highlighting incidences of both social isolation and loneliness. This decline is well documented across studies, with evidence showing that the social networks of individuals living with ABI often shrink after their injury (Dijkers, 2004; Finset et al., 1995), with adults living with ABI reporting notably higher levels of loneliness compared to the general population. In fact, research utilising national survey data for Wales suggests that 30-44% of individuals experience loneliness post-stroke and are 70% more likely to report loneliness compared to those without neurological deficits (Byrne et al., 2021). Such findings have been replicated in other countries, with US research for example reporting that adults with a history of brain injury experience greater loneliness compared to those without brain injury in a representative sample (Kumar et al., 2020). Qualitative research has emphasised the pervasive sense of internal loneliness experienced by adults with ABI, with participants describing feeling lonely in crowds, within their intimate relationships with friends and family, and even in terms of being separated from themselves (Lowe et al., 2021).

For those living with ABI, social isolation and loneliness are the result of challenges in both maintaining and establishing social relationships. Many report difficulties in keeping old friendships, creating new connections, and participating in routine social activities such as visiting friends or family, attending social events, or even talking on the phone (Tomberg et al., 2005). For some, these challenges stem from communication difficulties, particularly among those with post-ABI aphasia, a language disorder that impedes both expression and comprehension. Studies show that individuals with aphasia experience particularly high levels of social isolation and loneliness, with less diverse networks compared to older adults, fewer opportunities for conversation, and greater difficulty in maintaining friendships even compared to individuals with brain injury but no aphasia (Blom Johansson et al., 2012; Northcott & Hilari, 2011). However, difficulties with conversational skills nevertheless impact experiences of friendships in those without aphasia, with qualitative research emphasising the role of impaired conversational skills in reducing participation levels and self-disclosure in severe-TBI populations, for example (Shorland & Douglas, 2010). Self-report data from stroke populations similarly demonstrate that those with communication difficulties are significantly more likely to experience negative changes in their relationships with their loved ones (McKevitt et al., 2011). Cognitive and behavioural challenges associated with ABI further complicate social engagement efforts, contributing to what is often a persistent cycle of loneliness.

The Reaffiliation Motive model, proposed by Qualter et al. (2015) and contextualised by Byrne et al. (2022), offers insight into how cognitive mechanisms post-ABI may shape social behaviours and contribute to prolonged loneliness. While evolutionary theories of loneliness describe loneliness as an adaptive signal that motivates individuals to seek social connections (Cacioppo & Cacioppo, 2018), this model highlights a paradox. Although loneliness triggers a desire for social reintegration, it also heightens hypervigilance towards social cues and perceived threat. This results in withdrawal behaviours, as opposed to engagement in approach behaviours that facilitate connection. During this time, the individual cognitively appraises their social landscape. Neurotypical individuals typically navigate this complex process of reaffiliation by drawing upon executive cognitive and meta-cognitive processes and regulating their emotions and behaviours. However, the cognitive and behavioural impairments associated with ABI severely hinder this reaffiliation process. Maladaptive cognitive biases (such as attentional and attributional biases), language difficulties (e.g., aphasia), and social rejection from others - who may not understand the visible and hidden sequalae of ABI - further complicate reaffiliation efforts and reinforce withdrawal behaviours (Byrne et al., 2022).

There is much research to suggest that the visible and hidden sequelae of ABI are often poorly understood by the general public (Code et al., 2016), which can cause individuals with ABI to feel “abnormal” (Prigatano, 1999), profoundly different from their pre-injury selves (Villa et al., 2021) and misunderstood by those around them (Salas et al., 2018). This is exacerbated by social feedback from friends and family, which often coincides with a loss of autonomy, prompted by a lack of decision-making opportunities with the authority for such being assumed by others (Villa et al., 2021). Individuals living with ABI face social rejection and stigma from the public, within personal relationships and institutionally (Villa et al., 2021). In this regard, stigma comprises a sociocontextual factor that arises from societal attitudes and norms, influencing individuals' opportunities, social interactions, and overall wellbeing. Social stigma has been associated with greater psychological distress early in the recovery period, with those who perceive high levels of stigma showing poorer long-term community reintegration outcomes up to a year post-discharge (Ownsworth et al., 2024). This may be because stigma often forces individuals into a pattern of social withdrawal and concealment, which only further isolates them. Fearing the reaction of others, individuals with ABI internalise a sense of shame and embarrassment, causing them to avoid social engagement, withhold disclosure of their injury, and/or conceal their difficulties to avoid negative responses from others (Hagger & Riley, 2017; Lowe et al., 2021; Shorland & Douglas, 2010). The act of concealing ABI symptoms, while intended to shield individuals from stigma, often exacerbates stress and social anxiety due to the ongoing threat of exposure (Crisp, 1993; Hagger & Riley, 2017). Quantitative research has shown that this concealment is associated with lower self-esteem, and social anxiety mediates the negative impacts on community involvement, social avoidance, and feelings of loneliness (Hagger & Riley, 2017) Meanwhile, qualitative research has highlighted how concealment can create barriers to genuine connections, further pushing people with ABI toward isolation and enduring loneliness (Lowe et al., 2021).

Qualitative research utilising contextualist thematic analysis has revealed that individuals with ABI may feel internalised stigma and shame so intensely that they reject or distance themselves from the ‘injured part’ of their identity, which compounds feelings of disconnection from both the self and others. Participants in a qualitative study by Lowe et al. (2021) reported that this internalised stigma was one of the greatest barriers to reengaging in society, highlighting the complex interplay between external social stigma and internal psychological processes. Many participants expressed a desire for visible markers of their injury, believing that visible signs might encourage greater understanding from the public (Lowe et al., 2021). Visible disabilities, though more prone to overt social stigma, can sometimes help others understand and appropriately accommodate those affected. In contrast, hidden disabilities can provoke unrealistic expectations and exacerbate misunderstandings about the abilities of individuals with ABI, leading to unmet needs and emotional distress. This aligns with the work of Gilworth et al. (2008), who found that a lack of visible markers contributes to misunderstanding within the social environment, reinforcing symptom concealment and deepening the cycle of social withdrawal and loneliness (Byrne et al., 2022). Finally, the loss of social networks following ABI profoundly impacts one's self-concept and identity. Social relationships not only reinforce self-worth but also help shape individual identity. When these connections are strained or lost, individuals with ABI may experience an ongoing fragmentation of identity, which reinforces their feelings of isolation and further complicates efforts toward (re)engagement with their social world (Lowe et al., 2021).

For many individuals living with ABI, personal relationships may not only become sources of disconnection but also strain or harm. Research reveals that up to 54% of families experience relationship problems post-stroke, with 38% of couples reporting overt conflict, illuminating the fragile dynamics that can emerge in caregiving relationships (McCarthy et al., 2020). Thus, existing social relationships may not always function as protective or nurturing resources for people with ABI. Additionally, individuals with ABI may be particularly vulnerable to negative or exploitative relationships. Physical, cognitive, emotional, and communicative impairments are risk factors for exploitation (Lambert et al., 2025) that can compromise capacities to recognise risk, assert needs, and maintain healthy boundaries. While there is a dire lack of research that directly examines the dynamics of exploitative or harmful relationships following ABI, exploitation often arises in contexts of power imbalance, and these impairments, in addition to health behaviours and social factors such as employment and housing, are likely to create or exacerbate these disparities (Lambert et al., 2025; Zhang et al., 2023). This further emphasises that, for people living with ABI, the *quality* of social connections is as important as their presence, underscoring the need for careful consideration to avoid romanticisation of pathways to wellbeing as universal entities.

## 1.10 Conclusion

This chapter presents a holistic and integrated approach to understanding health and wellbeing in the context of ABI. After introducing a broad range of wellbeing theories across multiple levels of scale, it highlights the value of the GENIAL framework - a metatheoretical framework that unifies diverse perspectives and emphasises the dynamic interplay between psychological, biological, and social factors. This chapter illuminates the cascading impact of ABI at multiple levels, stressing the interconnected nature of these challenges and the need for solutions that consider the whole system. It provides a detailed overview of how the experience of ABI profoundly impacts an individual's wellbeing, with long-term consequences that span physical, cognitive, emotional, and social domains. For example, ABI can hinder a person's ability to re-engage in society, maintain relationships, and participate in meaningful activities, all of which are essential for wellbeing. However, promising evidence suggests that, despite these challenges, there reside opportunities for PTG. Factors such as adaptive coping, social support, optimism, acceptance, and spirituality can help individuals navigate this adversity, fostering positive psychological changes. Yet, barriers such as depression, social isolation, and a loss of self-identity can restrict opportunities for growth, while systemic influences, such as socio-economic status, access to support, societal stigma, and environmental stressors, also play a critical role in the rebuilding process (Domensino et al., 2022). These factors, while not always directly related to the injury, can profoundly affect mental health, coping strategies, and long-term rehabilitation outcomes.

By considering broader determinants such as those described, the holistic wellbeing model acknowledges that recovery (or rebuilding) in the context of ABI is not solely a physical or cognitive process, but a complex interplay of biological, psychological, social, and environmental factors. This integrated approach aligns with a significant shift in clinical psychology, exemplified by the PTMF, which challenges traditional clinical models that often focus on identifying what is '*wrong*' with a person. Rather than pathologising individuals, the PTMF encourages clinicians to ask, "*What happened to this person, and what didn't happen for them?*" This reframing highlights the importance of understanding a person's experience within their broader sociocultural and historical context, rather than simply locating the problem within them. In keeping with this shift, the limitations of a medicalised approach to brain injury become apparent as well as the utility of moving towards a more inclusive approach that captures the full complexity of ABI's impacts. The next chapter will explore how the health system supports individuals with ABI, focussing on the role and limitations of neuropsychological rehabilitation in promoting recovery, rebuilding and growth post-injury.

# 2 Chapter Two: Neurorehabilitation After Acquired Brain Injury and the Potential Contributions of Wellbeing Science

This chapter examines the evolving landscape of holistic neurorehabilitation, outlining its core aims, goals, and guiding principles and the evidence-base for its effectiveness. However, this chapter highlights that while holistic approaches seek to enhance recovery, clinical practice remains largely deficit-focussed, prioritising functional gains over a more comprehensive approach to supporting whole health and wellbeing. Many current interventions address isolated aspects of health rather than integrating them holistically, a challenge further compounded by the absence of transdisciplinary frameworks to guide intervention design. To bridge these gaps, the chapter introduces the transdisciplinary 'meta' theoretical 'GENIAL' framework of wellbeing as a potential solution, illustrating how insights from wellbeing science can enrich neurorehabilitation practice. By shifting the focus beyond symptom management, the framework offers a structured approach to fostering whole health and wellbeing, providing a foundation for more integrated, sustainable, and person-centred rehabilitation.

## 2.1 ABI: A Pressing Healthcare Challenge

ABI is a global challenge with far-reaching implications for healthcare systems and economic sectors worldwide. It is one of the most prevalent neurological conditions, affecting an estimated 1.3 million people in the United Kingdom (UK) alone (Barber et al., 2018). While annual estimates vary, statistics suggest approximately 356,699 individuals were admitted to UK hospitals with an ABI-related diagnosis between 2019-2020, reflecting a 12% increase from 2005-2006 (Headway, 2019). Many contemporary admissions are traumatic in nature, with motor vehicle accidents constituting the leading cause of hospitalisation for TBI, particularly among young adults (McKinlay et al., 2014; Styrke et al., 2007). Falls are a secondary leading cause of TBI across populations, however, they are notably common among the elderly, reflecting the increased risk associated with ageing, balance issues, and comorbid health conditions (Faul et al., 2010; Rubenstein, 2006). Systematic analyses from the Global Burden of Disease Study (Feigin et al., 2021) reported that, among non-traumatic brain injuries, stroke was the second leading cause of death and the third leading cause of combined death and disability in 2019. According to the Office for National Statistics (2017), the number of stroke cases has increased substantially in the last two decades alone. Medical advancements have contributed to an increase in survival rates following ABI events, meaning more people than ever are living well into older adulthood despite experiencing significant medical trauma. Crucially, many of these individuals experience a poor quality of life, with research indicating that even a decade after injury, their life satisfaction remains significantly lower compared to sex- and age-matched controls - especially in cases of more severe ABI (Jacobsson & Lexell, 2013).

Although the true human cost of brain injury is difficult to quantify, recent efforts have sought to make its impact on quality of life more visible in contexts where economic arguments often carry the most weight in policy and service planning. A newly published report by the UK Acquired Brain Injury Forum (UKABIF) has estimated that the wellbeing cost of ABI equates to £91.5 billion annually (UKABIF, 2025). These estimates reflect not only the profound reduction in quality of life for those directly affected, but also the ripple effects on carers and families across the trajectory from diagnosis through treatment, long-term morbidity, and premature mortality. Stroke alone is estimated to account for £24.2 billion of this total, reflecting its high prevalence and long-term effects. These figures are calculated using quality-adjusted life years (QALYs), which quantify reductions in mobility, self-care, usual activities, pain and discomfort, and anxiety or depression. However, even these estimates understate the true cost of ABI to wellbeing. Averages mask the depth of emotions and psychological impacts felt by individuals, which depend not only on the type and severity of injury, but also on factors such as family and social support. Moreover, standardised measures such as QALYs capture only a narrow subset of impacts. They fail to account for changes in identity, loss of autonomy, diminished sense of control and disrupted social connections, all of which have profound effects on wellbeing post-ABI, as highlighted in Chapter One. Thus, these figures should be interpreted with caution. Even so, these estimates help elevate considerations of wellbeing within policy discussions and economic analyses, particularly given the impact of poor life satisfaction and quality of life on long-term health service use.

Given the tight interconnectedness between psychological and physical health (as outlined in Chapter One), lower life satisfaction and a low sense of general wellbeing are associated with poorer physical health outcomes and increased healthcare utilisation (Boehm & Kubzansky, 2012; Steptoe et al., 2015). For example, research indicates that individuals with low life satisfaction are at a higher risk of developing chronic health conditions, such as cardiovascular disease, and may experience a decline in immune function, leading to increased susceptibility to illness and a greater need for medical intervention (Diener & Chan, 2011; Kubzansky & Thurston, 2007). These health risks are particularly concerning for individuals with brain injuries, who already face challenges including reduced mobility and significant lifestyle changes post-injury (highlighted in Chapter One), which can further exacerbate risk for these health issues (Corrigan & Hammond, 2013). This problem is compounded by the fact that TBI most commonly occurs in young adults who may spend decades living in poor health (McKinlay et al., 2014; Styrke et al., 2007). Complicating matters further is the societal tendency to equate disability primarily with older adults or those with developmental disabilities, often overlooking the unique and enduring needs of young adults with brain injury. This lack of awareness can lead to inadequate support systems, misaligned healthcare priorities, and a societal underestimation of the long-term care needs of this population. Consequently, this places a significant burden on the National Health Service (NHS) in the UK, which is renowned for providing free healthcare at the point of use and prioritising care based on need, rather than the ability to pay.

The NHS is a cornerstone of British social welfare. First established in 1948 and built according to a medical model of care (introduced in Chapter One), this part-publicly funded healthcare system was primarily designed to treat acute illnesses and injuries through a system of hospitals and general practitioners. This model focussed on diagnosing and treating specific medical conditions, often with a strong emphasis on acute physical conditions and curative approaches rather than preventive or long-term care. While this has contributed to increased longevity on a global scale (Roser et al., 2013), healthcare needs have evolved considerably. Chronic and long-term conditions have now surpassed acute conditions as leading burdens of morbidity, mortality, and healthcare expenditure (Bolnick et al., 2020; Roth et al., 2020). ABI represents one of the most pressing public health challenges faced in this context. The high incidence of hospital visits, extended rehabilitation trajectories, and the often-lifelong need for health and social care support translates into substantial costs to the NHS and the wider economy. Initial estimates placed the annual societal cost of ABI in the UK at around £25.6 billion, equivalent to around 10% of the annual NHS budget (Barber et al., 2018). However, more recent analyses by UKABIF (2025) places the economic figure much higher, estimating that the annual cost to the UK economy likely exceeds £43 billion. NHS and social care costs account for nearly half of the estimated £43 billion annual burden. UKABIF's analysis suggests that £15.4 billion falls directly on the NHS, with a further £4.6 billion borne by local authority social care services. These figures capture emergency treatment, acute hospital care, ongoing rehabilitation, and long-term support, further highlighting that ABI is not a one-off clinical event but a condition that reshapes health-service engagement over the life course.

While these figures attempt to put the societal and health service cost of ABI into perspective, the true economic cost is likely to higher than these estimates, due to the economic costs of homelessness and addiction (both of which disproportionately affect those with ABI), and secondary costs such as increased use of mental health and psychiatric services being excluded from analyses. Still, the estimates generated must be considered against the backdrop of a health service already under significant strain. Record demand in both primary and secondary care, rising inflation and energy costs, prolonged virus seasons, and ongoing industrial action have left the health service under unprecedented pressure (NHS Confederation, 2023). Moreover, public health trends reveal a rising prevalence in multimorbidity and infirmity, a burden expected to increase significantly in coming decades. For example, the number of individuals living with the long-term physical and psychological effects of stroke in the UK is predicted to increase by more than 60% by 2035, with social care costs for stroke survivors projected to surge by 250% during this time (King et al., 2020). These statistics highlight the growing demand for complex, ongoing care and underscore the need for comprehensive strategies within the NHS to manage such evolving health challenges. Here, service provision for ABI represents both a challenge and an opportunity: while it adds significantly to system pressures, evidence indicates that investment in specialist rehabilitation can generate substantial long-term savings.

Research by Turner-Stokes et al. (2019) suggests that even in the most severe cases of TBI - where rehabilitation can cost up to £43,000 per patient - the long-term savings to the NHS and social care amount to an average of £680,000 per patient. While the specific form of this neurorehabilitation is not operationalised, the newly published report by UKABIF (2025) highlights that this equates to a benefit-cost ratio of 16:1, making rehabilitation - in a general sense - a highly economically rational intervention. This is particularly pertinent given that lost productivity accounts for just over half of the total economic cost of ABI, at around £21.5 billion annually. This encompasses both the reduced workforce participation of people living with ABI (with the exclusion of unpaid volunteer work) and the informal care provided by family members, often at the expense of their own employment. Beyond the societal scale of this economic impact, the burden it places on individuals and their families is significant, with families already facing socioeconomic disadvantage often being least able to absorb the financial strain. Taken together with the newest estimates on the cost of ABI to the health service and to individuals and their families, there has been increasing calls for a *'right to rehab'* - one to be met with greater investment (UKABIF, 2025). The following sections offer a critical overview of the origins and evolving nature of neurorehabilitation, before outlining what investment - from a wellbeing perspective - is needed to fulfil this right.

## 2.2 Neurorehabilitation Following Acquired Brain Injury

Neurorehabilitation is a specialised branch of rehabilitation aimed at supporting individuals with neurological conditions resulting from injuries or diseases of the nervous system, which includes the brain, spinal cord, and peripheral nerves. Individuals who experience ABI in the UK will have access to a form of rehabilitation through the NHS; with immediate healthcare responses drawing upon the medical model to stabilise the patient and diagnose and treat their associated neurological impairments through the provision of timely medical intervention. This typically follows a structured and systematic approach wherein pharmacological treatments and surgical procedures are administered to facilitate recovery and improve the patients' functional outcomes. Structured medical approaches have been shown to significantly enhance initial recovery phases by stabilising the patient's condition and addressing acute neurological deficits (Turner-Stokes et al., 2015); thereby providing critical support and groundwork for further rehabilitation efforts in the immediate post-acute phase. However, ABI rehabilitation is a process that typically spans several years, and acute in-patient rehabilitation should always be followed by outpatient or community rehabilitation that is tailored to the long-term needs of the individual, offering the most appropriate form type of intervention at the right stage in the process (Wilson, 2010; Wilson et al., 2008). While emergency treatment and acute care are crucial to ensuring the survival of the individual with ABI, the effective delivery of longer-term rehabilitation services is equally necessary and far more complex (Andelic et al., 2014; Prang et al., 2012). In contrast to medical treatment of brain injury (which is longstanding), neurorehabilitation for brain injury is a relatively new field (Wilson et al., 2017).

Since its inception, neuropsychological rehabilitation has predominantly comprised a problem-solving process focussed on reducing the cognitive, emotional, psychosocial and behavioural deficits experienced following ABI (Wilson, 2013). These challenges, outlined in Chapter One, are addressed through tailored interventions delivered across various settings, including in-patient rehabilitation units during the early post-injury phase, specialist out-patient neurorehabilitation settings, and in community or home environments following discharge from acute care (Turner-Stokes et al., 2015). The primary aim has traditionally been to reduce the impact of impairment on everyday life and to support individuals in achieving their ‘optimum level of functioning,’ facilitating a return to their own most appropriate environments where possible (Wilson, 2010; Wilson, 2013). To achieve these aims, neurorehabilitation programmes employ a combination of strategies: restoring lost functioning, enhancing the use of residual skills, identifying alternative approaches to achieve individual goals, and implementing environmental modifications. Early research indicates that neuropsychologists working in adult brain injury rehabilitation in the UK often focus on the latter three compensatory strategies (Wilson et al., 2008), working to produce measurable gains in daily functioning**.** In accordance with the NICE Guidelines for Rehabilitation after Traumatic Injury (NG211), it is recommended that rehabilitation programmes include a variety of therapies to address individual physical, cognitive, and psychological needs, with these being delivered by a seamlessly coordinated multidisciplinary team (MDT) of health and social care professionals from diverse disciplines.

MDTs are widely recognised as fundamental to quality stroke and brain injury care, as they bring together professionals from physical, occupational, vocational, speech and language, cognitive, and psychological disciplines (Clarke & Forster, 2015). For example, physical therapy works to restore motor function through strength, coordination and balance training, with moderate-quality evidence to suggest that physiotherapy using a blend of evidence-based interventions is more effective than no treatment, standard care, or attention control post-stroke (Pollock et al., 2014). Speech and language therapy addresses communication and language difficulties, improving oral movements and enhancing social participation and quality of life (Brady et al., 2016; Duffy, 2012). Occupational therapy focusses on enhancing participation in daily activities (Wolf et al., 2014), while promoting engagement in personally meaningful activities and community reintegration. Vocational rehabilitation aims to build skills that support work engagement, which is crucial for economic independence, social integration, and psychological wellbeing post-ABI (Fadyl & McPherson, 2009; van Velzen et al., 2009). Cognitive rehabilitation, meanwhile, offers interventions aimed at improving memory, focus, and executive functioning, with strong evidence demonstrating enhanced cognitive performance and daily functioning (Cicerone et al., 2011; Rohling et al., 2009). Finally, psychological therapies help patients to manage the emotional, cognitive and behavioural challenges that follow brain injury and support adjustment, with research demonstrating significant benefits for reducing symptoms of depression and anxiety and enhancing overall quality of life for individuals with brain injury (Fann et al., 2009; Grant et al., 2025). Effective neurological rehabilitation is one which embodies a partnership between patients, families and health care staff (i.e., clinicians), and one in which goal setting is an integral feature that guides the process of recovery (Wilson, 2002). These two features of neurological rehabilitation may be closely linked, with findings from a systematic review suggesting that goal setting can improve recovery, performance and attainment of goals post-stroke while facilitating patient engagement in rehabilitation (Sugavanam et al., 2013).

Despite recommended guidelines and robust evidence supporting the benefits of individual therapies in improving outcomes beyond spontaneous recovery (Clarke & Forster, 2015; Langhorne & Ramachandra, 2020), the availability of and access to coordinated multidisciplinary rehabilitation services remains a challenge, with this comprising a source of frustration for patients and their carers (Harrison et al., 2017). Simply assembling individual professionals does not guarantee effective collaboration (Clarke & Forster, 2015). Often, MDT members work independently within their specialised domains, which can undermine the potential benefits of truly coordinated care and contribute to gaps in care provision and patient frustrations (Harrison et al., 2017). Research by Andelic et al., (2014, 2021) reveals that while physical, occupational and speech therapies are commonly utilised in rehabilitation programmes, psychological services are frequently underprovided. For instance, in their Scandinavian studies of adults with moderate-to-severe TBI, almost one-third of 93 patients reported unmet needs in emotional, vocational, and cognitive domains, with physical therapy being the most accessed and psychological therapies being the least accessed services (Andelic et al., 2014; Phillips et al., 2004). These findings were corroborated more recently in their study which spanned European rehabilitation provisions and drew on self-report data from 1206 adults with moderate-to-severe disability post-ABI (Andelic et al., 2021). They found that physiotherapy comprised the most frequently facilitated rehabilitation service for ABI populations (with it being delivered in abundance to patients who did not self-report the presence of physical difficulties following TBI), followed by speech and occupational therapy. In contrast, there was far less coverage for identified needs, with psychological services being provided to less than one-third of individuals reporting psychological problems (Andelic et al., 2021). Accordingly, psychological counselling was the least frequently accessed service, and those reporting psychological difficulties were least likely to be offered a rehabilitative intervention within the first six months post-TBI, as compared to those with physical or cognitive needs. Unmet psychological needs similarly prevail in ABI populations across the UK, with some patient reports indicating significant unmet needs in areas of emotional, cognitive and vocational support, contributing to mixed satisfaction levels concerning NHS care (Headway, 2019). This highlights an inadequate provision of services, and international prioritisation of physical rehabilitation over a comprehensive multidisciplinary strategy tailored to individual needs (Soberg et al., 2008). This disparity is perhaps a reflection of how the biomedical model, with its focus on the physical condition and the need to reduce disease, deficit and dysfunction, is still enshrined in our health and care systems.

Given the disparity in service provision then, aspects of the NICE Guidelines for Rehabilitation after Traumatic Injury (NG211) are not being met. That is, while MDTs form the backbone of neurorehabilitation, there remain critical gaps in the delivery of neurorehabilitation therapies which promote emotional, psychological and vocational adjustment. Moreover, a sole focus on compensatory strategies and deficit reduction can limit the potential for comprehensive recovery and do not align with national guidelines for rehabilitation after injury (i.e., NG211). In consideration of the aforementioned ‘right to rehab’ movement, which has been (re)ignited by the stark cost estimates of ABI presented in the UKABIF (2025) report, lies the crucial question of what forms of rehabilitation individuals living with ABI and their families should be entitled to access. Is it a minimal, fragmented multidisciplinary service, or something more comprehensive and transformative? The evidence is clear that rehabilitation delivers economic value (Turner-Stokes et al., 2019), but not all neurorehabilitation approaches are equally effective. Services that are narrowly biomedical or poorly integrated across sectors risk neglecting the holistic and interlinked needs of people living with ABI. To this end, it is argued that what is needed is not only a statutory *right to rehab* (as has been proposed), but an increased emphasis on the right to rehabilitation that is high-quality, holistic, and responsive to the complex and evolving wellbeing needs of people living with ABI. To achieve this, neurorehabilitation must transcend a narrow multidisciplinary approach to embrace an interdisciplinary perspective; one that considers the whole person, including their thoughts, values, and psychological wellbeing. This shift entails moving away from an exclusive focus on functional gains, such as activity or participation levels, toward outcomes that are personally meaningful to the individual and their families (Fish et al., 2018; Wilson et al., 2009), with this being advocated for by national guidelines. As Gracey et al. (2009) insightfully noted:

> *"The broader notions of psychological wellness and growth serve as a reminder that our focus in rehabilitation may go beyond compensation for deficits and optimum practical functioning in tasks and society, and perhaps should more explicitly incorporate a focus on growth and personal meaning."*

Such a perspective is essential to ensuring that individuals not only adapt to life after brain injury - but thrive.

## 2.3 Holistic Neurorehabilitation: The Dynamic Interactions Between the Whole and Not Just Individual Parts

Building on the foundational work of Kurt Goldstein, who emphasised the importance of understanding an individual in their entirety, the Holistic Model of Neurorehabilitation recognises the reciprocal interconnectedness between cognition, emotion, behaviour, and psychosocial functioning (Ben-Yishay & Diller, 2011; Ben-Yishay & Prigatano, 1990) - similarly to the latest developments in wellbeing science (Kemp et al., 2017; Mead et al., 2021). This patient-centred approach involves looking at every aspect of the individual *holistically* and how personal aspects affect how they interact with the world, emphasising the importance of concepts such as achieving a congruent self-identity, emotional adjustment, confidence, promoting engagement and social and community integration (Coetzer, 2008; Leplege et al., 2007). These outcomes transcend the capabilities of domain specific therapies and are valued by patients over and above functional gains (Fish et al., 2018; Wilson et al., 2009). Drawing upon their collective clinical experience, Ben-Yishay and Diller (2011) proposed key principles for holistic neurorehabilitation that extend beyond deficit reduction and instead towards holism. Specifically, they emphasised that holistic neurorehabilitation practices should promote identity reconstruction, but also engagement (motivating individuals to actively participate in therapeutic tasks with purpose and intention), awareness (helping patients to recognise their difficulties without feeling overwhelmed), mastery (teaching patients strategies to compensate for their deficits), control (encouraging focus on action-oriented goals), and acceptance (finding value and enjoyment in life despite challenging circumstances). This conceptual framework was born from clinical practice but resonates with established models of psychological wellbeing such as Seligman's PERMA model (Seligman, 2011), Ryff's model of psychological wellbeing (Ryff & Keyes, 1995) and emerging perspectives in the field of PTG (Wong, 2011), as detailed in Chapter One.

Many of these elements are interlinked and support psychological adaptation post-ABI. Conceptual frameworks such as Gracey et al.'s (2009) Y-shaped model (outlined in Chapter One) capture the complex interplay between cognition and emotion, particularly in navigating identity disruption and associated emotional distress, and how this shapes behavioural and social responses through to psychosocial adaptation (Gracey et al., 2009). Gracey's (2009) model delineates how individuals living with ABI must navigate a psychosocial pathway to adaptation and recovery (dealing with changes in self-identity, coping with emotional responses such as grief or anxiety, and re-establishing social roles and relationships) while also rehabilitating cognitive functions, involving the (re)acquisition of practical skills required for daily living, such as managing household tasks, and, where possible, returning to work or engaging in other meaningful activities. Crucially, Gracey (2009) emphasised that individuals living with ABI must balance both aspects of their recovery *simultaneously,* further highlighting the need for holistic approaches to rehabilitation that capture these interconnections and address them holistically.

Holistic neurorehabilitation can facilitate processes of adaptation and change by guiding individuals through these distinct but interconnected pathways of psychosocial and cognitive recovery. Building upon the structural framework set by Gracey (2009), qualitative work by Domensino et al. (2022) applied these concepts and contextualised the processes of change through which a group of twelve individuals navigated following their engagement in an infamous holistic neuropsychological programme at the Oliver Zangwill Centre for Neuropsychological Rehabilitation that was directly modelled on Ben-Yishay and Prigatano's (1990) holistic principles. Employing thematic analysis to analyse focus group discussions conducted 1-5 years later, Domensino et al. (2022) outlined how neurorehabilitation may support individuals to first develop awareness of discrepancies between their pre-injury and post-injury selves, which has been identified as the 'confrontation phase' and is often marked by negative emotions and distress (Cantor et al., 2005). Kurt Goldstein's early considerations of neurorehabilitation emphasised focus on helping individuals to manage 'catastrophic reactions,' which reflect severe emotional responses triggered by the awareness of one's deficits (Goldstein, 1942), emphasising the need for neurorehabilitation approaches that reduce distress while fostering adaptive responses. Following this phase, neurorehabilitation can support individuals to embark on a pathway of psychosocial recovery by facilitating rediscovery of aspects of their pre-injury identity, deriving new adaptive meanings from their experiences, and reinforcing these insights through engagement in meaningful activities. Individuals engage in phases of 'training' and 'experimentation' of skills and strategies, as conceptualised in the work by Domensino et al., (2022), where individuals test the application of strategies as they transition from the protective environment of the rehabilitation centre to everyday life. Implementing learned skills and strategies and finding ways to work around one's difficulties despite cognitive impairment was reported to contribute to an increased sense of competence and self-esteem embodied by empowerment, and over time, these skills consolidate within social contexts and contribute towards their re-established sense of identity. This phase is characterised by 'coming to terms' with one's injury, reflected in feelings of gratitude, acceptance and adaptability. Notably, this phase was found to be supported by, but not constrained to, the time spent in rehabilitation, with potential to extend to months or even years after the completion of intensive therapy (Domensino et al., 2022). In this regard, Gracey's (2009) Y-shaped model provides a valuable framework for understanding the psychological processes involved in rehabilitation after ABI and exemplifies the connections between emotions, cognition, identity and navigating social interactions to facilitate integration. Crucially, to help individuals to resolve their discrepancies, mitigate the occurrence of catastrophic reactions and maximise opportunities for adjustment, growth and positive change, providers of holistic neurorehabilitation must cultivate a therapeutic environment that is experienced by the person as safe (Cattelani et al., 2010). This is known as the therapeutic milieu.

The therapeutic milieu is a defining feature of holistic practices (Ben-Yishay & Diller, 2011), characterised by a cooperative and reciprocal relationship between the therapist and patient, wherein individuals feel safe to explore their difficulties without exposure to threat (Ben-Yishay, 1996). Within this supportive setting, individuals living with ABI can begin to draw upon and develop their capabilities, learn to manage their difficulties, and gradually adjust to life post-injury; a process explored in Chapter One. The 'healing' potential of this approach has been highlighted in qualitative research (Lowe et al., 2021), which has shown that the reciprocal therapeutic environment helps individuals with ABI transition from feelings of brokenness and loneliness to re-engage in meaningful social interactions and re-connect with themselves and others (Lowe et al., 2021), with these outcomes being pertinent to wellbeing (Mead et al., 2021). This process is particularly pertinent in group-based rehabilitation, where the therapeutic environment affords opportunities for adults living with ABI to connect to, share with and learn from peers who have faced similar challenges (Ben-Yishay & Prigatano, 1990; Wilson, 2013). This has positive implications for adaptation, adjustment, and identity renewal following injury, as it fosters an environment in which individuals can rebuild their self-concept, enhance resilience, and achieve meaningful social reintegration; critical factors that underpin long-term recovery (Nilsson et al., 2011; Patterson et al., 2016; Yeates et al., 2007).

The importance of the therapeutic milieu and group processes in supporting positive outcomes post-ABI was captured in the qualitative work conducted by Domensino et al., (2022) regarding patients' experiences of an 18-week holistic neurorehabilitation programme at the Oliver Zangwill Centre. This programme included group and individual sessions led by an interdisciplinary team and was carefully structured to encourage group processes and a highly reciprocal therapeutic environment. This approach successfully created a safe and supportive space where participants could explore personal changes, share their strengths and difficulties, and draw support from each other's experiences. These dynamics contributed to enhanced self-esteem, competence and overall adaptation, supporting individuals to regain a sense of identity whilst working through the processes of change. This further highlights the vital role of group-based milieu-oriented rehabilitation in driving psychological transformation through identity renewal, which comprises a salient and personally meaningful outcome that is valued beyond functional gains prioritised by multidisciplinary approaches.

Compelling empirical evidence bolsters the case for holistic approaches in achieving personally meaningful outcomes such as identity reconstruction and psychological adjustment. Further to supporting identity reconstruction, increasing emphasis has been placed on the importance of community integration as a core goal and outcome of neuropsychological rehabilitation (Cicerone et al., 2004; Mahar & Fraser, 2012). Community integration for adults with ABI is multifaceted, encompassing independence, adjustment, having a sense of belonging, stable housing, engagement in meaningful occupational activity, and being socially connected into the community (Shaikh et al., 2019). Other research has also highlighted additional factors that influence community reintegration (Williams et al., 2014), including perceived self-efficacy (Cicerone et al., 2004), cognitive function (Lu et al., 2023), as well as the supportive roles of peer relationships and family functioning (Sady et al., 2010). George Prigatano’s early research demonstrated that intensive, milieu-oriented programmes that integrated both group and individual therapies to enhance injury awareness, acceptance, and management of catastrophic reactions in addition to cognitive retraining and compensatory skill development yielded superior outcomes in emotional wellbeing and employment (reflecting return to meaningful engagement) compared to untreated controls (Prigatano et al., 1984). A follow up study ten years later further linked strong therapeutic alliances to improved productivity post-rehabilitation (Prigatano, 1999). A more robust single-blinded randomised controlled trial (RCT) has compared intensive holistic neuropsychological rehabilitation (15 hours per week over 16 weeks) with conventional, domain-specific multidisciplinary rehabilitation for adults with moderate-to-severe TBI (Cicerone et al., 2008). The holistic programme, grounded in the milieu model, incorporated group and individual therapy and focussed on emotional regulation and integrated interventions for cognitive, interpersonal, and functional skills. Although both groups showed improvements in neurological functioning, those in the holistic programme were twice as likely to achieve clinically significant gains in community functioning and perceived quality of life, with benefits maintained at six-month follow-up and even among those many years post-injury. Longitudinal studies further suggest that these benefits can persist for up to 30 years post-discharge (Cicerone et al., 2008; Perumparaichallai et al., 2020), providing evidence that holistic, milieu-oriented group therapies can promote core, meaningful and sustained goals of neurorehabilitation for adults navigating the personal consequences of ABI.

Overall, the converging lines of evidence demonstrate that holistic neuropsychological rehabilitation holds significant promise in supporting outcomes that are not only clinically meaningful but also deeply resonant with the personal recovery journeys of individuals with ABI. Compelling empirical findings highlight the importance of therapeutic and group processes, such as the establishment of a supportive therapeutic milieu, structured group interventions that foster peer support and shared learning, and the integration of individualised cognitive and emotional rehabilitation strategies in fostering identity reconstruction, psychological adjustment, and longstanding community integration. More recently, realist methodologies have been employed to disentangle the complex interactions influencing patient outcomes. A rapid realist review conducted by Fletcher et al. (2024) identified shifts in internal perspectives, enhanced self-worth, and a strengthened sense of mastery and connection as key mechanisms that underpin psychological wellbeing outcomes, including improved quality of life in individuals with ABI, particularly when interventions are adapted to individual needs. The findings align with the core tenets of holistic neurorehabilitation (Ben-Yishay & Diller, 2011; Ben-Yishay et al., 1985) and wellbeing science (e.g., Ryff & Keyes, 2005; Mead et al., 2021), further emphasising the necessity of fostering meaning, agency, and social integration within rehabilitation settings.

While mounting evidence continues to document measurable gains in functional outcomes, qualitative research has suggested that the true effectiveness of holistic neuropsychological rehabilitation stems not from isolated programme components but from their dynamic interplay, illustrating that the whole is indeed greater than the sum of its parts (Nilsson et al., 2011). In this way, neurorehabilitation functions as a system, echoing core principles of systems theory, where each element interacts synergistically to produce emergent outcomes that cannot be achieved through compartmentalised approaches. This systems-based view further reinforces the importance of designing rehabilitation interventions as interconnected ecosystems, rather than as fragmented, multidisciplinary treatments. Accordingly, it is imperative that clinical teams transition from a traditional MDT approach towards a more integrated interdisciplinary model, one in which collaborative goal setting, care planning and decision-making are shared responsibilities. By breaking down professional silos and pooling diverse expertise, interdisciplinary teamwork not only fosters a more comprehensive understanding of the complex challenges faced by individuals with ABI, but also drives innovative, patient-centred solutions with increased potential to support holistic patient outcomes (Sugavanam et al., 2013). The following section provides further discussion around the meaningful evolvement of holistic neurorehabilitation and highlights the added value of drawing upon wellbeing science to support rebuilding and flourishing in its fullest sense.

## 2.4 The Meaningful Evolvement of Holistic Neurorehabilitation and the Potential Contributions of Wellbeing Science

The development of neuropsychological rehabilitation has, thus far, drawn predominantly from advances in cognitive neuropsychology, behavioural psychology and a range of psychotherapeutic traditions (Wilson et al., 2017). Holistic neurorehabilitation, in particular, is built on an expansive theoretical base, acknowledging that no single framework from psychological science can fully address the multifaceted needs of individuals experiencing neuropsychological difficulties following ABI (Wilson, 2002; Wilson et al., 2008). With that, there exists wide variation in neurorehabilitation practices, shaped by regional variations in resources, service models, and practitioner expertise. The absence of clear guidelines on which interventions are most effective for specific populations and contexts continues to hinder widespread implementation. Instead, clinicians working in adult brain injury rehabilitation in the UK resort to a variety of theoretical approaches to meet the needs of patients and their families (Wilson et al., 2008). This variability creates diverse pathways through which neurorehabilitation goals may be supported, which is fitting, given the diverse and complex nature of brain injury and the profound impact it can have on an individual's life. However, it also highlights a critical gap in current practice, namely, the absence of a systematic, evidence-based framework to guide intervention design and delivery. This means that neurorehabilitation programmes may not always adhere to principles of holistic neurorehabilitation; emerging as a predominant focus on reducing illbeing, such as managing deficits and alleviating distress, which is anchored in a predominantly pathogenic model of health that seeks to address what is *wrong* (Fisher et al., 2022). While this approach is undoubtedly valuable, it risks constraining the potential of rehabilitation by overlooking opportunities to build whole health and wellbeing; dimensions that encompass more than just functional recovery but also support individuals in rebuilding a life filled with meaning, connection, and growth. As such, rehabilitation practices remain anchored in deficit reduction, despite the principles of holistic neurorehabilitation aligning with broader ideas of positive health, wellbeing and capability (Canguilhem, 1943).

In contrast to approaches embedded in deficit reduction, the concept of salutogenesis (Antonovsky, 1979, 1987) recognises that health is a process in a health ease/disease continuum (Eriksson, 2022) and emphasises factors that promote health and wellbeing, rather than merely preventing or treating illness (Lindström & Eriksson, 2005). Salutogenesis offers a shift from a deficit-based approach to a strength-based perspective, prioritising the resources and strategies that help individuals thrive despite challenges. Within neurorehabilitation, a salutogenic approach would mean shifting the emphasis from solely reducing symptoms to promoting strengths, resilience, and opportunities for growth. It focusses on fostering generalised resistance resources (e.g., social connections, meaningful activities, and environmental engagement) and enhancing a person's sense of coherence, comprising their ability to understand, manage, and find meaning in their circumstances (Lindström & Eriksson, 2005). Various therapeutic approaches can be integrated within a holistic framework to support these salutogenic principles. Acceptance and Commitment Therapy (ACT), for example, can facilitate psychological flexibility by helping individuals accept their limitations while committing to meaningful actions, facilitating the process of finding value and enjoyment in life despite ongoing challenges (Large et al., 2020; Majumdar & Morris, 2019). Similarly, positive psychotherapy, grounded in positive psychology, shifts the focus from deficits (fixing what's wrong) to strengths (building what's strong). It aims to promote optimism, engagement and meaning, amongst other positive experiences, and there is increasing evidence to suggest that such interventions can promote wellbeing in adults living with ABI (Cullen et al., 2018; Karagiorgou et al., 2018; Tulip et al., 2020). Albeit such approaches must be implemented with nuance to avoid an overemphasis on positivity and optimism - with the field of positive psychology historically being criticised for indulging in 'happyism' while downplaying the adaptive value of negative emotions. Notwithstanding, discussions on wellbeing are beginning to permeate the literature, with the inclusion of strengths-based approaches to build on patients' existing capabilities being recommended by national guidelines (i.e., NG211). Yet, there remains a gap in systematically including the broader dimensions of wellbeing that are crucial to rebuilding post-ABI. These include, for example, physical health and health behaviours, further to social, community, and environmental connectedness. Without a structured and coherent guiding framework, neurorehabilitation practices may lack consistency, depth, and the ability to systematically address the complex and multi-dimensional needs of adults with ABI, resulting in fragmented efforts.

Wellbeing science offers a promising avenue to achieve this evolution. By adopting evidence-based wellbeing frameworks, rehabilitation can consider both internal factors (like emotional regulation, identity reconstruction, and resilience) and external influences (such as social support and environmental engagement) that collectively contribute to whole health. These frameworks offer systematic approaches to incorporating contextual factors that influence wellbeing outcomes and emphasise interconnected dimensions such as psychological wellbeing, social connectedness, and physical health. For example, mounting evidence suggests that nature connectedness (Capaldi et al., 2015; Capaldi et al., 2014; Martin et al., 2020), social relationships, peer support and community cohesion (Haslam et al., 2018; Sveen et al., 2022) as well as positive health behaviours (Buecker et al., 2021) and positive behaviour change (Kwasnicka et al., 2016) exert significant influence over individual wellbeing (see Mead et al., 2021 for a comprehensive review). Yet, these components are often overlooked in neurorehabilitation contexts - and if they are considered - they are typically addressed in a fragmented, didactic, or one-off manner that lacks integration into everyday life and recovery trajectories. For example, regarding health behaviours, there is a need for structured opportunities for active practice, ongoing clinical support, and reinforcement through peer interactions. This is crucial because information alone does not lead to transformation (Sniehotta et al., 2005). Embedding such insights from wellbeing science into neurorehabilitation practice could transform neurorehabilitation from a model focussed on symptom reduction to one that fosters holistic wellbeing and long-term flourishing. To evolve meaningfully, neuropsychological rehabilitation must embrace a more holistic, systems-oriented approach to *building* the foundations of whole health and wellbeing, as opposed to reducing illbeing. This includes adopting innovative, evidence-based wellbeing frameworks that consider both internal (i.e., emotional regulation, identity reconstruction, and resilience) and external (i.e., social connections and environmental engagement) dimensions of health. Through this shift, rehabilitation practices can better support individuals with ABI to not only adapt but thrive, achieving fulfilment and a renewed sense of purpose.

As outlined in Chapter One, the literature surrounding wellbeing and its determinants is vast, complex, and disparate, much like the literature surrounding neurorehabilitation. Seminal work in the field of psychological wellbeing highlights critical components such as meaning and purpose, autonomy, engagement, mastery, achievement, acceptance, resilience and growth (Diener, 1984; Diener et al., 2002; Keyes & Annas, 2009; Ryff, 1989; Ryff & Keyes, 1995; Seligman, 2002; Seligman, 2011; Wong, 2011, 2013). Meanwhile, other research emphasises the role of social relationships, nature connectedness, and broader determinants of physical health and longevity. While these diverse strands contribute valuable insights, they also contribute to the disparate nature of wellbeing literature, presenting challenges for applying these concepts systematically in clinical practice. Recent scientific developments, however, offer promising solutions. Emerging broader frameworks of wellbeing synthesise and contextualise the interconnectedness between these disparate theoretical developments, addressing the fragmentation that often plagues the field of psychological and wellbeing science (Fisher et al., 2022; Kemp & Fisher, 2022; Mead et al., 2021). These integrative 'meta' theoretical frameworks not only provide a more holistic understanding of the myriad factors influencing an individual's rebuilding journey, spanning psychological and emotional aspects to social and environmental contexts, but also align well with the aims and principles of holistic neurorehabilitation, and transcend disciplinary boundaries to generate shared conceptual ground for practice, theory, and research. By drawing upon these insights, clinicians and researchers may enhance the delivery of comprehensive neuropsychological rehabilitation programmes, extending current models to reveal previously underexplored opportunities for promoting health and wellbeing in neurorehabilitation contexts. One such transdisciplinary metatheoretical framework is the GENIAL framework (Fisher et al., 2022; Kemp et al., 2017; Kemp & Fisher, 2022; Mead et al., 2021). This multi-level framework offers a robust theoretical foundation for guiding the design and delivery of neuropsychological interventions for individuals living with ABI, while also providing a coherent structure for evaluating their potential to facilitate key domains and determinants of wellbeing.

As introduced in Chapter One, the GENIAL framework is rooted in a biopsychosocial perspective and imposes an interpretative and coherent framework on an otherwise heterogeneous and disconnected body of health and wellbeing literature. Spanning epidemiological and psychological science, it integrates findings from across the broad range of peer-reviewed literature to highlight pathways through which wellbeing outcomes can be realised. Like holistic neurorehabilitation approaches that consider the whole person and the dynamic interplay between cognition, emotion, social functioning and behaviour, the GENIAL framework emphasises interconnectedness between various domains of wellbeing.

Informed by the tight linkages between body and mind (Kemp et al., 2017; Kemp & Quintana, 2013), it uniquely defines wellbeing in terms of connection to the self, others and the environment. Furthermore, and moving beyond an overly individualised approach to considering wellbeing in the context of neurological disorders, the authors of this model recently drew on social ecology theory (Bronfenbrenner, 1977) to emphasise core domains of wellbeing at different levels of scale (Fisher et al., 2022; Mead et al., 2021). Broadening from its initial focus on the individual (which captures the importance of having a balanced mind and healthy body), it acknowledges the role of the systems of communities and environments within which people live, and how these, in addition to socio-contextual factors, shape capacities for behaviour change and health behaviours.

While a detailed overview of the conceptual developments and theoretical iterations of the GENIAL framework is beyond the scope of this chapter (for further information see Mead et al., 2021 and Fisher et al., 2022), it is important to highlight its transdisciplinary foundation and relevance to neurorehabilitation. As a metatheoretical framework, GENIAL is explicitly situated within a broader context, aligning with an abductive or explanatory approach to theory generation (Haig, 2005). This marks a shift towards a transdisciplinary model of wellbeing - one that bridges clinical practice with wellbeing science to create a more comprehensive understanding of health and rehabilitation. This integrative transdisciplinary foundation enables the synthesis of diverse perspectives from psychology, clinical practice, wellbeing science, and neurorehabilitation, the application of which may help to ensure that interventions address the complex and multi-dimensional needs of adults living with ABI. In doing so, the GENIAL framework may provide clinicians with a structured yet adaptable tool to systematically assess and address the diverse determinants of wellbeing within a multi-level context, guiding the design of holistic, evidence-based interventions that align with salutogenic principles while promoting sustainable foundations for whole health and wellbeing. While this is yet to be thoroughly assessed, this justified integrative structure makes the GENIAL framework both conceptually grounded and practically useful – qualities which are necessary for meaningful advancement in wellbeing science and understanding (Goodman et al., 2018). Yet, the very breadth that makes the framework promising also introduces important challenges, which warrant further consideration.

The GENIAL framework’s strength lies in its conceptual richness, clearly articulated definition of wellbeing, and multi-level orientation, which together provide a valuable lens for thinking holistically about wellbeing. At the same time, this breadth introduces practical and operational complexity, raising important implementation challenges, particularly when services are constrained by suboptimal resources. Without explicit specification of minimal effective components and pragmatic tailoring rules, for example, there's a risk that interventions labelled 'GENIAL-informed' will vary widely, leading to inconsistent or partial adoption. However, this tension can also be seen as generative: partial adoption may still stimulate reflection, broaden the focus of care, and encourage services to consider how existing interventions facilitate wellbeing and where improvements could be made. Importantly, the empirical foundations for the determinants of wellbeing captured by the GENIAL framework have already been well-established. Drawing on such a framework has the potential to broaden clinical understanding of the mechanisms involved in neurorehabilitation outcomes by further illuminating the dynamic interplay between individual psychological processes, social connections, and environmental influences. By applying the transdisciplinary metatheoretical GENIAL framework as a tool to support the systematic mapping of mechanisms and their interactions, clinicians can better focus the design and delivery of interventions to harness synergistic effects across domains, while simultaneously evaluating and refining practice in line with emerging mechanistic evidence. Although many of the vital dimensions of wellbeing and (re)building after ABI - such as identity, belonging, and community - are slow to develop and challenging to capture, this orientation may serve to remind us that the true value of neurorehabilitation lies not only in reducing health system costs or supporting return to work, but in enabling individuals with ABI to live lives of meaning, purpose, and connection.

### 2.4.1 Thesis Aims

The overarching aim of this thesis is to explore and demonstrate how holistic neurorehabilitation can be enhanced by systematically integrating wellbeing science, offering sustainable pathways to wellbeing and improving meaningful outcomes for adults living with ABI. This will be achieved by critically exploring and unpacking interventions delivered within the context of holistic neurorehabilitation units across South Wales and developed in alignment with principles of salutogenesis in mind. By applying the GENIAL framework of health and wellbeing as a theoretical lens, this work seeks to exemplify how wellbeing-focussed interventions might cultivate multi-level connectedness, encompassing connection to the self, others, and the environment, in ways that align with the principles of holistic neurorehabilitation. Ultimately, this thesis aims to illustrate how adopting such integrative approaches may support adults with ABI not only to recover functionally, but to (re)build a life imbued with meaning, belonging and a sense of agency, which comprise key tenets of holistic neurorehabilitation. In keeping with discussions of the inherently personal process of navigating life post-injury as outlined in Chapter One, this thesis deliberately opts for the term ‘rebuilding’ rather than ‘recovery’ to reflect a shift from merely returning to a pre-injury baseline - which is often an unrealistic goal - toward fostering the development of a new, meaningful, and connected life (Park et al., 2008). This aligns with the principles of holistic neurorehabilitation and salutogenic-informed wellbeing science, emphasising growth, adaptation, and the pursuit of whole health and flourishing, even in the context of enduring challenges. The next chapter details and justifies the methodological approach adopted to explore, interpret and unpack such changes.

# 3 Chapter Three: Conducting Research and Evaluation in the Context of Neurorehabilitation

Various methods can be utilised to understand and evaluate the outcome of interventions designed to support people living with ABI, with these drawing on quantitative or qualitative paradigms - or both - used independently or together in a mixed-methods design. In choosing a fitting approach, the complexity of the population must be considered, and methods must be both pragmatic and meaningful in consideration of the research question and context. This chapter aims to provide a comprehensive exploration of the applications, opportunities, and epistemological foundations of clinically applied research (including service evaluation work) conducted within the context of neurorehabilitation. It sets to provide a clear framework for the methodological underpinnings of the thesis and its respective implications, offering a coherent plan for analysis and interpretation.

## 3.1 The Role and Importance of Research in Applied Settings

Research stands as an indispensable cornerstone in the advancement of neuropsychological rehabilitation, shaping and informing clinical practice, enhancing patient outcomes, and catalysing innovative therapeutic paradigms. Neuropsychological inquiry has unravelled a rich tapestry of understanding regarding brain functioning and neuroplasticity (providing a foundation for developing targeted rehabilitation interventions), contributed to the development of standardised assessment tools (helping clinicians evaluate difficulties and track progress over time), and continues to fuel an ever-growing evidence-base from which clinicians can design and deliver proven and personalised programmes to support patients in their rehabilitation journey. In considering the role of research in transforming and extending upon neurorehabilitation pathways and practice, it is essential to recognise that the classification and conceptualisation of research is multifaceted and vary according to content, setting, population, and method (Barker et al., 2015). The practice of research exists along a continuum, with academic research at one end and applied work at the other (Patton, 2002). Academic research in its purest form typically addresses the generation and testing of theory; often elucidating underlying processes that may be common to the general population. Research in the field of neuropsychology, however, is often positioned towards the more applied end of the research continuum, as it addresses more pragmatic questions such as whether a particular intervention works for a specific population. Evaluative work falls within the realm of applied research, primarily addressing the specific needs or outcomes of a particular organisation or service, yet its implications may extend more broadly (Patton, 2002). In the context of neurorehabilitation for adults living with ABI, applied and evaluation research can generate useful information regarding the effectiveness and comparative effectiveness of interventions, while elucidating important barriers that may hinder their success. This approach to research can answer a variety of questions aimed at improving patient outcomes and optimising rehabilitation practices and services.

Service evaluations are essential tools for assessing the quality, effectiveness, and efficiency of new innovations, initiatives or interventions within the NHS. They typically prioritise patient experiences, preferences, and outcomes, thereby driving continuous improvement and ensuring the delivery of high-quality, safe, and effective care. Acting as a structured feedback mechanism for continuous improvement, service evaluations gather insights from patients, healthcare providers, and other stakeholders to highlight areas of strength, expose inefficiencies or opportunities for improvement, and identify gaps in provision, such as unmet patient needs and suboptimal resource allocation. This is particularly pertinent in settings constrained by finite resources and where allocation is subject to close scrutiny.

At the individual level, service evaluations reinforce patient-centered care by ensuring that services evolve in response to feedback, tailoring services, interventions and the delivery of such to better meet patients' needs and preferences. At the organisational level, they generate evidence of service performance, supporting evidence-based decision-making, resource allocation, and long-term planning. Here, service evaluations play a dual role: shaping care that is responsive to individuals while strengthening systems to ensure sustainability and efficiency. Nevertheless, conducting service evaluations in NHS contexts is not without challenge. Finite financial resources, staffing pressures and competing demands can constrain the time and expertise available for rigorous evaluation. Furthermore, methodologically robust inquiry requires not only practical resources but also critical engagement with the philosophical underpinnings of knowledge production - asking fundamental questions about the nature of reality, how it can be understood, and the most appropriate methods for data collection and analysis.

## 3.2 The Philosophical Underpinnings of Knowledge Production

All forms of research and scientific inquiry are underpinned by assumptions about what exists in the world and how we can come to know it. These philosophical foundations - ontology and epistemology - are critical for shaping the questions asked, the methods employed, and the ways in which data is interpreted. Ontology refers to the study of being and reality. It addresses questions about what entities exist, influencing a researcher's perspectives on the phenomena they study and how they can believe them to be real or true. Epistemology, in contrast, concerns the nature of knowledge and how it is produced or acquired. Epistemology asks 'how we know what we know' and our justifications for claiming to know it. Alongside ontological considerations of reality, this 'theory of knowledge' is embedded within a theoretical perspective that informs all aspects of the research process (Hesse-Biber & Leavy, 2006), providing foundations from which researchers may achieve a comprehensive understanding of psychological phenomena (Barker et al., 2015).

A central ontological position is realism (Bhaskar, 1975; Bhaskar et al., 1998). Realism is embedded within a realist ontology, which asserts the existence of an objective reality independent of whomever may be observing it (Bhaskar, 1975). Realists argue that this tangible external reality can be known and understood through empirical observation and scientific inquiry using methods that aim to uncover causal mechanisms and regularities that govern phenomena. Akin to this ontological position, which asserts the existence of a reality independent of human perception, is the epistemological stance of positivism. Positivism holds that knowledge can directly ‘mirror’ the external world, with research serving to capture objective reality ‘as it is’. Within this paradigm, realism emphasises generating knowledge that corresponds to the external world through systematic observation and experimental verification, with an emphasis on objectivity and empirical validity. From this standpoint, scientific progress is understood as the rigorous testing of hypotheses against observable data, with the ultimate aims of prediction, generalisability, and replicability. Positivism has played an important role in establishing psychology as a science. Neuropsychological research, for instance, has relied heavily on experimental methods, standardised cognitive assessments, and statistical inference to build a body of knowledge about brain-behaviour relationships. Yet, positivism also carries limitations. It tends to privilege what can be measured, sometimes at the expense of lived experience. With that, it risks overlooking the contextual, relational, and structural factors that shape human life, particularly in complex and multifaceted phenomena such as wellbeing after brain injury.

The major opposition to a positivist realist position can be found in the various forms of constructionist and constructivist perspectives (Barker et al., 2015; Bhaskar, 1975; Bhaskar et al., 1998). These challenge the realist assumption of an objective, independent reality that exists independently of us. Instead, they argue that reality is socially and discursively produced. From a constructivist standpoint, knowledge is actively constructed by individuals through their experiences, interactions, and interpretations of the world. It asserts that each person creates their own meaning, shaped by their history, experiences, and personal perspectives. Thus, constructivism is concerned with how individuals come to know and understand the world around them, focussing on the processes of cognition and meaning-making. Constructionism, while similar, shifts the focus to socio-cultural contexts, emphasising how knowledge and meaning are produced and shared through collective processes - including language, culture, and social norms. Applied to brain injury, a constructivist might focus on how individuals make sense of their identity post-injury, while a constructionist might attend to how societal discourses of disability, dependence, or recovery shape those experiences. Both approaches highlight the importance of meaning-making, context, and power in the production of knowledge. However, taken alone, they risk sliding into relativism: if all knowledge is socially constructed, it becomes difficult to account for the material reality of neurological injury or the causal mechanisms through which it affects people's lives.

Critical realism, pioneered by Roy Bhaskar (1975, 1998), offers a philosophical middle ground. Embedded within a realist perspective and thus sharing the same ontological foundations as positivism, critical realism acknowledges the existence of an external reality with underlying regularities, particularly in terms of its structures and mechanisms. However, unlike positivism, it rejects the idea that this reality can ever be fully captured or known for certain through objective measurement. Instead, critical realism holds that we can, at best, *approximate* an understanding of it. This is because human knowledge is always tentative, partial, and fallible. In this subtle departure from the form of realism underpinning positivist perspectives, critical realism is less concerned with directly representing the world, and more focussed on generating the most robust explanations of the underlying mechanisms that produce observed phenomena.

A defining feature of critical realism is its stratified ontology. Reality, Bhaskar argued, operates at three distinct levels: the empirical, the actual, and the real. The 'empirical' layer of reality concerns what can be observed or experienced directly. In the context of brain injury, this might be a person reporting loneliness, or observable changes in social behaviour such as withdrawal. The 'actual' layer encompasses the events and mechanisms that contribute to the phenomena observed or reported. For example, fatigue, speech difficulties, or reduced confidence may cause a person to withdraw from social participation. This level includes psychosocial mechanisms, such as disrupted identity, changes in social roles, and feelings of 'not fitting in' post-injury. However, the 'real' layer of this stratified reality implicates deeper, often unseen structures and systems that shape what can or may be observed. These include, for example, transport barriers, inequity in access to high quality natural spaces, the unavailability of inclusive community programmes, or cultural stigma that perpetuate exclusion and isolation after injury, further to resource, policy and procedural barriers preventing access to high-quality neurorehabilitation. This stratified view allows critical realism to move beyond surface-level description, seeking to approximate an understanding of not only what happens - but why it happens, in what context, and for whom. This aligns with the type of thinking that underpins the PTMF outlined in Chapter One. In practice, the PTMF operationalises a critical realist perspective by prompting clinicians to ask, "What happened to this person, and what didn't happen for them?" This encourages exploration of both the real, systemic influences on an individual’s life (e.g., social, economic, and relational factors) in addition to their subjective experience.

Epistemologically, critical realism is fallibilist. It accepts that knowledge is always theory-laden and mediated by social, cultural and cognitive factors, but insists that some accounts are better than others in terms of explanatory power. Explanations should aim to uncover causal mechanisms, rather than simply describe regularities or individual perspectives. Critical realism asserts that in doing so, knowledge should be intersubjectively testable so that other researchers can evaluate the conclusions drawn. With that, critical realism encourages methodological pluralism: the use of multiple approaches (qualitative and quantitative) to triangulate evidence and uncover deeper insights into the underlying mechanisms of phenomena (Creswell & Zhang, 2009; Teddlie & Tashakkori, 2009).

## 3.3 Quantitative and Qualitative Paradigms in Neuropsychological Rehabilitation Practice and Research

Quantitative approaches to measurement partly derive from the philosophical position of positivism, which seeks to model psychology and the social sciences on the methods used in the physical sciences (Barker et al., 2015). In accordance with its philosophical underpinnings, quantitative paradigms aim to test hypotheses by collecting numerical data and applying statistical methods to provide descriptive information on phenomena, establish associations between variables, or identify trends and changes in data over time within large population, even generating predictive insights (Morse et al., 2020). Owing to its foundation in mathematical principles, the quantitative approach is commonly regarded as scientifically objective and rational. This objectivity is proposed to allow researchers to draw reliable conclusions and make evidence-based claims regarding the effectiveness of interventions. In the context of applied research, they are instrumental in conducting clinical trials, generating empirical evidence, and guiding the development of evidence-based guidelines for neurorehabilitation practices.

Quantitative paradigms are widely adopted in neuropsychological research, with a recent scoping review reporting that of 425 articles published on rehabilitation interventions for individuals with TBI between 2006-2019, the majority (71.8%) applied quantitative methodologies, with 19.7% being RCT’s (Sveen et al., 2022). The principal strength of RCT’s is that they allow for unknown confounding factors to be controlled for, which can be useful for well-defined and focussed evaluative designs, where observable and quantifiable changes are expected, specific, and additional or confounding variables can be accounted for (Andrews, 1991). RCT’s have traditionally been considered the gold standard of research in relation to determining the efficacy of a treatment intervention as they provide quantitative evidence either for or against one treatment over another. For example, Cicerone et al., (2008) conducted a single-blinded RCT to compare holistic neuropsychological rehabilitation to conventional multidisciplinary rehabilitation programme for adults with moderate-to-severe brain injury. This high quality RCT made a significant contribution to the field of neurorehabilitation in that it demonstrated the efficacy of holistic therapy over conventional programmes (Cicerone et al., 2008). In this way, research designs which allow for comparative analyses to take place are highly useful in a clinical context, as the identification of similarities and differences across different groups (such as individuals with ABI versus those without, or individuals with varying levels of impairment) can help patients, clinicians and policymakers to make evidence-informed decisions about whether to endorse an intervention. A key strength of quantitative research in this regard is that it allows for generalisations to be made about the broader trends and patterns in the experiences of individuals with ABI, providing a foundation for evidence-based practice that is often based on large sample sizes. This consensus generates a level of understanding of a given phenomenon across the field. However, nuance adds insight and opportunity; something which quantitative paradigms often miss - or reject altogether.

Unlike quantitative research (which allows for hypothesis testing and is often taken as a stepping stone towards the production of ‘complete’ knowledge), a qualitative research paradigm can be used to gather rich information about a person’s experiences, perceptions, beliefs, and attitudes, thus facilitating the generation of a rich tapestry of understanding from which explanations of phenomena or theories may be generated. Qualitative research has hereby made important contributions to field of neurorehabilitation, elucidating the subjective experiences of identity and social participation (Mamman et al., 2022), acceptance (Large et al., 2020) and sense-making (Stagg et al., 2022), among various other constructs relevant to adaptation and growth post-ABI.

Methods for qualitative data collection hereby include (but are not limited to) interviews, focus groups, observations and cultural immersion (ethnography), in addition to case studies. In these methods, language is the primary medium through which researchers gather information about participants' experiences, perceptions, beliefs, and attitudes. This language may serve various purposes, such as being used to examine the lived experiences of individuals to understand the essence of a phenomenon (phenomenology), exploring narratives to understand how meaning is constructed (narrative inquiry), or explicitly using language to inform the construction and development of theories in areas where understanding of a phenomena is lacking (grounded theory). Thus, language also comprises the medium for analysis, interpretation and communication. While there are many ways in which qualitative data may be analysed, interpreted and utilised based on the researcher's orientation and ontological and epistemological positioning, qualitative data (that is, language) is generally analysed through the identification of patterns of meaning and the researcher(s) organisation of such patterns into themes. However, it us upon this basis that qualitative research receives much of its criticism.

Qualitative research is often criticised by those from a positivist standpoint for its subjective nature, as data interpretation can be influenced by researchers' personal biases, perspectives, and preconceptions wherein qualitative researchers may selectively interpret data to fit their preconceived notions or theoretical frameworks. Critics (who typically strive for objectivity) argue that this subjectivity and bias may undermine the reliability and validity of findings. Such critiques, however, often rest on the assumption that objectivity is both possible and desirable in all forms of research, overlooking the epistemological differences that underpin qualitative inquiry.  For example, leading qualitative scholars in the field perceive subjectivity to be a resource that can enrich the research process by providing unique insights and interpretations of the data if one's biases and assumptions are critically reflected upon (Braun & Clarke, 2006, 2013, 2021). Reflexivity and transparency in this regard can enhance the methodological rigour of qualitative work. Thus, if conducted with thoughtfulness, qualitative methods can meaningfully capture nuance and complexity within personal narratives that quantitative methodologies miss.

Depth of exploration is crucial for advancing neurorehabilitation in addition to wellbeing theory and practice; particularly when exploring complex constructs such as wellbeing. To provide an example: researchers investigating coastal resource use, quality of life and wellbeing in Puerto Rico reported that without using ethnography in their mixed-methods approach, key elements of what constituted quality of life and wellbeing for their cohort and the relationships between coastal resource use and quality of life and wellbeing would have been missed if only relying upon their comparative, quantitative measures (García-Quijano et al., 2012). This is a common pitfall of forced-choice self-report quantitative assessment measures, to which some scholars argue there exists an overreliance in the context of wellbeing theory and its application in a therapeutic setting (Kagan, 2022; Rich, 2014). In contrast, exploring the meanings attached to complex and subjective experiences using qualitative methodologies can help to ensure that any subsequent theories, measures, and interventions that are developed are culturally sensitive and appropriate for the target population. Thus, while quantitative data provide breadth and generalisability, qualitative insights offer depth and context. From a methodological pluralism standpoint, neither method is superior. Rather, value can be found in drawing upon a variety of sources of information (Barker et al., 2015).

In applied settings such as that of neuropsychology, practitioners naturally draw upon a range of methods to understand the nature of a patient's difficulties and identify the best ways to support them. Following the acquisition of a brain injury, quantitative measures (such as the Glasgow Coma Scale) are used to index the nature of trauma if consciousness is lost before a battery of standardised neuropsychological and functional assessment procedures are used to objectively assess the extent of impairment and associated functional deficits. These quantitative methods hereby provide structured and measurable approaches to studying the effects of injury (van Heugten et al., 2020), encompassing standardised assessments of cognitive function, motor skills, emotional wellbeing, and quality of life. The use of such measures facilitates the detection of subtle changes in needs and functioning over time in persons living with ABI. Identifying areas of need is a crucial part of the rehabilitation process as it enables the clinician to build an immediate picture of the individual's strengths and difficulties (Wilson, 2010; Wilson et al., 2008) while informing the development of appropriate intervention strategies to address specific difficulties and opportunities for positive change.

While quantitative methods are useful for providing a snapshot into the persons position, these brief conventional measures are unable to fully capture the everyday and subjective difficulties faced by the individual and their family, including the profound impact that ABI has on one's sense of identity, self-worth and meaning (McGrath, 2011). To optimise the success of rehabilitation efforts, clinicians need to understand the unique circumstances of the individual and the difficulties that are having the most impact on them, further to their values and preferences regarding what they wish to achieve from their rehabilitation. This information is critical for decision-making in both patient-centered and evidence-based practice models of healthcare and can be achieved by drawing upon qualitative research methods such as interviews and observations (Vingerhoets et al., 2023). These methods allow for the opening of dialogue and understanding between the therapist, the patient, and their families regarding what matters to them and how the neurorehabilitation pathways can best support them in achieving meaningful outcomes. Qualitative inquiry hereby complements the principles of holistic neurorehabilitation by offering a means to understand the complex, contextual and multidimensional nature of patients' experiences. The foundational principles embedded within qualitative research are hereby consistent with principles of holistic neurorehabilitation in that it emphasises the importance of the whole person (Ben-Yishay & Diller, 2011; Prigatano, 1999). Like holistic neurorehabilitation, qualitative research facilitates a comprehensive exploration of patients' experiences, perspectives, and needs beyond just their clinical symptoms. This includes, for example, their lived experiences, their emotional responses and their social interactions. Holistic neurorehabilitation also recognises the importance of considering the broader environmental, social, and cultural contexts in which individuals live and rebuild their lives following ABI. Qualitative research provides a means of exploring the contextual factors that influence patients' experiences and outcomes, including social support networks, cultural beliefs, socioeconomic status, and access to resources. By examining these contextual factors through qualitative inquiry, researchers and practitioners can gain a deeper understanding of the barriers and facilitators to rehabilitation and develop more effective interventions that address the complex interplay between individual and environmental factors. Integrating patient perspectives and qualitative methodologies can hereby help to build a rich tapestry of understanding and/or generate explanations for phenomena, which is particularly useful when exploring complex constructs such as wellbeing and its contextual elements. In line with PTMF, it enables exploration into what may or may not have happened to and for a person, as discussed in Chapter One. While qualitative research may lack generalisability in the traditional sense of applying findings to broader populations, it hereby offers rich, detailed insights into the complexities of human experiences and behaviors. Instead of aiming for statistical generalisability, qualitative research often prioritises theoretical generalisability, seeking to develop theories, frameworks, or concepts that can be applied or tested in diverse contexts.

## 3.4 Navigating Relative Strengths and Weaknesses: The Case for Methodological Pluralism

In recognition of the relative strengths and weaknesses of qualitative and quantitative research, embracing methodological pluralism and adopting a mixed-methods approach to neuropsychological practice and research can offer significant advantages. Mixed-methods approaches have emerged as a powerful tool for triangulating findings, validating results, and capturing the richness and diversity of human experiences in clinical contexts. That is, integrating both approaches enables researchers to capture the breadth of experiences through quantitative data while also exploring depth and context through qualitative insights; thereby addressing the limitations inherent in each approach (Creswell & Creswell, 2017). In this way, incorporating mixed-methods approaches into an evaluation design may offer a more nuanced, comprehensive and holistic understanding of how adults with ABI experience various types of interventions that draw on the latest developments in wellbeing science, which is necessary to fully ascertain their potential impact (Coetzer, 2008).

While most practicing neuropsychologists working in adult brain injury rehabilitation in the UK try to evaluate their programmes, many report difficulties in doing so (Wilson, 2013). Methodological difficulties are inherent to the field of clinically applied research such that conducting a rigorous evaluation of an intervention can be challenging (Sveen et al., 2022). This complexity may stem from both the characteristics of the population and the inherently multifaceted nature of neurorehabilitation, an intervention composed of numerous interrelated and interdependent components (Turner-Stokes et al., 2015). There exists great heterogeneity in neurorehabilitation, which reflects the significant heterogeneity that exists at the level of the individual. Individuals with ABI demonstrate heterogeneity at various levels and enter neurorehabilitation services with various combinations of physical, communicative, cognitive, behavioural, psychosocial and situational difficulties (Turner-Stokes et al., 2015). This means that individuals experience a range of pathologies and unique difficulties depending on the severity and nature of their injury, among other factors, and they also approach rehabilitation from a variety of personal and social constructs. As highlighted by Turner-Stokes et al., (2015), this heterogeneity presents a challenge to quantitative paradigms, such as RCT-based methods, which are often favoured in neuropsychological research. In contrast, qualitative research can capture this complexity, if conducted thoughtfully and rigorously. However, one key limitation which is shared by both quantitative and qualitative designs for data collection (albeit, in varying magnitude) concerns their associated resource costs, in terms of finances, time and capacity. With respect to quantitative paradigms such as RCT's, the resources required to deliver different interventions to two or more groups can be considerable in terms of both financing and time costs, particularly when effects are intended to be captured over time. Various other common designs for quantitative data collection share similar limitations, including longitudinal, cross-sectional, case-control and cohort studies. However, qualitative research can unequivocally also be resource-intensive in terms of time, expertise, and funding.

Collecting and analysing qualitative data often require extensive fieldwork, transcription and analysis, which can be time-consuming and labour-intensive, particularly if the skills to conduct rigorous qualitative research are lacking. In this regard, some scholars argue that striving for empiricism has become so entrenched in psychology (the disciplinary background from which clinical neuropsychologists operate) that this orientation has overshadowed and undervalued qualitative methods and theory (Nelson, 2015). This is because, as an academic discipline rooted in positivism, psychology has tended to emphasise its status as a 'hard' science that strives for objectivity, accuracy and the strict control of variables where possible (Nelson, 2015), leading to a high prevalence of quantitative studies in psychological research (Breen & Darlaston-Jones, 2010; Ponterotto, 2005). However, the evolution of research in clinical practice has involved a widening appreciation of qualitative approaches and the recognition of their complementary role in advancing understanding, assessment, and therapeutic support within the field of psychology, especially when integrated into mixed-method designs. For example, health and wellbeing scholarship and certain domains of psychology have demonstrated increasing adoption of qualitative methods (Braun & Clarke, 2014). This shift reflects a broader acknowledgment of the multifaceted nature of wellbeing and the importance of embracing methodological pluralism to address its complexities effectively. Notwithstanding, research conducted within a clinical context requires balancing ideal goals with pragmatic solutions, taking into account what is both feasible and meaningful in the specific setting. One strategic means of optimising the potential for rigorous research is through appropriate collaboration with academia. Collaboration between clinical practitioners and academics may strengthen the research process by leveraging complementary expertise, resources, and perspectives, leading to more robust and impactful research outcomes that can inform and enhance clinical practice. The work to be presented in this thesis aims to be an exemplar of this. The following section hereby provides an overview and further justification for the methods adopted herein.

## 3.5 The Paradigm and Positioning of the Present Thesis

On the conceptual bedrock of critical realism, this thesis is guided by a philosophical framework that aligns closely with the aims of the applied work. Critical realism acknowledges the complexity of human experience and the notion of a stratified reality, where deeper systems and structures influence what can be observed. This is consistent with core principles embedded within the metatheoretical GENIAL framework of health and wellbeing, which argues that wellbeing (a largely subjective experience) is heavily influenced by context (Fisher et al., 2022; Kemp et al., 2017; Kemp & Fisher, 2022; Mead et al., 2021). It also aligns with the PTMF (Johnstone & Boyle, 2018), which emphasises that health outcomes are largely influenced by social and political influences. Consistent with the methodological pluralism afforded by the realist roots of critical realism, a mixed-methods approach will be adopted to evaluate the potential of various group-based interventions - designed and delivered independently of the GENIAL framework but informed by principles of salutogenesis and holistic neurorehabilitation - to build wellbeing in adults living with ABI. Given the largely exploratory nature of this thesis, it will primarily draw on qualitative methodologies, allowing the work to centre on the lived experiences (or situated realities) of participants, while also recognising that participant truths are obscured by subjectivity and the processes through which knowledge is generated. In keeping with its applied focus, this thesis draws on service evaluation data, ensuring that insights shared in the good faith that they would inform service development are formally utilised.

The transdisciplinary metatheoretical GENIAL framework will be used as a lens through which participant insights may be interpreted and contextualised in accordance with theory and evidence. This is fitting given that critical realism asserts that understanding of reality is both theory-laden and fallible - such that a researcher’s interpretations are informed by the theories and conceptual frameworks brought to the research process. Moreover, in emphasising the fallibility of knowledge, critical realism takes the position that interpretations are always provisional and open to revision. This is particularly useful when the aim is not only to demonstrate the value that may be added by embedding wellbeing science into holistic neurorehabilitation, but to also remain open to new, valuable insights that may inform local clinical practice or add to existing conceptual knowledge and theory. To achieve this, thematic analysis will be used to critically unpack qualitative data shared by participants.

### 3.5.1 Reflexive Thematic Analysis for Rich, Theory Driven Exploration

Thematic analysis (TA) comprises a theoretically flexible method of data analysis that has been highlighted for its utility in the context of psychological and applied research (Braun & Clarke, 2006, 2014). TA has been considered to be a relatively accessible approach to qualitative data analysis that can be used to identify and analyse patterns of meaning across a data set. It is considered a good entry method into qualitative research, with its creators emphasising the importance of "learning through doing" (Braun & Clarke, 2021), which makes it a practice-first method suitable for early career researchers embarking on their journey into qualitative research. TA is not wedded to any epistemological framework, such that it "can be started without deep and complex theoretical engagement" (Braun & Clarke, 2021). This makes it a practical method for use in clinically applied research, as evaluative insight can be generated relatively quickly to inform service improvement. A limitation of this flexibility, however, is that it may not be employed with sufficient understanding of the various approaches within TA, and the philosophical assumptions and analytical implications that each entail. For this reason, TA comprises a widely used yet poorly understood method.

There are various different approaches to conducting TA, with these spanning from what the pioneers of TA deem 'small Q' approaches (i.e., those that draw on qualitative techniques within a quantitative paradigm) to 'big Q' frameworks i.e., those that draw on qualitative tools and techniques within a qualitative paradigm (Braun & Clarke, 2013). Reflexive TA is an approach which constitutes the latter. It is a theoretically flexible and interpretive orientation to, and form of, TA. Unlike small Q approaches which see individual subjectivity as producing unwanted bias in research that can limit the credibility of findings, reflexive approaches embrace the subjectivity of the researcher and encourage researchers to draw upon their knowledge, skills, and experiences to generate insight into the lived experiences of participants. This can enhance the research process if used and reflected upon thoughtfully and can be particularly useful when the researcher has a substantive knowledge-base 'guiding' their interpretation and understanding of phenomena; one which they acknowledge they cannot (and would not wish to) detach from.

Reflexive TA is chosen as the method of data analysis in this thesis as it aligns with the author's perspectives and philosophical positioning and is well-suited to the research aims.

That is, reflexive TA is consistent with the need to generate understanding of how adults living with ABI experience various group-based interventions that have been purposefully designed to promote adjustment and meet their wellbeing needs in innovative ways, while also drawing on theory to unpack and explain pathways through which communicated outcomes may occur, such that knowledge outputs may add value to models of holistic neurorehabilitation. The work presented in this thesis is situated within the metatheoretical framework offered by the GENIAL framework (Kemp & Edwards, 2022; Kemp & Fisher, 2022; Mead et al., 2021) and embedded within principles and process theories of change underpinning holistic neurorehabilitation, as these comprise the bodies of knowledge within which the researcher's knowledge, curiosity and understanding is embedded. As such, the orientation to data taken by the researcher is, for the most part, deductive in that the analysis is shaped by existing theory which provides the lens through which codes and themes are developed. Note that themes are hereby conceptualised and developed in accordance with the definition provided by Braun and Clarke (2021), where themes comprise:

> *"Patterns of meaning (e.g., concepts, ideas, experiences, sense-making) that are underpinned and unified by a central idea. This central idea, concept or meaning that unites or holds a theme together is sometimes quite explicitly expressed (a 'semantic' theme) and sometimes quite conceptually or implicitly evidenced (a 'latent' theme)."*
>
> *(Braun & Clarke, 2021)*

Following the generation of themes, data extracts will be used illustratively to provide examples of analytic points, and a compelling theory-rich narrative will be used to contextualise participant insights, according to the interpretation of the researcher. However, in instances whereby the interpretation of participant insights implicates a curious or novel concept that is unknown to the researcher, inductive coding will be used, which is in keeping with a) the exploratory nature of the proposed work, and b) the flexibility afforded by reflexive TA, while also reducing the risk that deductive coding results in an impoverished analysis. This is also in keeping with the notion that producing knowledge based on understanding (which embodies a hermeneutics of 'empathy') can be complementary to that produced to explain (which embodies a hermeneutics of 'suspicion') as neither may generate satisfactory insights in isolation (Willig, 2017). Hermeneutics refers to the theory and practice of interpretation (Willig, 2017), and in the context of qualitative research, it involves understanding the meanings, intentions, and contexts underlying the data. Empathy plays a crucial role in qualitative research by allowing the researcher to connect with the experiences and perspectives of the participants. By empathising with the lived experiences of individuals, researchers can gain deeper insights into their thoughts, emotions, and motivations. This empathic approach enables researchers to interpret qualitative data in a way that "honours the voices and experiences" of the participants, arguably fostering a more genuine understanding of the phenomena under investigation (Willig, 2017). However, empathy alone is not sufficient for rigorous qualitative analysis, and adopting a hermeneutics of both empathy and suspicion is essential for interpreting qualitative data in a nuanced and insightful manner, with the dynamic interplay between these stances driving the interpretative process that is foundational to Big Q qualitative work. A hermeneutics of suspicion complements empathy by encouraging critical reflection and questioning of assumptions, biases, and underlying power dynamics that may influence the interpretation of data. Suspicion involves a healthy scepticism and awareness of potential sources of bias or distortion in the research process. By adopting a critical stance, researchers can interrogate their own perspectives and interpretations, as well as the broader socio-cultural, political, and historical contexts shaping the data. In combination, these complementary stances allow researchers to interpret data with both sensitivity and critical rigor, fostering interpretations that are rich and attentive to the broader contextual influences on participants' experiences.

As emphasised by the founders of TA themselves, qualitative research is a skilled endeavour (Braun & Clarke, 2021). In reflexive TA, researchers should ideally incorporate structured reflexive practices, such as maintaining a reflexivity journal, documenting analytical decisions in real time, and engaging in discussions with peers and superiors to ensure that transparency and rigour are maintained throughout the analytic process. However, due to TA being a practice-first method, reflexivity may not always be explicitly practiced from the outset, and key analytical decisions, such as the reasons for merging, moving or renaming codes, subthemes, and themes may not be systematically documented if not planned *a priori*. Accordingly, the depth and presentation of the analytic outputs and corresponding evidence of reflexivity presented in this thesis may vary as a reflection of researcher growth and development over the course of the thesis journey; with this also being fitting to the purpose of the work. Coding may move from a semantic to a latent orientation (i.e., capturing explicitly expressed meaning at the surface level of the data, towards capturing implicit meaning at a conceptual level) with increased skill and experience and continual refinement and iteration. Analyses will therefore move from being relatively descriptive in places, to more complex and theoretically embedded over time. Surface-level meaning pertaining to, for example, intervention feedback and opportunities for improvement may be captured in more general descriptive ways akin to producing a ‘topic summary’ of potential barriers. This is common in applied research (Braun & Clarke, 2021, p.230) and in this instance is used to provide an easily accessible overview of considerations that other clinicians may find insightful if wanting to design a similar intervention in their clinical practice, highlighting a need for a realist approach to qualitative evaluations of healthcare practice that realise new knowledge pragmatically through semantic level analysis and theoretically through analysis of implicit meanings. Overall, the purpose of this work is to produce insightful and theoretically driven knowledge (the output) to strengthen clinical practice and inform theoretical development (the intended outcomes) that may build more sustainable, holistic and balanced wellbeing in adults living with ABI (the desired impact). However, the level of confidence held by readers of this work is subject, in part, to the transparency of data analysis, interpretation and knowledge production offered by the researcher. In the context of reflexive TA, this can be upheld via statements of reflexivity.

### 3.5.2 Statement of Reflexivity

A defining feature of Braun and Clark’s approach to TA and one which differentiates it from alternative approaches to TA is its focus on reflexivity, which involves actively acknowledging and reflecting upon how one’s personal and professional background, values, beliefs, assumptions and experiences may influence the research process and outcomes. According to Braun, Clarke and Willig – and as strongly endorsed by the researcher herein - our assumptions and positionality influence everything that we do as researchers - from the methodological approaches we take to the conclusions we draw. These assumptions and experiences exert profound influence over a researcher’s interpretation of qualitative data; with interpretation being a largely subjective act. This perspective is endorsed by the author of this thesis, who strongly believes that data is always influenced to some extent by our values and preconceptions. After all, these determine what we choose to study in the first place, what we count as data, what we select as important to report from amongst our findings, and inevitably the conclusions we draw about the world from our research. Indeed, Baye’s theorem holds that drawing inferences from research to the world is impossible without taking prior assumptions into account (Dienes, 2011). Accordingly, a statement of reflexivity is provided below. In contrast to the main body of the thesis, which is written using a passive voice in accordance with the disciplinary norms embedded in psychological science, the reflexive statement is written in first-person to emphasise and embrace the role of the researcher in the analytic process. This is in line with reflexive TA.

#### *3.5.2.1 How My Research Interest in the Topic Developed*

As a quietly curious, white British female who has enjoyed studying, observing and learning from a young age, I have always had a keen interest in understanding human behaviour, health and psychology. My academic journey, from studying Health and Social Care at BTEC and psychology at A-level, undergraduate and master's degree, has shaped my understanding of human behaviour, health and psychological wellbeing. My former studies introduced me to concepts of healthy functioning and development (with particularly salient modules covering Maslow's Hierarchy of Needs and equality, diversity and human rights). To compliment my theoretical knowledge, I immersed myself in health and social care settings and volunteered on a weekly basis for six years alongside my studies at a council-funded day service supporting adults aged 45+ with learning needs and comorbid clinical difficulties (including Autism Spectrum Disorder, Schizophrenia and early onset Dementia). This service unknowingly emphasised the provision of person-centered care, with daily activities delivered by a small team of staff functioning to autonomy and engagement, build confidence, and provide opportunities for vital social interaction. Clinical diagnoses took a back seat to individual nuances, preferences and characteristics, fostering a strong sense of community, acceptance and belonging within the care setting. It was this sense of community which kept me volunteering well into my postgraduate studies; providing a consistent source of connection and community that bolstered my own wellbeing for many years.

#### *3.5.2.2 A Knowledge Base Steeped in Symptom Reduction*

My postgraduate studies commenced immediately following the completion of my bachelor's degree with immersion in a master's degree in clinical and abnormal psychology. This course placed increasing emphasis on understanding the aetiology, maintenance and treatment of abnormal conditions (including anxiety and depression, eating disorders, psychosis, etc). During this time, I supported a Consultant Neurologist who provided follow-up care to adults with epilepsy and psychogenic seizures in an outpatient department setting. Here I was responsible for independently conducting cognitive assessments with patients to assess their cognitive function and levels of anxiety and depression and fed this information back to the neurologist for consideration regarding future pharmacological treatment. During both my MSc studies and 18 months spent volunteering in the neurology clinic, there seemed to be a significant emphasis on fixing impairment and reducing symptomology. My academic studies seemed to be dominated by a positivist stance with its focus on experimentation and statistics and emphasis on diagnostic labels and amelioration of symptoms. Furthermore, there was a focus on treating symptoms as opposed to exploring wider (non-medical) influences on behaviour, with little consideration of the whole person. Similarly, my clinical experience was reductionist and embedded within a medical model of fixing impairment, although there were concerted efforts to acknowledge the need for psychological input due to increased awareness and understanding of psychogenic seizures and their proposed psychological basis, in contrast to a structural/neurological basis. My frustrations with the gaps in psychological support for adults with epilepsy fuelled my research pursuits, driving a focus on meaningfully enhancing interventions and services for adults with pervasive difficulties who report unmet psychological and wellbeing needs. Through immersion in both community-level and acute care facilities, I have grown to appreciate the importance of adopting a person-centered approach and the limitations of existing support structures in meeting the multifaceted needs of individuals with cognitive and emotional difficulties. With that, I believe that it is vital to merge both approaches, focussing not only on reducing distress but also on building wellbeing – holistically - and in ways that matter and are meaningful to the individual. I strongly believe that seeing individuals as unique persons rather than as patient numbers or diagnostic labels can help to lay the foundations for true wellness, and that harnessing the power of the natural environment can facilitate this.

#### *3.5.2.3 My Personal Affiliation with Nature*

Given that much of the evidence for the present work suggests that one’s personal affiliations with nature determine the extent of benefits experienced when spending time in the natural environment, I feel it is important to reflect on my own affiliations with nature and how this influences my work. As a White, British female who has lived in South Wales since birth, I have many fond memories of time spent in nature as a child. As an adult, I consider myself to have a strong affinity to nature, which I believe is strengthened by my desire to give my dogs an experience-rich and fulfilling lifestyle characterised by connection, shared experiences, physical exercise, and mental stimulation. However, I currently live in a highly urbanised area of Swansea which, despite having moderate quality green space within walking distance, is situated in a high-traffic environment. I have experienced restricted access to high-quality green and blue spaces due to a lack of personal transport. In this regard, while South Wales has bountiful availability of high quality green and blue spaces and has been recognised as housing several areas of outstanding beauty, access requires travel and transport due to its rurality. My affinity for spending time in nature hereby underscores my appreciation for the therapeutic potential of natural environments, while my personal experience of facing barriers to access underscores the emphasis I place on the importance of providing opportunities for disadvantaged populations to engage in such environments during the therapeutic process. Collectively, these experiences fuelled my research interest and enthusiasm for advocating for therapies (and particularly nature-based interventions) which consider the whole person.

#### *3.5.2.4 My Positionality as a Researcher*

Despite my preconceptions and experience of working on a professional basis with adults with neurological impairment, I consider myself an outside researcher as I have no personal experience of living with neurological impairment or any personal relationship to any individual with a brain injury. This is coupled with a belief that no amount of clinical knowledge or experience could possibly provide an individual who does not have a brain injury to fully understand the subjective experience that it encompasses. However, I have been described as a highly empathetic individual and use this when attempting to understand the experiences of those who have kindly shared their insights to support my work. While I am empathetic by nature, my academic studies (and personal hardships) have trained me to be questioning and critical, providing the tools to critically unpack subjective experiences shared by others by combining a hermeneutics of both empathy and suspicion.

Being an empathic individual who has been trained to think critically offers several advantages in the context of qualitative inquiry. Firstly, empathy may allow me to quickly establish rapport and trust with participants when hosting interviews. Empathic researchers are also considered better able to listen attentively, ask probing questions, and encourage participants to share meaningful, detailed narratives (Willig, 2017). Secondly, empathy enhances the researcher's ability to empathise with the lived experiences of the participants, leading to more nuanced and insightful interpretations of the data. Thirdly, critical thinking can enable researchers to examine the data through multiple lenses, identifying patterns, contradictions, and underlying themes that may not be immediately apparent. By balancing empathy with critical scrutiny, I may be able to develop a more comprehensive understanding of the complexities and nuances inherent in qualitative data. Overall, having a hermeneutics of empathy and suspicion is necessary for the rich interpretation of qualitative data (Dienes, 2011). Empathy allows researchers to connect with participants and understand their experiences, while suspicion encourages critical reflection and questioning of assumptions. Together, they may facilitate the production of deeper insights and nuanced interpretation.

#### *3.5.2.5 The Drawback of Drawing on Evidence-based Theories*

One limitation of applying qualitative methods through the lens of evidence-based theories, assumptions, or preconceived beliefs is the risk of confirmation bias. Confirmation bias in qualitative research refers to the tendency of researchers to interpret data in a way that confirms their preconceived beliefs, hypotheses, or theoretical frameworks (Klayman, 1995). Biases in analysing or interpreting data may exist in both quantitative and qualitative research paradigms, with the dismissal of results that don't fit existing preconceptions comprising a common form of subtle distortion in the context of self-deception (Barker et al., 2015). In the context of qualitative research, this bias can lead researchers to selectively focus on data that supports their existing views while disregarding or downplaying evidence that contradicts them (Braun & Clarke, 2021). While my preconceived beliefs, assumptions and theories ultimately guide my understanding and interpretation of qualitative data (with critical realism comprising an approach that is consistent with the use of theory in knowledge generation and production), it is crucial not to be blind sighted by these. Research itself demands a level of psychological flexibility, including the ability to revise one's ideas if they are not supported by the evidence (Barker et al., 2015). In reflecting on my own biases and assumptions, I will actively seek out evidence that challenges my preconceptions where possible and will revise preliminary interpretations in light of new insights and information. This approach fosters openness to alternative interpretations, helping to mitigate confirmation bias, broaden understanding of the topic, and potentially contribute to further theoretical development within the discipline. Therefore, while my background, experiences, and assumptions can add valuable nuance to the analytic process, critical reflection and active management of biases enhance both the methodological rigor and the quality of the work herein.

# 4 Chapter Four: Promoting Acceptance and Adjustment: A Mixed Methods Evaluation of an Adapted-ACT Intervention for Adults Living with Mild-to-Moderate Distress Post-ABI

Chapter One detailed the profound personal impact of ABI, where heightened emotional distress presents barriers to wellbeing and growth. Psychological flexibility has been identified as a key mechanism through which individuals can navigate these challenges, fostering adaptive coping and emotional adjustment in the face of adversity. Briefly introduced in Chapter Two, this approach explicitly aims to build psychological flexibility by promoting acceptance, mindfulness, and value-driven action, thereby supporting adjustment and enabling individuals to move towards a more fulfilled life post-injury. However, evidence for ACT's effectiveness in improving psychological flexibility remains mixed. This mixed-methods study examines the potential of a patient-informed, five-week adapted-ACT intervention to enhance psychological flexibility and adjustment in adults experiencing mild-to-moderate distress following stroke or ABI. To fully contextualise the profound personal impact of ABI, this chapter begins by revisiting the psychological and emotional challenges of ABI introduced in Chapter One.

## 4.1 Introduction

Stroke and ABI have a profound impact on the individual, with emotional consequences presenting as significant and enduring challenges. The experience of stress, trauma and sudden functional loss contribute to heightened emotional distress (Douglas, 2020). Anxiety and depression are particularly prevalent, often comorbid, and persist long after the acute phase of injury (Shields et al., 2016; Wang et al., 2021). Post-stroke, 55-57% of individuals experience anxiety and depression (Ayerbe et al., 2014; Hackett et al., 2005), with up to 20% facing major depression at two years post-injury (van Heugten & Wilson, 2021). Similarly, depression rates following brain injury range from 27-64% (Glenn et al., 2001; Jorge et al., 2004; Osborn et al., 2014), with many experiencing moderate to severe major depression at three to twelve months post-TBI (Wang et al., 2021). Recent findings indicate that individuals with TBI face a 1.9-fold risk of anxiety compared to healthy controls (Dehbozorgi et al., 2024) with anxiety disorders persisting long-term (Scholten et al., 2016). Depression amongst these populations correlates with poor involvement in rehabilitation, medication non-compliance, hospital re-admission rates, long-term disability, social withdrawal, and increased mortality and suicide rates (Ayerbe et al., 2013; Gillen et al., 2001; Kronish et al., 2012; van Eeden et al., 2016). Among ABI populations, depression raises suicide risk fourfold (Teasdale & Engberg, 2001), with severity predicting suicidal ideation (Mackelprang et al., 2014). Thus, emotional distress not only poses an immediate risk to the person’s wellbeing and livelihood - it also impacts upon long-term recovery, rebuilding and quality of life.

Multiple factors exacerbate emotional distress, including poor coping strategies, diminished self-worth, unemployment, deteriorating relationships, and lack of social support (Douglas, 2020). Emerging research highlights the interconnected nature of anxiety and depressive symptoms, where worrying thoughts and difficulty relaxing sustain anxiety-depression networks one-year post-injury (Carmichael et al., 2023) and difficulties with emotional dysregulation significantly contribute to variations in depression, anxiety, and overall distress (Shields et al., 2016). How individuals appraise their circumstances, along with their coping styles, plays a pivotal role in managing psychological and emotional distress (Kendall, 1996). For example, coping approaches characterised by denial or disengagement are associated with poorer psychological outcomes and delayed recovery (Anson & Ponsford, 2006; Clarke & Black, 2005). Effective adjustment to life post-ABI requires adapting cognitive, emotional, and behavioural responses to the challenges of living with a brain injury. Psychological intervention is hereby recommended to promote adjustment post-stroke and ABI (Mitchell et al., 2009; Towfighi et al., 2017; Williams et al., 2007) and build resources for adaptive coping.

The dominant psychological intervention used for supporting emotional adjustment in populations experiencing distress is Cognitive Behavioural Therapy (CBT) (Gómez-de-Regil et al., 2019; Hofmann et al., 2013). CBT posits that automatic and maladaptive cognitions about the self, the world, and the future are key contributors to emotional and psychological distress (Hofmann et al., 2012). Accordingly, therapeutic strategies focus on challenging and modifying these maladaptive beliefs to alleviate distress. This disease-focussed approach, which aims to 'fix what is wrong', has demonstrated effectiveness in managing conditions such as anxiety disorders, somatoform disorders, bulimia, anger regulation difficulties, and general stress (Hofmann et al., 2013; Hofmann et al., 2012). However, its efficacy in populations with TBI and ABI is less clear, with mixed evidence (Little et al., 2021; Waldron et al., 2013). In such cases, cognitive schemas may reflect a realistic appraisal of life-altering circumstances, making the approach less applicable (Kangas & McDonald, 2011). While CBT has been shown to reduce depressive symptoms in individuals with stroke or brain injury, clinical levels of emotional distress often persist, and improvements in functionality and coping are often not synonymous with enhanced psychosocial wellbeing post-ABI (Tiersky et al., 2005; Waldron et al., 2013). Evidently, reducing distress alone does not establish the foundations for wellbeing (Fisher et al., 2022). Critical aspects of wellbeing outlined in Chapter One, such as living a meaningful life, fostering a sense of belonging, and maintaining a coherent self-identity, are often overlooked (Anson & Ponsford, 2006; Tiersky et al., 2005). Instead, a realist review of neuropsychological rehabilitation interventions highlights the importance of approaches that help individuals reframe internal experiences, enhance self-worth, and build a sense of mastery and connection. These interventions, when adapted and tailored to the unique needs of individuals with ABI, offer the greatest potential for improving psychological wellbeing (Fletcher et al., 2024). Thus, there is a growing need for more salutogenic interventions that prioritise building capacities for emotional wellbeing over solely reducing distress. Such approaches should support individuals in re-engaging with a meaningful life post-ABI, addressing broader factors critical to psychological adjustment.

Acceptance and Commitment Therapy (ACT) is a mindfulness-based, third wave behavioural therapy that may better support adaptive coping and overall wellbeing post-stroke and ABI by helping individuals to live with pervasive difficulties (Hayes et al., 1999). Rather than focussing on the reduction or control of unpleasant psychological events, ACT promotes acceptance of these experiences and the importance of a meaningful and values-driven life. This aligns with developments in wellbeing science and salutogenic principles (outlined in Chapter One), which prioritise health promotion over the alleviation of pathology (Mead et al., 2021). Rooted within a sentimentalist philosophical perspective, ACT takes a functional, contextual and pragmatic view of human experience that conceptualises distress as a universal aspect of human experience (Hayes et al., 2006). Its therapeutic approach emphasises accepting and defusing, rather than directly challenging, thoughts, feelings, and experiences (Hayes et al., 1999), enabling individuals to re-engage in living a meaningful life despite unpleasant thoughts and emotions (Hayes & Smith, 2005) and neurological or physical limitations (Harris, 2013; Kangas & McDonald, 2011; Nordin & Rorsman, 2012). By promoting mental health and meaningfulness through values-based exercises, ACT fosters a sense of connection to oneself and supports altered perspectives on internal experiences, as highlighted by Fletcher et al., (2024). This aligns with the metatheoretical GENIAL framework, which explicitly emphasises ‘connection to self’ as a core component of wellbeing, achieved through the cultivation of a balanced mind (Mead et al., 2021). Emotional balance, a key aspect of this framework, refers not to the elimination of distress but to the ability to make room for and coexist with difficult emotions in a way that does not impede valued living. In this regard, ACT’s focus on psychological flexibility directly complements the GENIAL framework’s emphasis on holistic wellbeing, as it enables individuals to foster acceptance of challenging internal states while maintaining engagement with meaningful, life-enhancing activities.

The core aim of ACT is to alter the individual's relationship to their psychological and contextual experiences by cultivating psychological flexibility, a foundational process for adaptive functioning and a proposed hallmark of human health (Hayes et al., 2006; Kangas & McDonald, 2011). Psychological flexibility comprises a broad set of human capabilities that enable an individual to respond to stimuli in an adaptive manner that is functional (as opposed to dysfunctional) given a particular context (in this case - a neuropsychological condition). This involves responding adaptively to situational demands, adjusting behaviours or mindsets when current strategies impede wellbeing, balancing priorities across life domains, and acting with awareness and commitment to values-driven goals (Kashdan & Rottenberg, 2010). For those recovering from stroke or ABI, this may involve accepting physical or cognitive limitations, finding alternative pathways to achieve goals, or adopting new coping strategies while engaging in activities aligned with personal values. The ‘Hexaflex’ Model identifies six core processes that foster psychological flexibility and mitigate psychological rigidity - often considered the root of human suffering (Hayes et al., 2006). These processes include acceptance (noticing unpleasant thoughts, feelings, and experiences without avoidance or attempts to change them), cognitive defusion (disentanglement of and decreased fixation on thoughts), flexible attention to and contact with the present moment (maintaining attention to the present without judgement or attempts to change the experience), self-as-context (in the context of stroke and ABI, viewing one’s condition as only one aspect of self, fostering a broader, more fluid self-concept), valued living (identifying personal values), and committed action (taking purposeful steps guided by one’s values despite challenges). Together, these processes help individuals to detach from unwanted, disturbing thoughts and adopt a more mindful, observational orientation (Hayes et al., 2006), enabling one to act in alignment with values-based goals (Whiting et al., 2021). For individuals recovering from stroke or brain injury, this framework offers a pathway to live a meaningful life alongside the presence of distress.

Paradoxically, while the amelioration of distress is not a goal of ACT, a plethora of research suggests that learning to experience unpleasant emotions rather than avoiding them can improve one’s ability to live with distress (Leyro et al., 2010). A systematic review of 36 RCTs evaluating ACT for depression and anxiety disorders across diverse populations found ACT to be more effective than waitlist controls and treatment-as-usual in reducing psychological distress, with outcomes comparable to traditional CBT (Twohig & Levin, 2017). Importantly, these effects were mediated by increases in psychological flexibility, the intervention’s theorised process of change. Similar findings have been reported in more recent studies (Østergaard et al., 2020), which demonstrated that increases in psychological flexibility mediated reductions in depressive symptoms and enhanced positive mental health for up to twelve months post-intervention in non-injured populations with a history of depression. Thus, improvements in psychological flexibility not only contribute to wellbeing but are often accompanied by reductions in distress, as demonstrated in interventions targeting mild-to-moderate depression and anxiety (Fledderus et al., 2013; Kashdan & Rottenberg, 2010). While research regarding the use of ACT for adults with stroke and brain injury is still in its infancy, preliminary evidence is promising. However, much of this research has focussed on deficit reduction rather than salutogenic outcomes.

ACT interventions adapted for stroke and ABI have demonstrated significant reductions in distress and depression compared to controls receiving befriending, counselling, or educational interventions. For example, Majumdar and Morris (2019) and Whiting et al. (2019) reported clinically significant reductions in distress among stroke and severely impaired ABI populations, respectively. Adaptations tailored to cognitive difficulties associated with stroke and ABI, such as shorter session durations, simplified language, and the inclusion of injury-specific examples, have also demonstrated the potential for deficit reduction. Research by Liu et al. (2023) demonstrated that an adapted ACT intervention for acute stroke patients with mild depression significantly reduced depressive symptoms, with improvements maintained at three-month follow-up. Similarly, a multiple baseline design study reported medium-to-large decreases in anxiety and depression in three out of four participants with ABI-related anxiety and depressive symptoms following their engagement in an individually-delivered adapted-ACT intervention (Rauwenhoff et al., 2022). More recently, research from the same group found that the adapted ACT intervention led to clinically meaningful reductions in anxiety and depressive symptoms for stroke and TBI patients at twelve months post-intervention. However, these changes were not statistically significant, and limited effects were observed in the early months following treatment or when compared to control groups (Rauwenhoff, Bol, Peeters, & van Heugten, 2024).

While much of the research on adapted ACT interventions for stroke and ABI has focussed on reductions in distress and depressive symptoms - largely because these are commonly measured outcomes in clinically applied research - ACT is not designed to directly target symptom reduction but rather to enhance psychological flexibility. This is an important distinction, as psychological flexibility is proposed to underpin long-term wellbeing and adjustment by enabling individuals to engage with life in a values-driven manner despite ongoing challenges. If ACT outcomes are mediated by psychological flexibility, the efficacy of adapted interventions should be assessed in terms of their ability to foster this construct rather than solely through symptom reduction. Still, evidence on the effectiveness of adapted interventions in enhancing psychological flexibility remains mixed, highlighting the need for further research to determine how best to optimise ACT for individuals with ABI. Some studies, such as that by Sander et al. (2021) have demonstrated significant improvements in psychological flexibility and related outcomes following adapted ACT interventions for mild-to-severe TBI. Others, like Liu et al. (2023), have reported statistically significant gains in psychological flexibility alongside enhanced mental health-related quality of life, confidence, and sleep quality in stroke patients who engaged in a four-week adapted-ACT intervention, compared to treatment as usual controls. Statistically significant gains were maintained at 3-months follow-up, demonstrating the potential for relatively brief interventions to build psychological flexibility in individuals living with stroke. However, in contrast to these findings, some studies have reported non-significant changes in psychological flexibility relative to active control groups. Whiting et al., (2019) found that although their ‘ACT-Adjust’ programme facilitated significant reductions in depression and stress for severe TBI patients, these effects were not maintained at follow-up, and improvements in psychological flexibility were not statistically significant despite trends in the hypothesised direction. A recent multicentre RCT by Rauwenhoff, Bol, Peeters, Smits, et al. (2024) also found that while improvements in ACT-related process measures (e.g., psychological flexibility, valued living) were observed over time, these gains were not significantly greater than those achieved through psychoeducation or relaxation training. However, both studies utilised measures which have been criticised for capturing psychological *in*flexibility or negative affect rather than the theoretical constructs of, or related to, psychological flexibility (Newsome et al., 2019; Arch et al., 2023). The measure used (the Acceptance and Action Questionnaire-II, or AAQ-II) is frequently described as a measure of experiential avoidance (Ong et al., 2020) by scholars such as Moroz and Dunkley (2019) and Twohig et al. (2014) - a characterisation supported by correlational evidence (Francis et al., 2016). Nonetheless, a process evaluation conducted by Rauwenhoff, Bol, Peeters and van Heugten (2024) revealed that participants frequently integrated ACT skills into daily routines, suggesting potential functional benefits that may not be fully captured by quantitative measures, despite those same outcome measures of psychological inflexibility demonstrating significance in some instances (i.e., Liu et al., 2023).

Qualitative evidence provides valuable insights into the potential mechanisms underpinning the ACT’s effects. For example, Large et al., (2020) reported that acceptance of subjective experiences and post-stroke limitations was conducive to adjustment and recovery such that participants felt empowered and in control of their circumstances. These changes were accompanied by descriptions of a more fulfilling life despite residual impairment. However, feedback provided by participants also highlighted the importance of group process in supporting acceptance of a changed reality post-stroke, with participants expressing a desire for increased opportunities for discussion of group materials going forward and a less didactic approach. Group sharing in this context may facilitate a sense of unity and reduced social isolation (Patterson et al., 2016). This suggests that while group-based adapted ACT interventions which promote psychological flexibility may be positively received by stroke populations; opportunities for adjustment may be further optimised by creating an immediate support network for participants to benefit from (Kessler et al., 2014). Thus, while the current evidence base suggests that adapted ACT interventions may support psychological flexibility and adjustment following stroke and ABI, further exploration is needed; particularly given the heterogeneity in delivery schedules, intervention intensity, and adaptation strategies. Qualitative studies can hereby illuminate the subjective impact of ACT teachings and identify mechanisms of change that quantitative measures may overlook.

Building on these findings, the present mixed-methods study aims to evaluate an adapted group-based ACT intervention that incorporates stroke survivors' requests for more interactive and experiential learning facilitated through group discussions (Large et al., 2020). This will seek to determine if such adaptations lead to improved psychological flexibility and how ACT techniques may translate into perceived improvements in acceptance and adjustment. Additionally, qualitative investigations will examine which processes drive change and assess the extent to which the intervention meets the needs of this clinical population.

## 4.2 Methods

### 4.2.1 Design

The present study employed a mixed-methods design to investigate objective and subjective shifts in levels of psychological flexibility among adult stroke and brain injury survivors. Using a RCT framework, participants were randomly allocated to receive a group-based five-week adapted-ACT intervention, or a waitlist control. A 2 (group: intervention vs waitlist control) x 3 (time: pre-intervention, post-intervention, and follow-up) mixed factorial ANOVA was conducted to evaluate objective changes in levels of psychological flexibility - as measured by the CompACT scale (Francis et al., 2016). To complement the quantitative analysis and capture participants nuanced and subjective experiences of engaging in the intervention, semi-structured individual interviews were used to produce qualitative data.

### 4.2.2 Ethical Approval

The study (IRAS PROJECT ID: 259095) was approved by Wales (REC 3) Research Ethics Committee (19/WA/0026).

### 4.2.3 Sample Size Calculations

A power analysis was conducted to determine the sample size required for a 2 (groups: intervention vs. control) × 3 (timepoints: pre-intervention, post-intervention, follow-up) mixed-design analysis of variance (ANOVA). Based on an expected medium effect size ($f = 0.25$), a significance level of $\alpha = 0.05$, and power ($1 - \beta$) set at 0.80, the analysis indicated that a minimum of 38 participants would be needed to detect statistically meaningful effects. To account for potential attrition (up to 35%, equivalent to 10 participants), the study aimed to recruit 48 participants. This target was also informed by practical constraints, including recruitment feasibility and resource availability.

### 4.2.4 Participants

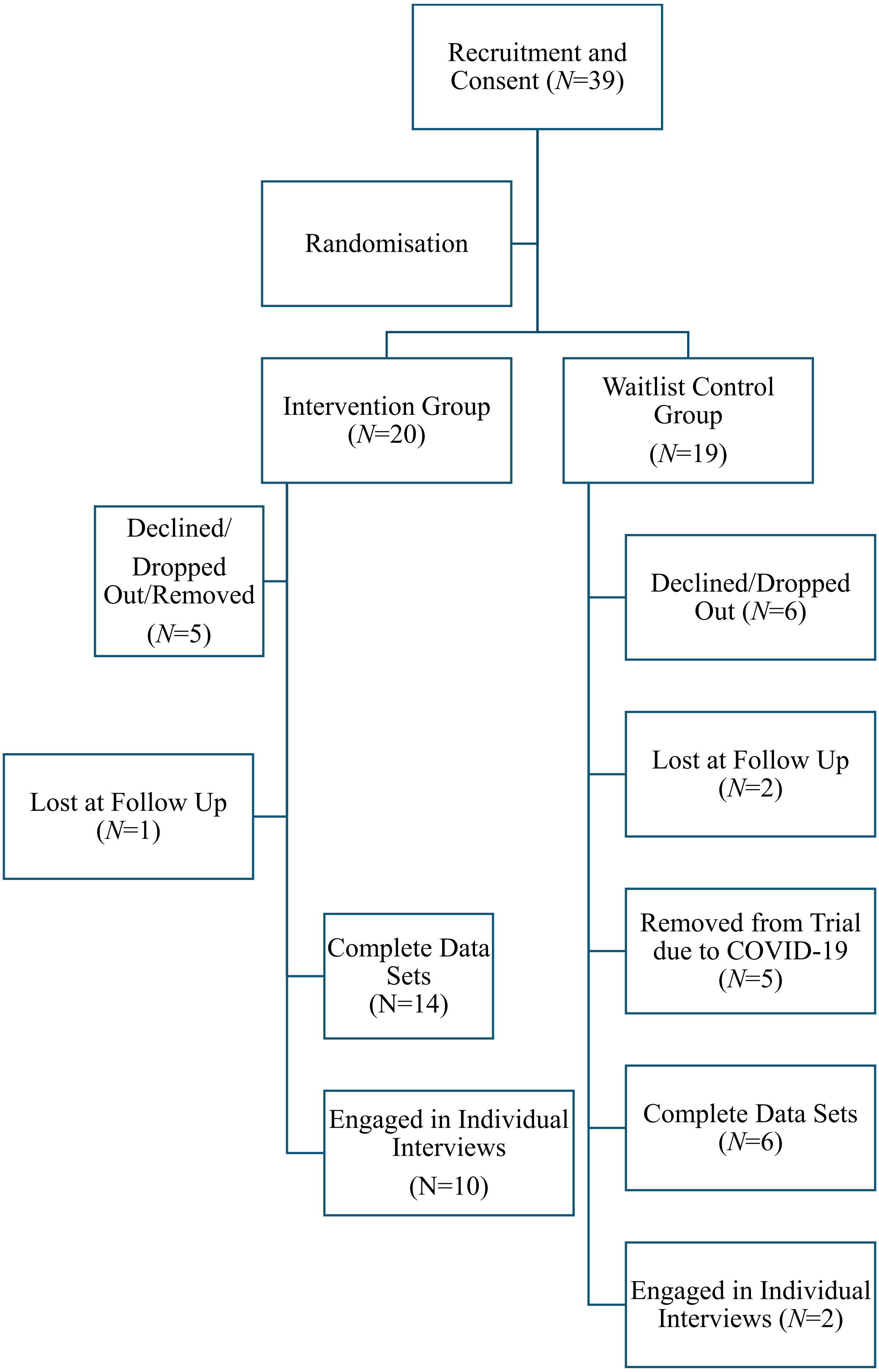
Participants were recruited from across a local Welsh University Health Board's neurorehabilitation provision for stroke survivors and individuals with brain injury, further to two third sector organisations (The Stroke Association and Headway [Brain Injury] Charity). The eligibility criteria included being aged 18 years or older, having a clinical diagnosis of stroke or brain injury, and not having any significant communicative or cognitive difficulties that might impede participants' ability to actively engage in the group. Individuals were not eligible if they had a diagnosed degenerative condition (e.g., dementia), presented with high psychological need or were experiencing severe mental health difficulties (e.g., psychosis), or if they were currently receiving another form of psychotherapy (with the exception of psychotropic medication) as this would prevent any changes specific to the group intervention to be estimated. Individuals could be recruited at any stage of the care pathway after discharge from hospital, with those meeting the inclusion criteria being identified by the referring clinicians. Those interested in joining the group were subsequently sent a participant information sheet (see appendix A) by a member of the research team who was not involved in delivering the group. This outlined the conditions of the study, including participant requirements, information on how the data would be used and the associated benefits and potential risks of taking part. Response slips were attached to the participant information sheet, which participants used to indicate consent to the quantitative component of the study in addition to the optional qualitative component of the study. These slips allowed individuals to either provide their contact information to express interest in participating in the qualitative component of the study or to formally decline involvement.

A total of 39 participants consented to participate in the study and were randomly assigned to either the intervention group or waitlist control group using internet software (www.randomizer.org). Letters were then sent to participants to indicate which group they had been assigned to and their respective course details (including the date, time and location). Thus, blinding was not feasible in this case because the nature of the intervention required participants to know when and where to attend. Additionally, participants in the waitlist control group ($n = 19$) needed to be informed that they would not receive the intervention immediately (waiting a total of six weeks before commencing their active treatment group), as this information was necessary to manage expectations and participation logistics.

Of those who consented to participate, one participant declined to engage before the intervention commenced, one participant could not be contacted to organise attendance, one participant was withdrawn and a further eight dropped out. A further five participants (all of whom had been allocated to the waitlist control group) were moved to a different treatment due to complications arising from the Coronavirus (COVID-19) pandemic, as it would have been unethical to keep these participants enrolled in the research without being able to offer them the intervention as intended. A total of 23 participants thus completed both pre- and post-outcome measures, however, three were subsequently lost at follow-up as they failed to complete the final quantitative measure within the specified timeframe of twelve weeks. Two had been allocated to the waitlist control group. Complete data sets were thus achieved for 20 participants, 14 of whom had been allocated to the intervention group and six of whom had been allocated to the waitlist control group. A flow chart diagram depicting the participant pathways is provided in Figure 1 overleaf.

**Figure 1**

*Participant Flow Chart for the Adapted-ACT Intervention*



Demographic data for the 20 participants who provided full sets of quantitative data is presented in Table 1 below.

**Table 1**

*Demographic Profile of Participants in the Adapted-ACT Intervention*

| | |
|---|---|
| Age | Mean = 60.7; Standard Deviation 12.19; Age range (36-86 years); Median = 59 |
| Sex | Female = 14; Male = 7 |
| Type of Acquired Brain Injury | Stroke *(N=10)*; Subarachnoid Haemorrhage *(N=3);* Subdural Hematoma *(N=3)*; Aneurysm *(N=1);* Arteriovenous Malformation Bleed *(N=1);* Hypoxic Brain Injury *(N=1);* Traumatic Brain Injury *(N=1)* |
| Time Since Injury | Mean = 27.75 months; Standard deviation = 25.53 months; Range = 4.5 months – 6.25 years; Median = 18 months |
| Employment Status | Employed (*N=8*); Retired (*N=8*); Unemployed (*N=4*) |

Following completion of the course, a purposive sample of the 20 participants who provided pre- and post-intervention quantitative data were invited to take part in an individual interview with an outside researcher. Sampling aimed to ensure diversity in age, gender and residual disability (i.e., limb weakness, speech and language difficulties) reflecting the value of purposive approaches such as maximum variation or criterion-based sampling in generating rich, nuanced insights (Braun & Clarke, 2013; Sparkes & Smith, 2013). Far from being a limitation, small and purposefully chosen samples are a defining strength of qualitative research, enabling the production of in-depth, contextually rich knowledge (Smith, 2018). Of those invited, twelve agreed to participate, ten of whom had been allocated to the active intervention group. As the study aimed to explore participants' engagement with and experiences of the programme itself rather than the experience of waiting for an intervention, this was deemed appropriate.

### 4.2.5 Intervention

The adapted-ACT intervention consisted of weekly 2.5-hour (maximum) skills-based group sessions delivered over five consecutive weeks in hospital and community venues across South Wales. The goal of these sessions was to support participants to learn and apply different ACT skills in response to difficult or distressing thoughts, feelings and emotions. Cultivation of these skills is considered to promote psychological flexibility by facilitating movement in the direction of acceptance of internal mental experiences and encouraging a commitment to act in meaningful and valued ways.

The intervention was delivered by one of three Registered Clinical Psychologists with support from an Assistant Psychologist employed by the health board. All facilitators of the intervention had experience with or training in ACT and were provided with regular supervision and monitoring by the Principal Investigator of the research team. This was to ensure the authenticity of facilitators and integrity to the broader model. A treatment manual was not devised to deliver the intervention. However, before the study started, all facilitators met to discuss the format of the PowerPoint slides, the content and how it would be delivered.

The intervention was designed to address all components of the ACT Hexaflex model, either through sessional activities or group discussions, to help promote psychological flexibility (Hayes et al., 2006; Kangas & McDonald, 2011). The group content was developed with support from core ACT textbooks - e.g., 'ACT made Simple' by Harris (2019), with resources extracted or adapted from these textbooks (e.g., the 'Bull's Eye' target for assessing closeness to values). The materials used in each session were appropriately tailored to enhance relevance to the target population and stroke/ABI-specific examples were presented to illustrate core ideas (Large et al., 2020) and aid comprehension of ACT skills and abstract concepts. Learning involved delivering principles of ACT via Microsoft PowerPoint presentation, group discussions, experiential exercises and homework tasks, as these experiences have been demonstrated to enhance application of knowledge in stroke survivors (Large et al., 2020).

Importantly, the format of the intervention was informed by patient feedback and refined based on qualitative feedback received from stroke survivors in previous research (Large et al., 2020). Specifically, the intervention sought to balance psychoeducation with more interactive components (e.g., video content and visual learning aids such as the use of an activities booklet, presented in Appendix B) and experiential components, providing opportunities for group discussion and shared learning between participants. For this reason, the group sizes were purposely small (comprising of 4-8 participants per group) to assist in creating a sense of safety and belonging (Large et al., 2020). The use of didactic teaching was minimal (not exceeding 30 minutes per session) and content was created in consideration of several different learning modalities. The design and delivery of the intervention conformed to recommendations proposed by The UK National Clinical Guidelines for Stroke and was structured to facilitate group processes by incorporating an extended break approximately one hour into the session, allowing participants to engage in peer support, vicarious learning, and open interaction while also accommodating cognitive and physical challenges associated with stroke and brain injury (Large et al., 2020).

An Activity Booklet (see Appendix B) was shared at the start of the course to support the group sessions. This booklet served as an additional resource to assist individuals with cognitive impairment and as a reference for future use after the intervention (Large et al., 2020). The booklet outlined the structure of the programme and contained key materials, including information relating to the content used in each session (with complimentary practical activities) and homework sheets. The session-by-session outline is presented in Table 2 overleaf.

**Table 2**

*Session-by-session Outline of "Rebuilding Your Life After Stroke or Brain Injury" Groups for Use by the Clinical Team*

| Session | Content |
|---|---|
| Week One<br>*'Getting to know each other'* | Explore and understand the impact of stroke and brain injury. Socialise group members to the ACT model and set the scene for the remaining sessions. |
| Week Two<br>*'Exploring thoughts, feelings and sensations, and how we cope with them'* | Introduce concepts of the 'reality gap' and creative hopelessness (using metaphors and videos to aid understanding). Explore and discuss coping strategies usually employed to deal with difficult thoughts and feelings (e.g., using DOTS exercise), and consider their long-term effectiveness in living a valued, meaningful life. Look to encourage curiosity and willingness of group members to consider different ways of coping and reducing the control agenda. |
| Week Three *'Thinking about what's important to you (values)'* | Distinguish between values and goals. Aim to identify group members' personal/individual values (e.g., through use of a values card exercise) and explore how closely they feel they are living towards those values (e.g., Bulls-eye worksheet). Attempt to set meaningful, values-driven goals (committed action). |

| | |
|---|---|
| Week Four<br>*'Moving more into the present moment'* | Develop awareness of the 'observing self' and enhance connection to the 'present moment'. Look to introduce ways of reducing actions that are controlled by our mind ('autopilot') and develop a more flexible stance where we can pay attention to or observe our thoughts and feelings non-judgmentally and curiously. Exercises that might be practiced include savouring the raisin; dropping anchor; or compassionate hand scripts. Self-as-context is discussed implicitly throughout most sessions, but particularly here in the context of the 'observing self' and regarding flexible perspective taking. |
| Week Five<br>*'Getting distance from difficult thoughts and feelings'* | Develop skills to step back or get distance from unhelpful or painful thoughts that we can fuse with when in a state of distress (e.g., defusion skills such as 'leaves on a stream' or 'I am having the thought that…'). There is also a focus on willingness to experience acceptance of unpleasant feelings and sensations (e.g., pain, anxiety), without attempts to fight against them (e.g., expansion scripts/discussions). |

### 4.2.6 Quantitative Outcome Measures

The Comprehensive assessment of Acceptance and Commitment Therapy processes (CompACT) developed by Francis et al. (2016) was used to assess levels of psychological flexibility, the mechanism through which ACT is considered to exert its effects (Twohig et al., 2017). This assessment was developed by Clinical Psychologists and has been deemed a good fit for use in clinical populations and English-speaking samples experiencing general psychological distress (Ong et al., 2020). The CompACT is a relatively brief self-report measure consists of 23-items that participants rate on a six-point Likert scale, ranging from 0 ("strongly disagree") to 6 ("strongly agree"). A total of seven items are reverse-scored to provide a more comprehensive understanding of the construct by assessing behaviours and attitudes inconsistent with flexibility, such as avoidance, emotional suppression, or lack of alignment with values. By including such items, the CompACT accounts for the multidimensional nature of psychological flexibility, balancing positively and negatively framed statements. This ensures a more nuanced measure that captures both the presence of flexibility processes (e.g., openness to experience and valued living) and inflexibility (e.g., avoidance and cognitive fusion). Whilst the CompACT briefly touches on inflexibility in seven of its 23 items, the instrument as a whole evaluates psychological flexibility across three subscales or factors. Each factor measures a distinct component process of psychological flexibility, ensuring a multidimensional assessment of the construct (with the exception of self-as-context). These include Openness to Experience, Behavioural Awareness, and Valued Action.

The first factor, Openness to Experience, encompasses both acceptance and cognitive defusion. It comprises ten items to assess an individual's ability to accept difficult thoughts and emotions without avoidance or suppression. Example items, agreement to which would suggest high levels of openness to experience, include “I can take thoughts and feelings as they come, without attempting to control or avoid them,” and "I can recognise that challenging thoughts and feelings are part of life." Reverse-scored items include "I work hard to keep out upsetting feelings.” The Behavioural Awareness Factor comprises of five items which aim to reflect mindful awareness of one's actions and experiences in the present moment. Example items which, if scored highly, would indicate high levels of behavioural awareness (and thus psychological flexibility) include agreement to the statement: "I am aware of thoughts and feelings without being distracted by them", and "I am able to focus on what I’m doing even when I’m feeling uncomfortable." An example of a reverse-scored item here includes “I find it difficult to stay focussed on what’s happening in the present." Finally, the Valued Action factor reflects values identification and commitment to action. It contains eight items to measure the extent to which an individual acts in alignment with personal values despite challenging internal experiences, e.g., “I behave in line with my personal values”. An example of a reverse-scored item on this subscale includes "I get distracted from what I’m doing by thoughts or feelings." Overall, higher scores on the CompACT indicate greater psychological flexibility, suggesting an individual's ability to accept challenging internal experiences, stay behaviourally aware and mindful, and take value-driven action despite psychological distress. The maximum total score here is 138.

Preliminary evidence has suggested that the CompACT has good internal consistency and convergent and divergent validity (Francis et al., 2016), with excellent internal consistency for the full scale (α= .91) and good to excellent for its subscales (α = .84 for Openness to Experience, .89 for Behavioural Awareness, and .90 for Valued Action). Indeed, in a psychometric comparison of measures commonly used to assess psychological (in)flexibility, the CompACT was commended for its strong discriminant validity from measures of psychological distress (Ong et al., 2020). More recently, others have commended the assessment for its content validity and internal consistency (Cherry et al., 2021). However, recent research has called to question its structural validity, suggesting that the items contained within the CompACT do not consistently load on to their respective corresponding subscales. Accordingly, the CompACT will only be used in this mixed-methods study to indicate overall levels of psychological flexibility. Currently, the CompACT does not have established cut-offs to classify levels of psychological flexibility (e.g., high vs. low flexibility). Instead, scores are interpreted relatively by evaluating pre- and post-intervention changes in research and clinical contexts and conducting comparisons with control groups. This lack of fixed cut-offs reflects the multidimensional and contextual nature of psychological flexibility and embodies a more functional contextual perspective. That is, the goal of the measurement is not to establish 'true' scores, but to assess variables related to meaningful changes in wellbeing across populations, prioritising the measurement of progress and outcomes over static scoring and the assigning of definitive, rigid labels of psychological inflexibility. The raw CompACT scores of the participants in the present study are presented in Appendix D.

### 4.2.7 Qualitative Data Collection

Consenting participants engaged in individual interviews with the understanding that these would be held by a postgraduate researcher who was unknown to them but had experience in working with individuals with neurological difficulties. All interviews were conducted in the participants' own home as this was the preferred venue of choice. Before the interviews began, participants were made aware of the purpose of the discussion and were informed that their anonymised data would be used for evaluative purposes. Each interview followed a similar pattern and a topic guide containing twelve broad questions was devised by the researcher to focus discussions on experiential gains, points for improvement and salient aspects of the course (see Appendix C). Discussions were semi-structured in nature and utilised open-ended questions, with follow-up queries developed iteratively over the course of the discussions. This approach facilitated flexibility and responsiveness, consistent with best practice in qualitative research.

Interviews were recorded using a Dictaphone to support with transcription and data analysis. Participants were assigned a numerical identifier during transcription to protect their identity. Interviews were 35 minutes and 44 seconds long on average, ranging from 14 minutes and 28 seconds to 56 minutes and 29 seconds in duration (*SD* = 12.88). Audio data of interviews totalled seven hours and five minutes and was independently transcribed without the use of supportive transcription software. This approach to data management allows for the researcher to draw on both verbal and nonverbal exchanges with the participants during the interview process, thus supporting verbatim transcription of audio data (Halcomb & Davidson, 2006). Interviews were transcribed verbatim except for the names of participants, staff names and locations, which were omitted to ensure anonymity. Transcription was conducted without the use of supportive software, supporting immersion in and familiarisation with the data.

## 4.3 Results

### 4.3.1 Quantitative Results

Participants from each of the intervention and waitlist control groups were combined into a single ‘intervention’ and ‘waitlist control’ group for all statistical analysis. Quantitative data was analysed using IBM SPSS Statistics 28.0.1 and parametric assumptions were checked. The data was determined to be normally distributed by Shapiro-Wilk test ($p > .05$). No outliers were identified and Mauchly’s test of sphericity did not indicate any violations. Homogeneity of variance was assessed using Levene’s test and a statistically significant result was found for pre-intervention CompACT scores ($p <.05$). Inspection of the mean and standard deviation scores according to group indicated larger variances in the intervention group prior to their engagement in the intervention, as shown in Table 3 overleaf, which presents the descriptive statistics per condition. A visual representation of mean changes in scores across the groups is then presented in Figure 2.

**Table 3**

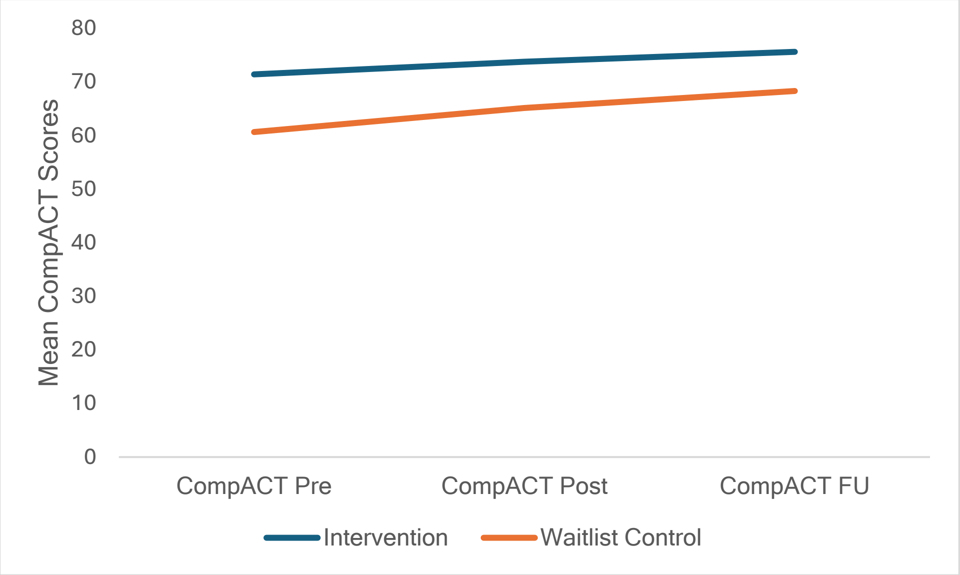
*Mean and Standard Deviation of CompACT Scores by Group and Time*

| Group | Time | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pre-intervention | | Post-intervention | | Follow-up | |
| | *N* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Intervention | 14 | 71.43 | 23.99 | 73.79 | 12.81 | 75.64 | 17.81 |
| Control | 6 | 60.67 | 10.75 | 65.17 | 17.27 | 68.33 | 22.16 |

*Note.* The maximum total score on the CompACT scale equals 138.

**Figure 2**

*Line Graph Depicting Changes in Mean CompACT Scores by Group and Time*



*Note.* Pre = pre-intervention, Post = post-intervention, FU = 10 week follow up

Although changes of psychological flexibility (as measured via CompACT scores) changed in the hypothesised direction, the results of the mixed ANOVA found no significant main effect of group [F(1,18) = 1.29, p = 2.30, $\eta_p^2$ = .07], no significant main effect of time [F(2,36) = 1.24, p = .302, $\eta_p^2$ = .06], and a non-significant interaction [F(2,36) = .106, p = 9.00, $\eta_p^2$ = .006]. According to the benchmarks suggested by Cohen (1988), the effect sizes indicate medium effect sizes for both group ($\eta_p^2$ = .07) and time ($\eta_p^2$ = .06); suggesting an influence of between and within-subject effects on levels of psychological flexibility as measured by the CompACT scale. Thus, the nature of the effect indicates that 7% of the variance not accounted for by time is accounted for by group, and 6% of the variance not accounted for by group is accounted for by time. These findings suggest that while the intervention had observable trends in the expected direction, its effects may have been insufficiently pronounced or limited by methodological constraints to reach statistical significance.

### 4.3.2 Qualitative Data Analysis

Consistent with the approach outlined in Chapter Three, a reflexive approach to TA was used to explore participants' subjective experiences of the adapted-ACT intervention, according to a critical realist perspective. Using an exploratory and inductive approach to coding, salient insights across the data set were synthesised into meaningful accounts, drawing on the six-phase process outlined by Braun and Clarke (2006). Following extensive familiarisation with the data, these phases outline a recursive process of coding the data and developing candidate themes that capture the essence of shared meaning across the data set. Candidate themes were reviewed and continuously refined and re-defined prior to writing a descriptive narrative to contextualise the qualitative output.

The formal analytic process began with re-familiarisation with the data collected in previous weeks by carefully transcribing the audio files generated through individual interviews. The inherently interpretive practice of transcription has been considered by some to comprise an essential process that lends itself to analytic immersion (Bird, 2005; Riessman, 1993). Computer-assisted qualitative data analysis software (ATLAS.ti) was used to support the coding process, whereby all provisionally interesting features of the data were coded. This process marked the authors first engagement with qualitative data, with the first cycle of coding comprising 126 codes. Codes included 'hope/optimism,' 'openness to change,' and 'emotional release.' Particularly salient features of the data which were considered to be meaningful in answering the research question were then clustered together into candidate themes and sub-themes. The themes and sub-themes were iteratively refined and reviewed against the data set to ensure internal homogeneity and external heterogeneity, before provisionally naming and defining them. An example of this process is provided in Appendix E. During this process, candidate themes were shared with the supervisory team (ZF and AK), who contributed their insights and expertise to facilitate a rich and clear reading of the data. Here, the supervisory team evaluated whether the themes and sub-themes were coherent in light of their clinical experience and assessed whether the author could justify decisions made in a compelling and convicting manner. Following regular reflection and discussion, conceptually ‘thin’ sub-themes and themes were integrated into other parts of the analytic output, and all extracts were revisited to ensure the suggested themes captured the essence of the data. The supervisory team continued to offer clinical insight and feedback during this iterative process.

Meaningful quotes which exemplified the core features of each theme were extracted from the data set and organised with an accompanying analytic narrative. Relevant literature was integrated to contextualise the analysis and construct a cohesive narrative of participants’ experiences with the adapted ACT intervention. After completing an initial draft of the manuscript, an extended break from the data was taken while the broader thesis was developed. Upon returning, the manuscript was assessed independently by the author, and significant refinements were made to ensure the analysis remained open to new insights and avoided analytic foreclosure. Conceptually weak or redundant themes were consolidated, the dataset was revisited to uncover additional depth, and the qualitative findings were revised to improve clarity and succinctness. The final overarching themes were finalised after being deemed a provisionally good fit with both the data and the contextual literature. With that, the final thematic structure was developed before being reviewed by the clinical member of the supervisory team (ZF).

### 4.3.3 Qualitative Output

Many participants who participated in the adapted ACT intervention reported feelings of significant loss and lifestyle change following their stroke or injury. Several participants expressed difficulty coming to terms with their diagnosis and struggled to accept what had happened to them, often becoming frustrated, withdrawn and fearful of their emotions. Participants emphasised how individuals without stroke or ABI are seldom aware of the debilitating nature of its pervasive symptoms, particularly in the context of ‘looking’ the same as before. As such, many participants indicated feeling isolated due to their condition and described not feeling able to discuss their true feelings with family and friends. It is this background context within which the adapted-ACT intervention was delivered.

Three final overarching themes were generated from individual interviews with the twelve participants, with these capturing the importance of 1) Openness and Supported Self Disclosure, 2) Accepting Mental Experiences, Learning to Regulate and Choosing How to

Respond, and 3) Self-Acceptance, Compassion and (Re)Connecting with Values. In line with the exploratory nature of this study, a domain summary was also included to highlight potential areas for further refinement of the patient-informed adapted-ACT intervention. This addition aimed to provide clinical readers with actionable insights on how the intervention delivery could be enhanced, while underscoring the necessity of sustained support for meaningful and long-term impact in neurorehabilitation. Each theme is discussed in relation to the broader literature, including theories of change and psychological growth, while also exploring potential mechanisms that may subserve psychological change in individuals living with mild-to-moderate distress following stroke and ABI.

#### *4.3.3.1 Theme One: Openness and Supported Self Disclosure*

First and foremost, participants reflected upon the anxiety-provoking nature of engaging in group therapy - feelings which are well-documented within the literature, and particularly present in individuals experiencing anxiety or depression (Shay, 2021). However, they described a readiness for personal change and a willingness to confront the group with openness. Willingness to engage in change is a critical determinant of therapeutic success (Prochaska & Diclemente, 1982), and may reflect an intrinsic motivation, aligned with self-determination theory (Deci & Ryan, 2015), where goals related to social relationships and personal growth drive the therapeutic process. This highlights that personal growth and therapeutic progress are contingent upon an individual's readiness to embrace vulnerability, both with themselves and others.

> “Unless you’re open and willing to share or talk about your experiences, you’re not going to get anywhere. You had to be open and truthful. There’s nothing to lose, nothing to be embarrassed about. But you have to be open-minded and be honest with yourself” (Participant Eleven).

Research on processes and stages of change has highlighted the importance of openness and acknowledgement of difficulties for individuals living with ABI, with studies suggesting that those who acknowledge their difficulties often experience the most positive therapeutic outcomes and better psychological adjustment (Lam et al., 1988). Although this concept is not unique to ACT-based interventions, it underpins the importance of recognising individual factors that can precipitate psychological change in adults living with stroke or brain injury, regardless of the intervention. In approaching the group with an open mind, the intervention provided an opportunity for participants to revisit and confront long-standing, unresolved thoughts, experiences, or emotions, which is necessary for building a balanced mind.

> "At the beginning, it brought a lot of things up in my head…some things that I'd not had to think about for years and years" (Participant Two).

Several participants reported crying during the groups. The cathartic expression of emotions allowed individuals to confront, process, and release unresolved or suppressed feelings, thus facilitating a deeper engagement with personal struggles. Whilst challenging, this was interpreted positively, with participants considering this release a necessary step in their personal progress, and a process that had not been afforded by other interventions. Taken together, these insights point towards the makings of acceptance; a concept which suggests that *"there is something meaningful in feeling what there is to be felt"* (Hayes et al., 2011).

> "You come away a little bit emotionally drained because you kind of relive a little section of your life every week, but then I think that's something you've got to do to kind of get to the next - my next little destination anyway… I've been to lots of different groups, but ACT is the one compared to them that hit me the hardest" (Participant Four).

Self-disclosure of such thoughts, experiences and emotions was facilitated by the safe and supportive space cultivated by the therapists and group members. A sense of reciprocity and collaboration between participants and therapists played a key role in fostering this atmosphere, with participants describing feelings of being "on the same level" as the therapists (Participant Eight), emphasising the egalitarian and cooperative nature of the sessions as a "joint" endeavour (Participant Seven). This cooperative and reciprocal relationship between the participant(s) and therapist represents the therapeutic milieu, which is a defining feature of holistic neurorehabilitation and one which has been shown to maximise social participation and adjustment and facilitate positive cognitive, behavioural and psychosocial change (Cattelani et al., 2010), as detailed in Chapter Two. The therapeutic milieu provided the context for supported self-disclosure, sharing and learning, encouraging stroke and ABI survivors to discuss traumatic or distressing experiences in a safe and supportive environment. For example, one participant described how they didn't need to "pretend to feel well" (Participant Three) and could openly and honestly discuss how they were feeling.

> “You felt at home so you could share experiences with them, and they could understand a bit about what we’ve gone through and give us different ways of dealing with things” (Participant Two).

Some researchers consider emotional disclosure a necessary prerequisite to coping and PTG following trauma; particularly when such disclosures are met with positive responses from listeners (Calhoun & Tedeschi, 2013). Many participants indicated that they felt understood by their group peers given that they had had similar experiences to themselves. Sharing hereby helped to normalise and validate thoughts, emotions and experiences, which has been found to contribute to acceptance of a changed reality post-stroke (Large et al., 2020). The sharing of emotional experiences can enhance feelings of social integration and identity, reducing feelings of loneliness, particularly when sharing is reciprocated with social support, understanding and validation of one’s feelings (Haslam et al., 2016; Nils & Rimé, 2012).

> “I did cry a few times in the group; all the emotions came out. You’re talking about something so close to home, but then when you’ve got other people who are going through the same, it makes you feel a lot better” (Participant Four).

However, even within the safe and supportive environment, some participants reportedly masked their struggles, perhaps due to difficulties in either articulating or openly expressing difficulties within the group context. If the latter, this reflects the gradual process of trust-building within the group, where participants initially conceal their struggles but may eventually feel safe enough to disclose them as the therapeutic rapport strengthens. This aligns with the broader theme of supported self-disclosure, where the collaborative and empathetic environment fosters a sense of security, allowing participants to confront and share their challenges at their own pace. The recognition of shared struggles, even when masked, reflects a mutual understanding amongst group members.

> “I could see some people were struggling and obviously masking it, as we all do, a bit” (Participant Seven).

Sharing experiences with peers in a group context hereby facilitated a sense of belonging in participants (a key component of the community domain proposed by the GENIAL framework) which has been linked to increased feelings of personal empowerment, hope, reduced isolation (Tomaka et al., 2006) and opportunities to rebuild a sense of self and identity (Amarshi et al., 2006). This sense of relatedness with others has been described as a fundamental psychological need that is essential for the promotion of psychological wellbeing (Deci & Ryan, 2014), while group identification may provide important foundations for PTG following ABI (Griffin et al., 2022; Karagiorgou et al., 2018). In this regard, one participant went on to describe how the group provided them with support they felt they could not receive elsewhere:

> “They are our only kind of little thing we have apart from doctors, [to whom] you go to your appointment, and you’re back out, but you don’t really have like a support network. So, when you go there, I think we’re all kind of looking for a bit of support as well as a group. Because that’s the only time we’re probably really seeing people exactly the same as us, from all ages” (Participant Four).

Within the adapted ACT groups, openness, when met with positive reinforcement in a supportive environment, facilitated self-disclosure, connection, and understanding among group members. This illustrates the synergistic interplay between key components of individual wellbeing (the cultivation of a balanced mind) within the GENIAL framework and the community domain, with the therapeutic milieu acting as a fundamental facilitator, consistent with its central place in holistic neurorehabilitation. By providing a safe and supportive environment, the therapeutic context enabled emotional disclosure, which in turn fostered trusting social connections. These connections encouraged further disclosure, creating a reinforcing cycle of openness, disclosure and connection to both the self (through one’s emotions and experiences) and others within the group. Learning about the experiences and challenges faced by others through their disclosures helped participants to have a better understanding of their own experiences and seek “feedback from other stroke [and brain injury] patients” (Participant Twelve) who were at different stages within their recovery trajectory. This has positive implications regarding one’s capacity for better managing and accepting the newfound reality of life after stroke or injury (Large et al., 2020), where acceptance of difficult emotions and enhanced regulation capabilities are crucial to adaptive coping.

#### *4.3.3.2 Theme Two: Accepting Mental Experiences, Learning to Regulate and Choosing How to Respond*

Acceptance, as defined by Stephen Hayes and colleagues, is the voluntary adoption of an intentionally open, receptive, flexible, and nonjudgmental stance toward moment-to-moment mental experiences; thus embodying ‘experiential acceptance’ (Hayes et al., 1996). Mental experiences hereby include emotions and thoughts (Ford et al., 2017; Ford et al., 2018). This stance particularly includes a willingness to remain in contact with aversive experiences in their entirety, allowing distressing thoughts and negative emotions to arise without avoidance or struggle. In the context of the adapted-ACT group, the concept of acceptance of one's mental experiences comprised a "novel" and "striking" approach to thoughts (as described by Participants Seven and Eight respectively) that they had not considered prior to the group. Several participants approached difficult thoughts and emotions with a mindset of 'fixing' them - developing ineffective strategies to control or eliminate their feelings. This aligns with principles of stoicism which advocate for the strict control of emotions, often judging them as harmful (Long, 1890). It also aligns with the ideologies entwined in the medical model of care that are concomitant with cultural rules (Hayes et al., 2011), where distress is pathologised and symptom reduction is epitomised as the primary pathway to wellbeing - despite negative emotions guiding individuals towards positive change and/or containing seeds for personal growth (Wong, 2011). In contrast, the intervention taught participants to "accept things more than fighting them" (Participant Seven). Noticing unpleasant thoughts, feelings, and experiences without trying to change, control, suppress or avoid them is a defining feature of acceptance, a core facet of ACT (Hayes et al., 1999) and fundamental for psychological wellbeing (Fisher et al., 2022; Wilkie et al., 2021) and the cultivation of a balanced mind.

> "I think it was quite a new thought, really, accepting. I think up until now, I've been trying to – myself, and I think through other courses that I've been to – come up with coping mechanisms and come up with ways to overcome how you feel and things like that. But this course taught us to accept things, rather than trying to – not rather than trying to deal with them, but rather than trying to change how things are in order to feel better. That was quite novel for me" (Participant Seven).

Some participants demonstrated a shift in mindset in which they began to internalise and apply the concept of acceptance as an alternative response to their habitual tendencies to overcome or control difficult circumstances. This highlights the transformative potential of ACT in challenging ingrained habits of avoidance or control and fostering a more flexible, accepting approach to difficult experiences, which has positive implications for wellbeing. The GENIAL framework conceptualises acceptance as a key pathway through which a balanced mind can be achieved, while emphasising the importance of cultivating a mindset that accommodates, rather than suppresses, difficult emotions (Mead et al., 2021). This is embedded in the belief that wellbeing is not merely the absence of distress but the capacity to engage meaningfully with life despite it. By promoting psychological flexibility, ACT supports this process, enabling individuals to navigate life’s challenges with greater emotional balance and resilience. In line with this, research by Ford et al., (2017) has shown that accepting emotions and thoughts is associated with greater psychological wellbeing and life satisfaction across multiple measures, as well as lower levels of anxiety and depression in student and community samples, which is in keeping with the results of earlier work by Shallcross et al. (2010). This is because habitually accepting emotions and thoughts helps individuals to experience less negative emotion in response to daily stressors, such that acceptance of one’s mental experiences can predict lower negative emotional responses to stress (Ford et al., 2017).

Other participants had reported previously ignoring or suppressing negative or difficult thoughts or emotions altogether, with some being “really fearful of [their] emotions” and being “scared to cry” (i.e., Participant Four). Experiential avoidance (attempts to avoid, deny, minimise or escape negative thoughts and feelings) can have adverse consequences for mental and physical wellbeing (Campbell-Sills et al., 2006), while avoidance coping is linked to distress and increased depressive symptoms (Holahan et al., 1999; Penley et al., 2002). Moreover, avoidance presents an obstacle to behaving in ways that align with personal values-based goals (Hayes et al., 2011). In the present intervention, the group's teachings - encouraging emotional acceptance and providing validation by normalising experiences - appear to have helped some adults living with ABI to break a harmful cycle of suppression and escalation, facilitating self-regulation and movement from overwhelming, uncontrollable reactions (described by Participant Four as “tsunami’s”) to more measured and less disruptive responses (with the same participant describing these events as “tidal waves”). Indeed, both theory and research suggest that experiential acceptance limits avoidance coping and helps individuals to not react to their own emotions and thoughts in ways that exacerbate mental experiences, enabling them to diffuse more quickly (Campbell-Sills et al., 2006; Singer & Dobson, 2007) and supporting enhanced regulation abilities (Hofmann & Asmundson, 2008; Shallcross et al., 2010; Tull & Roemer, 2007). In the context of wellbeing science, enhanced regulation abilities are conducive to achieving emotional balance; and thereby the building of a balanced mind - a key component of individual wellbeing proposed by the GENIAL framework.

> “From the group I’ve kind of realised to just go with my emotions, let it out, cry it out and not beat myself up or not try and like suppress it. Because what I was doing, I was

> suppressing and suppressing and having major outbursts and then I was having major crashes and then I kept going like that. I was literally having a tidal wave. They teach you to kind of just go with it. If you want to cry, cry. If you feel like this, it's fine. And then my outbursts are kind of littler [pause]. I have them in waves, not tsunami's" (Participant Four).

Meanwhile, approaching negative, unhelpful *thoughts* with curiosity and a nonjudgmental stance has been proposed to reduce their impact and foster greater psychological flexibility (Hayes et al., 2011). This can be achieved by practicing cognitive defusion and mindfulness - learning to observe thoughts as transient mental events rather than absolute truths, focussing on the present moment, and (re)engagement with values-based behaviours. One participant alluded to this process, explaining how focussing on the present moment allowed them to shift attention away from needless entanglement with intrusive or unhelpful thoughts, observe them as mere mental activity (likened to "rubbish" that comes to their mind) and concentrate on immediate tasks. This aligns with the skill of being mindful and observant of the current moment, and points towards the practice of cognitive defusion - both of which are key to psychological flexibility and acting in accordance with values-based goals (Whiting et al., 2021).

> "We have different thoughts, they come in, and the mind goes boggling and what we should think of it – we shouldn't! So, the way they explained that 'just think about now, here, now. Just concentrate on this one.' So that means I'm leaving all the rubbish that comes to my mind, leaving it behind. Just think about now and it helps me to think now and today and now. Which helps to sort out all the rubbish and whatever I'm doing, I can concentrate on that" (Participant Eight).

Meanwhile, one participant reported that the intervention helped them to better respond to emotionally provocative or stressful situations that would previously trigger "massive outbursts", recognising that such reactions often exacerbated conflict rather than resolving it (Participant Seven). This was facilitated by both the practice of acceptance, in addition to the group discussions around the values-based exercises covered in sessions two and three, which highlighted the vast differences in people's priorities and motivations. This helped them to approach sources of distress with greater flexibility and consider the ways in which their behaviours or emotional reactions were or were not conducive to helping them live a meaningful and engaged life following trauma (Muldoon, Haslam, et al., 2019). The person reported that their acceptance did not mean that they didn't "get upset and hurt by different circumstances," but rather, that the ways that they chose to respond was more adaptive, noting a "subtle difference in how [they would] react to things" since attending the intervention. Greater flexibility in responding to stressful events or stimuli in a manner that is functional has been linked to enhanced adjustment to a changed reality post-stroke and reflects the ability to expand one's thinking and behaviour in a way that is congruent with long-term personal values (Kashdan & Rottenberg, 2010). This, by definition, encompasses psychological flexibility, while acting in ways that are congruent with long-term values has positive implications for predicting PTG post-ABI (Powell et al., 2012).

> "By going on this course, a few things have come up that normally would inspire in me a massive outburst, which ultimately doesn't help anybody. It just causes a bigger rift than there was to begin with. So, I've tried not to do it now…It's not to say I don't get upset and hurt by different circumstances and things that happen, but I've just tried not to blame other people. Which I have done in the past, and really when I think about it now, I've blamed them because they don't think the same way as I think. And this course taught me that, and that's the biggest gain that I had" (Participant Seven).

Overall, participants reported feeling better equipped with the "tools" and "strategies" to accept difficult emotions and mental experiences, regulate their emotions in response to emotionally provocative events and manage their anxiety (as highlighted by Participant Two). Some reported using nature to "slow themselves down" during their daily lives and employed grounding strategies to help them take notice of the present moment. These strategies were promoted throughout the intervention through means of mindfulness-based exercises and were explicitly covered in week four. In accordance with previous research (Large et al., 2020), the subjective accounts of those participants who continued to practice ACT strategies (including mindfulness and grounding techniques) beyond the parameters of the intervention pointed towards increased adaptability in response to distress and reported reduced emotional reactivity. Reduced emotional reactivity and improved behavioural regulation are examples of positive psychological effects that have been linked to mindfulness practice (Keng et al., 2011), with research to suggest that it can increase flexibility in the generation of cognitive appraisals (Garland et al., 2015). Whilst mindfulness may not confer benefits for psychological wellbeing that outweigh those posed by acceptance (Ford et al., 2017), it nonetheless presents complementary pathways to emotional balance, and thereby wellbeing.

> "If I get really overwhelmed or really anxious or really angry, or all of it, I have gone for a walk…just because they said [about] nature, being in the here and now, taking in the like sounds and smells. So, I have done little elements in day to day, so that's helped. I've been in the bath; I've listened to my heartbeat under the water, little things. They're not major things, but they bring me and my anxiety down a little bit" (Participant Four).

Crucially, acceptance is best considered an ongoing voluntary and functional process that does not remain constant, but requires practice, and is lived out moment-by-moment (Hayes et al., 2011). Indeed, participant insights points towards a sense of ongoing effort and self-reflection, with research highlighting the importance of post-intervention mindfulness practice in supporting individuals with anxiety to attain long-term beneficial clinical outcomes following engagement in acceptance-based behaviour therapies (Morgan et al., 2014). This illustrates the gradual nature of change facilitated by ACT, emphasising the importance of group discussions in fostering moments of insight that can lead to deeper personal growth. Acceptance, shared experience and appropriate emotional expression have been implicated in positive psychological change and growth in individuals with ABI (Allen et al., 2022; Lyon et al., 2021), which is characterised by a 'coming to terms' with a changed reality and movement towards leading a more fulfilled life (Large et al., 2020).

#### *4.3.3.3 Theme Three: Self-Acceptance, Compassion and (Re)Connecting with Values*

Acceptance, as defined in the context of ACT, refers to a nonjudgemental and open stance towards one's mental experiences, including thoughts and feelings. This embodies an experiential form of acceptance. However, the literature on self-identity following stroke or ABI emphasises an additional dimension of acceptance: self-acceptance. For individuals facing a significant discrepancy between their pre- and post-injury selves, this involves acknowledging and adapting to the losses associated with their former identity, while reconstructing a coherent and adaptive sense of self (Gracey et al., 2009). Participants described their journeys toward accepting the profound, life-altering impact of their stroke or ABI, which was neither linear nor straightforward, but involved significant emotional and psychological shifts over time. Reflecting on the aftermath of their stroke or injury, participants commonly expressed feelings of loss, injustice, and despair. While they recognised that the experience of stroke or ABI as "devastating, and you can't take that away" (Participant Three), they also began to confront the reality that the past could not be undone.

> "This type of thing, this brain injury or this stroke can happen to anyone, at any time… A lot of it was accepting what had happened to you, you can't go back" (Participant One).

One of the most challenging aspects of accepting what happened involved letting go of pre-injury identities and adjusting to new capabilities. Participants described the frustration and exhaustion of striving to return to their pre-injury selves, only to realise that such efforts were both unsustainable and detrimental to their wellbeing. As Hayes et al., (2011) emphasise, acceptance involves recognising when existing strategies are no longer effective and embracing new approaches that are better aligned with value-driven goals. This realisation led participants to accept their limitations and shift their focus to "do things differently" (Participant Two). Acceptance in this regard emerged as a dynamic process of psychological adjustment and an active acknowledgment of one's reality, supporting individuals to recognise that they could not undo what had happened, and shifting their focus on moving forward with this experience.

> "Before, I was trying to get back to who I was…I tried to carry on, but it wasn't working, and it was making me poorly, so I needed to stop doing that. It helped me to learn that it was okay to step back" (Participant Two).

This shift required practical and emotional adaptations, such as setting boundaries, pacing themselves, and stepping back to prevent fatigue and burnout. Participants highlighted the role of values-based activities (covered in sessions two and three of the intervention) in supporting them to reconnect with themselves and work towards building a life that was meaningful to them.

> "When you write down things that you used to do, and how your life was, where you were at that particular stage, it was like a standstill [in relation to] where you wanted to be. You might not be at the very top where you were previously but working towards it makes you feel so much better… I think I needed that" (Participant One).

In reconnecting with their values and learning how to move towards them in an adaptive way, participants learned that a meaningful life could still be achieved despite residual deficits and functional limitations.

> "It was teaching me, or showing me, that there is life afterwards. And it was working towards it" (Participant One).

With that, some individuals reported feelings of hopefulness and expressed gratitude (i.e., feeling “very lucky,” as expressed by Participant One) for the capabilities and opportunities they still had, while others expressed newfound optimism for the future despite ongoing suffering. Adjustment theories often describe a staged journey where individuals grieve their past self before reaching acceptance, allowing them to reconcile their new identity and regain a sense of hope for the future (Vaghela et al., 2021). Individuals living with stroke or brain injury often report that increased positive emotions such as hope motivates them and acts as a source of strength during their recovery (Bright et al., 2011), while gratitude may motivate individuals to engage in positive behaviours that lead to self-improvement (Armenta et al., 2017). Others exerted realistic optimism regarding their recovery trajectory, acknowledging the likelihood that their pre-injury capabilities and functioning would never fully return, but began to see some “light at the end of the tunnel” (Participant Eleven). Realising that there is a life to be had after ABI can support movement toward PTG (Lyon et al., 2021), while the presence of positive emotions is associated with high levels of subjective and eudaimonic wellbeing (Wood et al., 2010) and high levels of PTG in individuals with chronic conditions (Vescovelli et al., 2021).

> “I know even in time it will improve; I will get a bit better. I probably won’t be 100%, you know, but I know I will be a lot better” (Participant Twelve).

However, not all participants expressed optimism about their potential for improvement, with some accepting that further recovery was unlikely, particularly those several years post-injury. In certain cases, such acceptance may be adaptive, as acknowledging limitations can prevent individuals from repeatedly striving toward unrealistic goals, which could otherwise lead to frustration and distress. For instance, many individuals with ABI struggle with the loss of previous roles, such as returning to work, and may initially experience grief when confronted with this reality. However, acceptance of these changes can create space for new opportunities, allowing individuals to explore alternative sources of meaning and fulfilment that they may not have previously considered.

> “Well, I’ve accepted that this is it. You know? It’s been nearly four years in April, so I’m not going to get much better than I am now. So, I’ve accepted that and just get on with it, you know?” (Participant Nine).

That said, it is important to recognise the potential ‘dark side’ of acceptance when it shifts into resignation or passivity. If acceptance leads to disengagement from opportunities for adaptation and growth, it may have detrimental psychological consequences, particularly when meaningful change is still possible (Nakamura & Orth, 2005). For example, evidence suggests that neuroplasticity and growth are viable even years post-injury (Kleim, 2011; Robertson & Murre, 1999). This underscores the importance of framing acceptance as an ongoing, dynamic process; one that balances acknowledging limitations with remaining open to possibilities for rebuilding and adaptation.

Overall, participants reported a positive shift in attitudes, recognising that their personal trajectory, while different from their pre-injury expectations, still held potential for growth and fulfilment. The process of psychosocial adjustment to life-altering events is deeply intertwined with reconciling the past self with the present and adapting to realities shaped by functional limitations, shifting social roles, and the meaning assigned to the condition and recovery (Hjelmblink et al., 2007; Hutton & Ownsworth, 2019). Participants' experiences illustrated this dynamic process, reflecting both emotional challenges and the emergence of hope and resilience as they adjusted to a redefined way of living, which is in line with previous findings reporting on a group-based adapted-ACT intervention for adults living with stroke (Large et al., 2020). This theme further exemplifies how adapted-ACT supports the cultivation of individual wellbeing through the development of a balanced mind, as outlined in the GENIAL framework, fostering eudaimonic wellbeing by promoting meaning-making, self-acceptance, and personal growth. Even so, the data highlighted avenues better tailoring group-based adapted-ACT to the needs of adults living with ABI, highlighting opportunities for further service improvement. These opportunities are discussed accordingly.

#### *4.3.3.4 Further Enhancing Adapted-ACT: Calls for More Tailored Delivery and Sustained Support for Long-Term Impact*

Consistent with the exploratory nature of the study, this domain summary identifies barriers to benefiting from the adapted-ACT intervention and offers recommendations to guide the development of future group-based ACT interventions for stroke and ABI. This serves to build upon previous patient feedback concerning the adaptations necessary for delivering ACT within the context of holistic neurorehabilitation (Large et al., 2020) and is consistent with a learning approach to clinical practice which constantly seeks to further develop and refine service provision based on patient needs and preferences.

Despite the ACT intervention being adapted to meet the cognitive deficits associated with stroke and ABI (as per recommendations proposed by The UK National Clinical Guidelines for Stroke), two-thirds of the twelve participants felt that the sessions were too long and/or intense, with “a lot of information packed into such a short space of time” (Participant Eleven). This contributed to lapses in concentration, significant post-session fatigue and some participants reportedly leaving the sessions early. Cognitive impairment presents a significant challenge to the success of neurorehabilitation programmes (Michael, 2002) and this further highlights the need to design neurorehabilitation services to accommodate for such difficulties.

> “You get to a stage where you cannot take in anymore, so you’re either then concentrating on the second bit and you’ve forgotten the first bit, or vice versa. It’s very difficult” (Participant Eleven).

One participant recommended incorporating more breaks between activities (Participant Four), while a majority of participants recommended reducing the duration of individual sessions but increasing the number of sessions provided, with some suggesting that a period of up to ten weeks (as opposed to five) would be acceptable. Participants also highlighted barriers concerning access, timing and the location of the groups as factors which exacerbated cognitive barriers to engaged participation. Accessibility and appropriate adaptations comprise some of the broadest challenges in the context of providing tailored neurorehabilitation to adults with ABI, and significant variations in individual deficits can be considerably challenging to accommodate in a group format. This was echoed within the current data, whereby contrasting suggestions for improvement were made concerning the timing and duration of the intervention, in addition to preferences regarding group size and location. However, one potential way to reduce cognitive barriers and subsequent adverse effects would be to incorporate more mindfulness practice within the sessions, given that mindfulness strategies have been consistently shown to alleviate symptoms of fatigue (Ulrichsen et al., 2016). This may also help participants to ground themselves after emotionally provocative sessions, as suggested by participant four, who indicated that having more mindfulness sessions - particularly towards the closing of each day - would circumvent potential adverse effects resulting from prolonged heightened emotional states following emotionally provocative sessions. Specifically, Participant Four expressed feeling that they had not had sufficient opportunities to talk privately with the leading clinicians about thoughts or ideas that “hit home.” This highlights the need for creating dedicated spaces within group interventions so that individuals can process and explore personal experiences during one-to-one discussions with their supporting clinician.

Finally, despite the course offering strategies and tools that participants could take forward to support them beyond the context of the intervention, some expressed difficulty in applying the concepts and strategies in their daily life. Specifically, Participant Four acknowledged understanding the principles taught during the group sessions but struggled to apply them independently in their home environment, describing how they would "slip back into normality." These findings align with those of Large et al., (2020), where some participants struggled to understand and generalise abstract concepts outside the group such that they felt ‘confused’ when they got home.

> “I know what I should do in practice, I know what it says, but I don’t know how to do it when I go home” (Participant Four).

However, this same participant had reported engaging in mindfulness exercises outside the context of the group, such as paying mindful attention in nature, which indicates that some wellbeing-promoting elements of the group had been integrated into their routine. This suggests at least partial success in applying ACT principles, particularly mindfulness, even if other strategies remain difficult to implement consistently. Nonetheless, the participant’s experience underscores the importance of providing additional support or follow-up resources to help individuals bridge the gap between learning, application and practice, ensuring that acquired knowledge and skills can be meaningfully implemented in daily life.

Meanwhile, others expressed a need for some form of continuation of the group such that they could maintain a level of social contact “to support the friendship” developed during the intervention (Participant Five). For some, the group offered not only therapeutic benefits but also a vital sense of community that was difficult to replicate elsewhere. Participant Six reflected that “it’s hard to get that support” outside of stroke or brain injury-specific groups, while another participant shared that “things had gone down” since the group ended (Participant Eleven). This decline stemmed from a lack of meaningful engagement opportunities and a loss of belonging among peers with shared experiences, the wellbeing implications of which were discussed in Chapter One.

> “It gave me something to go to, something to look forward to, but then it stopped. Yes, I go to other places, but for that day, everything stopped and it’s not the same. So, it’s

> gone down, rather than a plateau, or up. It's trying to find something to do within those days and I find it very difficult (Participant Eleven).

In the present sample, only 40% of participants were employed during the intervention, leaving many without structured environments to connect with others or engage in purposeful activity. This emphasises the importance of providing opportunities for sustained social contact and peer support in fostering long-term psychological adjustment and wellbeing for individuals living with stroke or ABI. This is particularly important in the context of depleted social networks, isolation and pervasive loneliness experienced post-stroke or injury (Douglas, 2020). Without ongoing engagement, participants risk isolation, reduced motivation, and diminished progress in their journey towards rebuilding. This highlights the need for post-intervention programmes or community initiatives that can provide continuity, facilitate peer connections, and promote ongoing opportunities for meaningful participation after ABI.

## 4.4 Discussion

Building on patient requests for more interactive and tailored approaches to ACT in neurorehabilitation (i.e., Large et al., 2020), the present mixed-methods study investigated whether engagement in a group-based adapted-ACT intervention would lead to improvements in psychological flexibility for adults living with distress post-stroke and brain injury (the theorised process of change through which ACT interventions exert its effects) and sought to elucidate its subjective effects through qualitative inquiry. Specifically, it aimed to explore whether the intervention, designed to promote the building of a balanced mind, would produce superior outcomes relative to a waitlist control group in receipt of care as usual. However, attrition posed a significant challenge, with a dropout rate of 48.7% (a loss of 19 of 39 consenting participants). This aligns with high levels of attrition reported in psychotherapy, with Wierzbicki and Pekarik (1993) for example reporting attrition rates ranging from 35.9% to 48%. However, the dropout rate of the present study is notably higher than the average weighted dropout rate of 19.7% found in Swift and Greenberg (2012), albeit dropout rates ranged from 0% to 74.23%. These figures highlight the ongoing challenges of recruiting and retaining participants in clinical contexts. Recruitment and retention difficulties were further compounded by the COVID-19 pandemic, which limited the number of groups that could be delivered. Consequently, the study was substantially underpowered, with only 20 participants enrolled (six in the control group and 14 in the intervention group), compared with the 38 required to detect statistically meaningful effects based on an expected medium effect size. This limitation significantly constrained the statistical analysis, and the quantitative findings should therefore be approached with caution.

The quantitative analysis revealed no statistically significant differences in psychological flexibility measured by the CompACT scale (Francis et al., 2016) between the active intervention and waitlist control groups from pre- to post-intervention or at three-month follow-up. However, descriptive data indicated a trend toward increased psychological flexibility over time in both groups, with moderate effect sizes suggesting a potential intervention effect, particularly in differentiating the intervention group from controls. However, this does not provide definitive evidence of its efficacy in fostering psychological flexibility relative to the control group, which the current study sought to determine. While these findings align with previous studies that have reported trends toward improvements in psychological flexibility following adapted-ACT interventions as compared to controls engaging in befriending groups, psychoeducation and relaxation groups (Rauwenhoff, Bol, Peeters, Smits, et al., 2024; Whiting et al., 2019), they contrast with Sander et al. (2021), who reported significant and sustained improvements in TBI populations.

The absence of significant findings in this study is likely attributable to methodological limitations, particularly the small sample size and high variability across conditions. A small sample reduces statistical power and increases the risk of failing to detect an effect, while high variability within the data further limits the ability to identify consistent patterns. Nevertheless, the present findings are not without value; they provide preliminary insight into potential trends and effect sizes (and attrition rates) that can inform the design of future research. Studies with larger sample sizes – potentially through a multi-site RCT to enhance recruitment and account for higher-than-expected attrition – will be necessary to determine whether the observed trends persist and whether significant effects emerge. Methodologically, the ACT literature has faced critiques for small sample sizes, underpowered studies, and inconsistent control conditions in RCT’s (McKay & O'Donohue, 2023). The lack of rigour in treatment fidelity and the absence of robust mediational analyses have further limited the ability to draw definitive conclusions about the potential for ACT to induce clinically meaningful change in ABI populations or further elucidate its mechanisms of action. Indeed, Whiting et al., (2019) acknowledged a lack of insufficient statistical power stemming from high attrition rates and a lower-than-expected final sample size, which could have contributed to a lack of statistical significance. These same limitations were evident in this mixed-methods study, where recruitment and retention were significantly impacted by the COVID-19 pandemic. For example, five participants in the waitlist group were transitioned to alternative interventions due to accessibility challenges posed by the COVID-19 pandemic, further limiting the final sample size. Attrition rates, particularly within the waitlist control group, reduced the statistical power necessary to detect significant changes, increasing the risk of Type II errors. However, it is possible that the promotion of psychological flexibility may not be unique to ACT but shared across other therapeutic modalities. In this study, mean improvements in psychological flexibility were observed not only in the active intervention group but also among waitlist controls who received only standard (holistic) neurorehabilitation. Similar findings have been reported by Rauwenhoff et al., (2024) and Whiting et al., (2019) who used befriending, psychoeducation and relaxation training as control groups. This raises questions about the specificity of ACT mechanisms and underscores the need for structurally equivalent control groups in future trials to disentangle intervention effects from broader rehabilitative processes. Moreover, careful consideration should be made regarding the structure, dosage and timing of interventions.

There is considerable variability in the delivery methods and schedules of adapted-ACT interventions targeting psychological flexibility. For example, Rauwenhoff et al., (2024) implemented an individual-based intervention consisting of eight 60-minute sessions delivered over 3.5 months, complemented by 30 minutes of daily homework six days a week. This approach, however, did not yield statistically significant changes in levels of psychological flexibility. Similarly, Whiting et al. (2019) delivered group-based sessions over a seven-week period, with weekly 1.5-hour sessions, and also observed no significant improvements in psychological flexibility. The current study used a group-based intervention comprising weekly 2.5-hour sessions over five weeks (inclusive of an extended break) and likewise found no statistically significant changes. In contrast, interventions that achieved statistically significant changes in psychological flexibility utilised shorter yet more frequent session schedules. For example, Sander et al. (2021) delivered eight weekly sessions of 1.5 hours each and reported sustained improvements in psychological flexibility. Similarly, Liu et al. (2023) conducted a relatively brief group-based adapted ACT intervention comprising seven 45–60-minute sessions over four weeks. This approach not only cultivated significant improvements in psychological flexibility among acute stroke patients but also enhanced mental health-related quality of life, cognitive fusion, confidence, and sleep quality, with improvements maintained at 3 months follow-up. These findings suggest that intervention dosage and session structure may be critical factors in facilitating measurable improvements in psychological flexibility. More frequent but shorter sessions could enhance engagement, reinforce key ACT principles more effectively, and allow participants to better apply the skills and strategies learned over time.

There is also considerable variation in the outcome measures used to assess ACT-related processes. For instance, Rauwenhoff et al. (2024) employed the Acceptance and Action Questionnaire II (AAQ-II), while Whiting et al. (2019) used a shortened version specifically adapted for ABI populations. The latter was developed following pilot research indicating that the standard AAQ-II may not be suitable for individuals with ABI (Whiting et al., 2015). However, critics have raised concerns about the validity of such measures, suggesting they may primarily capture psychological *in*flexibility, emotional distress and experiential avoidance, rather than positive theoretical constructs of, or related to, psychological flexibility (Arch et al., 2023; Newsome et al., 2019). Regarding the CompACT measure used in the present study, just under one-third of the 23 items are reverse-scored to assess psychological inflexibility. The absence of statistically significant changes in levels of psychological flexibility within and between groups calls to question the conceptual clarity surrounding such self-report measures and their suitability for capturing complex constructs, particularly when changes may be subtle or incremental. This concern persists despite research suggesting that the CompACT is more sensitive to treatment changes than its counterparts (Ong et al., 2020). Moreover, some critics have questioned whether psychological flexibility can be reliably interpreted as an indicator of change or intervention efficacy at all (Arch et al., 2023). Fortunately, qualitative inquiry provided an opportunity to explores participants nuanced, subjective experiences, shedding light on how ACT principles were understood, applied, and translated into meaningful change, in addition to elucidating barriers that may limit the intervention’s effectiveness.

The qualitative results illuminate the complex process of psychological adjustment and acceptance for adults living with stroke or ABI, supporting the limited existing qualitative evidence that ACT can foster meaningful subjective change in those experiencing mild-to-moderate distress (Large et al., 2020; Whiting et al., 2017), offering insight into both the mechanisms of change and the personal relevance of the intervention. Key themes highlight the interplay between individual processes (such as openness and willingness to engage), group dynamics (including a supportive therapeutic milieu and facilitated self-disclosure), and mechanisms of ACT pertinent to the development of psychological flexibility (acceptance of difficult thoughts and emotions, mindfulness practice and (re)connecting with values). These elements converge with processes of identity reconstruction such as self-acceptance to enhance emotional regulation and adaptive coping, which are critical for psychological adjustment and PTG (Tedeschi & Calhoun, 1996).

In keeping with narrative presented in Chapter Two, a safe and supportive therapeutic environment emerged as pivotal in fostering emotional disclosure and reciprocal sharing among individuals living with stroke and ABI. This environment fostered group identification and a sense of belonging which validated experiences, helping participants to feel understood and connected (Griffin et al., 2022; Haslam et al., 2016; Nils & Rimé, 2012). Group identification also provided a foundation for shared understanding, promoting social connectedness and offering a vital buffer against the isolation commonly experienced by stroke and ABI populations (Douglas, 2020). This exemplifies the synergistic interplay between individual wellbeing (the building of a balanced mind) and the community domain within the GENIAL framework, whereby emotional disclosure and social connection mutually reinforce each other to support holistic wellbeing.

Although the therapeutic milieu and the delivery of group-based interventions are recognised as integral to holistic neuropsychological rehabilitation (Ben-Yishay & Diller, 2011), their implications remain unexplored in the context of adapted-ACT for stroke and ABI populations. Large et al., (2020) highlighted the value of peer group interactions, with participants expressing a desire for greater group discussion. In the context of the present intervention, these interactions not only promoted social connectedness - which is sorely lacking in stroke and ABI populations - but also served as a foundation for group identification through shared understanding and social support, which is critical for acceptance, adaptive coping and supporting movement towards a more fulfilled life (Allen et al., 2022; Griffin et al., 2022; Karagiorgou et al., 2018; Lyon et al., 2021; Muldoon, Walsh, et al., 2019). These processes provide a foundation for psychological growth and PTG (Allen et al., 2022; Griffin et al., 2022). This highlights the importance of incorporating group-based, socially oriented activities into interventions for stroke and ABI populations, as they offer opportunities to support both emotional and social aspects of one’s rebuilding, thereby promoting more holistic rehabilitation outcomes.

The principles embedded within the adapted-ACT intervention itself also supported participants to develop a stance of acceptance towards their mental experiences (Large et al., 2020). This marked a significant shift from maladaptive coping strategies such as experiential avoidance, which is detrimental to mental and physical wellbeing (Campbell-Sills et al., 2006), toward experiential openness and acceptance. Alongside mindfulness practice, this approach supported emotional regulation and reduced reactivity, enabling some participants to respond to stress adaptively and in ways that were conducive to values-based goals (e.g., maintaining relationships with family members). This active form of acceptance facilitated emotional balance, a cornerstone of individual wellbeing (Mead et al., 2021), supporting the transition from intense emotional outbursts to more regulated, value-driven behaviours (Campbell-Sills et al., 2006). This shift indicates enhanced psychological flexibility, aligning with the theoretical underpinnings of ACT and emphasising the transformative role of acceptance in adaptive coping and psychological adjustment. However, qualitative insights also highlighted the importance of acceptance of the self, a relatively unexplored outcome in ACT literature.

The theme ‘*Self-acceptance, Compassion and (Re)connecting with Values’* extends the ACT literature by emphasising the critical role of self-acceptance in rebuilding a coherent sense of identity post-injury, bridging ACT concepts with psychological frameworks regarding self-identity reconstruction post-ABI (Gracey et al., 2009). Participants described the emotional challenges of letting go of their pre-injury selves and adapting to new realities often characterised by loss and frustration. Through reflection and values-based discussions, participants shifted their focus toward meaningful goals and adaptive ways of living with their limitations, fostering psychological adjustment and a renewed sense of hope and purpose - key determinants of psychological wellbeing and PTG. Clinically, these findings underscore the importance of facilitating self-acceptance and incorporating values-based discussions into therapeutic interventions beyond ACT that may support adaptive coping, meaningful behaviour change and PTG (Kashdan & Rottenberg, 2010). Facilitating acceptance of oneself may also bolster social connectedness as it underpins the ability to engage in meaningful social interactions and rebuild relational roles (Lowe et al., 2021). This aligns with the ‘broaden and build principles central to Barbara Fredrickson’s (2001; 2004) theory and illustrates the synergistic, mutually reinforcing interactions between individual and community domains of wellbeing as proposed by the GENIAL framework. However, the findings also caution against passive or resigning forms of acceptance, which may undermine psychological outcomes.

Framing acceptance as an ongoing, active process is crucial for fostering resilience, optimism, and the pursuit of a fulfilling and meaningful life post-injury. These insights offer valuable guidance for enhancing the therapeutic potential of ACT and related interventions in neurorehabilitation contexts.

Despite the content and context of the intervention providing important foundations for adaptive coping and psychological adjustment, the qualitative data provide additional insight into the ways in which ACT could be better tailored to suit the cognitive and psychosocial needs of adults living with stroke or ABI. Participants identified several barriers that may have reduced their ability to benefit from the intervention, including the intensity and duration of sessions, which exacerbated cognitive fatigue and difficulties with retaining information. Recommendations included incorporating more breaks or reducing session length while increasing the overall number of sessions. This aligns with existing evidence suggesting that shorter, more frequent sessions may enhance intervention effectiveness, particularly when delivered within a timeframe that balances therapeutic intensity with participants' capacity for sustained engagement. A critical distinction between the interventions showing significant changes in psychological flexibility (e.g., Sander et al., 2021; Liu et al., 2023) and those reporting non-significant findings (e.g., Rauwenhoff et al., 2024; Whiting et al., 2019; and the present study) lies in session frequency and duration. Frequent, shorter sessions may reduce fatigue while also encouraging ongoing practice of acceptance - an essential component of psychological flexibility which takes time, and real-life opportunity, to develop (Hayes et al., 2011). In this regard, a longer follow-up period may also better capture delayed effects, particularly given varied trajectories of change observed in persons experiencing distress and depression (Helmich et al., 2020).

Alongside highlighting opportunities to better tailor adapted-ACT interventions to participants' needs, the findings emphasise the need for ongoing social and emotional support post-intervention. Some participants reported a sense of loss after the intervention ended, describing difficulties in maintaining the social connections formed during the sessions. Providing opportunities for group identification and a sense of purpose, only to remove them, may have detrimental effects on psychological wellbeing. These findings highlight the importance of supporting access to sustainable opportunities for connection, belonging and meaning throughout the rehabilitation pathway such that individuals living with ABI can continue to strengthen group memberships that support positive adjustment and growth following trauma (Griffin et al., 2022). This could be achieved by signposting participants towards local peer support groups within their communities; or supporting departing attendees to set up their own peer support network with other participants. Drawing upon community assets and services provided by third-sector organisations represent a sustainable vehicle for meaning, shared learning and belonging from which stroke and brain injury survivors may benefit. Moreover, ongoing support structures may help to bridge the gap between learning and application, encouraging individuals to practice the principles learned and integrate them in their daily lives.

### 4.4.1 Conclusion

Overall, the adapted-ACT intervention did not produce statistically significant improvements in psychological flexibility among adults experiencing mild-to-moderate distress following stroke or ABI, compared with the waitlist control group. These results may be explained by methodological limitations such as the small sample size and high variability within groups, which reflect broader challenges in the field. While the absence of significant differences suggests the study may have been underpowered to detect subtle changes, meaningful outcomes were reported by participants, with qualitative data providing insight into the processes of psychological adjustment in this population. Themes highlight a complex pathway of change characterised by acceptance, emotional regulation and reconnection with personal values, all of which were facilitated by group dynamics and therapeutic techniques. These insights emphasise the complementary and mutually reinforcing role of the therapeutic milieu and group process in supporting individual wellbeing and community, demonstrating the value of group-based interventions that promote openness, self-disclosure and shared experiences in meaningfully supporting emotional adjustment and coping in adults with mild-to-moderate distress post-stroke or ABI. The interconnected nature of these processes thus highlights the value of integrating ACT principles, such as acceptance and mindfulness, into the neurorehabilitation pathway to support adjustment, while also embedding enduring opportunities for continuity to reduce to the sense of loss experienced when interventions end and groups disband.

# 5 Chapter Five: Expanding Neuropsychological Rehabilitation Beyond Traditional Settings: Immersing Patients into their Natural and Social Ecologies for Sustainable Health and Wellbeing

This chapter explores the role of community as a core domain of wellbeing, highlighting how current interventions often fall short in supporting sustainable integration into individuals' local environments. It highlights the importance of fostering connections within the communities where people live, which can provide significant health and wellbeing benefits. Although the NHS has increasingly acknowledged the potential of community assets and green spaces to address mental health challenges, approaches such as social prescribing are often poorly suited or inaccessible for those living with ABI. The chapter advocates for tailored, partnership-driven strategies and draws on wellbeing science to examine how care models can be expanded to enhance wellbeing across multiple levels.

As outlined in Chapter Two, long-term neurorehabilitation may be delivered in hyper acute, acute and post-acute inpatient settings, in specialist out-patient neurorehabilitation centers, or within the individual's local community or home following hospital discharge (Turner-Stokes et al., 2015). Traditionally, interventions delivered within out-patient neurorehabilitation settings have been the standard format of provision for neuropsychological rehabilitation within the UK, although NICE Guidelines for Rehabilitation after Traumatic Injury (NG211) emphasise that individuals with brain injury should also be supported to access community activities, in addition to vocational and educational opportunities. While clinic-based interventions can provide important benefits, some struggle to address the complex, real-world challenges faced by individuals with ABI, and paradigms that aim to test and strengthen the skills necessary to confront such challenges often lack ecological validity. Skills acquired and principles learned within the clinical setting may not be adequately translated to or applied within the patient's everyday life, as demonstrated in Chapter Four. Accordingly, these settings fail to support the penultimate goal of holistic neurorehabilitation and a key driver of sustainable wellbeing: successful community (re)integration.

## 5.1 Community Integration as a Key to Sustainable Wellbeing

Holistic neurorehabilitation emphasises community reintegration as a cornerstone of recovery (or rebuilding) post-ABI. Successful community reintegration in the context of neurorehabilitation for adults living with ABI is characterised by the management of independent living tasks, engagement in productive activities (including employment, education, or volunteering) and social engagement (Sander et al., 2010). It is well-documented that comprehensive, holistic neurorehabilitation can effectively improve community reintegration (Cattelani et al., 2010; Cicerone et al., 2004; Cicerone et al., 2008), with studies also demonstrating positive outcomes in psychosocial functioning, including interpersonal relationships, independent living status, financial independence, societal participation and satisfaction in overall quality of life (Geurtsen et al., 2011; Klonoff et al., 2006). Particularly, rehabilitation programmes that prioritise community-based activities, such as vocational training or peer support groups, generate important wellbeing outcomes for adults living with ABI, facilitating meaningful social connectedness and identity reconstruction (Douglas, 2013). It has been stated that the purpose of neuropsychological rehabilitation is to help those affected by ABI to achieve their optimum level of functioning, thus supporting return to their own most appropriate environments where relevant (Wilson, 2010; Wilson, 2013). Given the critical importance of social connectedness for human health and wellbeing (Haslam et al., 2018), these most appropriate environments should be characterised by a place of and for belonging, offering opportunities for meaningful engagement. Despite this, many individuals with ABI experience long-term loneliness and social isolation, even after participating in rehabilitation programmes (Colantonio et al., 2004; Forslund et al., 2019; Ponsford et al., 2014). Whilst group-based interventions, such as that described in Chapter Four, may foster a brief sense of community in adults living with ABI by providing opportunities for shared experience, social connectedness, and social support, these interventions are short-lived. With that, the individual is left to return home, albeit armed with coping strategies that are critical for adjustment, but often without access to sustained social opportunities or support systems which are so pivotal to experiences of wellbeing.

## 5.2 Connecting to Domains of Wellbeing at Multiple Levels of Scale

Given the profound influence of social ties on mental and physical health (Cacioppo & Patrick, 2008; Holt-Lunstad et al., 2015; Kemp et al., 2017), community is recognised as a core domain of wellbeing within the metatheoretical GENIAL framework. Social identity theory highlights that belonging and identification within group memberships can reduce loneliness and mental health difficulties such as anxiety and depression while improving life satisfaction (Haslam et al., 2016). Communities can form around shared values, common interests, or geographic location (MacQueen et al., 2001). While individuals may define community in their own terms, Wiseman and Brasher (2008) extend the concept beyond social connection, emphasising that community wellbeing reflects the interplay of social, economic, environmental, cultural, and political conditions that people consider necessary for their flourishing. Yet, at its core, the essence of community lies in mutual identification, sustained connection, and a continuing sense of belonging.

In the context of ABI, it is the shared lived experience of injury, trauma, and adaptation that typically forms the basis for this identification, as illustrated in Chapter Four. Group-based interventions, such as the five-week adapted-ACT programme, can provide valuable opportunities for social connection in populations who typically experience disconnect (Douglas, 2020; Morton & Wehman, 1995; Schöttke & Giabbiconi, 2015). However, the social and emotional benefits of group-based therapies often diminish after the programmes conclude. For group identity to translate into enduring community belonging, connections must be supported and maintained within the context of an individual’s everyday environment, where they can continue to access and contribute to shared networks.

Sustained community engagement and contribution carries reciprocal benefits: altruistic participation fosters social ties, enhances positive emotions, and supports wellbeing for both the helper and the recipient (Kahana et al., 2013; Weinstein & Ryan, 2010). Moreover, communities act as gateways to essential resources such as healthcare, education, and employment, all of which profoundly shape wellbeing (Bronfenbrenner, 1977; Putnam, 2000). While peer-to-peer support and community connectedness may be facilitated digitally (Tistad et al., 2025), key goals of holistic neurorehabilitation nevertheless emphasise the importance of supporting (re)integration into physical community settings and promoting active participation in community life. Here, the role of place and environment becomes central. Physical environments provide the spaces within which communities can connect and flourish, affording opportunities for individuals living with ABI to sustain social contact and a sense of belonging, engage in community activities, and experience a sense of belonging within their local surroundings.

## 5.3 Integrating Natural Ecologies in Neurorehabilitation: Building Sustainable Wellbeing for ABI Populations

Increasing evidence within wellbeing science shows that engagement with the natural environment promotes both immediate and lasting wellbeing outcomes essential for human and collective flourishing, highlighting a key pathway through which salutogenic approaches to neurorehabilitation can be realised. The GENIAL metatheoretical framework of wellbeing emphasises the importance of fostering connections with oneself, others, and the environment (Mead et al., 2021). While neurorehabilitation traditionally focusses on individual and social domains, the integration of natural ecologies expands this framework, offering novel pathways for sustainable wellbeing and human flourishing post-ABI. Epidemiological studies consistently demonstrate a strong association between exposure to green spaces and improved health outcomes, including enhanced mental health and vitality (van den Berg et al., 2016; van den Berg et al., 2015). Spending just two hours per week in nature has been shown to significantly improve self-reported health and wellbeing, irrespective of demographic or health status (White et al., 2019). Pathways linking time spent in nature to individual wellbeing highlight the role of stress reduction (Ulrich et al., 1991) and attention restoration (Kaplan & Kaplan, 1989; Kaplan, 1995). Moreover, the promotion of transcendent emotions such as compassion, awe and gratitude are often reported, which in turn support positive social connections through prosociality (Bethelmy & Corraliza, 2019; Stellar et al., 2017). Nature provides the prime context for social connection and engagement in meaningful activities with others, highlighting the interconnectedness between social and environmental pathways to individual wellbeing. These interconnected pathways to wellbeing are crucial in the context of ABI, as these populations tend to experience heightened distress, attention deficits, and social isolation. In this regard, nature is salutogenic (Coventry et al., 2021) and presents pathways to flourishing (Capaldi et al., 2015), with meta-analytic research indicating moderate associations between time spent in nature and positive affect, with smaller but consistent reductions in negative affect (McMahan & Estes, 2015). However, the extent to which one is connected to and identifies with nature determines the extent of benefits experienced (Capaldi et al., 2014; Capaldi et al., 2017), and research suggests widespread disconnection from nature across populations (Capaldi et al., 2015; Nisbet & Zelenski, 2011). Thus, innovative efforts are needed to promote connectedness at multiple levels of scale.

## 5.4 Harnessing Community Assets for Wellbeing Promotion

With unprecedented demand on healthcare and mental health services, there is a growing shift toward preventative and early intervention approaches, accompanied by greater emphasis on community-based provision (Chatterjee et al., 2018). This approach is reflected in long-term strategic frameworks for health mandated by the Welsh Government, including *A Healthier Wales,* the *Social Services and Wellbeing (Wales) ACT*, and the *Wellbeing of Future Generations Act (Wales)* 2015. Promoting wellbeing through local communities is considered an economical, accessible, and person-centred approach to healthcare that is actively supported by the NHS through initiatives such as social prescribing (Wildman et al., 2019). Social prescribing encompasses the linking of individuals to sources of local, non-clinical community-based schemes and activities to address health and wellbeing needs such as anxiety, depression and social isolation (Chatterjee et al., 2018; Price et al., 2017). Through community referral pathways, social prescribing links individuals to local groups and initiatives such as sport groups and exercise classes, horticulture activities and nature-based interventions, art groups, and volunteering opportunities (Kilgarriff-Foster & O'Cathain, 2015). In accordance with wellbeing theory, these activities provide the context for building skills, confidence, meaning and self-esteem, in addition to providing opportunities for social interaction, physical activity, and meaningful engagement with nature (Chatterjee et al., 2018). Research has demonstrated that social prescribing can enhance health and wellbeing via mechanisms of ‘social cure,’ which include fostering a sense of belonging and support while reducing loneliness (Kellezi et al., 2019; Wakefield et al., 2020). In this regard, community-based services and organisations, including social enterprises and third sector organisations, offer unique assets for health and wellbeing promotion (Baird et al., 2016), particularly when individuals are able to sustain their participation in activities (Husk et al., 2016). Evidence for social prescribing highlights its potential to improve wellbeing in a variety of populations, including those with psychosocial issues (Grant et al., 2000) and chronic conditions (Moffatt et al., 2017), though high attrition rates are generally observed (Grayer et al., 2008). Moreover, applying this approach to support individuals with ABI requires careful consideration. While connecting people to community-based resources is promising, those with ABI often face unique challenges that can limit their ability to engage fully with such services. Simply signposting individuals to community resources may therefore be insufficient and risks overlooking the complexity of their needs and circumstances.

## 5.5 Barriers to Community Access and the Role of Partnership Working

Individuals with ABI often encounter significant barriers to accessing community-based resources and their natural environments, with transportation issues, financial constraints and physical impairments comprising barriers to access. Psychological obstacles, including anxiety, depression, and fears of social stigma, in addition to cognitive and emotional barriers further compound barriers to community engagement (Douglas, 2020; Ownsworth et al., 2024). These barriers are particularly problematic when services lack the knowledge and understanding about the long-term consequences of ABI, resulting in environments that are not adequately adapted to accommodate individuals' needs (McCabe, Lippert, Weiser, Hilditch, Hartridge, & Villamere For The Erabi Group, 2007). Given these limitations, it may be more effective to adopt a partnership-based approach, wherein neurorehabilitation professionals collaborate with community organisations to deliver tailored interventions, share knowledge and build social capital. This approach could integrate the expertise of MDTs with the contextual benefits of community-based services, ensuring that interventions are both person-centered and sustainable. For example, embedding neurorehabilitation practices such as cognitive training or psychosocial interventions within community settings may facilitate meaningful participation while addressing specific impairments (Ownsworth et al., 2008). Interventions rooted in milieu-centred neurorehabilitation that transition from clinical into community settings (e.g., home, work and school environments) throughout the course of holistic neurorehabilitation have been shown to be highly effective in increasing long-term productivity at up to 30-years post-discharge, such as employment and regular engagement in structured volunteering (Perumparaichallai et al., 2020). Teaching compensatory skills and strategies within the settings where they are most needed, such as work or school, was hypothesised to help individuals with ABI apply and sustain these skills, thereby supporting ongoing productivity. This highlights the importance of delivering interventions in environments where they are most relevant, allowing individuals to generalise and sustain compensatory strategies. By supporting personal rebuilding within these real-world contexts, interventions can align with each person's unique life circumstances, promoting autonomy, mastery and engagement with their local environments, thereby strengthening connections to the self, community, and nature.

## 5.6 Bridging Social and Natural Ecologies in Neurorehabilitation

This chapter emphasises that immersing individuals in their social and natural ecologies offers a dual pathway for enhancing connectedness - a defining feature of wellbeing (Mead et al., 2021) - across multiple levels: to the self (identity-reconstruction), to communities (fostering a sense of belonging), and to the environment (nature connectedness). This salutogenic approach may support more sustainable wellbeing for marginalised ABI populations who face sociostructural barriers to accessing resources for wellbeing. For example, community-based outdoor group activities may simultaneously build social ties and a sense of community belonging whilst also strengthening connections to nature, amplifying the therapeutic benefits of each domain (Capaldi et al., 2017; Richardson, Passmore, et al., 2020). Notably, this is advocated for in *addition* to existing neurorehabilitation practices, in the same manner that wellbeing science can provide opportunities to *expand upon* current models of neurorehabilitation rather than replace them. In the same vein, a recent meta-analysis found that incorporating nature-based social prescribing interventions *into* mental healthcare plans provides an effective pathway for improving mental health outcomes in a way that *complements* traditional therapies (Menhas et al., 2024). Partnership-based approaches to neurorehabilitation, which embed nature-based interventions within community contexts, offer a practical framework for achieving these goals in consideration of sociostructural factors. By integrating the expertise of holistic MDTs with the therapeutic potential of nature and drawing on the sustainable social resources embedded within communities, neurorehabilitation can extend its impact beyond traditional settings, reducing barriers and fostering sustainable wellbeing across multiple domains and levels of scale.

In summary, this chapter highlights the importance of community and nature connection as foundations for wellbeing, particularly for individuals with ABI. It calls for more tailored nd inclusive approaches that move beyond generic interventions, advocating for partnership-driven strategies that embed individuals within supportive local environments while responding to their unique needs. An applied example of this is presented in the following chapter.

# 6 Chapter Six: Riding the Wave into Wellbeing: A Qualitative Evaluation of Surf Therapy for Individuals Living with ABI

**Portions of this chapter are based on the following publication:**

Gibbs, K., Wilkie, L., Jarman, J., Barker-Smith, A., Kemp, A. H., & Fisher, Z. (2022). *Riding the wave into wellbeing: A qualitative evaluation of surf therapy for individuals living with acquired brain injury,* **PLOS ONE**, 17(4), e0266388.
DOI:https://doi.org/10.1371/journal.pone.0266388

This work has also been presented at several academic, patient-facing, clinical and multidisciplinary conferences and has also been disseminated through multiple media outlets, including the following:

**A Press Release by Swansea University (May 2022)**

New research shows how surfing may boost wellbeing of brain injury survivors - Swansea University

**Surf Simply Magazine Interview and Website Article**

https://surfsimply.com/surf-coaching/surf-therapy-for-people-with-acquired-brain-injury/

**An Invited Article in The Conversation (May 2023)**

https://theconversation.com/why-surfing-can-be-beneficial-for-people-with-brain-injuries-203094

**BBC Wales Interview (Filmed and Broadcast in July 2022)**

Surfing improves wellbeing of brain injury survivors - BBC News

## 6.1 Introduction

Nature has long demonstrated the capacity to facilitate wellbeing at multiple levels of scale. Interventions involving the natural environment, such as surf therapy, are increasingly being used to facilitate aspects of wellbeing in clinical populations. However, exploration of how nature-based interventions such as surf therapy may be used to promote wellbeing in the context of neurorehabilitation are missing from the peer-reviewed literature. The nature based Surfability intervention, described herein, is an example of expanding the holistic model of neurorehabilitation by focussing on determinants of wellbeing that are often neglected. The Attention Restoration Theory emphasises the restorative effects of spending time in nature on attention and concentration (Kaplan & Kaplan, 1989; Kaplan, 1995) which may be particularly useful for people with ABI. Other scholars argue that exposure to unthreatening natural environments help to reduce physiological arousal following stress (Bowler et al., 2010; Tsunetsugu et al., 2009) and increase resilience (Hansmann et al., 2007), in line with stress reduction theory (Ulrich et al., 1991). The potential for nature to facilitate resilience may be particularly important in the context of brain injury populations (Lukow et al., 2015). Nature can meaningfully reduce psychological and physiological markers of stress and replace them with feelings of refreshment and vigour in as little as 10-20 minutes (Meredith et al., 2020). Contact with nature has also been shown to improve cognitive functioning (Berman et al., 2008; Berto, 2005; Festinger, 1954) and facilitate the experience of psychological flow (Csikszentmihalyi et al., 2014) and there is now a growing body of evidence for the wellbeing benefits associated with engagement in water-based activities (Foley & Kistemann, 2015). A systematic review of 35 studies concluded that exposure to outdoor blue spaces is positively associated with higher levels of physical activity, better mental health, and improved wellbeing within the general population (Gascon et al., 2017). Psychological processes including empowerment and respite have been proposed as potential mechanisms through which surfing may facilitate wellbeing (Marshall et al., 2020).

Surf therapy provides a context for the experience of multiple determinants of wellbeing. The potential for exercise to serve as an immediate psychological reward for the continuation of health behaviours that support self-management is particularly important in the context of individuals with brain injury (Rzezak et al., 2015; Van Cappellen et al., 2018), with the development of a ‘healthy body’ comprising a key component of individual wellbeing highlighted in the GENIAL framework. Connection with nature may also have benefits over and above benefits associated with exercise (Pasanen et al., 2014; Thompson Coon et al., 2011; White et al., 2019), as highlighted in the preceding mini-chapter. The present chapter explores whether a Surfability intervention may facilitate wellbeing in groups of service users living with ABI. The benefits of surfing in the context of this unique population remain - until now - unexplored. Accordingly, the aim of this evaluation is to critically unpack the experiences of service users in accordance with wellbeing theory, and to reflect on potential mechanisms through which reported improvements in wellbeing may function.

## 6.2 Methods

### 6.2.1 Design

A qualitative evaluation design was employed to gather detailed accounts of service user experiences of the Surfability intervention, consistent with national requirements for evaluating services and patient experience. As detailed in Chapter Three, this is in keeping with a participatory and context-sensitive approach, and aligns with previously published work generated through strategic partnership between the Community Neurorehabilitation Service (CNS) in question and Swansea University (Tulip et al., 2020; Wilkie et al., 2021).

### 6.2.2 Setting and Participants

The service evaluation was carried out in a CNS set in a general hospital setting in South Wales, UK. This service encompasses the Traumatic Brain Injury Service (which primarily works with individuals who have experienced mild or moderate and severe brain injury), the Vocational Stroke service (which accepts referrals from stroke patients who wish to return to employment) and the General Neuropsychology Service (which accepts referrals for people living with ABI). All services provide clinical and neuropsychological support, with standard care across services centred around the holistic model of neurorehabilitation (Ben-Yishay, 1996; Ben-Yishay & Diller, 2011; Ben-Yishay et al., 1985). This involves working with service users to identify goals that they wish to work on as part of their rehabilitation. This may include brain injury education, vocational rehabilitation, and interventions to help service users compensate for difficulties, adjust to their circumstances and new identity, and work towards rebuilding a different meaningful life when returning to their ‘old’ life is not possible. Various therapies are offered to help patients achieve their rehabilitation goals. For example, the TBI Service is composed of an MDT including speech and language therapists, occupational therapists, music therapists and clinical psychologists/neuropsychologists. In keeping with the holistic model of neurorehabilitation, almost all service users will engage in a combination of individual and group therapies.

As part of their ongoing treatment and rehabilitation, service users were invited to attend one of three Surfability interventions delivered over a three-year period (2018-2020). These interventions were offered during the latter months of each year (July-October) in accordance with the optimum sea temperature and seasonal weather conditions. These environmental variables impacted upon the numbers of service users able to access this intervention within the focus of the current evaluation. Sample size was also further restricted by the COVID-19 pandemic, which resulted in the cessation of in person group-based neurorehabilitation services during the first year of nationwide lockdown. As such, a total of 25 participants were purposely invited to attend the intervention and 18 consented and accepted the invitation. Reasons for not accepting the invitation included other commitments and travel difficulties.

In accordance with the eligibility criteria for the service, all participants had a confirmed diagnosis of ABI, were aged 18 years or older, lived in the community and catchment area of the health board, and were able to actively engage in neurorehabilitation, as determined by treating clinicians. Participants were only invited if they were able to provide informed consent to participate. All participants experienced cognitive difficulties, particularly in relation to memory, processing, and executive function. Risk assessments were carried out by clinicians, and all staff were made aware of participant needs and individual requirements. Individuals deemed not medically fit to partake in physical activity were excluded from the intervention, with uncontrolled epilepsy comprising the only reason the service has had to exclude potential participants on the basis of physical health grounds. Physical difficulties which needed to be managed for almost all participants during the intervention included fatigue, dizziness, and balance difficulties. Participant needs were accommodated due to adaptations made by Surfability to increase accessibility.

All 18 participants attending one of the three Surfability interventions over the three-year period were invited to provide qualitative feedback about their experience of the intervention. Of these 18 participants, three were lost at interview because they could not be contacted to make an appointment or because they failed to attend the interview appointment that had been made for them. Accordingly, 15 service users consented to take part in the service evaluation. Informed consent was collected prior to their engagement in the service evaluation, with an example of the generic consent form used by the service provided in Appendix F. Table 4 shows demographic data for the 15 individuals who provided qualitative data about their experience of the Surfability intervention.

**Table 4**

*Demographic Profile of Participants in the Surfability Service Evaluation*

| | |
|---|---|
| Age | Mean = 42.4; Standard Deviation 12.88; Age range (29-69 years); Median = 38 |
| Sex | Male = 10; Female = 5 |
| Type of Acquired Brain Injury | Severe Traumatic Brain Injury *n* = 6; Moderate Traumatic Brain Injury *n* = 3; Moderate-Severe Traumatic Brain Injury *n* = 1; Mild-Moderate Traumatic Brain Injury *n* = 1; Mild Acquired Brain Injury *n* = 1; Pontine Cavernoma Bleed to the brain *n* = 1; Subarachnoid Haemorrhage secondary to a ruptured right middle cerebral artery aneurysm *n* = 1; Multiple Sclerosis diagnosed in 2006 *n* = 1 |
| Time Since Injury | Mean = 2 years and 9 months; Standard deviation = 3.07; Range = 6 months – 12 years; Median = 2 years |
| Employment Status | Employed *n* = 3; Employed but on sickness leave; *n* = 2; Medically retired *n* = 3; Unemployed *n* = 7. |

### 6.2.3 Intervention

A five-week Surfability therapy intervention was delivered in a collaborative partnership between the CNS and a local community-based third sector surfing organisation. Surfability UK (https://surfabilityukcic.org) is a Community Interest Company that provides surfing experiences for individuals with additional needs due to disability, illness, injury or learning difficulties. The aim of Surfability is to help people with impairment to push past the boundaries of what they thought possible and engage in safe, group-based physical activity in a natural outdoors environment. Surfability UK is located at Caswell Bay on the Gower Peninsula of South Wales. This coastal setting is accessible to individuals with restricted mobility and is renowned for its aesthetically pleasing environment, facilitating psychological and physical connectedness to nature, laying strong foundations for building wellbeing in people living with ABI.

The intervention consisted of weekly two-hour sessions delivered in groups of no more than five participants. Groups were led by three qualified surf instructors employed by Surfability UK, in addition to two members of therapy staff from the CNS, plus volunteers. Each group comprised sufficient staff to provide one-to-one support to participants. Participants had sufficient time (usually about 30-minutes) before the session to meet staff and other group members and to change into their wetsuits before the surfing intervention commenced. Adapted wetsuits with extra zips and heated vests were available for participants who struggled to put on their wetsuits, thus preventing the cold from being a barrier to inclusion. Surfing activities lasted for 1 hour and 30 minutes, commencing at 10am and finishing at 11.30am.

At the start of the first session, appropriate surf boards and buoyancy aids were distributed amongst participants by the Surfability team. Surfability UK possess a range of different sized surf boards which vary in length, width, flexibility, firmness, and level of adaptation to suit those with physical limitations. For instance, if a person's physical difficulties meant they were unable to use a traditional board even with support, then Surfability has a large surfboard with a seat attached to it. Use of this seated board would involve a coach paddling out and catching waves so the seated participant could still experience the thrill of being on a wave and in the ocean. Another coach would be waiting at the end of the wave to provide support if necessary. This meant that physical disability was not a barrier to participating. Although no participants in the present sample had severe mobility impairments, all required adaptations to the size and firmness of their boards to compensate for balance difficulties and enhance stability. Beach-access wheelchairs and walking frames were made available to support participants whose mobility difficulties made walking to the sea especially challenging.

Once boards were selected, the lead instructor provided verbal guidance on surfing techniques and demonstrated appropriate positions to adopt while on the board. A thorough physical demonstration of surfing techniques was provided; including how to lay down, kneel and stand up on the board. Verbal health and safety instructions were provided, and participants were encouraged to raise their hand and call for assistance if support was needed. Surfing activities typically began with staff members supporting participants to lay down (where possible) on the board while in the sea. Staff members would help participants to ride the waves of the sea by pushing them onto the waves. This process was repeated so that participants could practice the skills necessary to balance on the board while focussing on the movement of the sea and the waves. This would continue until participants felt that they no longer required the support from staff members and had learnt to ride the waves for themselves. Participants were able to take short breaks whenever they felt it was appropriate and would often sit with peers and observe the group activities during breaks.

Informal goal setting and progress monitoring comprised an integral component of the intervention. Clinical team members at the CNS worked with participants to identify initial informal goals prior to engaging within the intervention. These goals typically reflected individual reasons for taking part and often reflected psycho-social outcomes and opportunities, including socialising with new people, and learning about the experiences of others with brain injury. During each week, goals tailored to the needs and requirements of each participant were revisited and participants were encouraged to reflect on their progress and outline actions that they wanted to achieve for that day. Sessions were carefully designed to bring clients out of their comfort zone and help them to make room for difficult experiences/feelings and focus on positive experiences such as the feeling of being in the water, while bringing awareness to the present moment and experiencing a sense of belonging to a group. Meanwhile, informal goal setting was included to facilitate achievement and the broadening of skills.

### 6.2.4 Data collection

All interviews were conducted by one of two Assistant Psychologists, both females, with postgraduate training in psychology. Neither Assistant Psychologist were known to participants but had relevant clinical experience in working with individuals with ABI. Twelve interviews were conducted face-to-face in a hospital setting and three were conducted via telephone. During face-to-face interviews, two participants were accompanied by a member of their support circle (i.e., parent or support worker) as requested, and clinical staff were in the building (for governance reasons) but not in the interview room. Before the interviews began, participants were made aware of the purpose of the discussion and were informed that their anonymised data would be used for evaluative purposes. Each interview followed a similar pattern, and discussions were framed around experiential gains, points for improvement and salient aspects of the course which may have impacted upon individual wellbeing. Discussions were semi-structured in nature and utilised open-ended questions (see Appendix G for the topic guide devised by the lead clinician), with follow-up queries developed iteratively over the course of the discussions. This approach facilitated flexibility and responsiveness, consistent with best practice in qualitative research.

All interviews were recorded using a Dictaphone and participants were assigned a numerical identifier during transcription to protect their identity. Audio data of interviews totalled 6 hours and 52 minutes. Interviews were on average 27 minutes and 45 seconds long, ranging from 10 minutes and 41 seconds to 45 minutes and 30 seconds in duration (*SD* = 10.70). Audio files were transcribed orthographically by Assistant Psychologists, incorporating utterances, hesitations, false-starts and repetitions, and utilised grammatical correctness to ensure the true essence of the data was captured. Interviews were transcribed verbatim except for the names of participants, staff names and locations, which were omitted to ensure confidentiality. Anonymised transcripts were stored on a secure shared drive within the health board.

### 6.2.5 Data analysis

Consistent with that stated in Chapter Three, a reflexive approach to TA was employed to critically unpack participants' subjective experiences of the Surfing intervention and synthesise participant insights into meaningful accounts (Braun & Clarke, 2006, 2013). Using the GENIAL framework as a lens through which participant's experiences could be understood and contextualised, coding was completed according to a critical realist epistemological perspective (Archer et al., 2013), fitting with the broader approach of the thesis.

Data analysis was supported by computer-assisted qualitative data analysis software (ATLAS.ti) and guided by the six-phase process described by Braun and Clarke (2006). Following careful familiarisation with the data and re-reading of the data, these phases outline a recursive process of coding participant transcripts to capture provisionally interesting features *within* the dataset and developing candidate themes and subthemes that capture the essence of shared meaning *across* the data set. Codes were generated with a stronger hermeneutics of suspicion and a more deductive orientation than the inductive approach outlined in Chapter Four, reflecting the author's theoretically informed perspective. Examples of codes include ‘achievement,’ ‘fatigue’, ‘perseverance,’ ‘acceptance’ and ‘respite.’ Candidate themes and subthemes were reviewed and continuously refined while a descriptive narrative was created to contextualise the outcome of the analysis. At this stage, orthographic details were removed from the extracts used to contextualise the narrative as it was felt that this impeded readability.

The analysis, which was completed over several months, saw the generation of six overarching themes. Meaningful quotes which exemplified the core features of each theme were extracted from the data set and used to offer an interpretation of participants’ experiences of the Surfability intervention, drawing upon the existing evidence-base to contextualise the insights in accordance with wellbeing theory. During this process, members of the supervisory team (ZF and AK) contributed their insights and expertise to help shape the analytic output, providing directives to facilitate a rich and clear reading of the data. This feedback supported the further refinement and development of the analytic output, which was shaped by the individual nuances and expertise of the thesis author. Candidate themes and subthemes were merged, renamed and recontextualised as the author generated the narrative. A detailed account and overview of the analytic process is presented in Chapter Ten.

## 6.3 Results and Discussion

All participants who provided feedback on the Surfability intervention reported psychosocial difficulties secondary to brain injury, including cognitive difficulties, negative affect, job loss and relationship breakdown. Many felt that the experience of sustaining an ABI had changed their lives for the worse such that they struggled to come to terms with their diagnosis. This background information provides important context for the themes discussed below.

### 6.3.1 Overarching themes

Six overarching themes were generated, including: 1) Connection to Nature, 2) Facilitating Trust and Safety, 3) Managing and Accepting Difficult Emotions; 4) Facilitating Positive Emotion, Meaning and Purpose, 5) Building Community through Social Connection; and 6) Positive Change. Additionally, a domain summary theme - Barriers and Opportunities – was developed to capture insights and learning opportunities to further refine the service in line with participant needs and preferences, in accordance with the purpose of the service evaluation. These themes are discussed in detail and situated within the context of the broader literature, reflecting on potential underpinning mechanisms through which they may facilitate wellbeing across multiple levels of scale.

#### 6.3.1.1 Theme One: Connection to Nature

The nature-based component of Surfability provided participants with the opportunity to interact with their natural environment, contributing to experiences of empowerment, a sense of relaxation, revitalisation and refreshment, and an appreciation of beauty regarding the coastal location in which surfing took place.

> "The scenery we have got in South Wales is some of the best in the world and seeing that - being able to be grateful to see that, it definitely has lifted me" (Participant Seven).

Nature Restoration Theory argues that nature may have restorative effects on our attention and concentration such that spending time in natural, yet aesthetically pleasing environments takes us away from the effortful attention-demanding tasks associated with the urban world (Kaplan & Kaplan, 1989; Kaplan, 1995). Participants described feeling beneficial effects of being in the open water that are consistent with theories of attention restoration.

> "Surfing especially - it's physical, but not too overly demanding, you know? It's the sensations of the water, the smells, it's really good for the senses" (Participant Ten).

Exposure to unthreatening natural environments may also reduce physiological arousal following stress (Ulrich et al., 1991), such that immersion in a natural and social ecology took participants away from everyday stressors, if only for a short while. This demonstrates how engagement with nature can contribute to feelings of balance.

> "I love the water, it's the feeling of safeness again, just being able to feel, you know. Feel the waves, the elements" (Participant Thirteen).

Some participants reported feeling more connected to nature following engagement in the intervention, with one participant expressing a preference for outdoor surfing as opposed to other natural outdoor environments (Capaldi et al., 2015).

> "It's [the Ocean] just so calming. I don't know. That's something that's changed. I always enjoyed swimming and the relaxing-ness of the water, but I just feel as if I'm more connected to water than trees" (Participant Thirteen).

Nature connectedness is a key prerequisite for health outcomes that affects the extent of psychological benefits obtained through spending time in the natural environment and is considered one path to flourishing in life (Capaldi et al., 2014; Capaldi et al., 2015), with the environment comprising a core domain of wellbeing proposed by the GENIAL framework (Kemp & Fisher, 2022; Kemp & Quintana, 2013; Mead et al., 2021). Accordingly, it is proposed that connecting to nature facilitated a variety of benefits reported by participants, with such benefits reflected in the following themes. These include the facilitation of trust and safety, managing and accepting difficult emotions, evoking positive emotions and a sense of meaning and purpose, as well as promoting a sense of community, all of which – in accordance with the literature on wellbeing and key principles of holistic neurorehabilitation - support capacity for positive change.

#### *6.3.1.2 Theme Two: Facilitating Trust and Safety*

This theme captures how the creation of a safe and supportive environment empowered participants to push past their self-doubt and anxieties and to focus upon re-building their confidence and capacity for self-management. Participants reported feeling safe and secure in the group and indicated that the presence of a qualified network of skilled professionals and surf instructors provided them with the opportunity to try something new without fear, harm, or ridicule. Here is an exemplar quotation from Participant Five:

> "I thought this was an environment where it didn't matter if I made a tit of myself, it didn't matter. I would feel safer if I was with someone who was proficient in their field, you know? They were able to teach this. I did it because it felt a safe environment for me to be able to learn something that I had never done before. And I think that is quite precious, that the opportunity was given" (Participant Five).

The impact of trauma affects the nervous system, altering cues of risk and safety, a process described as neuroception, which can lead to the perception of threat even when the environment is safe (Porges, 2007, 2011, 2015). This mismatch results in physiological and behavioural states that support defensive and avoidant strategies, compromising the ability to detect and to express positive social cues, leading to social withdrawal (Kemp & Quintana, 2013). Connecting with nature may have facilitated feelings of safety, an experience that was supported by Surfability staff and clinicians. For example, one participant emphasised how the Surfability team saw past their diagnosis and treated them as capable individuals with the means to achieve.

> "Everybody who works in the team, they don't patronise you, they don't see you as 'Oh you have this, or you've got that condition.' They just see you. 'Right OK, you want to learn to surf, let's see you get on that board.' You know? And I think that is the best place to be. I think that it's just that they see the person in front of them, and not the condition, and I think that is really important" (Participant Three).

These findings capture the importance of the therapeutic milieu in determining positive neurorehabilitation outcomes, which has implications for adjustment, social participation and positive change, as outlined in Chapter Two. They also illustrate how synergistic interactions between domains of wellbeing operate in practice. For example, by fostering trust and safety, the therapeutic context provided a platform for psychological growth, including enhanced capacity to manage and accept difficult emotions, a key overarching theme discussed next.

#### 6.3.1.3 Theme Three: Managing and Accepting Difficult Emotions

Almost all participants who engaged in the Surfability intervention reported experiencing psychological distress, including anxiety and depression, prior to participating in the group. While the experience of negative emotions isn't antithetical to wellbeing and instead represents a fundamental part of the human experience, the GENIAL framework emphasises the importance of balance for individual wellbeing. This is in keeping with the views of Bradburn (1969) and complements dual-factor and meaning-centred approaches (e.g., Wong, 2011, 2013).

Increasing evidence suggests that surfing in an ocean environment can facilitate feelings of respite and enhance wellbeing in individuals with lasting psycho-social difficulties (Marshall et al., 2020; Walter et al., 2020) by necessitating a focus on body and mind in the present moment (Caddick et al., 2014). In line with these findings, participants who attended the Surfability intervention reported feelings of stress reduction, indicating that surfing had interrupted bouts of rumination arising from relationship breakdown and challenging personal events.

> "It was just like a break from my mind if I'm honest. Out in the sea I literally didn't think of anything else that was happening in my life." (Participant Eleven)

The experience of surfing also facilitated acceptance of difficult emotions. Here, participants indicated that the unpredictable and uncontrollable nature of the water taught them that they could not always control the occurrence of unpleasant events and feelings. This included, for example, the cold weather, the size of the waves and getting hit by the board or falling into the water (at least before practice enabled them to develop their skills). As such, participants learnt that unpleasant feelings (beyond their control at that point in time) were an integral feature of the human experience: insights which were reinforced by clinicians who tried to make these links explicit.

> "I think that it sort of proved to me that I don't have to know everything - what's going to happen - all the time. Because I can't control it and I think that's what it taught me, in the water, I can't control that. Whatever is going to happen, whether it hits me in the face, or I fall off the board, it's going to happen. And I can't control that. So just sort of go with it" (Participant Three).

Some participants reported that these insights helped them to better manage difficult emotions and experiences beyond the parameters of the Surfability intervention, indicating that they were able to generalise experiences in surfing to other aspects of their lives. This extends upon one of the key limitations described in Chapter Four and demonstrates the value of delivering milieu-oriented neurorehabilitation while simultaneously immersing individuals into their local and natural environments, as argued for in the preceding mini-chapter.

> "I can now step back and say the majority of the time 'Come on, you know you can't control this, why are you freaking out?' or 'Why are you crying, why are you panicking?' You know?" (Participant Three).

As discussed in Chapters Two and Four, acceptance of one's mental experience has been linked to better adjustment and functioning in individuals with chronic conditions (Baer et al., 2004; Cardaciotto et al., 2008; Kohls et al., 2009) and improved psychological health within the general population (Ford et al., 2018). This may be because individuals who are better able to accept difficult thoughts and emotions experience reduced negative emotions in response to stressors (Ford et al., 2018), facilitating opportunities for improved psychological wellbeing, including meaning and purpose, the theme discussed next.

#### 6.3.1.4 Theme Four: Positive Emotion, Meaning and Purpose

Surfability provided opportunities for positive psychological experience, with many participants describing a "boost" or a "buzz" suggestive of feelings of revitalisation, refreshment, and vigour. Engagement in the group made brain injury survivors "feel alive" (i.e., Participant Thirteen), with one participant exclaiming that it gave them 'a new lease of life' (Participant Three). This captures the hedonic effects of such interventions, with hedonia being a core component of psychological wellbeing. Some participants reflected upon the impact that physical exercise had on their mood and perceptions, consistent with evidence indicating that even minimal levels of aerobic exercise can have a positive impact on emotional balance in those living with brain injury (Weinstein et al., 2017); reinforcing the link between mind and body that is central to the GENIAL framework of wellbeing

> "It's as if, sort of like a dirty duvet cover – you put a dirty duvet cover in the washing machine, and you come out and you feel sort of refreshed then. That's how I feel when I go" (Participant Thirteen).

Surfability provided individuals living with ABI with opportunities to engage in and master their surroundings (Ryff, 1989; Ryff & Keyes, 1995; Seligman, 2011) and pursue clearly identified and meaningful goals with autonomy and control. This aligns with the key principles of holistic neurorehabilitation proposed by Ben-Yishay and Diller (2011) and others. Some participants reported experiencing a flow-like state during the session, such that they felt immersed in the experience and were so focussed on overcoming the challenges inherent to surfing that they lost track of time (Participant Four). Positive psychological experiences were facilitated and reinforced through goal setting exercises, supported by clinicians working with patients during the Surfability sessions. Feelings of achievement cultivated joy, gratitude, and hopefulness for the future, with one participant expressing how lucky they felt to be alive (Participant Six).

> "You've got the board, you've got the waves, you've got the sea, and nobody is sitting next door to you with dual controls, and that's a heck of an achievement" (Participant Six).

Surfability also facilitated aspects of eudaimonia, with group members reporting a new sense of meaning and purpose in life. Specifically, engagement in the group contributed to a sense of direction and the perception that life was worthwhile.

> "To have something that I enjoyed that made me want to get up, get dressed, to prepare for that was amazing, I think that's really beneficial. 'Cause it encourages a good lifestyle, healthy lifestyle. It encourages you to do anything because you can still do stuff and you have got a valid reason for being alive" (Participant Five).

Research indicates that engagement and meaning are more strongly related to the experience of wellbeing than that of pleasure (Schueller & Seligman, 2010), again highlighting the potential for surfing interventions to optimise wellbeing in participants with chronic conditions. This is particularly important given that opportunities for meaning and achievement following ABI are lacking due to barriers to employment (Birgit et al., 2016; van Velzen et al., 2009), with only 20% of participants in the present sample being able to return to work. Moreover, positive experiences may broaden mindsets in ways that build social resources over time, as proposed by Fredrickson (2004) and discussed in Chapter One. Such experiences may facilitate community integration in persons with ABI (Fisher et al., 2022), with this comprising a core goal of holistic neurorehabilitation (Wilson et al., 2017) and a key domain of wellbeing proposed by the GENIAL framework.

#### *6.3.1.5 Theme Five: Building Community through Social Connection*

Surfability provided an opportunity for brain injury survivors who had previously reported feeling isolated to experience greater social connections and form meaningful social ties with individuals from diverse backgrounds. This reinforces the role of social connectedness in surf-related positive health and wellbeing outcomes (Marshall et al., 2020; Marshall et al., 2019; Walter et al., 2020) and illustrates how such group-based experiences can foster community-level wellbeing. Being in a group with similar others facilitated a sense of belonging and identity through shared life experiences (Britton, Kindermann, & Carlin, 2020), with one person describing their peers as a “family” connected by a mutual understanding of experience (Participant One). Within this community, participants provided emotional support to their peers through expressions of encouragement and reassurance. These emotionally supportive interactions fostered feelings of belonging in participants, helping them to feel accepted and valued despite personal difficulties. Meanwhile, seeing similar others succeed by sustained effort motivated participants to “go back to the shore and get straight back on again” (i.e., Participant Five), potentially enhancing levels of self-efficacy through vicarious learning and experience (Bandura & Wessels, 1997), while also promoting further engagement in physical exercise – a key component of individual wellbeing.

> “What was good about it was you could see other people - not that I am trying to put them down - but they were falling off as well as I was falling off. Yet, when each individual person did it, it was a group where we all applauded then, which was like bonding. You weren’t trying to put somebody down - we were hoping that they could get up!” (Participant Six).

Relating to other survivors through ‘sameness’ helped to combat social isolation and build a sense of community (Salas et al., 2018), facilitating social cohesion and cultivating teamwork. Participants provided informational support to their peers, sharing coping mechanisms, knowledge, and values with the aim of supporting others to live well with injury:

> “You know you’re sitting in that chair, and you think ‘What is going to happen to me?’ And you’re just ticking over in your own mind. But now, seeing these people here and even people with head injuries, you can talk to them, and they are giving their experience. And maybe I can give my experience and that will help them” (Participant Six).

Sharing within this network contributed to the building of trust and learning of new skills (Gaspar de Matos et al., 2017; Godfrey et al., 2015). Feelings of trust and belongingness are basic psychological needs which are important for renewal of self-identity after brain injury (Ownsworth, 2014). Meanwhile, the sharing of resources between individuals from diverse backgrounds united by social and/or cultural cleavages also provide the grounds for bridging social capital, increasing acquisition of knowledge and social resources which facilitate adaptability and successful self-management. This is captured by the community domain of the GENIAL framework (Fisher et al., 2022; Kemp & Fisher, 2022; Mead et al., 2021), with synergistic implications for individual wellbeing. For example, the experience of mutual identification, shared understanding, and sense of belonging in this context may foster positive psychological and physical health outcomes in individuals with chronic conditions (Cohen, 2004), and improve quality of life and adjustment in individuals with ABI (Hughes et al., 2020; Levy et al., 2019). Thus, the group-based surf therapy intervention facilitated a cascade of positive changes for individuals living with ABI, with such changes spanning multiple levels of scale.

#### *6.3.1.6 Theme Six: Positive Change*

The Surfability intervention provided a context for sustained positive change both within and beyond the parameters of the Surfability project itself, nourishing the belief that despite ‘being a bit broken in some places’ (Participant Four), participants were capable of achieving and experiencing wellbeing. It enabled them to continue building a better version of themselves, such that participants reported positive changes across psychological, cognitive, physical, and behavioural domains. Firstly, making room for difficult thoughts enabled participants to (re)connect with themselves in terms of their values, hobbies and identity, shifting their focus from their ailments and towards their capabilities. This aligns with salutogenic approaches to health and wellbeing and those which emphasise capability (Canguilhem, 1943). These changes contributed to the development of self-efficacy, an aspect of cognitive self-appraisal that helps to reduce discrepancy between achievements and expectations (Cicerone & Azulay, 2007).

> “It made me feel like *Oh my god*, you can still do stuff! Oh, my goodness me, you just sat up on a surfboard, amazing, and you’re 47, you know, cracking!” (Participant Five)

Some participants reported that the act of surfing enhanced their awareness, attributing these changes to the fluid and dynamic movements of the tide, wind, and sea. For example, one participant reported becaming more aware and observant of their surroundings during daily activities such as cooking, doing laundry or sitting as a passenger in a car. The activity of surfing thereby facilitated more mindful perceptions in participants, facilitating a deeper awareness of oneself and one’s surroundings in other day-to-day activities. This suggests that mindful experiences facilitated over the course of the intervention generalised to other experiences within participants' daily lives, perhaps reflecting characteristic increases in trait mindfulness and contributing to a less distressed disposition (Kiken et al., 2015).

> "I do like being outdoors, you know the gardening outside but how can I say it - the garden stays still, doesn't it? Surfability doesn't stay still, and you are achieving or getting your mind to work on what's going on around you. You've got to be aware of what's going on around you because Surfability is a thing that's moving, and you are not really in control of it. Although you are on a surfboard, you are trying to guide it, it's keeping you aware then and you've got to be aware. You are looking around to see if there is anyone else in your way that you don't want to go into people, so it does bring awareness to you" (Participant Six).

Participants also reported that attending Surfability helped them to (re)engage in physical activity and positive health behaviours outside of the group by providing a more enjoyable form of exercise than gym-based workouts. This is particularly important given the elevated risk of sedentary behaviours and insufficient levels of physical activity levels among this population (Goverover et al., 2017; Hamel & Smoliga, 2019; Hamilton et al., 2016; Wise et al., 2010). As discussed in Chapter One, prolonged inactivity increases the risk of cardiovascular disease, hypertension, obesity, and diabetes, and premature mortality (Warburton et al., 2006); emphasising the importance of delivering holistic neurorehabilitation for physical and psychological health.

> "I have dropped out of the gym so many times because it's just been too much. But, with Surfability, I can't explain it - it's an exercise but it's a pleasure and it doesn't wear me out as much as the gym does" (Participant One).

Surfability hereby provided the opportunity and context for new skill development and repetition of that skill - a key component of successful behaviour change for individuals with neurological impairment (Fisher et al., 2022). Participants reported improved fitness, coordination, and balance; capabilities which may promote functional independence and support individuals to lead a more active and fulfilling life. Adults with ABI often experience reduced participation in leisure activities, which are intrinsically motivated, non-obligatory pursuits completed for pleasure or enjoyment (Molineux, 2017). Exercise completed in this sense then may improve one's capacity for self-management (Fleischmann et al., 2011), further to promoting emotional balance (Weinstein et al., 2017), which is a core pathway to individual wellbeing proposed by the GENIAL framework. In this context, the six-week surf therapy intervention supported participants to re-engage in exercise for leisure within the community, promoting enjoyment (a key component of hedonic wellbeing) and broader health benefits.

> “What Surfability has given me is that it has helped me with my coordination, my fitness, getting me out the house, yeah, getting wacked by mother nature really” (Participant Two).

Theme One captured the psychological impacts of contact with and connecting to the natural environment. In this regard, Surfability re-ignited pre-existing affiliations with the outdoors for many participants. For others, it provided the opportunity to build such an affiliation, with several participants expressing a desire to spend more time outdoors and explore new places since engaging in this nature-based intervention. Indeed, nature connectedness is a key component of the GENIAL framework, with substantial evidence demonstrating its immediate psychological and physical benefits (Barton & Pretty, 2010; Capaldi et al., 2014; Capaldi et al., 2015). Beyond these well documented effects, the quote below illustrates how providing opportunities to connect with nature can simultaneously support key objectives of holistic neurorehabilitation; helping adults with ABI to live a more active, engaged, and socially connected lives.

> “I feel like I want to be a bit more outdoorsy, I don’t want to be sort of hidden away anymore” (Participant Three).

The transition from ‘wanting to be hidden’ to seeking visibility and actively re-engaging with life represents a profound personal transformation, aligning closely with the core goals of holistic neurorehabilitation and key components of PTG. It illustrates movement away from withdrawal and isolation - a common challenge following ABI - towards openness, agency, and living a more fulfilling life. Collectively, these insights support the notion that engaging in a group-based physical activity in one’s local natural environment may have a broader implications for physical and mental wellbeing than exercising indoors (Thompson Coon et al., 2011). However, several barriers can limit engagement in outdoors, nature-based activities, some of which are discussed in the domain summary theme that follows.

#### *6.3.1.7 Theme Seven: Barriers and Opportunities*

This domain summary theme captures the essence of barriers reported by adults with ABI that may hinder their ability to benefit from therapy across different contexts. For example, some participants reported difficulties in accessing holistic healthcare interventions altogether, with one participant indicating that their needs had not been met by more traditional services that focussed on reducing illbeing. Among those who *could* access more holistic therapies, the activities to which they were referred to were not suited to their needs, interests, or values, highlighting a clear mismatch with the core goals of holistic neurorehabilitation (Wilson et al., 2009).

> "I think that I have been through so many things in the hospital where I have either not been believed or just given the pill." (Participant Three)

This feedback highlights a need for greater attention to be directed towards identifying a range of programmes to suit the needs of a heterogeneous client group, as well as the importance of involving participants in the design and delivery of healthcare (Halvorsrud et al., 2019). Moreover, it emphasises the utility of building strategic and creative partnerships between the healthcare sector and community organisations, such as the Community Interest Company described herein, to provide innovative healthcare. Research indicates significant social inequalities in access to and use of blue spaces, with financial constraints limiting participation among individuals from lower socioeconomic backgrounds (de Bell et al., 2017). In accordance with Chapter Five, the surfing intervention described herein is an exemplar of how sociostructural barriers may be circumvented by partnering with community providers; a collaborative approach which lays important foundations for a more sustainable healthcare sector. Meanwhile, individual-specific barriers that were identified in this study may be used to improve the delivery of wellbeing therapies in the context of brain injury. Specifically, clinicians should be aware of participant fatigue, which was reported by six participants, assumptions regarding abilities (Participant Five) and older participants comparing themselves unfavourably with their younger peers regarding progress made (Participant Thirteen). These factors may have restricted the efficacy of the Surfability intervention itself and reflect common barriers to neurorehabilitation. Additionally, a limitation of the present work concerns the lack of cultural diversity within the sample, in that different cultural values differentially influence determinants of wellbeing (Mead et al., 2021). For example, in individualistic cultures, wellbeing has been shown to be more strongly associated with self-esteem and sense of personal achievement. In contrast, collectivist cultures place more value on social harmony, with wellbeing being more strongly associated with avoiding social conflict and interpersonal goals (Uchida & Oishi, 2016). However, the sample in the present evaluation is reflective of the typical population accessing community neurorehabilitation services within the general hospital setting in question.

### 6.3.2 Conclusion

This chapter draws on the latest advancements in wellbeing science to demonstrate how group nature-based physical activity can serve as a pathway to wellbeing and positive change in adults living with ABI. The dynamic interplay between themes underscores that the effectiveness of holistic neurorehabilitation lies not in isolated components but in the integration of multiple, reinforcing factors. However, insights from the domain summary theme highlight a key challenge: while holistic neurorehabilitation emphasises tailoring interventions to the individual goals, needs, and preferences of those living with ABI, these principles are not always fully realised in practice. This chapter demonstrates how immersing individuals in their natural and social ecologies can facilitate a cascade of mechanisms for positive change, fostering psychological, social, and physical resources fundamental to the experience of individual and community-level wellbeing.

Although service evaluations do not aim to generate generalisable knowledge, the results of the analytic output present opportunities for transferability that may be applied in other clinical settings. Notably, nature-based interventions need not be in the form of surfing specifically, an activity inherently constrained by geographical considerations. A growing body of evidence supports the broader wellbeing benefits of water-based activities (Foley & Kistemann, 2015). A systematic review of 33 studies concluded that engagement in a variety of purposefully designed and structured water-based activities can enhance mental health and psychosocial wellbeing in individuals with mixed cognitive and physical disabilities (Britton, Kindermann, Domegan, et al., 2020). Given that blue space interventions typically focus on fostering meaningful and active experiences in natural environments, it is plausible that other water-based activities could facilitate similar wellbeing benefits provided they facilitate key mechanisms identified in this evaluation (e.g., emotional acceptance, social connection, achievement, meaning, physical exercise) or those recognised in the wider literature, including empowerment (Marshall et al., 2020). Here, surfing comprised a vehicle to connect service users to blue spaces and positive experiences, in addition to other determinants of wellbeing (e.g., positive health behaviours, connection to others and the self, etc). The evidence-base surrounding surf therapy in particular is far more developed than that for other water-based activities, although it is possible that other water-based activities (such as canoeing, for example) could tap into the same key determinants and elicit similar benefits. How specific these findings are to the activity of surfing itself is unclear, highlighting the need for more research in this area. Crucially, a key feature of this intervention - regardless of the specific activity - is that it increased the accessibility of physical exercise and connection with nature. This is important given that many of the participants who were involved in this evaluation struggled to access blue spaces, highlighting barriers and opportunities that must be considered prior to using nature as therapy. This further emphasises the need to consider the individual in relation to their communities and natural environments, taking into consideration socio-contextual factors and associated barriers to (and opportunities for) neurorehabilitation. Ultimately, this chapter demonstrates how developing collaborative interventions with community partners may add value to holistic practices by facilitating access to community resources and allowing for neurorehabilitation interventions to make use of the emerging benefits associated with the natural environment (Martin et al., 2020; Pritchard et al., 2020; White et al., 2019) in addition to those associated with positive health behaviours (Buecker et al., 2020; Chekroud et al., 2018).

# 7 Chapter Seven: Prioritising Wellbeing for People and Planet

The previous chapter demonstrated how facilitating access to blue spaces through community partnerships provided opportunities for adults living with ABI to directly interact with the natural elements and build resources for the experience of wellbeing. However, such activities are limited by geographical and seasonal constraints and are thus not universally accessible. In contrast, green spaces - including parks, woodlands, gardens, and other natural areas - are more widespread and offer similar, if not equally profound, benefits for wellbeing, especially when they are more easily accessible and actively engaged with (Lee et al., 2015). These spaces can provide a variety of opportunities for both individual and community engagement with nature, with activities including forest bathing (shinrin-yoku), horticultural therapy, and guided walks. Engagement in these activities not only allows individuals to immerse themselves in the restorative qualities of green spaces but also helps cultivate a deeper sense of nature connectedness, fostering a relationship with the environment that supports both personal and collective wellbeing.

Nature-based interventions that enhance nature connectedness have significant benefits for individual, community, and planetary wellbeing. For example, nature-based interventions that enhance nature connectedness can foster psychological restoration and physical health (Barton & Pretty, 2010), while those undertaken in groups may foster social cohesion and a sense of belonging, strengthening community bonds. Critically, the link between nature connectedness and pro-environmental behaviours highlights broader benefits for planetary wellbeing. Research by Mackay and Schmitt (2019), Martin et al. (2020) and Richardson, Passmore, et al. (2020) suggests that individuals with stronger connections to nature are more likely to engage in conservation efforts and sustainable practices. This makes nature-based interventions a strategic tool for promoting ecological sustainability while simultaneously providing opportunities to promote the psychological wellbeing and social integration of adults living with ABI. Moreover, purposeful ecotherapy programmes that integrate psychotherapeutic activities and sustainability education offer an enhanced pathway to achieve these outcomes. Such programmes go beyond facilitating superficial contact with nature and instead aim to promote a deep sense of connection, through meaningful engagement, while actively cultivating ecological consciousness (Jordan & Hinds, 2016). By emphasising sustainability, ecotherapy interventions foster a deeper sense of responsibility toward the environment, supporting communities to be more environmentally conscious. These interventions may help build community resilience by promoting sustainable living and environmental stewardship. Crucially, these approaches shift from an extractionist mindset - focussed on how individuals can benefit from nature - towards one of reciprocity and contribution. Ecotherapy programmes, facilitated by the NHS and in partnership with community providers, may provide opportunities for individuals living with ABI to not only benefit from natural environments but also actively engage in their preservation and enhancement. This aligns with national and global strategies regarding wellbeing and sustainability, including The *Wellbeing of Future Generations Act (Wales)* 2015, which mandates public bodies such as the NHS to consider the long-term social, economic, environmental, and cultural wellbeing of Wales when designing and delivering interventions. It also connects with broader, international agendas such as the United Nations Sustainable Development Goals (SDGs; https://sdgs.un.org/), which build on and extend the principles of wellbeing legislation. The SDGs provide a comprehensive global framework encompassing 17 interrelated goals, including health and wellbeing, poverty reduction, equality, sustainable communities, and climate action.

The United Nations SDGs represent a global call to action to achieve peace, prosperity, and ecological sustainability by 2030 (https://sdgs.un.org/). The goals capture the changes needed at a societal and global scale, spanning individual, economic, social, and environmental domains. Despite this vision, progress has been disappointing (https://unstats.un.org/sdgs/report/2022/). While neurorehabilitation services within the NHS are not explicitly mandated to work towards the United Nations SDGs, doing so offers a valuable opportunity to extend the impact of rehabilitation beyond individual outcomes to broader societal and environmental goals. This connection is particularly salient in the context of growing recognition that cultivating personal and relational capacities - referred to as ‘inner development’ - can act as a catalyst for meaningful, scalable change that supports both collective and planetary wellbeing (https://www.innerdevelopmentgoals.org/).By fostering a culture of care for individuals, communities, and the planet, these interventions exemplify a holistic and forward-thinking approach to wellbeing that aligns with both local wellbeing frameworks and broader global agendas regarding climate change and health system sustainability (Hartig et al., 2014).

# 8 Chapter Eight: Constructing the Conditions for Wellbeing: A Qualitative Evaluation of Group-based Ecotherapy for Adults Living with ABI

The surf therapy intervention detailed in Chapter Six provided adults with ABI the opportunity to engage with ‘blue spaces’ through meaningful, group-based physical activity, delivered in collaboration with a local community interest company. Building on these findings, the present chapter explores whether a group-based ecotherapy construction intervention, embedded in ‘green spaces’ and delivered in partnership with a local social enterprise, may offer similar wellbeing benefits across multiple levels of scale. This approach acknowledges that blue spaces may not always be accessible for neurorehabilitation interventions, nor may they align with service users' preferences. As in Chapter Six, this chapter utilises service evaluation data to inform local service improvement. It begins by providing an overview of the evidence specifically related to green spaces.

**Portions of this chapter are based on the following publication:**

Gibbs, K., Fisher, Z., Denner, K., & Kemp, A. H. (2025). Constructing the conditions for wellbeing: A qualitative evaluation of group-based ecotherapy for adults living with acquired brain injury. *Neuropsychological rehabilitation*, 1–35. Advance online publication. https://doi.org/10.1080/09602011.2025.2516560

## 8.1 Introduction

As outlined in Chapters Five and Seven and demonstrated in Chapter Six, nature has tremendous capacity to support individual wellbeing, with a culmination of several nature-derived benefits for psychological, physical and social wellbeing firmly recognised (Coventry et al., 2021; Silva et al., 2023). Whilst benefits differ according to the type of environment, e.g., in terms of biodiversity and urbanisation (Lovell et al., 2014) and the extent of contact itself (Silva et al., 2023), 'green spaces' (outdoor public spaces occupied by vegetation) can reduce psychological and physiological arousal following stress (Meredith et al., 2020) and significantly improve positive affect, and to a lesser extent, reduce negative affect (McMahan & Estes, 2015). Local evidence from a recent longitudinal evaluation of population data in Wales has reported that greater levels of green space around one's home is associated with a reduced likelihood of subsequent common mental disorders, and an even lower likelihood of experiencing mental health difficulties in those with a history of mental health disorder (Geary, Thompson, Mizen, et al., 2023). Similar population-based research from the same group has reported that spending time in nature (four hours per week vs. none) is associated with higher wellbeing for residents of Wales (Garrett et al., 2023), as is use of green and blue space (outdoor bodies of water) for leisure (Geary, Thompson, Garrett, et al., 2023).

Green spaces are purported to be health protective because of their restorative properties, with leading theories implicating the role of restoration and stress reduction on psychological and physiological systems (Kaplan & Kaplan, 1989; Kaplan, 1995; Ulrich et al., 1991). Wellbeing benefits extend to clinical populations (Berman et al., 2012), older adults with long-term health conditions and those with existing mental health difficulties (Coventry et al., 2021; White et al., 2019). Notably, population-based research from Wales suggests that individuals living in areas of social deprivation may reap the most benefit from time spent outdoors, with the association between nature exposure and wellbeing moderated by household-level deprivation. In such contexts, time spent in nature may mitigate and/or prevent mental health problems in those who experience material deprivation. However, marked inequalities exist regarding access to high-quality green spaces, with people living in deprived areas and those with longstanding health conditions or functional limitations experiencing reduced accessibility (Geary, Thompson, Mizen, et al., 2023; Mitchell & Popham, 2008; van den Berg et al., 2015). Socioeconomic status and (dis)ability hereby operate as forms of sociocultural discourse which shape how individuals access and engage with natural environments (Wijaya Mulya et al., 2025). This is an example of how environmental factors, including the physical surroundings and broader social and attitudinal context within which an individual lives, can influence experiences of health, disability and participation. This is reflected in key international frameworks such as the World Health Organisation's International Classification of Functioning, Disability and Health (ICF) and is particularly relevant in the context of ABI: a prevalent neurological condition which, as indicated by UK-based research, is more common among individuals from deprived areas (Dunn et al., 2003).

As outlined in Chapter One, individuals with ABI experience wide-ranging and often pervasive effects across physical, emotional, cognitive and social domains (Milders et al., 2003), contributing to profound levels of psychological distress (Ayerbe et al., 2014; Glenn et al., 2001; Hackett et al., 2005; Jorge et al., 2004). Relative to physical disabilities, the persistent cognitive and behavioural sequalae of ABI often create the biggest barrier to psychosocial adjustment, in addition to social, community and vocational reintegration (Lefebvre et al., 2008; Milders et al., 2003). Return to work and leisure is often difficult, with up to 60% of survivors facing personal and activity-related barriers to employment (Donker-Cools et al., 2016; van Velzen et al., 2009) and many facing barriers to community integration even after 10+ years post-injury (Lefebvre et al., 2008; Morton & Wehman, 1995). This means that opportunities for engagement, achievement, meaning and purpose are limited, with these experiences being closely connected to one's experience of psychological wellbeing (Schueller & Seligman, 2010). Meaning, for example, constitutes a sense of connectedness to a greater whole (Seligman, 2002) and comprises the web of connections and understandings that facilitate comprehension of one's lived experience (Steger, 2012). This becomes particularly important after brain injury, as individuals work to make sense of their new realities and rebuild identity and purpose amid disrupted roles, routines, and relationships (Gracey et al., 2009; Gracey et al., 2008).

Positively, experiences in the natural environment can comprise an important source of meaning for adults of all ages (O'Connor & Chamberlain, 1996; Reker & Woo, 2011), including clinical populations (Berger & McLeod, 2006; Granerud & Eriksson, 2014), with green spaces facilitating opportunities for social interaction and cohesion (Wan et al., 2021) and positive health behaviours (Jennings & Bamkole, 2019). This extends to people with ABI, with Chapter Six demonstrating how surfing can provide the context for adults living with ABI to experience positive emotions, meaning and purpose, while cultivating feelings of trust, safety, acceptance and community through social connection, further to providing foundations for sustained positive change (Gibbs, Wilkie, et al., 2022; Wilkie et al., 2021). Facilitating multiple components of wellbeing in this way promotes balance and boasts subjective wellbeing, which is contingent on meeting survival and growth needs (Sirgy & Wu, 2009). Notably, intentional interaction with nature may provide adults living with ABI with engaging opportunities to experience key components of wellbeing and personal growth - including a sense of autonomy, self-efficacy, community and social cohesion - that can be difficult to achieve through conventional rehabilitation in hospital settings (Vibholm et al., 2024). Although research exploring the therapeutic potential of nature for people living with ABI is still in its infancy, a newly published systematic scoping review provides promising evidence in support of this approach. Norwood et al. (2025) report that intentional interaction with natural environments during inpatient and outpatient rehabilitation has been found to improve overall wellbeing, mood, depression, anxiety and quality of life in adults with ABI, with qualitative findings emphasising the restorative potential of nature and its broader contribution to the rehabilitation process. This work illustrates how the Holistic Model of Neurorehabilitation (Ben-Yishay & Diller, 2011; Ben-Yishay & Prigatano, 1990), which advocates for the whole consideration of every aspect of a person's functioning, may be strengthened by immersing individuals within their local natural environments: to which some adults living with ABI explicitly report feeling 'more connected' following group-based structured intervention (Gibbs, Wilkie, et al., 2022), as evidenced in Chapter Six.

The extent to which one is cognitively, affectively and experientially connected to nature is a prerequisite for individual health outcomes; affecting the breadth and magnitude of wellbeing benefits obtained through spending time in the natural environment (Capaldi et al., 2014). While recent discursive scholarship has drawn attention to how nature connectedness and nature-derived wellbeing benefits are culturally mediated and shaped by socio-political context (Wijaya Mulya et al., 2025), those who are more closely connected to nature typically experience more vitality, positive affect and life satisfaction (Capaldi et al., 2014); with nature connectedness increasing one's sense of meaning and autonomy (Keyes & Annas, 2009). Robust epidemiological studies have shown a strong association between meaning and purpose in life and reduced mortality (Alimujiang et al., 2019), with research to suggest that the perception of a worthwhile life may have a greater impact on wellbeing than socioeconomic status itself (Martin et al., 2020). Yet, global evidence indicates that disconnect and psychological detachment from our natural surroundings is growing (Capaldi et al., 2015), with its beneficial effects often underappreciated (Nisbet & Zelenski, 2011).

Given that nature connectedness and the degree to which people associate and identify with nature is linked to environmental concern (Schultz et al., 2004) and engagement in pro-environmental and pro-nature conservation behaviours (Mackay & Schmitt, 2019; Martin et al., 2020; Richardson, Passmore, et al., 2020), this has important implications for planetary wellbeing, which is in a state of increasing crisis (Mead et al., 2023).

The wellbeing of people and the planet are significantly intertwined, and actions to support individual and collective wellbeing can often be aligned with those required for planetary health and wellbeing (Isham et al., 2023; Mead et al., 2023; Robinson & Breed, 2019). This aligns with recent multidimensional definitions of planetary wellbeing, which conceptualise it as the highest attainable standard of wellbeing for all of earths inhabitants and its natural and social systems (Antó et al., 2021). Improving the human-nature relationship comprises one pathway through which we can care for ourselves and the planet (Brymer et al., 2019), with findings from a meta-analysis of correlational and experimental studies asserting nature connection as a promising avenue for promoting pro-environmental behaviours with applicability across diverse populations (Mackay & Schmitt, 2019). Simple everyday activities and those which facilitate a sense of meaning, emotional attachment and a compassionate relationship with nature (e.g., through purposeful engagement) may strengthen nature connectedness over and above superficial contact (Lumber et al., 2017; Richardson, Dobson, et al., 2020; Richardson, Passmore, et al., 2020). This, coupled with a deep sense of immersion in nature, may provide opportunities for autonomy and freedom to be one's authentic self: contributing to personal growth, enhanced self-esteem and self-regulation, and improved social competency (Norton & Watt, 2014; Passarelli et al., 2010; Ray & Jakubec, 2014). Practices such as 'forest bathing' for example have been shown to induce transcendent emotions such as awe, gratitude and selflessness, as reported by an empirical review (Hansen et al., 2017). These experiential and relational processes help cultivate inner capacities such as self-awareness, perspective-taking, connectedness and care that align with the Inner Development Goals (IDGs; https://www.innerdevelopmentgoals.org/), a framework increasingly recognised as critical for enabling progress toward the United Nations SDGs (https://sdgs.un.org/). In this way, nature-based interventions which intentionally foster these inner capacities while strengthening one's sense of belonging to both human and ecological communities help to build capacities for individual, societal and planetary wellbeing (Mead et al., 2023). Ecotherapy is one such intervention which explicitly aims to cultivate ecological consciousness while promoting inner development through purposeful psychotherapeutic activities (Jordan & Hinds, 2017). Typically defined by this intentional therapeutic framing, eco-therapeutic activities vary from hiking, adventure and wilderness therapy, to bushcraft and horticultural activities, to mindfulness practice in nature and nature-based art and creative activities (Isham et al., 2025; Wijaya Mulya et al., 2025). Some may also include activities which support individuals to engage with and preserve natural environments, such as structured conservation and sustainable construction projects.

Engagement in conservation activities may present valued opportunities for achievement, pleasure and social contact, with qualitative research findings documenting subjective improvements in health and wellbeing in adult members of the general population who experience social isolation and poor psychological wellbeing (Lovell et al., 2015). Similar outcomes have been echoed in more recent research which has highlighted the potential for group-based sustainable construction projects to lead to statistically and clinically significant mental health and social benefits in marginalised and hard-to-reach groups (Davies et al., 2020); with individuals who have needs in these areas demonstrating positive changes in self-reported levels of anxiety and depression, further to increased resilience and greater social connectedness. Overall, a recent review of the literature suggests that structured nature-based activities are perceived to provide opportunities for the strengthening of social support networks, personal growth and skill acquisition in the general population (Silva et al., 2023). These opportunities are particularly important in the context of individuals living with ABI and pervasive impairment due to difficulties returning to work and participating in hobbies (van Velzen et al., 2009), resulting in diminished opportunities for meaning, social connectedness and a sense of belonging (Fisher et al., 2022). Nature-based interventions which support the human-nature connection may thus provide a range of leverage points to facilitate individual wellbeing in those living with such difficulties, yet they remain relatively under-utilised within the healthcare sector (Capaldi et al., 2015).

Despite well-documented nature-derived benefits for physical and psychological wellbeing, (Taylor et al., 2022), and emerging evidence documenting reductions in illbeing and improvements in general wellbeing that may aid rehabilitative processes in those with ABI (Norwood et al., 2025), there remains limited exploration of how nature-based activities might foster broader experiences of meaning, belonging, and social participation in this population. This is particularly important for individuals with ABI, who typically face psychological, social and structural disadvantage, and may benefit considerably from inclusive nature-based interventions (Coventry et al., 2021; Geary, Thompson, Mizen, et al., 2023). A recent narrative review concluded that nature-based interventions targeted at socioeconomically deprived communities can generate meaningful health and social benefits in addition to economic and environmental outcomes (Harrison et al., 2023). Yet, much of the clinical literature continues to frame nature primarily as a passive resource for therapeutic extraction, rather than recognising the potential for reciprocal benefit. Such a framing risks overlooking how nature-based interventions might promote wellbeing outcomes that extend beyond the individual – supporting not only personal rebuilding but also contributing to community and planetary wellbeing through the cultivation of care, compassion and connectedness to human and non-human life (Blackburn et al., 2025; Robinson & Breed, 2019). Accordingly, the aim of the present evaluation is to unpack the experiences of individuals living with ABI following engagement in a group-based ecotherapy programme which merges meaning making with sustainability-focussed practices, offering insight into how such interventions may support more holistic, socially and ecologically attuned models of neurorehabilitation.

## 8.2 Methods

### 8.2.1 Design

Consistent with the methods outlined in Chapter Three and the qualitative service evaluation detailed in Chapter Six, this chapter draws on reflexive TA to critically unpack service evaluation data collected during focus groups hosted by the CNS within which this thesis is embedded. This data was collected as part of routine service improvement efforts. The work serves to retrospectively evaluate the potential of this group, nature-based ecotherapy intervention to support holistic wellbeing in adults living with ABI.

### 8.2.2 Participants

All participants were receiving multidisciplinary neurorehabilitation from the multidisciplinary CNS in South Wales, UK. As per the eligibility criteria for the service, all had a confirmed diagnosis of ABI, were aged 18 years or older, and lived in the community and catchment area of the health board. Participants were required to have active rehabilitation goals and to be willing and able to engage fully in the rehabilitation process. This service works with individuals who have experienced ABI, including moderate and severe TBI, hypoxic brain injury, subarachnoid haemorrhage, encephalitis and people living with stroke who wish to return to employment. The service model is centred around the

Holistic Model of Neurorehabilitation (Ben-Yishay, 1996, 2000; Ben-Yishay & Prigatano, 1990; Prigatano, 1999), with both individual and group-based therapies being offered to help patients achieve their rehabilitation goals. Service users were invited to attend the Down to Earth intervention if the clinical team felt a) it would help them progress towards their wider rehabilitation goals and facilitate meaningful opportunities for community engagement post-discharge, b) they were able to engage with the activities safely and meaningfully, and c) they could provide informed consent. Exclusion criteria included not being able to provide informed consent, having receptive or expressive language difficulties or low memory function that could preclude meaningful engagement, having behavioural difficulties that could potentially disrupt other group members (as determined by their clinician), or other medical or psycho-social reasons (based on risk assessment by the referring clinician). Service users were able to attend the intervention multiple times over the course of their rehabilitation. This evaluation reports on insights shared by 41 individuals who consented to share their experiences, inclusive of three individuals who completed the Down to Earth programme twice, and one individual who completed it thrice. An overview of the characteristics of those who consented to engage in the service evaluation is presented in Table 5 overleaf.

**Table 5**

*Demographic Profile of Participants in the Down to Earth Focus Groups*

| | |
|---|---|
| Age | Mean = 42.4; Standard Deviation 10.65; Age range (18-60 years); Median = 40 |
| Sex | Male = 29; Female = 12 |
| Type of Brain Injury | Traumatic Brain Injury *n* = 25; Traumatic Brain Injury with Epilepsy *n* = 3; Acquired Brain Injury *n* = 13 |
| Time Since Injury | Mean = 56 months (4.66 years); Range (6 months – 33 years) |
| Employment Status | Employed *n* = 4; Retired due to ill-health *n* = 1; Unemployed *n* = 36 |
| Living Arrangements | Living alone *n* = 20; Living with partner/family *n* = 21 |

*Note:* This table presents demographic information for participants (*n* = 41) at the time of their initial engagement in the intervention. Of these, three individuals completed the intervention and corresponding focus group session twice (consecutively), and one individual completed it thrice within one year. Living and employment circumstances remained stable for three of these participants, while one participant moved from living alone to taking early retirement and living with family part-time.

### 8.2.3 Intervention

As part of their ongoing treatment and rehabilitation, service users were invited (via mail) to attend an eight-to-ten-week nature-based intervention delivered in partnership with ‘Down to Earth’ (downtoearthproject.org.uk). This not-for-profit social enterprise provides accessible, inclusive, and meaningful outdoor experiences for vulnerable and highly marginalised populations such as health board patients with chronic conditions; with this being inclusive of adults living with ABI. Outdoor experiences hereby include community construction projects which merge traditional and sustainable construction to create permanent sustainable learning spaces, eco-restorative social housing, and accommodation for vulnerable populations. The purpose of the enterprise is to support positive change in individuals while providing opportunities for the building of diverse skills for four hours per week at one of two sites within the Gower Peninsula of South West Wales: 'Murton' and 'Little Bryn Gwyn'. The Murton site is a four-acre smallholding which showcases various buildings made using cob (earth), strawbale, timber, thatch, and green roof systems; demonstrating how traditional and sustainable construction technologies can be used in conjunction with each other. The Little Bryn Gwyn site is six acres in size and is the primary site hosting construction-based activities; showcasing round pole timber frame and reciprocal roof sustainable construction methods. Buildings here are constructed with the skilled support of the Down to Earth construction team using natural and locally sourced materials.

Participants were able to engage in a range of outdoor activities with the support of two members of the Down to Earth team and two members of staff from the CNS. Down to Earth staff provided specialist knowledge of their activities (namely sustainable land and woodland management tasks and adventure activity) and the CNS staff (professionals working within the discipline of clinical psychology, occupational therapy or speech and language therapy) provided knowledge of brain injury and the clinical skills needed to help patients work towards their individual rehabilitation goals (e.g., to return to work or feel more integrated into their communities), which is in-keeping with the Holistic Model of Neurorehabilitation (Ben-Yishay, 1996, 2000; Ben-Yishay & Prigatano, 1990; Prigatano, 1999). Each intervention comprised elements of building, conservation, woodwork, and/or outdoor activities, but the precise content of the group and emphasis on each component differed slightly as a function of the needs and physical abilities of the group (informed by appropriate risk assessment) and the initiatives that Down to Earth were involved at the time.

The nature of available projects was explained to each cohort at the start of the intervention and activity options were presented based on the bespoke collective needs of all group members. From this information, a programme for the intervention was co-constructed and this was reviewed throughout its duration to ensure that activities were meeting group needs. Thus, the choice of activity was determined somewhat by participant needs and preferences, which is in-keeping with a participatory approach to rehabilitation and patient-centred approach to care. Tasks were conducted in small groups, and group activities (such as river walking, shelter building, mallet making, fire lighting, organic horticulture, outdoor cooking and sustainable land management tasks) were used to bring service users together. Participants were encouraged to pace themselves while completing activities and could take breaks when needed.

### 8.2.4 Data Collection

All participants who attended the Down to Earth intervention were invited to share feedback on their experiences of engaging in the intervention to inform service development. This was organised during the intervention period and required service users to sign a consent form (see Appendix F for a generic example of the consent forms used by the service for service evaluation purposes). Through convenience sampling, seven face-to-face focus group discussions were conducted with a total of 41 individual participants, with groups spanning from March 2014 to April 2020. This quantity of focus groups is consistent with the recommended range for achieving saturation of meaning (namely, depth and understanding of phenomena), particularly in instances where conceptual codes are likely to be generated to capture nuance and complexity (Hennink et al., 2019). Face-to-face focus group discussions were chosen as the method of data collection because they build on group dynamics (Nyumba et al., 2018) and allow for organic social interactions to occur; potentially allowing for more 'naturalistic' accounts of experience to be shared than those achieved via individual interview (Wellings et al., 2000). Moreover, this method of gaining feedback may be more appealing for groups for whom individual participation may be daunting, providing an open and potentially empowering environment within which meaning making can be explored (Braun & Clarke, 2013). This is consistent with national requirements for evaluating services and patient experience and aligns with a participatory approach to healthcare services and applied research, in line with previously published work in the field (Tulip et al., 2020; Wilkie et al., 2021). Individual interviews were offered if participants couldn't attend the focus groups. However, no participants opted for this method of sharing their insights.

The size of the focus groups varied from five to nine participants; consistent with recommended practice for conservation-based research, wherein smaller groups are considered to generate depth of discussion while also being easier for moderator(s) to manage (Nyumba et al., 2018). While this approach helped create a familiar and supportive environment, it is possible that this familiarity could have introduced social desirability bias, potentially limiting the expression of critical or negative views. To mitigate this, participants were reminded that all feedback, whether positive, negative, or neutral, was welcomed and necessary to shape service development. Open-ended questions were used throughout, and where positive experiences were shared, follow-up prompts encouraged the exploration of alternative or contrasting perspectives.

Focus groups were moderated by a clinical team member or by a member of staff at Down to Earth (or both, in some instances) and were thus known to the participants. Focus groups were held at the respective site at Down to Earth and conducted immediately after participants completed the intervention, except for one focus group (Little Bryn Gwyn, September 2015) which was conducted at four weeks and facilitated by a member of staff at Down to Earth, and one focus group (Murton, December 2019) which was conducted on the last morning of an eight-week intervention by a trainee Clinical Psychologist. The early hosting of these groups was necessary to a) accommodate for time resource constraints and reflects a practical difficulty of conducting service evaluation work within a clinical context, and b) generate timely feedback to inform service delivery. However, given that spending 120 minutes in nature per week is associated with positive self-reported health and wellbeing gains (White et al., 2019), the use of data generated prior to intervention completion was considered acceptable. Table 6 provides a detailed overview of the focus groups based on the intervention attended, including the duration, location and size, in addition to key contextual details relating to the focus group discussions, including group size, characteristics and the focus group moderator.

**Table 6**

*Down to Earth Intervention - Overview and Focus Group Details/Demographics*

| Intervention Details | | | Focus Group Details | | | Focus Group Demographics | | |
|---|---|---|---|---|---|---|---|---|
| Location | Duration | Group Size | Date | Size (% of Group) | Moderator | Employment Status | Sex Assigned at Birth | Age Range |
| Murton | 8 sessions | 9 | March 2014 | 7 (≈78%) | Clinical Psychologist and Community Neurorehabilitation Services Lead (Author ZF) | All unemployed | Majority male cohort (*n*= 6/7) ≈ 86% | 27-58 years old |
| Murton | 8 sessions | 10 | November 2014 | 9 (90%) | Clinical Psychologist and Community Neurorehabilitation Services Lead (Author ZF) and Down to Earth Staff Member (female) | Majority unemployed (*n*=7) ≈ 78% | Majority female cohort (*n*=5) ≈ 56% | 26-54 years old |
| Little Bryn Gwyn | 8 sessions | 11 | February 2015 | 5 (≈45%) | Clinical Psychologist and Community Neurorehabilitation Services Lead (Author ZF) | All unemployed | Majority male cohort (*n*=4) ≈ 80% | 28-57 years old |
| Little Bryn Gwyn | 8 sessions (focus group held after 4) | 10 | September 2015 | 8 (80%) | Down to Earth Staff Member (female) | Majority unemployed (*n*=7) ≈ 88% | Majority male cohort (*n*=5) ≈ 63% | 30-60 years old |
| Little Bryn Gwyn | 10 sessions | 8 | November 2015 | 5 (≈62%) | Clinical Psychologist and Community Neurorehabilitation Services Lead (Author ZF) | All unemployed | Majority male cohort (*n*=4) ≈ 80% | 30-55 years old |
| Murton | 9 sessions | 10 | March 2017 | 5 (50%) | Clinical Psychologist and Community Neurorehabilitation Services Lead (Author ZF) | All unemployed | Majority male cohort (*n*=3) ≈ 60% | 18-47 years old |
| Murton | 8 sessions (focus group held on morning of final session) | 10 | December 2019 | 7 (70%) | Trainee Clinical Psychologist (male) | Majority unemployed (*n*=5) ≈ 71% | All male cohort | 32-57 years old |

As focus groups were conducted on service evaluation basis, questions centred upon salient aspects of the course and practical points for improvement (in terms of timing, group size, and managing difficulties such as fatigue). Notwithstanding, participants were encouraged to reflect on what they felt that they took away from the intervention, with questions revolving around the nature of the activities themself, the environment, and how engaging in the activities made them feel. Questions posed to the group were open-ended and developed iteratively over the course of the discussion in response to topics raised by participants. The moderator used prompts to stimulate group discussion and paraphrasing to clarify understanding and create opportunities for other members to agree or disagree with the points raised. The flow of the discussion was directed by the moderator, but driven by participants, such that the moderator took a more peripheral role allowing the group to discuss points which they considered to be meaningful. A semi-structured topic guide was created following supervisor ZF's moderation of the first three focus groups to ensure consistent coverage of topics across all subsequent groups. The topic guide underwent continuous refinement over the six-year evaluation period, with questions becoming more focussed on skill building and attitudes concerning sustainable practices as interest and understanding of the concepts grew (see Appendix H for the finalised topic guide). Focus groups lasted no more than one hour in duration and were audio recorded with the consent of participants. These were then transcribed by a clinical team member, with each textual transcript capturing auditory emotional expressions and behaviours (i.e., laughter and clapping), which were combined with behavioural notes recorded by the moderator(s) (i.e., nods of agreement to indicate consensus). This contextual information was included to aid understanding of the emotional dynamics of the group during review of the data. Anonymised textual transcripts were stored on a secure shared drive within the health board and password protected. Audio recordings were deleted to ensure participant anonymity. Data triangulation (e.g., member checking) was not sought owing to the data being collected on a service evaluation basis.

### 8.2.5 Data Analysis

In alignment with the broader approach of this thesis, reflexive TA was used to critically unpack participants' experiences of the Down to Earth intervention according to a critical realist perspective (Archer et al., 2013). This approach allowed for a nuanced interpretation and evaluation of its potential to foster wellbeing across multiple levels of scale by collating patterns of meaning across the groups (Braun & Clarke, 2006, 2013). By this stage in the doctoral programme, the author's knowledge was deeply embedded within the GENIAL framework and the evidence base concerning nature connectedness, with interest broadening into ecopsychology. Accordingly, coding was predominantly deductive, shaped by this theoretical grounding, though the author remained open to nuanced insights and employed inductive coding to reduce the risk of producing an impoverished analysis with narrow interpretation. As detailed in Chapter Three, this blended approach is in keeping with the notion that producing knowledge based on understanding (which embodies a hermeneutics of ‘empathy’) can be complementary to that produced to explain (which embodies a hermeneutics of ‘suspicion’) as neither may generate sufficient insight in isolation (Willig, 2017).

The analytic process began with a thorough familiarisation phase, which involved reading the dataset while simultaneously cleaning transcripts to ensure consistency in grammar and formatting. This step was essential, as multiple Assistant Psychologists and support staff employed by the CNS had transcribed the focus group discussions over the data collection period, resulting in inconsistencies in transcription style (e.g., variations in orthographic detail and presentation). To enhance coherence and readability, the author standardised the transcripts by removing orthographic markers. Given the large dataset and the communicative impairments associated with ABI, it was felt that retaining such details could detract from textual clarity and accessibility of the data. Moreover, as many transcripts lacked these features to begin with, their selective inclusion risked further inconsistency in the dataset.

The same digital qualitative analysis software (ATLAS.ti) used in Chapters Four and Six was employed, given its functionality in organising and securely storing large volumes of digital text data. Cleaned text documents were uploaded to the platform, and provisionally interesting insights were coded. Codes were both semantic and latent (capturing explicit and underlying meanings of the data), and concrete and conceptual (capturing both the specific content/words used in addition to abstract concepts guided by the researcher’s knowledge and interpretation). Examples of codes include ‘meaning,’ ‘skill building’, ‘challenge,’ and ‘acceptance of self.’ Over the course of several weeks, codes were merged, renamed, and condensed throughout the analytic process, with provisional themes being gradually generated according to the author’s categorisation of the data. These themes were iteratively developed and refined to capture shared meaning across the data units whilst also remaining open to complexity and nuance.

A key reflexive consideration in this phase was the deliberate move away from simply ‘mapping’ existing theoretical knowledge onto the data. Instead, the author engaged with principles of good qualitative research, opting for longer, more descriptive theme names that conveyed the depth and richness of interpreted meaning contained within each theme. This approach led to the use of double-barrelled theme names to encapsulate the layered nature of participants' experiences. Candidate themes were shared and discussed with the supervisory team (ZF and AK), whose clinical expertise provided valuable insights that helped clarify the distinctiveness of each theme and ensured that selected quotes aligned with the broader clinical narrative. Theme naming and the contextual narrative underwent multiple cycles of refinement, with the analytic framework and overarching narrative evolving over several months. This iterative process aimed to construct a compelling, nuanced interpretation and evaluation of the Down to Earth programme. Each major iteration of the analysis was reviewed by the supervisory team, reinforcing the theoretical and clinical robustness of the findings. Further contextual details purporting to the analytic process can be found in Chapter Ten.

Following the completion of a mature draft of the manuscript, this was shared with the Research Lead at Down to Earth, providing a theoretically informed interpretation of participants' experiences while also inviting feedback. This engagement fostered a reciprocal exchange of knowledge, ensuring that the qualitative findings were not only theoretically robust but also practically meaningful and accessible to a practitioner unfamiliar with the GENIAL framework. The Research Lead highlighted key insights and identified areas requiring further clarification, prompting refinements to enhance clarity and applicability. This reinforces the value of co-produced knowledge in shaping and optimising future nature-based interventions. This collaborative approach functions to not only strengthen trust and mutual understanding between researchers and practitioners but also exemplifies the potential of partnership working to bridge evidence and practice in ways that can meaningfully inform service delivery and enhance participant or patient outcomes.

## 8.3 Results and Discussion

Participants (*n* = 41) were adults aged between 18 to 60 years old. The majority were male (*n* = 29) and most were unemployed at the time of participation (*n* = 36), reflecting the significant impact of brain injury on sustained engagement in work (Donker-Cools et al., 2016; van Velzen et al., 2009). Time since injury varied from six months to 33 years, reflecting the service’s inclusive approach to supporting individuals at different stages of adjustment and rebuilding. Rather than limiting participation to those in the acute or early phases post-injury, the intervention aimed to provide meaningful engagement, social connection, and access to green space for individuals who may face ongoing barriers to participation and wellbeing, regardless of how long ago their injury occurred. Although specific demographic data on ethnicity or cultural background were not collected, the sample was composed predominantly of White British adults, broadly reflecting the demographic profile of the population served by the local health board. Living arrangements were mixed, with roughly equal numbers living alone ($n = 20$) compared to those living with family or a partner ($n$ – 21), offering varied social contexts that shaped their experience of the intervention.

Throughout the focus group discussions, participants described the reality of their injury and its impact on their lives prior to engagement in the group. Some alluded towards a sense of disconnection from themselves, others, and their surroundings. This is in keeping with the findings of a meta-synthesis (Levack et al., 2010); with one person describing the experience of ABI as having one's "life swept from underneath you" (Participant 13, Little Bryn Gwyn, November 2015, Third Course Completion). In line with previous research, many reported reduced social participation (McLean et al., 2014), with some describing how they seldom left home, felt socially isolated, and did not feel understood by their family and friends (Gibbs, Wilkie, et al., 2022). Regarding the hidden nature of their disability, one person exclaimed that "the outside world really doesn't know anything about brain injuries" (Participant 39, Murton, December 2019). This suggests that many people who took part in the groups previously felt a lack of belonging and thus integration into their family and community life post-ABI. Understanding the circumstances of the cohort with regards to life with ABI provides important context for the following four themes.

#### *8.3.1.1 Theme One: Broadening Skills and Building for the Future: Supporting Movement Towards an Engaged and Meaningful Life*

While reflecting on their initial experience of life with ABI, several participants described a sense of "worthlessness." This is consistent with research which contextualises a loss of occupational identity following injury (Bryson-Campbell et al., 2013), where difficulties in resuming meaningful roles is associated with feelings of fragmentation and distress after ABI (Levack et al., 2014). Having the opportunity to participate in work-like activities embedded within the Down to Earth intervention provided participants with scope to learn, use, and develop their skills; giving them "a focal point; something to aim for" (Participant 35, Murton, December 2019). This created opportunities through which they could experience a sense of "meaning" (Participant Two, Murton, November 2014) and "fulfilment" in their daily lives (Participant 30, Murton, March 2017), enabling them to regain a sense of self-worth and feel hopeful for a positive and capable future. These experiences carry important benefits for psychological wellbeing (Mead et al., 2021), particularly after ABI, where experiences of hope can act as a motivator and source of strength to support one's rebuilding (Bright et al., 2011).

> "I basically was feeling like I had come to the end of my useful life and that I was no use at anything. This has kind of given me a lot of hope. I have actually managed to do stuff and make things and feel important again" (Participant 28, Little Bryn Gwyn, November 2015).

The group activities themselves provided opportunities for participants to practice a diverse range of skills within a suitably challenging and structured context, enabling them to focus on their strengths and capabilities instead of their difficulties and ailments. Some recognised that they could still use the skills that they had before acquiring their injury, but doing so would require adaptability to "learn how to use them differently" (Participant 26, Little Bryn Gwyn, September 2015). This focus on strengths as opposed to the amelioration of deficits can support more positive appraisals of oneself and the future and has been highlighted as one pathway to ease the process of psychological adjustment post-ABI (Vaghela et al., 2021).

> "This is a challenge for me. This project gives me a chance to see what I can do, instead of always being reminded of what I can't" (Participant 20, Little Bryn Gwyn, September 2015).

Providing opportunities for achievement paved the way for the experience of positive emotions and increased motivation, making some participants "want to take on more things when [they got] home" (i.e., Participant 30, Murton, March 2017). Some reported transferring the practical skills they acquired during the intervention to benefit their home life, including cooking, as in the case of a participant who engaged in a Murton-based group (November 2014), or completing the perceivably insurmountable task of decluttering one's home environment (Participant 35, Murton, March 2017) or engaging in physical exercise – which, along with the development of a balanced mind, is key for individual wellbeing.

> "I have been feeling internally unfit. Being here is good physical and mental exercise. I am going home feeling motivated. Last week I was prompted to do physical

> exercise. I went for a run! No-one could believe it!" (Participant 26, Little Bryn Gwyn, September 2015).

Overall, participants alluded to the intervention affording various opportunities for the development of skills and confidence necessary to live more independently, with one person who engaged in the Murton-based group in December 2019 for example describing how they now felt able to undertake daily living activities that they previously felt unable to do (such as shopping or using public transport). Meanwhile, others emphasised how the group helped them to develop key social and self-management skills and encouraged them to meaningfully consider their direction of work.

> "We learn new skills for work, and not just the manual work. We learn how to work as part of a team again and how to help and support others. This is something that I really want to do when I get back to work. This project helps me prepare for work and has helped me make up my mind for what type of work I want to do." (Participant 15, Little Bryn Gwyn, September 2015).

This theme highlights how broadening practical and social skills can support movement towards an engaged, meaningful and more independent life, with positive implications for one's experience of psychological wellbeing (Wood et al., 2009). Good psychological wellbeing broadens social repertoires (Fredrickson, 2001) and contributes to increased social connectedness (DuBois et al., 2012), as discussed in Chapter One, while having the opportunity to develop social skills and work as part of a team provides key foundations for group memberships. This demonstrates the synergistic relationship between individual and social wellbeing, with the importance of belonging and identification with group memberships discussed next.

#### *8.3.1.2 Theme Two: Shared Experiences with Similar Others: Belonging in Group Memberships*

Consistent with the adapted-ACT intervention described in Chapter Four and the group-based surf-therapy intervention detailed in Chapter Six, the Down to Earth intervention provided an opportunity for participants to connect with others with similar experiences, reducing feelings of loneliness typically experienced following ABI (McLean et al., 2014). This provided nuanced opportunities for participants to learn about themselves and their injury through observation and conversation, with social participation being an important conduit for making sense of oneself post-ABI (Gracey et al., 2008), as detailed in Chapter One.

> "You do feel as though you're not alone now … when it first happens to you, you collapse, implode. Your whole world implodes. Because you think you're the only one, you ask yourself 'why?'. But then you see that there are other people out there" (Participant 44, Murton, December 2019).

Shared experiences paved the way for a sense of mutual identification, belonging and understanding between group members (Salas et al., 2018), creating a safe and comforting community within which participants felt that they were "not judged" (Murton, March 2014) and need not explain, apologise or compensate for their difficulties, or "make excuses or try to be something [they're] not" (Participant 8, Murton, November 2014). This might have enabled participants to fully immerse themselves in the natural environment and connect with their authentic selves, which has positive implications for self-esteem, self-regulation, and personal growth (Norton & Watt, 2014; Passarelli et al., 2010; Ray & Jakubec, 2014). Identifying with and feeling a sense of belonging to the group meant that participants could focus on learning and building new skills while reaping the benefits of social engagement (Kemp et al., 2017), demonstrating how social domains of wellbeing create conditions that foster personal growth and development for the promotion of individual wellbeing

> "Being here has increased my confidence levels... It has brought me serenity. It is the one time in my week I can take myself out of my daily world and just be here, just be me…Here, there has been no need to explain, just get on with the jobs and learn new skills" (Participant 27, Little Bryn Gwyn, September 2015).

In contrast, participants spoke about how their family and friends knew their pre-injury identity, with one person indicating that pre-established connections were perhaps less accepting of who they were in the present moment (i.e., their post-injury identity). Similarly, another participant indicated how the group afforded them an opportunity to experience joy and social engagement in ways that they had difficulty achieving with their family members since sustaining their injury, such that they stated feeling a lot more like themselves within the group (i.e., Participant 41, Murton, December 2019), while others felt less isolated. This emphasises the importance of providing ABI survivors with opportunities to identify with new group memberships, particularly in the context of depleted pre-injury social networks (Salas et al., 2018), as argued for in Chapter One.

> “We all accept each other for what they are at this moment in time. I think that’s really comforting as our family and friends all knew the old us” (Participant 9, Murton, November 2014).

One person described their intervention group as their “little net and circle” (Participant 37, Murton, March 2017), within which social resources could be shared (including coping strategies, practical advice, and emotional support) to support adjustment following ABI. The experiences and perception of social support and the quality of social connections have important implications for psychological wellbeing post-ABI (Salas et al., 2022), with these experiences potentially circumventing the mental health impacts of loneliness more-so than the quantity or presence of social relationships themselves (Byrne et al., 2021). The group intervention presented opportunities for individuals living with ABI to develop meaningful social connections (or “lifelong friends,” as stated by Participant 11, Murton, November 2014) and engage in skill-building activities with others beyond merely providing opportunities for social contact. Indeed, research suggests that participation in meaningful social activities (such as support groups, work and skill-building programmes) through ‘meaningful doing’ (Gallagher et al., 2015) provides key foundations for social engagement and friendship building post-ABI (Muldoon, Walsh, et al., 2019).

> “It makes your recovery a lot less isolating…being here, getting healthy, having tasks to do, makes you want to put things in your personal life right… So, it gives motivation, confidence and you just don’t feel so alone” (Participant 17, Little Bryn Gwyn, February 2015).

The development of new and valued group memberships after traumatic identity change (such as that experienced following ABI) may counter the loss typically experienced following the breakdown of pre-injury group memberships; providing a basis for gains in social identity resources, self-redefinition and social identity reconstruction (Muldoon, Haslam, et al., 2019; Muldoon, Walsh, et al., 2019) that contribute towards increased adaptability (Ellis-Hill & Horn, 2000) and PTG (Muldoon, Walsh, et al., 2019). Longitudinal research indicates that PTG hereby occurs through stronger connectedness with new group memberships (even when controlling for initial PTG in ABI survivors and the effects of pre-injury group memberships) and is associated with reduced post-traumatic stress and increased resilience over time (Jones et al., 2012). Resilience, in addition to a sense of unity and belonging, may in turn facilitate acceptance of oneself following ABI (Large et al., 2020;

Nalder et al., 2019; Patterson et al., 2016) and enhance psychological adjustment (Vaghela et al., 2021). This is discussed accordingly.

#### *8.3.1.3 Theme Three: Self-Acceptance and Identity: Resources for Personal Growth*

In accordance with previous research, ABI survivors reported experiencing a shift in identity following their injury and grieved the person that they used to be prior to engaging in the intervention, with some harbouring negative feelings towards their post-injury self and having an initially poor self-concept (Beadle et al., 2016). Positively, the Down to Earth intervention helped some participants to learn to ‘let go’ of negative feelings regarding their new identity and accept and embrace their post-injury self, which can have positive implications for engagement with life, meaning making and the development of PTG (Allen et al., 2022).

> “You are suddenly alone and you're alone with this person that you don’t know anymore. You have to learn about who this person is, and you have to push yourself. Your family does wrap you in cotton wool, your friends don’t know how to handle you… You sort of have to let go of the old you and you have to learn to embrace the new you” (Participant 9, Murton, November 2014).

Further to accepting one’s post-injury self, engaging in the intervention helped some participants to realise that there *is* a life after ABI, and while they may not be in the same position that they were prior to their injury - they could continue living a valued life through adjustment, acceptance and altering their discourse. As discussed in Chapters One and Four, acceptance is conducive to psychological adjustment, providing important foundations for growth in individuals with ABI and supporting movement towards a more fulfilled life (Large et al., 2020; Vaghela et al., 2021). To this end, some participants reported feeling grateful for being alive, described an appreciation for medical advancements and their recovery journey and expressed a desire to engage in opportunities presented to them.

> “Here, you realise that there is a lifeline. I won’t be where I was before my injury, but I can get nearer to where I was, just by going a different way” (Participant 29, Little Bryn Gwyn, September 2015).

Having a greater appreciation of oneself and of life itself is a key pillar of PTG following ABI, as are having positive shifts in one’s life philosophy (Griffin et al., 2022).

> "Since I had the accident, I know it is going to sound strange, but it's been a godsend, because it stopped me doing what I was doing. I was working six to seven days a week and 100 miles an hour all the time. Always wanted to do, funnily enough, things like this, cob building and what we've been doing …and doing archery, it's since I've been a kid. Always wanted to do it, but you always sort of put it off… Coming here has been opening my world up" (Participant 2, Murton, March 2014).

Overall, participants recognised that grieving their old selves was a key part of the process towards rebuilding a life after injury, but that engaging in meaningful and functional activities (like those afforded by Down to Earth) presented opportunities for positive change (i.e., psychological growth) to occur. Meaningful functional goal directed activities are day-to-day activities that form the basis for social participation, which include vocational, educational, recreational, social and independent living domains (Wilson, 2010). Participation in these domains provide a sense of meaning and purpose in life, while the Holistic Model of Neurorehabilitation emphasises the importance of meaningful activity to promote adjustment (Ben-Yishay, 1996, 2000; Ben-Yishay & Prigatano, 1990; Prigatano, 1999).

> "I feel like this place helps with my patience levels and my acceptance levels. I have felt like I was floating, like I had lost my identity. I am enjoying getting involved, getting hands on and learning and moving" (Participant 24, Little Bryn Gwyn, September 2015).

To this end, some participants described taking responsibility for their personal growth and reported a transition towards becoming a "better person now, a more real person" (Participant 32, Little Bryn Gwyn, November 2015) to which they would continue working to build upon and improve.

> "I think the one thing that really hit home for me is that when you have a brain injury, no matter what type of brain injury it is, the consultant and nursing team, the amazing team put you back together again, they fix the physical side of you, but they don't fix you properly. You have to go home and almost regrow" (Participant 9, Murton, November 2014).

Overall, participant insights hereby highlight the importance of providing opportunities for acceptance, identity-reconstruction and inner-development within holistic neurorehabilitation, as these constructs provide foundations for PTG following ABI. Importantly, growth in this context may facilitate and be facilitated by connecting and contributing to domains of wellbeing beyond the self (Mead et al., 2021; Mead et al., 2023), which is captured within the following theme.

#### *8.3.1.4 Theme Four: Connecting and Contributing: Towards Community and Planetary Wellbeing*

Consistent with theories implicating the role of restoration and stress reduction in regard to the health protective properties of green spaces, spending time in nature was accompanied by feelings of calmness and freedom from distraction; providing a space within which participants could connect to nature (Kaplan & Kaplan, 1989; Kaplan, 1995; Ulrich et al., 1991). These findings resonate with those discussed in Chapter Six.

> "It's an automatic feeling of calm, and there's nothing, there's no phone, there's nothing. You almost feel like you're at one with nature" (Participant 9, Murton, November 2014).

As outlined in Chapter Five, nature connectedness comprises a fundamental psychological need (Capaldi et al., 2014; Capaldi et al., 2015; Kellert & Wilson, 1993), yet humanity is becoming increasingly disconnected from nature (Soga & Gaston, 2016). This disconnect was recognised by some participants, with one describing how the natural therapeutic setting of the intervention provided the prime space and context within which they could reflect on their broader values.

> "Coming out into this sort of environment, it brings you back to what's important. And I think human beings become disconnected so much throughout their lives that they forget all about the outdoors. When you've got an opportunity like this, it grounds you. It kind of reminds you of what's important" (Participant 40, Murton, March 2017).

Some participants described how the intervention activities provided them with opportunities to make "a difference" and provide "a valuable contribution" to their community, which in turn made them "feel valued" at an individual level (Participant 33, Murton, March 2017). A sense of connectedness to a greater whole is critical in the pursuit of a meaningful life (Schueller & Seligman, 2010; Seligman, 2002). Meanwhile, boasting values that go beyond self-serving interest and embracing transcendent sources of meaning, such as nature connectedness and leaving a legacy for the next generation, is associated with several positive indices of psychosocial adaptation, albeit in older populations (Reker & Woo, 2011).

> "I didn't realise how important it was to be involved in giving back to the community. That makes me feel important and like I'm doing something that is needed" (Participant 23, Little Bryn Gwyn, September 2015).

Recognition of the positive impact of activities embedded within the intervention was hereby extended to the immediate place or setting of the intervention (as captured by the quote below) and more broadly, the planet.

> "If you think about the community of Gower, I bet they are absolutely stoked that there is a group of people that go around and help look after the environment and all around. So, not only are we benefiting, but the environment is also benefitting, and other people locally who can enjoy that now" (Participant 33, Murton, March 2017).

The promotion of sustainable construction methods coupled with eco-education helped participants to learn about the environmental impact associated with various building materials. This, in addition to spending time in nature (DeVille et al., 2021), supported a shift in perspectives among those who had previously utilised ecologically unsustainable materials to complete personal or work-related projects, encouraging them to "think differently about how we [humans] build," and see value in constructing in ways that "does not deplete the resources" of the planet (Participant 20, Little Bryn Gwyn, September 2015). Working to reduce or minimise the adverse environmental impact of human activities and preserving the integrity of the natural world reflects a pro-environmental orientation grounded in an ecocentric worldview wherein increased value is ascribed to nature. Overall, participation in the intervention contributed to a sense of investment or "worthwhile future involvement" (Participant 26, Little Bryn Gwyn, September 2015) towards supporting the future of the planet; with this perhaps further substantiating the interconnectedness between the natural world and meaning in life. This has key implications for the advancement of clinical therapy and highlights the importance of incorporating domains of wellbeing that extend beyond (but nevertheless impact upon) the individual (Kemp & Edwards, 2022). This is discussed in the domain summary below.

#### *8.3.1.5 Enhancing Clinical Practice: Key Opportunities for Service Development*

Reflections shared across the focus groups highlight key opportunities for supporting service development within the CNS, which are captured and contextualised in this domain summary. While these findings are not generalisable, the learnings of this service evaluation may illuminate useful considerations for neurorehabilitation services seeking to co-create rehabilitative experiences that build foundations for wellbeing, capability, and connection within their own unique contexts.

Firstly, many people living with ABI expressed a preference for therapeutic interventions that immersed them in the outside world and afforded them opportunities to partake in meaningful, group-based skill-development activities to support their rehabilitation, which helped some to feel "inspired to go back to work" (Participant 17, Little Bryn Gwyn, February 2015). This was contrasted to goal-directed discussions or hospital-based interventions which typically focus on fixing impairment through the completion of arbitrary tasks.

> "In a hospital you can talk about the way forward, what you need to do and this, that and the other, but then it doesn't always translate into actual therapy. You`ve got to then go home and either do it yourself or get your family motivated to help you do it" (Participant 17, Little Bryn Gwyn, February 2015).

The outdoors activity-based nature of the intervention presented an authentic setting for rehabilitation and rebuilding to occur, wherein developing practical skills in a group setting was found to be "far more helpful than sitting in a classroom with ten other people learning words" (Participant 8, Murton, November 2014). Engagement in meaningful activities can boost the social value of groups (Cutler et al., 2016) while the meanings and experiences embedded within combined social and practical activities supports sense-making after ABI (Gracey et al., 2008). This highlights the importance of providing more holistic and balanced opportunities for whole health and wellbeing within the natural and local settings within which an individual lives, as these are most likely to enable a person to rehabilitate and function with confidence outside of the clinical setting (Kemp & Edwards, 2022; Kemp & Fisher, 2022), as reasoned for in Chapter Five.

> "It's not only just the task because you could get us into a room or something or whatever room and just give us a load of Lego blocks and say build something… I think it's the fresh air, it's the sense of achievement as it's going along, you see the progression" (Participant 19, Little Bryn Gwyn, February 2015).

Participants indicated how having clinical staff present meant that staff could observe their functioning in authentic settings, enabling them to gain a truer understanding of their needs, skills, and difficulties while being "on hand" to provide therapeutic support, as highlighted by Participant 11 (Little Bryn Gwyn, February 2015, Second Course Completion). This emphasises the importance of working *with* patients in their authentic local and natural settings, as these are the environments through which a person with ABI must navigate and learn to function and thrive as independently as possible. The co-creation of therapeutic experiences within nature-based interventions can be facilitated by the therapeutic relationship, wherein working with individuals to develop autonomy and confidence can support the translation of benefits from a context-specific intervention to a person's daily life (Harrod et al., 2023).

> "When you go to the hospital, and you're getting asked questions all the time, the doctors are not really getting to see what type of person you are. But by you lot coming out here and being with us, you're actually getting to see what we're like and what we have to live with and deal with" (Participant 34, Murton, March 2017).

Team-based activities set within the local and natural environments of adults living with ABI provided concrete opportunities for community integration post-injury, with this typically comprising a key goal for rehabilitation that carries greater value over and above recovery (Muldoon, Walsh, et al., 2019). Community integration is associated with improved quality of life following ABI (Huebner et al., 2003) and higher levels of wellbeing in disadvantaged populations who typically experience stigmatisation (McNamara et al., 2013). Participants compared the natural context of the intervention to individual therapeutic work that they had previously engaged in, to which they described as only offering 'hypothetical' advice and support in attempt to facilitate social pillars of wellbeing and functioning. In contrast, it was perceived that the collective aspects of the intervention (connecting to others, nature, and engaging in meaningful activities) made the group a worthwhile and integrating experience, consistent with recent developments in wellbeing science (Kemp & Edwards, 2022; Kemp & Fisher, 2022).

> "One-to-one doesn't integrate you, it's all hypothetical. This sort of group is really integrating" (Participant 22 - Second Course Completion, Little Bryn Gwyn, November 2015).

Despite perceptions of positive change, some expressed concern over the course ending and potentially "falling back to square one" (as stated by Participant 30, Murton, March 2017) without regular opportunities to engage in meaningful group-based activities. This reinforces the importance of helping people with ABI to build a positive self-concept of themselves and their capabilities (Harrod et al., 2023) while supporting them to secure personally meaningful opportunities beyond the context of the intervention. This might include mentorship or volunteering, which promotes feelings of wellbeing, belonging and social cohesion (Mead et al., 2023; Seligman, 2011). Several participants across the focus groups explicitly expressed wanting to return as a volunteer mentor to “help others who are going through the same thing” (Participant 25, Little Bryn Gwyn, September 2015), with Down to Earth hosting regular reconnection opportunities and volunteer days to enable past attendees to stay connected to its community. This illustrates how interventions delivered in partnership with community providers may present sustainable wellbeing opportunities for individuals living with pervasive impairment using a ‘bottom-up’ approach (Gibbs, Fisher, et al., 2022). However, top-down ways of working are needed to promote and create funding opportunities through which partnerships can be cultivated or strengthened. This is pertinent given that engagement with nature is highly dependent upon accessibility (Nejade et al., 2022); to which one participant suggested that nature-based interventions should be a core component of therapy akin to “giving out antibiotics for an infection” (Participant 9, Murton, November 2014).

> “Projects like this show what can be done with the right initiative. The more people who know about it, the more accessible it will become for us all” (Participant 24, Little Bryn Gwyn, September 2015).

### 8.3.2 Discussion

Core goals of psychologically informed neurorehabilitation following brain injury include supporting a sense of integration, including the development of an integrated sense of self and identity (Fisher et al., 2022) and meaningful integration into one’s communities (Muldoon, Walsh, et al., 2019; Perumparaichallai et al., 2020; Sander et al., 2010). This service evaluation demonstrates how meaning-focussed, skills-based group interventions embedded in the natural environment can support these aims, providing the context for individuals living with ABI to experience a strengthened connection to themselves (through compassionate self-reflection of one’s strengths and identity), to others (via social group memberships that provide foundations for a sense of belonging and community integration) and to the natural environment (supported by eco-education and meaningful doing in nature). These findings are consistent with recent developments in the field and reflect growing evidence for the role of nature-based interventions in cultivating holistic wellbeing (Kemp & Edwards, 2022; Kemp & Fisher, 2022).

In alignment with the IDG's, such integrative experiences may lay the foundations for building key resources for personal agency and psychological growth (Griffin et al., 2022) that are essential not only for personal recovery but also for broader societal engagement, driving actions to benefit community and planetary wellbeing (Morgan et al., 2022; Pihkala, 2020, 2022). These capacities can serve as enablers for action on the United Nations SDG's, particularly those related to good health and wellbeing, reduced inequalities, sustainable communities and climate action. This highlights the potential value of designing nature-based interventions that cultivate connection and capability, supporting participants to feel part of something larger while also equipping them to contribute meaningfully to social and planetary wellbeing. However, a complexity of supporting nature identification is the potential for unintended psychological consequences. While not measured in this service evaluation, enhanced nature identification coupled with increased awareness of environmental challenges can elicit difficult feelings of ecological grief or eco-anxiety (Coffey et al., 2021; Cunsolo & Ellis, 2018), which can be isolating, distressing, and lead to inaction through disavowal (Passmore et al., 2023). The Power Threat Meaning Framework (Johnstone & Boyle, 2018) - introduced in Chapter One - provides a valuable lens through which to interpret such responses, framing them not as pathologies to be treated, but as intelligible reactions to threats within broader sociocultural and ecological contexts. If channelled adaptively, however, eco-anxiety can manifest as a practical anxiety which catalyses problem-solving attitudes and constructive action (Pihkala, 2020). This points to the importance of interventions that not only foster nature connectedness but also build the psychological and relational scaffolding required to engage with ecological realities without becoming overwhelmed. The nature-based ecotherapy intervention described herein illustrates how key capacities associated with inner development can be cultivated, including identity and sense-making, alongside enhanced connectedness, collaboration and compassion toward others and the environment.

Notwithstanding, it is crucial not to overemphasise inner development without acknowledging structural realities. The challenges of sustainable development are not borne solely by individuals or communities; they are fundamentally shaped by systemic forces. This holds particular relevance for marginalised populations such as people with ABI, who may face persistent barriers to ongoing participation in environmental initiatives. Encouragingly, the community interest company delivering the intervention in question plays an active role in addressing some of these social and structural barriers, rejecting notions of ableism which prevent participation. The organisation has a strong commitment to working with marginalised and hard-to-reach groups and continues to offer sustained opportunities for meaningful engagement through regular volunteer days and accessible nature-based activities, promoting inclusion beyond the parameters of the structured programme. This highlights the importance of providing sustainable opportunities for the development of internal resources for wellbeing, integration, and outwards contribution through volunteerism, for example (Mead et al., 2023; Seligman, 2011). Future service evaluations could explore how these nature-based interventions impact long-term outcomes related to identity, community participation, and ecological wellbeing, further to quantitatively capturing the extent to which participants identify with nature. Such work should also consider how sociocultural discourses, shaped by factors like class, ability, and local context, influence how participants experience and make meaning of nature-based engagement (Wijaya Mulya et al., 2025).

#### *8.3.2.1 Conclusion*

This service evaluation demonstrates how collaborative working between clinicians, academics, and third-sector organisations can lead to the development of innovative, ecologically attuned interventions that provide holistic opportunities for whole health and wellbeing in persons living with ABI, but in a way that is supportive of the wider environment and society (Gibbs, Fisher & Kemp, 2022). While this example is context specific and not intended to produce generalisable findings, it offers valuable, situated insights that may inspire service development in contextually comparable clinical settings. It illustrates how clinical practice can be meaningful enriched by developments in wellbeing science that merge ideas on sustainability and psychology (eco-psychology) (Kemp & Edwards, 2022; Kemp & Fisher, 2022). Rather than presenting a generalisable panacea, this work reflects a shift towards a more ecocentric orientation to healthcare that focusses on systems, wholes and interdependencies and one which prioritises both human and ecological health needs (Jordan & Hinds, 2017). As with any holistically informed approach, ecotherapy should be grounded in person-centred values, aligning activities with the needs, goals and preferences of those accessing care (Isham et al., 2025). The realisation of such opportunities, however, is contingent on strategic and sustained partnership working and investment in community providers. Without this, the accessibility and delivery of nature-based wellbeing interventions - particularly in resource constrained contexts - will remain limited (Gibbs, Fisher, et al., 2022), resulting in missed opportunities to foster the wellbeing of individuals, communities, and the planet upon which all life depends.

# 9 Chapter Nine: Bridging Wellbeing Science and Neurorehabilitation: Insights, Implications and Influences on the Field – A Thesis Discussion

Recent advancements in wellbeing and psychological science (e.g., Fisher et al., 2022; Kemp & Fisher, 2022; Mead et al., 2021) highlight the necessity of transdisciplinary frameworks in addressing complex health challenges and fostering whole health and wellbeing. Similarly, holistic neurorehabilitation emphasises the integration of physical, cognitive, emotional, and psychosocial recovery within comprehensive care models, recognising the intricate interplay between cognition, emotion, behaviour and psychosocial functioning (Ben-Yishay & Diller, 2011). This approach acknowledges that rebuilding life after ABI is not simply about restoring function where possible, but also about providing opportunities within which individuals can reconstruct their identities; facilitating psychological adjustment and supporting reintegration into society and a return to meaningful activities (Ben-Yishay & Diller, 2011; Ben-Yishay & Prigatano, 1990; Coetzer, 2008). Rather than viewing rehabilitation as a finite process focussed on remediation, holistic neurorehabilitation supports individuals in adapting to post-injury challenges while cultivating a sense of identity, purpose, and autonomy (Ben-Yishay & Diller, 2011; Coetzer, 2008). This whole-person perspective emphasises the importance of addressing wellbeing in a multidimensional way, considering not only biomedical recovery but also the broader determinants of health that influence an individual's ability to live well. However, in practice, neurorehabilitation continues to be largely shaped by a deficit-oriented paradigm, wherein interventions are predominantly designed to mitigate impairments rather than actively foster wellbeing. This narrow focus conflicts with the broader goal of promoting long-term quality of life, leaving gaps in care that may hinder personal growth, psychological adjustment, and social reintegration. Furthermore, despite growing recognition of the need for an integrative, person-centred approach, there remains a lack of application of broad, transdisciplinary frameworks that clinicians can use to conceptualise and implement wellbeing-oriented neurorehabilitation. Without a guiding model that synthesises diverse determinants of wellbeing (including psychological, social, and environmental factors), opportunities to build sustainable foundations for whole health and wellbeing remain underutilised.

This thesis addresses this gap by integrating wellbeing science with holistic neurorehabilitation, applying the GENIAL framework as a theoretical lens to explore and promote whole-person recovery and rebuilding. This metatheoretical framework offers a transdisciplinary perspective that bridges contemporary wellbeing research with healthcare practice, highlighting how connectedness to the self, others, and the environment serve as fundamental pathways to human flourishing. By aligning holistic neurorehabilitation with this framework, the thesis demonstrates how rehabilitation can move beyond deficit reduction to actively cultivate wellbeing, supporting adults with ABI to rebuild with resilience, purpose, and social belonging.

To operationalise this bridging of wellbeing science and neurorehabilitation, the work presented in this thesis draws upon partnerships with clinical neurorehabilitation units and community interest companies across South Wales. Using primarily qualitative methodologies (including individual interviews and focus groups) it critically unpacks the experiences of 75 adults (aged 18-86 years old) living with ABI following their participation in three group-based interventions. The interventions varied in format and delivery, ranging from subtle adaptations of traditional therapies designed to foster psychological adjustment and emotional balance (e.g., an adapted-ACT programme, as detailed in Chapter Four) to immersive, community-based, nature-focussed activities that promote social and environmental engagement (e.g., the Surfability and Down to Earth interventions detailed in Chapters Six and Eight). Crucially, these interventions were developed and delivered independently of the GENIAL framework, drawing instead on established principles of holistic neurorehabilitation. However, this thesis retrospectively evaluates and critically unpacks participants' experiences through the lens of the GENIAL framework, applying its theoretical constructs during the analysis to explore how these interventions supported wellbeing across individual, social, and environmental domains. Through a critical realist philosophical lens, this thesis employed both inductive and deductive coding within a reflexive TA framework to construct a nuanced understanding of the mechanistic underpinnings of participant reported outcomes and the dynamic interplay between neurorehabilitation practices and key determinants of wellbeing. This theory-driven approach provides valuable insight into how existing rehabilitation interventions may align with and extend contemporary wellbeing science, offering a pathway for integrating multi-level, whole-health approaches into neurorehabilitation.

Each intervention demonstrated complementary, multi-level pathways to individual wellbeing, with synergistic effects across key domains. For instance, the qualitative component of Chapter Four indicated that the Adapted-ACT intervention supported capacities for psychological flexibility and self-regulation, providing participants with strategies to navigate distress through acceptance, reconnection with values, and self-acceptance. These outcomes support emotional balance, contributing to the development of a ‘balanced mind’ within the individual domain of wellbeing proposed by the GENIAL framework, defined as the ability to manage and make room for difficult emotions alongside the experience of positive emotion. However, it also benefited from the supportive group and therapeutic context, without which emotional disclosure, self-acceptance and perspectives pertinent to self-regulation may not have been achieved. This is one of few studies to explicitly implicate the importance of connectedness to others (captured within the community domain of the GENIAL framework) as driving forces in fostering core aims of group-based adapted-ACT for adults living with ABI. The Surfability and Down to Earth interventions extended these foundations by integrating meaningful social connectedness and environmental engagement, demonstrating how neurorehabilitation can move beyond deficit-based approaches to actively cultivate holistic wellbeing through the clinical application of the GENIAL framework. Specifically, the intervention delivered in partnership with Surfability UK demonstrated the therapeutic potential of nature-based activity, captured within the environmental domain of the GENIAL framework, illustrating how engagement in outdoor physical activity within a social and community context can promote psychological restoration and social belonging. Building on this, the intervention delivered by Down to Earth highlighted the benefits of combining ecotherapy with opportunities to engage in meaningful activities that promote skill development and connectedness to nature, facilitating both personal growth and deeper engagement with environmental sustainability. Collectively, these interventions exemplify how neurorehabilitation practices informed by wellbeing science can holistically address the complex needs of adults with ABI. By fostering connectedness to the self, others and to the environment, these approaches facilitate a progression from individual psychological adjustment to socially embedded participation and, ultimately, community-driven environmental engagement. This progression is outlined in Table 7 overleaf, which provides practical insights into the operationalisation of wellbeing science within neurorehabilitation, offering a blueprint for embedding wellbeing promotion into clinical and community-based healthcare practice.

**Table 7**

*Mapping Interventions to the GENIAL Framework: Promoting Connectedness at Scale*

| | Individual Domain (Connectedness to the Self) | Community Domain (Connection to Others) | Environmental Domain (Connection to Nature) |
|---|---|---|---|
| Adapted-ACT | Facilitated acceptance of difficult thoughts and emotions.<br>Provided tools for coping with distress and aligning behaviour with personal values.<br>Supported self-acceptance and aided identity reconstruction. | The safe therapeutic space provided the context for emotional disclosure and sharing. This promoted group identification and shared understanding. | N/A, although opportunities to reflect on values related to broader life contexts could be incorporated. |
| Surfability Programme | Promoted acceptance of difficult emotions and experiences.<br>Provided positive psychological experiences (e.g., joy, achievement).<br>Improved confidence and self-efficacy.<br>Provided opportunities for engagement in physical activity and promoted health behaviour change. | Facilitated social connection and group identification.<br>Established camaraderie through shared experiences in a supportive setting.<br>Created a sense of belonging. | Connected participants to the natural environment, fostering a sense of rejuvenation and awe.<br>Promoted nature connectedness for some. |
| Down to Earth Programme | Provided opportunities for skill-building and meaningful activity.<br>Encouraged identity adjustment and acceptance of post-injury selves.<br>Facilitated psychological growth and a sense of purpose. | Cultivated a sense of mutual understanding and belonging through shared experiences.<br>Promoted opportunities for contributing to and feeling valued by the community. | Fostered connection to nature, encouraging reflection on environmental values.<br>Increased knowledge and understanding of sustainable practices. |

## 9.1 Synergistic Effects: Interconnections Between the Individual, Social, and Environmental Domains of Wellbeing

The interventions evaluated in this thesis demonstrate how neurorehabilitation can build the foundations for wellbeing by supporting connection across multiple levels of scale, moving beyond an isolated focus on the individual to encompass the broader dynamic and synergistic determinants of wellbeing. For instance, the work in this thesis highlights that having the tools and strategies to practice acceptance, emotional regulation, and reconnect with personal values at the individual level is strengthened by the social benefits of group-based activities. Trust, openness, and a sense of belonging at a community level foster an environment where participants can share experiences, exchange coping strategies, and offer mutual support and encouragement (Calhoun & Tedeschi, 2013; Nils & Rimé, 2012). This not only enhances social wellbeing but also reinforces psychological adjustment, self-acceptance, and psychological growth (Haslam et al., 2016; Large et al., 2020), all of which are essential for individual wellbeing post-ABI. The natural environment further enriches this process by providing a restorative space and dynamic context within which individuals can engage in positive health behaviours, meaningful activity, and interpersonal connection. Engagement with nature has well-documented benefits for stress reduction, psychological restoration, and the cultivation of awe and perspective-taking (Kaplan, 1995; White et al., 2019). In the context of neurorehabilitation, natural spaces may create unique opportunities for individuals to practice emotional regulation in real-world scenarios, promoting both physiological and psychological balance with long-term health benefits (Kuo, 2015). These environments also promote deeper social engagement through shared activities (Gallagher et al., 2015; Muldoon, Haslam, et al., 2019; Muldoon, Walsh, et al., 2019), cultivating meaningful connections that help to circumvent the deleterious effects of loneliness and social isolation, to which adults with ABI are particularly vulnerable (Morton & Wehman, 1995). Collectively, these findings underscore the importance of designing comprehensive and holistic neurorehabilitation programmes that view wellbeing as a dynamic and interconnected system and so leverage therapeutic potential across domains.

Neurorehabilitation must offer a range of interventions that accommodate individual differences in cognitive, emotional, and social functioning, particularly given the heterogeneity of this population (Halvorsrud et al., 2019). In this regard, it would be useful if future work were to focus on developing structured frameworks that explicitly guide clinicians in fostering connectedness to the self, in addition to that of others and the environment; providing a blueprint of the various evidence-based activities which may promote wellbeing within and across domains. This is particularly important given the practical difficulties of drawing upon such a broad, transdisciplinary metatheoretical framework of wellbeing in resource-constrained settings, as outlined in Chapter Two. The breadth of the GENIAL framework also raises operational challenges, particularly around how clinicians may allocate scarce session time across individual psychological work, community and relational interventions, and environmental engagement in the absence of third-sector partnerships. Without clear specification of minimal effective components and pragmatic tailoring rules, there is a risk that interventions labelled ‘GENIAL-informed’ will vary considerably, hindering efforts to build coherent service-level pathways. These translation challenges are neither unique to GENIAL nor insurmountable. They do, however, necessitate deliberate implementation work that translates conceptual sophistication into clinical simplicity. While the development of a definitive blueprint is beyond the scope of this thesis, the following subsections further illuminate the specific pathways through which connectedness was facilitated at multiple levels of scale by the interventions evaluated herein.

## 9.2 Connecting to the Self After ABI: Building a Balanced Mind, Healthy Body and Renewed Sense of Self

The GENIAL framework emphasises the importance of a balanced mind for individual wellbeing (encompassing both hedonic and eudaimonic aspects of psychological wellbeing) and positive health behaviours to maintain a healthy body, with the body and mind being deeply interconnected (Kemp et al., 2017; Kemp & Quintana, 2013). This balance accounts for the role of negative emotions and experiences as containing seeds for personal growth (particularly following trauma, such as that imposed by ABI) while striving for joy, pleasure, meaning and purpose (Bradburn, 1969; Wong, 2011). However, adults with ABI may habitually attempt to suppress or ‘fix’ difficult emotions (as exemplified in Chapter Four), which can hinder psychological adjustment. The interventions evaluated in this thesis facilitated a shift in this approach, either directly (through structured group teachings and mindfulness practice) or organically, by presenting real-world opportunities for practice. Crucially, the therapeutic milieu (a key principle of holistic models of neurorehabilitation) provided a safe, supportive environment that encouraged openness, emotional processing and psychological adjustment safe (Cattelani et al., 2010). This demonstrates the complementary relationship between holistic rehabilitation principles and the mechanisms outlined in the GENIAL framework. By fostering safety, trust, and relational depth, such holistic practices create the conditions in which individual, social, and environmental pathways to wellbeing can effectively unfold in practice.

Facilitating psychological flexibility and emotional balance was a key aim of the adapted-ACT intervention evaluated in Chapter Four, which sought to equip adults living with mild-to-moderate emotional distress following stroke or brain injury with the tools and knowledge to accept difficult emotions and re-engage with their values. While no significant quantitative changes in levels of psychological flexibility were found between groups or over time, qualitative insights indicated that acceptance of difficult thoughts and emotions was explicitly cultivated through structured teachings and experiential group discussions. Participants were taught strategies to support emotional regulation and connect with the present moment, practices which are conducive to emotional balance. The intervention also helped participants to reconnect with personal values, guiding them toward a more meaningful life, with research by Schueller and Seligman (2010) suggesting that eudaimonic wellbeing (engagement, meaning and purpose) is more strongly linked to long-term wellbeing than hedonic experiences (pleasure or joy). However, the intervention did not directly connect participants to these experiences; it merely provided guidance towards them. Similarly, although such interventions are valuable for teaching the principles of emotional regulation, which can be useful for fostering positive psychological change (e.g., Large et al., 2020), the settings in which they are delivered may constrain participants' ability to apply these strategies in real-world scenarios. Without opportunities to implement ACT concepts and practice strategies for emotional regulation in authentic contexts where challenges naturally arise, the learnings can remain abstract and difficult to translate into everyday life during times of emotional turbulence. This highlights the importance of situating neurorehabilitation interventions within the context of the natural and local settings within which an individual lives, wherever possible, as these are most likely to enable a person to rehabilitate and function with confidence outside of the clinical setting (Kemp & Fisher, 2022).

In contrast, the intervention delivered in partnership with Surfability UK (described in Chapter Six) immersed participants in real-life, dynamic nature-based experiences that naturally prompted and reinforced emotional regulation strategies and acceptance. Specifically, being in nature and confronting new challenges created organic moments for psychological growth, allowing participants to engage with difficult experiences and emotions as they arose and practice strategies for emotional regulation (i.e., mindfulness) in real-world settings. Moreover, it provided opportunities for adults living with the emotional and cognitive sequalae of ABI to experience the beneficial psychological effects of nature (namely, restoration and rejuvenation), which has positive implications for mental health (Britton, Kindermann, & Carlin, 2020; Foley & Kistemann, 2015). Interventions which take place in natural environments hereby embody the ebb and flow of human experience and present diverse opportunities for the promotion of wellbeing via meaningful and active experiences (Britton, Kindermann, & Carlin, 2020; Foley & Kistemann, 2015). For example, the physical activity embedded within the surf therapy programme described in Chapter Six may have also supported psychological health while promoting physical wellbeing – a key tenet of the GENIAL framework's vision of a healthy body which has a bi-directional relationship with the promotion of a balanced mind. Some participants reported sustained engagement in physical activity, suggesting the potential for positive long-term health behaviours that are crucial for individual wellbeing, particularly given the risk of sedentary behaviours and associated health complications post-ABI (Goverover et al., 2017; Hamel & Smoliga, 2019; Hamilton et al., 2016; Warburton et al., 2006; Wise et al., 2010).

Beyond emotional regulation, the collective findings of this thesis also highlight the importance of self-acceptance and identity reconstruction in contributing to a balanced mind. Following ABI, individuals often experience a profound discrepancy between their pre- and post-injury selves, necessitating both adaptation and identity reconstruction that is emphasised within holistic models of neurorehabilitation (Gracey et al., 2009). These processes align with the GENIAL framework's concept of 'connectedness to the self,' yet, until now, have not been explicitly identified as such. A central tenet of the adapted-ACT intervention described in Chapter Four was to encourage values-based living, facilitating a coherent sense of self through reflection and meaning-making. Acceptance, in this context, emerged as a dynamic process of psychological adjustment, enabling participants to acknowledge their new reality while redefining their sense of purpose and choosing to move forward in alignment with their values. This shift in perspective enabled some individuals to cultivate hope and optimism for their future despite ongoing limitations. Similarly, the Down to Earth intervention described in Chapter Eight - which combined social and productive activities and explicitly focussed on building meaning, compassion and practical skills in nature – offered distinctive opportunities to support self-identity, community integration and re-engagement in meaningful work-related activities among adults living with ABI. As a community-based group ecotherapy programme, it enabled this somewhat disconnected and marginalised population to reconnect with themselves through self-acceptance and compassionate inward reflection of their strengths and identity. Moreover, Surfability and Down to Earth extend upon the psychological benefits generated by the group-based adapted-ACT intervention by introducing opportunities for joy, engagement and mastery, promoting both immediate (hedonic) and sustained (eudaimonic) wellbeing through skill development, achievement and meaningful engagement. These experiences allowed participants to reconnect with themselves by building confidence, self-esteem, and self-efficacy, reinforcing a renewed sense of personal agency and competence and reinforcing their evolving sense of identity post-ABI. However, self-acceptance and identity reconstruction are inherently relational, requiring interpersonal validation and group identification with similar others (Large et al., 2020; Nalder et al., 2019; Patterson et al., 2016). In this regard, capacities for self-connection and psychological adjustment (Vaghela et al., 2021), which are integral to individual wellbeing post-ABI, were catalysed by structured group-based activities which provided meaningful opportunities to connect to others.

## 9.3 Rebuilding Wellbeing Through Social Connection: The Role of Cultivating a Sense of Community

The transdisciplinary metatheoretical GENIAL framework of health and wellbeing acknowledges the significant role of social connectedness and interpersonal relationships in building capacities for individual wellbeing and thus highlights the community as a core domain (Mead et al., 2021). Neurorehabilitation models similarly acknowledge that recovery and rebuilding is not a solitary process, but one deeply embedded within social networks, shared experiences, and community integration (Ben-Yishay & Diller, 2011; Prigatano, 1999). The literature hereby underscores the importance of interventions that tackle internal barriers to social engagement, such as issues of self-identity, injury concealment, and emotional difficulties, as these can inhibit meaningful social connections and hinder overall wellbeing. A recurring theme across all interventions was the transformative power of the group dynamic in catalysing these positive outcomes. The therapeutic milieu provided a safe, trusting space where participants felt encouraged to try something new, engage in emotional disclosure, and receive support from others facing similar challenges (Calhoun & Tedeschi, 2013). Reciprocal support and shared experience between group members provided nuanced opportunities for participants to learn about themselves and their injury, with social participation being an important conduit for making sense of oneself post-ABI (Gracey et al., 2008). The group environment hereby provided space within which participants could be themselves. Connecting with one's authentic selves has positive implications for self-esteem, self-regulation, and personal growth (Norton & Watt, 2014; Passarelli et al., 2010; Ray & Jakubec, 2014), reinforcing the GENIAL framework's premise that social wellbeing is integral to individual flourishing.

Notably, interventions must aim to build both social networks and meaningful social connections (Byrne et al., 2021), as social wellbeing comprises both the quantity or presence of social networks (with an increased social network mitigating social isolation) and the perceived quality of one's social connections (with closer social connections mitigating loneliness and associated mental health impacts). This was emphasised in Chapter One. While increasing the quantity of social interactions is beneficial, the quality and depth of these connections are equally, if not more, critical in promoting meaningful engagement and sustained psychological wellbeing after ABI, with loneliness being closely tied to emotional wellbeing and quality of life in this population (Salas et al., 2022). While the adapted-ACT intervention provided a safe space for individuals to explore and express their emotions while forming social bonds with peers who shared similar experiences, this intervention may have only supported momentary reductions in loneliness by providing opportunities for participants to reap the benefits of social engagement (Kemp et al., 2017) during the parameters of the intervention. The qualitative data suggests that it did not necessarily create the conditions for sustained social connection or long-term social integration. Internal psychological work, including emotional regulation and acceptance, is an important precursor to social engagement; however, it must be complemented by opportunities for meaningful, real-world social participation and broader social integration strategies (Lowe et al., 2021). In this regard, it is not simply enough to provide ABI survivors with structured groups, but rather, group processes which facilitate a sense of connection and social group identification should be supported (Griffin et al., 2022). Without a bridge to external social opportunities, internal psychological progress alone may not translate into sustained improvements in social wellbeing.

In contrast, the interventions delivered in partnership with Surfability UK and Down to Earth provided enhanced opportunities for social connectedness by facilitating access to novel, challenging and purpose-driven group-based experiences and nature-based activities that embodied 'meaningful doing'. Engagement in meaningful activities can provide key foundations for social engagement and friendship building post-ABI (Gallagher et al., 2015; Muldoon, Haslam, et al., 2019; Muldoon, Walsh, et al., 2019), with one participant who engaged in the Down to Earth intervention evaluated in Chapter Eight describing how the intervention had enabled them to develop “lifelong friends.” In this regard, meaningful activity (engaging with nature in ways that also promoted skill-building with others) acted as a natural catalyst for facilitating the development of deeper relational bonds and the creation of a community within which adults living with ABI could share stories and social resources to aid coping and psychological adjustment. This paved the way for a sense of mutual identification, belonging and understanding between group members (Salas et al., 2018), allowing them to develop new group memberships that provide a basis for self-redefinition and social identity reconstruction post-ABI (Muldoon, Haslam, et al., 2019; Muldoon, Walsh, et al., 2019). Stronger connectedness to social group memberships builds key resources for inner development, contributing towards increased adaptability personal agency, resilience and psychological growth (Ellis-Hill & Horn, 2000; Griffin et al., 2022; Jones et al., 2012; Muldoon, Walsh, et al., 2019). While the lack of longitudinal follow-up and quantitative measures makes it difficult to determine the strength, sustainability and long-term impact of these connections, these findings emphasise that social connection should not be considered a passive by-product of neurorehabilitation, but a central target for intervention. This aligns with the GENIAL framework’s conceptualisation of wellbeing as multi-level and relational, reinforcing the idea that connectedness to others serves as a key determinant of individual health and flourishing. Nevertheless, these findings underscore the pivotal role of nature not merely as a backdrop for positive social interaction but as an active facilitator of connection - to the self, to others, and to meaningful experiences.

## 9.4 Delivering Neurorehabilitation in Nature: Building Wellbeing at Scale and Beyond Individual Gains

Alongside social connectedness, the GENIAL framework highlights the natural environment as a key pathway to individual wellbeing; something which is often neglected in discussions of neurorehabilitation despite increasing evidence of its therapeutic benefits. Interpretation of participants’ experiences of the interventions delivered in partnership with Surfability UK and Down to Earth demonstrates the dual role of nature (and nature-based activities) in facilitating wellbeing. For one, nature provided an immersive context for neurorehabilitation, providing a physical and dynamic space within which adults living with ABI could connect to oneself and others by housing opportunities for physical activity, emotional regulation, skill development, and meaningful activity, all of which align with holistic neurorehabilitation goals (Ben-Yishay, 1996, 2000; Ben-Yishay & Diller, 2011). Secondly, nature acted as a direct agent of wellbeing, offering inherent psychological benefits beyond its function as a setting for group-based therapeutic intervention. Participants who engaged in the Surfability intervention, for example, described how the ocean provided moments of respite from rumination and emotional distress, which is in accordance with evidence suggesting that natural environments can reduce stress and promote emotional regulation (Kaplan, 1995; White et al., 2019). Additionally, participants across the two nature-based interventions reported feeling more connected to and appreciative of nature, with nature connectedness determining the extent of psychological benefits derived from time spent in nature (Lumber et al., 2017; Martin et al., 2020). In this regard, interventions which actively promote a sense of care and responsibility for the natural world may enhance individual wellbeing over the long-term, reinforcing the GENIAL framework's emphasis on nature as a key pathway to individual flourishing. Beyond individual benefits, the GENIAL framework also emphasises the role of nature connectedness in influencing pro-environmental behaviours, ecological responsibility, and long-term stewardship (Lumber et al., 2017; Martin et al., 2020), with positive implications for planetary health and wellbeing.

## 9.5 Moving Beyond Extractionism towards Collective and Planetary Wellbeing

Community settings and healthy ecosystems are not merely therapeutic backdrops for human wellbeing; they have intrinsic value and require active stewardship to sustain their integrity (Chapin et al., 2022). Recent developments in ecopsychology emphasise that building resources for inner development and connection may extend to an outward compassion for both people and planet (Mead et al., 2023), driving actions to benefit the wider environment and society (Morgan et al., 2022; Pihkala, 2020, 2022). This is critical given that individual and collective wellbeing relies so heavily upon the wellbeing of the planet, and likewise, the wellbeing of the planet relies upon the inner development of humanity (Wamsler & Brink, 2018; Woiwode et al., 2021). However, interventions delivered with the aim of supporting health and wellbeing typically focus on how nature can serve human wellbeing, often neglecting the reciprocal relationship between human and planetary health. This extractionist approach overlooks the potential for these interventions to contribute meaningfully to communities and the restoration and preservation of the environments within which interventions take place. Recognising the interconnectedness of human and planetary wellbeing, it is essential to design and deliver interventions that prioritise mutual flourishing.

The Down to Earth programme described in Chapter Eight offers a compelling model of such an approach, offering opportunities to promote wellbeing across multiple levels of scale. At the individual level, providing opportunities for meaningful doing with others in nature fostered whole-person health by creating opportunities for identity reconstruction and a deepened sense of connection to oneself, others, and nature. At the community level, not only did the intervention provide opportunities for adults living with ABI to establish a sense of community - facilitating a key pathway to individual wellbeing in this population - but the activities themselves also supported marginalised populations beyond those living with ABI. The activities achieved this through the building of low-carbon community facilities and inclusive learning spaces that support education and promote community cohesion for others. While the GENIAL framework effectively highlights the relational determinants of wellbeing, it primarily emphasises these connections through the lens of individual wellbeing - similarly to most models of wellbeing in psychological science (i.e., Martin Seligman's PERMA model, 2011). However, writings around the GENIAL framework also acknowledge the concept of collective wellbeing, describing philosophical tensions around individualism and collectivism. Moving forward, it may be beneficial to more explicitly articulate these nuances within the community domain, acknowledging that relationality can be viewed both from the perspective of individual flourishing and as a contributor to collective wellbeing. That is, community can be understood in a dual sense. On one hand, it is something that is felt internally - a subjective sense of belonging, connection, and identification with others, which supports individual wellbeing. This is the emphasis typically reflected in discussions of community wellbeing within the GENIAL framework. On the other hand, community can also be conceptualised as a social system (Sirgy, 2018) in which individuals, embedded within shared social structures (and often, shared spaces), draw on common norms and social capital to create the conditions that enable connection, participation, and collective flourishing. By explicitly addressing this dualism, the GENIAL framework could strengthen its explanatory power, better accounting for the ways in which social contexts underpin both personal and collective wellbeing. In doing so, it would more closely parallel the environmental domain, which encompasses both nature connectedness as a foundation for individual health and pro-environmental behaviours as essential for planetary flourishing.

At its core, the Down to Earth programme emphasises wellbeing at the environmental level by nurturing nature connectedness - an essential factor in promoting human health - while directly cultivating environmental stewardship and engaging individuals in sustainable practices such as eco-friendly construction and tree planting. This approach not only addresses immediate therapeutic goals but also contributes to the broader imperative of planetary health. Transitioning from an extractionist mindset to a regenerative approach requires reframing nature as a partner rather than a resource, and fostering a sense of interconnectedness, where the health of people and ecosystems is seen as inseparable. By embedding principles of reciprocity and sustainability, nature-based interventions, designed and delivered in partnership between the third sector and the healthcare system, can become a force for ecological restoration and community empowerment rather than exploitation. In this way, neurorehabilitation (and the healthcare sector more broadly) can contribute not only to personal rebuilding and resilience but also to broader ecological and societal wellbeing, prioritising mutual flourishing to ensure that both people and the planet thrive by cultivating a culture of care for all (Gibbs et al., 2022). Such an approach reflects and reinforces global agendas that seek to advance sustainability, social equity, and prosperity for people and the planet alike.

### 9.5.1 Contributions Toward the United Nations Sustainable Development Goals

As mentioned in Chapter Seven and further contextualised in Chapter Eight, the work presented in this thesis demonstrates clear potential for group-based, wellbeing-informed holistic neuropsychological rehabilitation to support progress on the SDGs while also promoting inner development for adults with ABI. While neurorehabilitation services within the NHS are not explicitly mandated to work towards these goals, doing so demonstrates the capability of holistically informed neurorehabilitation to have far-reaching impact beyond a sole focus on the individual.

The work presented in this thesis aligns most directly with SDG 3: Good Health and Wellbeing, by emphasising the importance of holistic health and wellbeing in adults with ABI. Through the qualitative evaluation of group, nature-based, and community-centred interventions, the work illustrates how wellbeing can be nurtured across individual, community, and environmental dimensions while supporting key goals of neurorehabilitation. This work also intersects with end goals of SDG 4: Quality Education, by demonstrating how rehabilitation can become a site of lifelong learning and skill development. For example, the adapted-ACT intervention detailed in Chapter Four explicitly taught adults with ABI about the nature of brain injury, it's symptoms, and how thoughts and behaviours can influence emotional responses, further to teaching grounding and mindfulness skills and strategies to support emotional regulation. Meanwhile the ecotherapy programme evaluated in Chapter Eight created opportunities for participants to develop new competencies such as sustainable construction or conservation skills that bolster confidence, autonomy, and, in some cases, provide pathways toward vocational or leisure re-engagement.

A further contribution of this thesis relates to SDG 10: Reduced Inequalities. Adults with ABI are a marginalised and often underserved population, facing systemic barriers to accessing services and assets key to neurorehabilitation and good health and wellbeing – including psychological therapies and access to high quality natural spaces (Geary, Thompson, Mizen, et al., 2023; Mitchell & Popham, 2008; van den Berg et al., 2015). This thesis addresses these inequities by demonstrating the potential of inclusive, community-driven, and ecologically grounded interventions that can be tailored to local contexts. Additionally, through strategic partnerships with local community interest companies and not-for-profit organisations, the work has relevance to SDG 11: Sustainable Cities and Communities, given its emphasis on the role of green and accessible community spaces in wellbeing. Partnerships with local third-sector organisations illustrate how sustainable, community-based infrastructures can provide ongoing support for people living with ABI, highlighting the importance of ecologically attuned and locally embedded services for promoting sustainable communities. Finally, the work presented in this thesis demonstrates the potential of neurorehabilitation to engage with SDG 13: Climate Action. By fostering nature connectedness and ecological consciousness through engagement in sustainability-focussed interventions, participants may develop stronger pro-environmental attitudes, promoting behaviours aligned with global climate and conservation goals.

Overall, this thesis demonstrates how embedding wellbeing science within neurorehabilitation not only supports individual pathways to holistic health and wellbeing but also contributes to collective aspirations for the wellbeing and sustainability of both people and planet. Moreover, by encouraging participants to (re)connect with themselves and their values, to others, to nature and to their communities, these interventions also nurture IDG qualities such as humility, compassion, and a sense of interconnectedness. The alignment with both the SDGs and IDGs demonstrates that neurorehabilitation, when re-imagined through holistic frameworks such as the metatheoretical GENIAL framework and bolstered by community partnerships, can extend its impact far beyond the clinical context to address global goals for health, equity, and sustainability.

## 9.6 Implications for Neurorehabilitation: Enhancing Systems-Level Wellbeing through Partnership Working

This thesis demonstrates the potential of a multi-level, wellbeing-informed, systems-oriented approach to neurorehabilitation, redefining what it means to achieve whole health through healthcare intervention. The findings reinforce the necessity of multifaceted, person-centred approaches that go beyond symptom reduction to address both internal (individual) determinants of wellbeing (e.g., emotional regulation, identity reconstruction, and PTG) and external, synergistic influences (e.g., social connectedness, environmental engagement). Crucially, connectedness to others and nature should not be viewed as supplementary components, but rather as essential elements of recovery and rebuilding for sustainable wellbeing post-ABI. As one participant from the Down to Earth intervention in Chapter Eight noted, nature-based interventions should be a core component of therapy akin to 'giving out antibiotics for an infection.' This is particularly important given that access to such environments comprises a significant barrier for many people living with ABI due to socioeconomic disadvantages (de Bell et al., 2017), with the sequalae of ABI further hindering access to and engagement in these health promoting spaces (Winkler et al., 2005).

To overcome these barriers, it is imperative that clinical teams and their respective healthcare institutions establish effective partnerships with community-based providers and third-sector organisations, as reasoned for in Chapter Five. These organisations possess the resources and expertise to create opportunities for safe and meaningful engagement within blue and green spaces; without which, nature-based interventions would not otherwise be available or accessible, particularly in resource constrained contexts. For example, Surfability UK provided specialist equipment and expert guidance for adapted sporting activities, while Down to Earth created inclusive opportunities for conservation and construction-based projects. Both interventions provided opportunities for adults living with ABI to connect with themselves (supporting skill development, building confidence and self-efficacy, and nurturing the reconstruction of capable identities), whilst also providing opportunities for meaningful doing with others in nature. These partnerships exemplify how collaborative relationships between healthcare services, community organisations, and third-sector entities can enable the delivery of previously unimagined and innovative interventions that lay crucial foundations for individual wellbeing that may also support the wellbeing of communities and the planet. However, as highlighted in Chapter Five, it is the *integration* of diverse resources, skills, and expertise that can create coherent and sustainable approaches to rehabilitation. With that, the active involvement of multidisciplinary team members, working in transdisciplinary ways, is key.

The presence of clinicians alongside community providers functions to ensure that core principles of holistic neurorehabilitation are maintained and environments are adequately adapted to accommodate the unique and complex needs of those living with ABI specifically (McCabe, Lippert, Weiser, Hilditch, Hartridge, & Villamere, 2007). Moreover, it ensures that therapeutic support, reassurance, and clinical oversight are available in the challenging moments that participants need them. The importance of this was exemplified in the service evaluation described in Chapter Six, where the presence of the clinical staff in addition to the expert surf therapy staff facilitated feelings of trust and safety, enabling participants to try something new without fear or harm or ridicule. Meanwhile, participants who attended the Down to Earth intervention described in Chapter Eight highlighted that this collaborative approach enabled clinical staff to observe their functioning in authentic settings; thereby enabling them to gain a truer understanding of their needs, skills, and difficulties while being "on hand" to provide therapeutic support. This emphasised the importance of working *with* patients in their authentic local and natural settings, as these are the environments through which a person with ABI must navigate and learn to function and thrive as independently as possible. Harrod et al. (2023) emphasise that the therapeutic relationship facilitates the co-creation of therapeutic experiences within nature-based interventions that enable individuals to develop autonomy and confidence, which can support the translation of benefits from a context-specific intervention to a person's daily life. Moreover, the continued delivery of milieu-centred principles in community settings can support long-term productivity at up to 30 years post-discharge, such as employment and regular engagement in structured volunteering (Perumparaichallai et al., 2020), with the latter comprising a pathway to sustained wellbeing (Mead et al., 2021).

To optimise the likelihood that therapeutic gains are maintained, it is crucial that stroke and brain injury survivors continue to have access to meaningful group-based activities even after formal programme completion. Otherwise, stripping these individuals of such opportunities can hinder their recovery and rebuilding. This was illustrated in Chapter Four, where one participant reported a decline in their wellbeing following cessation of group-based engagement afforded by the group-based adapted-ACT intervention. Likewise, a participant who engaged in the Down to Earth intervention evaluated in Chapter Eight expressed concern about "falling back to square one" without regular opportunities for meaningful group-based engagement. These challenges highlight the need to nurture a positive self-concept (Harrod et al., 2023) and to support individuals in securing personally meaningful opportunities that support their sense of belonging and social cohesion. This can be catalysed by strategically partnering with community providers who already facilitate this. For example, Down to Earth offers regular reconnection opportunities and volunteer days, which allow attendees to stay connected to the community. Activities such as mentorship, volunteering, or greater community involvement can cultivate social cohesion and present sustainable opportunities for wellbeing (Mead et al., 2023; Seligman, 2011). For instance, when service users are given opportunities to mentor peers and co-deliver therapeutic interventions alongside clinical staff, it not only offers a meaningful role for the mentors but also instils hope and inspiration in those they support (Tulip et al., 2020). These initiatives exemplify the potential of 'bottom-up' approaches in creating enduring pathways to wellbeing (Gibbs, Fisher, et al., 2022). However, the development and maintenance of such partnerships are often contingent on top-down policies and funding streams. Access to community and nature-based interventions is highly dependent on infrastructural and policy support (Nejade et al., 2022), highlighting the need for coordinated efforts between healthcare providers, community organisations, academics and policymakers to develop funding and policy frameworks that facilitate integrated, systems-level approaches to neurorehabilitation. Collectively, these findings illustrate the importance of partnership working in creating adaptable, inclusive, and sustainable rehabilitation pathways. By strategically aligning healthcare services, community resources, and policy support, neurorehabilitation can move beyond deficit-focussed models to cultivate whole health and wellbeing for individuals living with ABI, whilst also contributing to broader community and planetary wellbeing and goals for the sustainable development of such. With that, it is important to take a staged approach to addressing multi-level wellbeing, adopting a flexible continuum of care that incorporates both individual and group-based interventions.

## 9.7 The Limitations of Group and Nature-Based Interventions and the Importance of Tailoring to Personal Preference

While the work in this thesis emphasises the benefits of embedding neurorehabilitation in community and nature-based settings where possible, it is important to acknowledge that not all individuals are immediately ready (or willing) to engage in activities that are group-based, outdoors, and/or physical in nature - or any combination of these formats. For example, while neurorehabilitation should comprise a blend of individual and group therapies; shame, anxiety and depression, cognitive fatigue, or difficulties processing complex interpersonal interactions can prevent individuals from engaging in group-based therapies (Shay, 2021). Accordingly, a flexible continuum of care is required, allowing for gradual progression from more structured, psychological and clinic-based interventions, such as the adapted-ACT programme, to community-integrated and nature-based approaches such as - but not limited to - surf therapy or group-based ecotherapy. This progression respects individual readiness while also building resources for inner development (including connectedness to the self) that lay the groundwork for connectedness to others and nature. Individual therapy, such as the adapted-ACT programme, hereby offers a structured space for individuals to process their experiences, work through psychological challenges at their own pace, and build confidence in managing their wellbeing independently. In this sense, psychological or cognitive-based therapies such as adapted-ACT can serve as a preparatory intervention, equipping participants with psychological flexibility and emotional regulation skills. These skills enable individuals to fully engage in more dynamic, nature-based and community-driven interventions where they can practice the application of tools that support adjustment, extend their social and behavioural repertoires, and help them to behave in ways that align with their values. A stepped approach could be taken to help build individuals up to participate in group nature-based activities. For example, gardening can enhance wellbeing even when not conducted in a group context, whilst simultaneously presenting social opportunities (Genter et al., 2015). It is equally important to recognise that not all individuals will wish to engage with natural environments, nor will they do so in ways that are universally applicable or maximise the potential for benefit.

Whilst the biophilia hypothesis posits that connection to nature is a fundamental and potentially innate human need (Kellert & Wilson, 1993), preferences for nature contact are shaped by a complex interplay of factors, including prior experiences, culture and ethnicity, sensory sensitivities, and even practical considerations such as allergies or mobility limitations (Kaplan & Talbot, 1988). Participation in the interventions examined in this thesis was voluntary, in line with ethical principles of healthcare and rehabilitation practice. As such, those who took part represent a self-selecting cohort, likely comprised of individuals who already had some level of openness to, or affinity with, nature-based activities. For some, the interventions may have served as an opportunity to rekindle or deepen an existing connection, rather than to establish an entirely new one, as alluded to in Chapter Six. This raises important considerations regarding the acceptability and inclusivity of nature-based interventions: those less inclined toward nature, or who face barriers to participation (whether cultural, physical, or psychological), may not engage in the same way, potentially limiting the accessibility and reach of such interventions. This variability has important implications for the design and delivery of nature-based interventions. For example, while some participants may embrace activities such as gardening or structured 'forest bathing,' others may find these approaches unappealing or alienating. However, given that nature provides a space within which various health-promoting activities may take place, it increases the likelihood that elements will resonate differently with different individuals. One participant may reject the idea of gardening yet still experience the benefits of spending time in natural environments through cycling, walking groups, or conservation tasks. As highlighted in Chapter Six, the activity of surfing comprised a vehicle for building wellbeing by supporting a sense of connection (to oneself, others, and blue spaces). Whilst there is a more established evidence-base for this activity over other water-based interventions (Britton, Kindermann, Domegan, et al., 2020), it represents one of many possible nature-based activities that individuals may engage with. From a practical standpoint, this underscores the need for flexibility, choice, and personalisation in the delivery of nature-based interventions, recognising that engagement with the natural environment can occur in diverse and sometimes indirect ways. Even when engagement is passive or does not involve explicit nature-focussed activities, exposure to natural environments can still produce meaningful psychological and physical health outcomes, including enhanced mental health and vitality (van den Berg et al., 2016; van den Berg et al., 2015), as outlined in Chapter Five. Still, active and intentional engagement remains key to fostering deeper nature connectedness and optimising psychological and planetary benefits (Capaldi et al., 2014; Capaldi et al., 2015), emphasising the importance of supporting meaningful engagement with nature in ways that suit the person's needs and preferences. Adding another layer of complexity to this - engagement in therapeutic activities occurs within a multi-level ecosystem of influences, including the social, familial, and systemic contexts in which the individual is embedded. The importance of this is discussed in the next section.

## 9.8 Multi-Level Influences Affecting Successful Neurorehabilitation

In keeping with a critical realist orientation, the experience of navigating life with ABI and the process of adjustment is not solely an individual process but a systemic one, with the individual at its centre. Qualitative research suggests that recovery trajectories post-ABI are influenced by broader systemic and social factors, such as interactions with family, friends, community and governmental systems, all of which shape rehabilitation outcomes (Domensino et al., 2022). To draw on one of these spheres of influence as an illustrative example, the active involvement of the wider support system (including family and services) plays a pivotal role in empowering individuals as they navigate their adjustment process (Vaghela et al., 2021). Bronfenbrenner's Ecological Systems Theory (Bronfenbrenner, 1977) reinforces the centrality of family within the microsystem, emphasising how family dynamics exert a direct and profound impact on an individual's development and functioning. Within the collective domain of the GENIAL metatheoretical framework, the family constitutes a critical network, analogous to peers and social groups, in fostering (or diminishing) wellbeing. This highlights the need for educational and emotion-focussed interventions that target family members, friends, and the broader community in order to foster empathy, increase understanding, and provide caregivers with the tools necessary to facilitate recovery and rebuilding (Fleminger & Ponsford, 2005).

Addressing family dynamics may also support the growth of the individual's personal network, promoting acceptance which is key for adapting to change (Ghosh-Cannell et al., 2023). Integrating family-centred approaches into neurorehabilitation - where possible - thus aligns with both ecological and systems theories, recognising that recovery and rebuilding are deeply embedded within interpersonal relationships. Moreover, it may strengthen the broader social fabric that contributes deeply to these processes, addressing concerns highlighted by participants who contributed to the service evaluations presented in this thesis, who at times reported feeling like strangers in their own homes. By taking a multi-level approach to wellbeing, one that draws on frameworks inspired by social ecological models and systems thinking, clinicians may design and implement interventions that comprehensively address the multi-dimensional influences on individual wellbeing, placing the individual and their familial and social networks at the core of the process. In doing so, however, it is also important to remember that social connections and relationships do not always function as pathways to wellbeing, but also have the potential to contribute to distress, further loss of personhood, and mental and physical illbeing. After ABI, personal relationships can be sources of strain, conflict, or even exploitation (Lambert et al., 2025), as highlighted in Chapter One. Such risks expose a critical blind spot in wellbeing-focussed neurorehabilitation: without attention to the quality and dynamics of interpersonal relationships, interventions that emphasise social connection risk overlooking how fragile, unequal, or harmful relational contexts may actively undermine recovery and rebuilding. This emphasises that, for people living with ABI, the *quality* of social connections is as important as their presence, underscoring the need for careful consideration when romanticising social connection as a pathway to wellbeing. This represents a topic of discussion that has, until now, gone underexplored, highlighting the importance of meeting such complex and dynamic relational contexts with appropriate sensitivity, critical awareness, and evaluative approaches that can capture both their potential to support and to hinder wellbeing.

## 9.9 Directives for Future Work: The Value of Mixed-Methods Evaluations

Qualitative research plays a crucial role in deepening our understanding of complex human experiences, particularly in fields such as neurorehabilitation, where individual and social factors intersect within broader systemic contexts. However, as outlined in Chapter Three, the integration of both qualitative and quantitative exploration through mixed methods approaches enables a more comprehensive understanding of phenomena.

Owing to its qualitative depth and critical application of the GENIAL framework, the work in this thesis provides a strong foundation for future evaluative designs that integrate rich qualitative insights with longitudinal and quantitative methodologies. Particularly, incorporating validated measurement tools offers the potential to rigorously evaluate the proposed mechanisms of change and facilitate comparisons across different intervention modalities. Doing so may serve to enrich the evidence base and better inform clinical practices (as reasoned for in Chapter Three), allowing researchers and clinicians to continue refining intervention strategies and find innovative, scalable way of supporting the goals of holistic neurorehabilitation across diverse contexts. Taking social wellbeing as an example, this thesis approached community integration by critically unpacking qualitative insights to evaluate how group and nature-based interventions can facilitate connectedness and community engagement among adults with ABI. It has illuminated how engagement in meaningful, nature-based activities with others can promote a sense of belonging and social group identity: key components in successful community reintegration. Future research may complement this work by incorporating validated instruments to further investigate the psychological and social pathways through which group and community-based interventions (like those described in Chapters Six and Eight) support outcomes including home competency, social integration and productive activity. For instance, the Community Integration Questionnaire (Sander et al., 1999; Sander et al., 1997) could be used to assess pre and post-intervention integration, thereby identifying areas where additional support is needed whilst also providing insight into progress towards core neurorehabilitation goals. This has a clinically and theoretically meaningful three factor structure that has been specifically designed for and widely used in ABI research (Sady et al., 2010).

Incorporating validated tools into the design of research offers an opportunity to differentiate between complex dimensions of determinants of wellbeing. In the case of social wellbeing, they enable data to be captured to quantify the presence of social contact and networks (a lack of which contributes to social isolation) versus one's satisfaction with the quality of their social relationships (with loneliness being characterised by a subjective perception of disconnection). Applying these measures would support a more nuanced understanding of how opportunities for meaningful doing - with others in natural settings - may enhance social wellbeing beyond the outcomes achieved through traditional group-based interventions, such as the adapted-ACT intervention evaluated in Chapter Four. However, for the measurement of individual wellbeing - which is considered by the GENIAL framework to comprise both a healthy body and balanced mind - quantitative measures typically used in wellbeing science and clinical fields may be less inclusive. Measurements used in clinical fields and research tend to narrowly assess mental wellbeing. For example, the widely used short Warwick-Edinburgh Mental Wellbeing Scale (sWEMWBS), the nine item Patient Health Questionnaire (PHQ-9) and seven item scale for capturing Generalised Anxiety Disorder (GAD-7) all overlook the adaptive value of negative emotions. As highlighted by Wong (2011, 2013), negative emotions contain seeds for personal growth and can foster meaning-making, personal resilience, and psychological flexibility – all of which are important post-ABI. This is a limitation, as wellbeing is not merely the presence of positive affect and absence of negative affect; it involves the capacity to navigate, tolerate, and learn from challenging experiences such as loss, frustration, social conflict, or physical and cognitive limitations

(Fredrickson, 2009). While some measures aim to capture broader processes that lean into such skills - such as psychological flexibility, exemplified by the CompACT used in Chapter Four, these are often lengthy, abstract, and limited in their ability to capture the nuanced ways in which negative emotions can serve as catalysts for PTG. This is precisely where qualitative methods add value; highlighting the potential for mixed methods approaches to offer a more holistic account of wellbeing following neurorehabilitative intervention. To capture whether such benefits are sustained, future research should ideally adopt longitudinal designs, enabling a richer understanding of the potential for lasting positive change.

Longitudinal mixed methods research, whilst resource intensive, is critical for assessing the sustainability of positive change. Evaluating whether participants continue to engage in nature-based activities, maintain value-driven lifestyles, sustain robust social connections or partake in altruistic or pro-environmental behaviours can provide essential insights into the lasting impact of these interventions and the broader societal and environmental benefits of such programmes. Such evidence is vital for supporting continued investment in effective practices, ensuring that healthcare decisions are informed by robust, enduring outcomes. Alongside this, economic analyses can illuminate the financial viability of programmes. However, commissioners are often incentivised by measurable short-to-medium-term savings (e.g., reduced NHS expenditure and increased productivity), which biases investment toward interventions that demonstrate rapid, quantifiable gains. In contrast, the deeper, multi-level outcomes emphasised in holistic wellbeing frameworks - such as identity, belonging, and nature connectedness - are less easily captured in traditional economic framings. Encouragingly, ongoing research is already building on the foundations of the work presenting in this thesis, paving the way for a more comprehensive understanding of sustainable wellbeing in holistic neurorehabilitation. Key developments inspired by the group nature-based activities evaluated herein are discussed in the following section.

## 9.10 From Evaluation Output to Broader Field Influence: Nature-Based Interventions for Holistic Wellbeing

Publishing service evaluations plays a crucial role in advancing applied knowledge and shaping the future of clinical interventions, with publication of the qualitative surf therapy evaluation in Chapter Six exemplifying this process. It has contributed to the growing recognition of nature-based interventions, such as surf therapy and similar activities, as valuable rehabilitation tools that build wellbeing beyond mere symptom alleviation. In doing so, it has expanded both the theoretical and practical understanding of how these therapies promote broader psychological, social, and environmental benefits. While some citations of this evaluation originate from within the clinical-academic network that facilitated this doctoral work, many come from broader neurorehabilitation circles. This wider engagement reflects a shifting paradigm in the field, where nature- and community-based interventions are increasingly seen as critical opportunities for fostering sustainable wellbeing. The influence of this work extends well beyond surf therapy, having catalysed broader discussions on the role of nature-based interventions in promoting human, collective, and planetary health. Ultimately, these contributions help pave the way for a more holistic understanding of wellbeing; one that transcends traditional, symptom-focussed models to support enduring, multi-level flourishing.

Directly building on the foundations set by the publication of the surf therapy evaluation presented in Chapter Six, Wilkie et al. (2022) employed a mixed-methods approach to assess both the psychological and physiological effects of the five-week surf therapy programme delivered by Surfability UK. They reported significant improvements in subjective mental wellbeing, alongside reductions in anxiety and increased happiness, as measured via a visual analogue scale. This builds upon the qualitative narrative of Chapter Six, demonstrating the potential for the surf therapy intervention to produce measurable improvements in psychological health. However, no statistically significant changes were found in anxiety and depression measures when measured using the Hospital Anxiety and Depression Scale (HADS) or resting heart rate variability (HRV), with the latter comprising a physiological marker of wellbeing. This discrepancy may reflect the conceptual difference between wellbeing (as targeted by the GENIAL framework) and illbeing (as measured by traditional clinical tools), underscoring the importance of using assessment tools that align with the holistic, strengths-based focus of wellbeing science. These findings also highlight the need for interventions more specifically targeted at managing emotional distress, such as adapted-ACT, which may complement nature-based approaches by providing structured strategies for acceptance and emotional regulation. Regarding the lack of statistically significant physiological changes, the study also demonstrates the challenges of capturing psychophysiological effects in applied settings, with methodological challenges exacerbated by the inability to control confounding variables such as alcohol intake, caffeine consumption, and participants' exercise routines (Fatisson et al., 2016). This highlights the need for more refined methodological tools to accurately assess the physiological impacts of wellbeing interventions.

Importantly, through the use of ripple effects mapping at 6-10 months follow up, qualitative insights pointed towards a profound mindset shift in participants, characterised by increased confidence, optimism and improved self-perception. This was attributed to the both the challenge imposed by learning to surf and the therapeutic group experience, where peer support helped participants to overcome fear and experience a sense of achievement – findings that resonate with the qualitative reports presented in Chapter Six. This empowered the adoption of sustained wellbeing-promoting behaviours at multiple levels, including increased mindfulness and physical activity at the individual level, strengthened personal relationships and community engagement at the social level, and a deeper connection to nature at the environmental level. In a similar vein, Østergaard et al. (2024) explored the lasting impact of a group-based stand-up paddling (SUP) intervention among women managing mental health disorders. Qualitative data collected 18 to 42 months post-intervention indicated enduring improvements in emotional balance, self-confidence and social connectedness, marked by reduced rumination, and increased positivity, freedom, and outward focus. Similarly to the findings of Wilkie et al. (2022), participants demonstrated a transformative shift in mindset facilitated by increased incorporation of blue space activities in their lives and continued to engage in new social and environmental contexts. This transformative shift in mindset illustrates the long-term and broadening benefits of water-based nature activities. It further supports the multi-level perspective of the transdisciplinary metatheoretical GENIAL framework and aligns with the emphasis of this thesis on the importance of nature-based activities as catalysts for long-term wellbeing across individual, social, and environmental domains. Moreover, it contributes to the longitudinal evidence demonstrating the sustained impact of such activities.

Further extending these insights, Denneman et al. (2024) report moderate to strong indication for improvements in self-perceived physical function, balance, and self-perceived recovery in adults with stroke and TBI following engagement in a five-day surf therapy programme. These gains, which included improvements in self-confidence, physical function, and a renewed sense of purpose, persisted at six-month follow-up. By quantitatively tracking changes over time, these findings complement the qualitative analyses of Wilkie et al. (2022), Østergaard et al. (2024) and that presented in Chapter Six by providing greater insight into the sustainability of intervention effects. Collectively, these studies not only complement the insights produced by this thesis but also reinforce the value of a mixed methods approach to understanding the sustained impact of nature-based interventions. They highlight that while the immediate therapeutic effects are important, the long-term sustainability of these benefits - measured across individual, community, and environmental dimensions - is crucial for informed decision-making in healthcare.

Beyond its clinical applications, the work presented in this thesis has contributed to a broader discourse on wellbeing and environmental sustainability concerns within communities that engage in health-promoting natural spaces for recreational activities. A growing body of research is positioning engagement with natural environments, such as blue spaces, as pivotal for not only personal health but also social and ecological responsibility. For example, Mach et al. (2024) build upon the application of the GENIAL framework in this thesis by investigating how place attachment to frequently visited natural environments (surf breaks) contribute to surfers' wellbeing, and how environmental threats (such as coastal development, reef degradation, and overcrowding) impact their experience. Using a Likert-scale measure aligned with the core domains of the GENIAL framework, Mach et al. (2024) found that those with a stronger emotional and functional connection to a surf break reported significantly greater wellbeing benefits, including improvements in physical health, emotional balance, and a strengthened sense of community and connection to nature. The ability to experience unspoiled natural environments was central to these benefits, with a lack of pollution and seeing wildlife and healthy coral reefs being amongst the most valuable attributes for fostering a positive connection to nature. These findings highlight that the wellbeing benefits attached to nature-based interventions and activities is inextricably linked to the ecological integrity of natural ecosystems, making conservation a critical factor in sustaining health-promoting spaces. Additionally, Mach et al. (2024) establish an important link between place attachment and conservation behaviours, demonstrating that those who feel more attached to frequently visited environments are more likely to engage in environmental conservation efforts, such as beach clean-ups and advocacy for ecological protections. These findings reinforce the idea that by strengthening individuals' connection to nature through targeted interventions, broader ecological stewardship may be cultivated that encourages active conservation and sustainable environmental management. Furthermore, qualitative insights highlighted how engagement in nature-based activities can enhance social cohesion and community, with nearly half of those interviewed reporting a reduction in isolation and many surfers expressing a desire to pass on their knowledge and environmental ethics to younger surfers, reinforcing the role of surfing as a vehicle for social integration and ecological awareness. Specifically, one participant noted how surfing "teaches people to take care of the ocean and each other." Thus, the work of Mach et al. (2024) extends the implications of the service evaluation presented in Chapter Six by providing compelling evidence that surf therapy not only promotes community and nature connectedness but can also foster community cohesion and inspire environmental stewardship, thereby contributing to long-term ecological sustainability.

Overall, these studies collectively demonstrate the interconnectedness of individual, social, and environmental health, reinforcing the need for holistic, nature-based interventions that promote long-term wellbeing in both human and ecological systems. In this way, the growing body of research applying the GENIAL framework emphasises the importance of integrating environmental sustainability into health interventions, ensuring that the wellbeing benefits derived from nature-based programmes are tied to the preservation and responsible management of the natural ecosystems that sustain them. Future research must continue to deepen understanding of the dynamic relationships between individual, community and environmental wellbeing, addressing the complex interplay that shapes outcomes in nature-based interventions. By incorporating robust control groups, refining assessment tools and expanding into different populations and ecological contexts, future research may build on the application of the GENIAL framework embodied in this thesis to capture the broader implications of these interventions for both human and planetary wellbeing.

## 9.11 Thesis Conclusion

To conclude, the work presented in this thesis illustrates the potential of wellbeing science to enhance neurorehabilitation practices, creating clinically relevant and personally meaningful value for adults living with ABI. Through the strategic application of the GENIAL metatheoretical framework, the qualitative work in this thesis highlights the importance of integrating multi-level, evidence-based interventions into neurorehabilitation. It calls for a paradigm shift from siloed, disease-focussed approaches to those that actively foster connections between individuals, their communities, and their environments. By addressing these interconnected levels of wellbeing, neurorehabilitation can evolve into a truly holistic and cross-sector practice. Moreover, this thesis reinforces the imperative to incorporate environmental sustainability into discussions of health and wellbeing, making it clear that human health cannot be separated from the health of the planet. By fostering a relational rather than extractive approach to nature, healthcare interventions can move beyond merely using natural spaces as therapeutic backdrops, towards models that promote mutual flourishing for both people and the planet. While the focus of this work is on ABI, many of the difficulties faced are not unique to this population. With figures demonstrating an exponential rise in the prevalence of chronic conditions, the insights gained here have broader implications for innovative healthcare strategies. Designing systems that integrate social ecology, environmental sustainability and systems thinking will further optimise opportunities for long-term wellbeing at scale. Future research must continue to refine and expand these multi-level approaches to ensure that healthcare decisions are informed by robust, enduring evidence that promotes sustainable, whole-person health and wellbeing for all. Indeed, the results may sit uneasily alongside prevailing economic models that privilege short-term, easily quantifiable outcomes - such as reduced NHS expenditure or return-to-work rates - over the broader and slower-developing components of wellbeing, such as having a sense of identity, acceptance, and belonging, which are critical to long-term adjustment and rebuilding post-ABI. This reliance on narrow metrics risks favouring interventions that deliver short-term, quantifiable gains while overlooking those that build deeper, multi-level wellbeing but require longer timeframes and different evaluation methods. Here, wellbeing science stands strong in offering a valuable reorientation. The GENIAL framework, which conceptualises wellbeing as emerging from connections to self, others, and nature across multiple levels of scale, provides a foundation for reimagining neurorehabilitation beyond a cost-containment view, supporting a vision of care that promotes flourishing at individual, community, and societal scales. Such an approach recognises that the true value of neurorehabilitation lies not only in reducing NHS expenditure or enabling return to work, but in enabling individuals with ABI to live lives of meaning, purpose, and connection. In line with the knowledge generated herein, calls for the ‘right to rehabilitation’ should extend beyond clinical access to include interventions that are genuinely holistic, with service models rooted in transdisciplinarity and collaborative partnership working, enabling neurorehabilitation to foster meaningful connection and promote wellbeing across multiple levels of scale. However, realising this vision will require sustained and increased investment in neurorehabilitation, ensuring services are adequately resourced to meet the full breadth of need.

# 10 Chapter Ten: Ensuring Quality in Qualitative Research: Upholding Rigour and Practicing Reflexivity

In contrast to quantitative traditions, where quality is defined through established criteria such as validity, reliability, and generalisability, qualitative research occupies a more nuanced and often contested methodological landscape. Here, notions of quality are shaped by the researcher's epistemological stance, disciplinary context, and evolving methodological debates within the field. This chapter explores how quality is conceptualised, demonstrated, and assessed within qualitative inquiry, before positioning the work presented in this thesis in relation to these guiding principles. It concludes with a reflexive account, written in first person, offering insight into the researcher's reasoning, decision-making, and evolving methodological understanding; thereby upholding key principles of high-quality qualitative research, and specifically, rigorous and reflexive TA.

Standards of quality, like all forms of social knowledge, are dynamic and embedded within specific disciplinary contexts and ongoing scholarly debates. While quantitative research is guided by well-established criteria such as validity, reliability, generalisability, and objectivity, the qualitative research landscape is characterised by a diverse range of concepts and discussions regarding quality, reflecting the nuanced and context-dependent nature of qualitative inquiry (Tracy, 2010; Tracy & Hinrichs, 2017). Broadly speaking, quality in qualitative inquiry can be achieved through a commitment to transparency, consistency, and coherence in both analytic process and reporting. Reflexive TA, as outlined by Braun and Clarke (2006, 2021), emphasises that quality resides in how well the researcher's interpretative choices are articulated, how consistently the analysis aligns with the stated epistemological and theoretical positions, and how coherently the themes generated by the researcher tell a meaningful story about the data. This contrasts to perceived markers of quality and rigour in work with post-positivist underpinnings, such as inter-coder reliability or the quantification of consensus across themes. While demonstration and evidence of rigour manifests in varying degrees in qualitative research, rigour in reflexive TA is best demonstrated through reflexivity, depth of engagement with the data, nuance, and the articulation of a clear analytic narrative (Tracy, 2010; Tracy & Hinrichs, 2017)

To support researchers in putting these principles into practice, Braun and Clarke (2006) proposed a 15-point checklist for TA. The checklist serves both as a guide for conducting TA and as a tool for retrospectively evaluating quality, offering a pragmatic framework for demonstrating transparency and consistency. Importantly, it reflects the view that the strength of qualitative research is judged, in part, by the coherence between philosophical positioning, aims of inquiry, the analytic process undertaken, and the claims advanced. This checklist has been retrospectively applied to demonstrate the quality of the work presented in this thesis, with an overview presented in Table 8 overleaf.

**Table 8**

*Applying Braun and Clarke's 15 Point Checklist of Quality Thematic Analysis*

| Process | No. | Criteria | Justification |
|---|---|---|---|
| **Transcription** | 1 | The data have been transcribed to an appropriate level of detail, and the transcripts have been checked against the tapes for 'accuracy.' | Audio data analysed in Chapter Four were carefully transcribed by the author and checked against the recordings to ensure they captured an appropriate level of detail. Audio data analysed in Chapters Six and Eight were transcribed by members of the CNS who were supporting the service during the delivery period. In line with ethical procedures, recordings were deleted following transcription, preventing any independent verification prior to analysis. However, transcripts were subsequently reviewed, cleaned, and grammatically edited by the author to ensure consistency and readability. |
| **Coding** | 2 | Each data item has been given equal attention in the coding process. | All data items were considered systematically, with equal attention afforded to their potential to generate new, meaningful, and theoretically relevant insights. |
| | 3 | Themes have not been generated from a few vivid examples (an anecdotal approach), but instead the coding process has been thorough, inclusive and comprehensive. | The coding process was thorough, inclusive, and conceptually driven. Themes were not based on a small number of vivid extracts but instead reflect comprehensive engagement with the dataset. Care was taken to avoid 'bucket' themes, and diverse extracts from multiple participants were incorporated to evidence analytic claims. |
| | 4 | All relevant extracts for each theme have been collated. | All relevant extracts were collated during the analytic process. Those included in the written output were carefully selected based on clarity, meaning, nuance and representativeness, while avoiding redundancy and maintaining narrative flow. |
| | 5 | Themes have been checked against each other and back to the original data set. | Themes were carefully reviewed for conceptual clarity and distinctiveness, considered in relation to one another, and repeatedly checked against the dataset to ensure a coherent and holistic analytic narrative. |
| | 6 | Themes are internally coherent, | All themes were developed to be internally coherent, consistent, and distinctive. This was supported through frequent 'sense-checking' |

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| | | consistent, and distinctive. | during regular supervisory discussions and further endorsed by independent peer reviewers of published work generated from Chapters Six and Eight. |
| **Analysis** | 7 | Data have been analysed - interpreted, made sense of - rather than just paraphrased or described. | Data were analysed interpretatively through the lens of wellbeing science, moving beyond description to generate theoretically informed and critical insights. Contrasting or less favourable perspectives were thoughtfully considered and situated in relation to the wider literature or field. The analytic narrative is evidence-based and balanced, with a rich ratio of data extracts to interpretation. |
| | 8 | Analysis and data match each other- the extracts illustrate the analytic claims. | Extracts were selected to directly support analytic claims, ensuring close alignment between evidence and interpretation. This alignment was sense-checked in supervisory meetings and affirmed by external peer review of published outputs for Chapters Six and Eight. |
| | 9 | Analysis tells a convincing and well-organised story about the data and topic. | The analytic narrative was carefully organised to tell a coherent and persuasive story. Each theme was designed to build on its predecessor, providing context and laying the foundations for subsequent insights, thereby reflecting the multi-level and synergistic application of the metatheoretical GENIAL framework. Evidence is integrated throughout, with the author's positioning explicitly articulated across multiple chapters, providing key insight into the perspectives and decisions that shaped the 'story' presented. |
| | 10 | A good balance between analytical narrative and illustrative extracts is | Each theme integrates a rich analytic narrative, supported by a minimum of five illustrative extracts. The balance ensures that extracts so not serve to 'stand alone,' but are embedded within interpretative narrative, consistent with the principles of reflexive TA and the aims of this thesis. While an earlier analysis (e.g., Chapter Six) demonstrated slightly less narrative depth than later chapters, it was reviewed and endorsed by supervisors and peer reviewers as achieving an appropriate balance between interpretation and illustration. The narrative was subsequently expanded upon to better align with the depth and richness of other qualitative outputs presented in this thesis. |
| **Overall** | 11 | Enough time has been allocated to | The analytic process for each evaluation unfolded over several months, affording time for depth and reflexivity. Only one analysis |

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|---|---|---|---|
| | | complete all phases of the analysis adequately, without rushing a phase or giving it a once-over-lightly. | was undertaken at any one time, and analytic outputs were revisited after extended breaks – exceeding a year in some cases. These breaks, consistent with Braun and Clarke's recommendations, supported critical engagement with the data, enabling the refinement of conceptual clarity, distinctiveness, coherence, and the overall contribution to knowledge production. Weaker themes were refined, merged, renamed, or reorganised as appropriate. |
| **Written Report** | 12 | The assumptions about, and specific approach to, thematic analysis are clearly explicated. | The underlying assumptions and specific approach to TA have been clearly articulated and justified in Chapter Three and are briefly reiterated in each qualitative chapter for accessibility and clarity. |
| | 13 | There is good fit between what you claim you do, and what you show you have done- i.e., described method and reported analysis are consistent. | The conduct and reporting of each analysis have been carefully conducted and reported in accordance with the underlying philosophical positioning and are detailed transparently in Chapter Ten. |
| | 14 | The language and concepts used in the report are consistent with the epistemological position of the analysis. | The terminology used throughout the text is consistent with both reflexive TA and the author's epistemological positioning. |
| | 15 | The researcher is positioned as active in the research process; themes do not just 'emerge.' | The active role of the researcher is explicitly acknowledged and positioned as an asset to the analytic process. The author's interpretative agency is evident throughout the evaluative chapters and is articulated in depth in Chapters Three and Ten. |

When considered against these criteria, the conduct and reporting of the analyses presented in this thesis demonstrate strong adherence to principles of transparency, consistency, and coherence. In particular, the analytic processes have been conducted with reflexivity, are well-documented, and the themes generated are both conceptually clear and meaningfully situated within broader theoretical frameworks. However, the ways in which quality is conceptualised in qualitative inquiry is ultimately shaped by one's epistemological and ontological underpinnings. A relevant illustration of this is provided by a scoping review by Leeson et al. (2023) of interventions designed to enhance social participation for adults with moderate-to-severe TBI. This review critically assessed the peer-reviewed published version of the service evaluation presented in Chapter Six, which critically unpacked participants' experiences of a group-based surf therapy intervention. While acknowledging the strengths of the evaluation, the authors critiqued several methodological aspects, particularly the small sample size ($n = 12$), the use of single-researcher coding, and the absence of triangulation. A response to this review is provided accordingly to further demonstrate divergent assumptions regarding quality in qualitative inquiry, and to clarify how the methodological choices underpinning this thesis align with the principles of reflexive TA and the epistemological foundations cited.

With respect to triangulation, while it is widely recognised as a valuable strategy for enhancing validity through the convergence of diverse data sources or methods (Patton, 1999), not all forms are appropriate for every research design. Critiques of this nature often stem from positivist principles that value inter-coder reliability and numerical generalisability, rather than appreciating the depth and nuance central to reflexive TA, where transparent engagement in the data is rooted in single-researcher reflexivity. In 'Big Q' qualitative research (discussed and practiced by Braun & Clarke, 2021), depth and richness of data take precedence over sample size, as emphasised in Chapter Three. A well-contextualised sample of twelve participants can yield meaningful and nuanced insights into complex phenomena, particularly when situated within a strong metatheoretical framework such as that of GENIAL, which has undergone several iterations and rigorous peer-review to strengthen its credibility. While iterative development and peer-review do not guarantee the absolute validity of the model, this thesis is one example of ongoing work to test and strengthen its applicability in the context of neurorehabilitation. With that, theoretical triangulation was inherently applied throughout the evaluations presented in this thesis, with the GENIAL framework providing a coherent conceptual framework that draws from an expansive theoretical basis, complemented by key, evidence-based principles of holistic neurorehabilitation which guided the interpretation of qualitative insights. This multi-theoretical approach allowed for a more nuanced understanding of how innovative group-based therapies facilitate wellbeing, identity reconstruction, and social reintegration for individuals with ABI, as per the aims of this thesis. While future studies may benefit from methodological and data source triangulation (i.e., incorporating diverse data sources and perspectives from family members or community stakeholders), the absence of this does not undermine the validity of the qualitative insights discussed. This is because wellbeing, like social connectedness and integration, is an inherently subjective experience, such that depth of insight may outweigh breadth.

This discussion shows that what one researcher considers a limitation may, from a different philosophical standpoint, be entirely appropriate and consistent with the goals of the chosen approach. Consequently, researchers should exercise caution when offering critiques of methodological quality, ensuring they first understand the theoretical and analytic frameworks underpinning the work under review. Superficial judgments grounded in positivist criteria risk not only misrepresenting the rigour and credibility of research designed to prioritise depth, reflexivity, and conceptual insight over numerical generalisability, but also spreading misconceptions about the validity of wholly qualitative, ‘Big Q’ approaches. Such misinterpretations can perpetuate the mistaken notion that qualitative inquiry is inherently less reliable, undermining confidence in research that intentionally values richness, nuance, and context. Awareness of these differing perspectives is therefore essential, both for fostering constructive dialogue and for advancing methodological literacy within and across the field, ensuring that the contributions of diverse qualitative approaches are accurately recognised and respected.

In an effort to establish a shared language for assessing quality across diverse qualitative paradigms, Tracy and Hinrichs (2017) propose the ‘Big Tent’ criteria - a framework that emphasises the end goals of qualitative inquiry rather than prescribing strict methodological pathways. While several frameworks for assessing qualitative quality exist, the Big Tent approach stands out for its parsimony, offering eight broad criteria that capture universal hallmarks of high-quality research while accommodating methodological diversity (Denzin, 2008). These criteria are concerned with worthiness, rigour, sincerity, credibility, resonance, significance, ethicality, and coherence. Each function as an end goal that may be achieved through different methodological approaches according to one’s purpose and positioning, offering flexibility while retaining conceptual clarity.

Firstly, the worthiness of the topic can be judged by qualities such as the timeliness of insights and the extent to which they are compelling. The work presented in this thesis is timely, given the increasing application of nature-based therapies for human health, alongside renewed calls for a 'right to rehab' in light of evidence on the economic and wellbeing burden of ABI (UKABIF, 2025). It compellingly demonstrates how two distinct yet complementary fields - holistic neurorehabilitation and wellbeing science - can be integrated to promote pathways to connectedness across multiple domains of scale. Rigour, meanwhile, concerns the depth and appropriateness of design, data collection, and analysis. This is evidenced throughout, due to the level of transparency in how data were sorted, organised, and interpreted, alongside a clear methodological description. Similarly, sincerity is reflected in explicit reflexivity and transparency, with the researcher's positionality, motivations, and interpretive role made clear, particularly in Chapters Three and later in Chapter Ten. Reflexive accounts are written in the first-person, and challenges are openly acknowledged. Credibility is facilitated by thick description, with interpretations scaffolded by the conceptual and empirical depth of the GENIAL framework and strengthened by supervisory expertise, which transcended clinical and psychological disciplines. The inclusion of divergent insights, interpreted with a lens of both empathy and critique, further strengthen the credibility of the findings.

The next two criteria, resonance and significance of contribution, are arguably more difficult to assess in situ, particularly when applying the framework to assess one's own work prior to dissemination. Resonance refers to the capacity of qualitative findings to influence, move, or engage audiences. In the context of the present thesis, richly described thematic narratives and emotive extracts invite connection from clinicians, researchers, and providers. The follow-up interest and further research arising from publication of the service evaluation presented in Chapter Six offers evidence of such resonance. Complementary to this, a significant contribution can be achieved when qualitative work extends, complicates, or reframes existing knowledge, theories or practices. This thesis provides a key contribution to existing knowledge and practice by demonstrating how wellbeing science can be embedded within holistic neurorehabilitation to support outcomes such as identity reconstruction, community connectedness, PTG and (re)engagement in meaningful activity. It also highlights pathways of connection to the self, others, and the environment, with positive implications for individual, collective and planetary wellbeing. While insights generated from service evaluations are not transferrable, they bear potential to enhance local clinical practice, particularly in relation to the domain summary themes that illuminate barriers to success. Moreover, these insights serve as an exemplar of how strategic partnership working can facilitate the delivery of previously unimaged nature-based interventions that promote pathways to whole health and flourishing in adults with ABI, providing inspiration for comparable services.

Ethical considerations are a cornerstone of high-quality qualitative research, as emphasised by the Big Tent criteria. While formal HRA approval was deemed unnecessary for the service evaluations presented in Chapter Six and Eight (see the statement on page seven for context), ethical standards were consistently prioritised throughout this thesis. This included obtaining informed consent, anonymising transcripts, de-identifying insights, and deleting audio data. These measures ensured that the work was conducted with integrity, respect for participants, and transparency. Furthermore, by drawing on service evaluation data, the present work ensures that insights shared in the good faith that they would inform service development are formally and meaningfully utilised. The final hallmark of quality TA proposed by Tracy and Hinrichs (2017) - meaningful coherence - is evident in the alignment of aims, ontological and epistemological positioning, methods, and reporting, which together produce a consistent and transparent narrative. Overall, the qualitative work presented in this thesis may be seen as worthy and of significance, conducted with rigour, sincerity, ethical integrity, and meaningful coherency, having potentially resonated across both applied and scholarly domains. With the context of what ensures quality clarified, the following (and final) written section of this thesis aims to fulfil the claim for transparency by further illuminating the interpretative role of the researcher and detailing the process of analysis and knowledge production in depth, as outlined in Table 8 above. It provides a reflective account of how reflexivity was practiced, and how complexities of the analytical processes were navigated. Positioning this discussion within a core chapter underscores its centrality in contextualising the work. In line with the reflexive approach outlined in Chapter Three and consistent with principles of reflexive TA, these reflections are presented in the first person, deliberately foregrounding the active role of the researcher in shaping the interpretation and analytic outcomes.

## 10.1 Further Contextualising the Analytic Process: Decisions, Reflections and Revisions Made

The process of conducting qualitative research, particularly as an outside researcher, involved my grappling with unfamiliar methodologies and negotiating the demands of balancing methodological rigour with the unique challenges posed by the field. These reflections serve to illuminate how I approached data collection and analysis, highlighting the practical, ethical, and epistemological considerations that shaped the applied work. By providing this contextual narrative, the chapter aims to add an additional layer of transparency and reflexivity to the thesis. It complements the procedural details outlined in the methods chapter and the thematic insights presented in the research and service evaluation chapters. The goal is not only to account for decisions made, but also to offer a candid reflection on the learning process and its impact on the research outputs. In doing so, this chapter underscores the iterative and evolving nature of qualitative inquiry, particularly for a novice researcher, and seeks to foster a clearer understanding of how the analytical framework was constructed and the interpretative lens applied. This reflexive exploration ultimately seeks to enrich the reader's appreciation of the analytic process, while providing a foundation for critical engagement with the findings. Given that the first chapter within the thesis represents both my first and most recent analysis, an in-depth account of the process is provided.

### 10.1.1 The First Encounter: Navigating a (Now) Mixed-Methods Evaluation of Adapted ACT for Stroke and ABI

The manuscript titled *'Promoting Acceptance and Adjustment: A Mixed Methods Evaluation of an Adapted-ACT Intervention for Adults Living with Mild to Moderate Distress Post-ABI'* marked my first engagement with qualitative research after my supervisors were approached by a clinical team from a local health board facing significant resource constraints. The team sought a researcher to support data collection and analysis for their project. This partnership emerged organically, with me being motivated by an alignment between the research topic and my academic interests, particularly my conceptual thesis framework and a broader rejection of reductionist ideologies in health and wellbeing. My foundational knowledge of ACT principles earned through my postgraduate studies and my prior experience in neurorehabilitation settings contributed to my initial understanding of the intervention's context. At an inception meeting with the clinical team, it was agreed that I would lead the qualitative component of the study. TA, as outlined by Braun and Clarke (2006), was selected as the analytic framework due to its flexibility and compatibility with the research aims and my personal ontological and epistemological standpoint at the time. I now candidly acknowledge that my philosophical understanding of these positions was nascent, necessitating a commitment to ongoing self-education and engagement with relevant literature throughout the project. From this point, I developed a semi-structured topic guide, drawing on drafts from previous similar studies (e.g., Large et al., 2020) and refining them with input from my supervisor, a Consultant Clinical Psychologist. Progress was swift, and I commenced data collection as soon as the topic guide was approved by the wider clinical team.

Individual interviews were arranged with consenting participants with the support of an Assistant Psychologist working at the health board. I followed the semi-structured topic guide but adapted it to reduce unnecessary repetition where possible, ensuring a balance between brevity across topics and a natural flow in the depth and progression of conversation. During data collection, I maintained regular debriefings with the clinical team, which enabled them to address any potential participant distress and to provide a space for me to reflect on my interactions and refine my technique. I began transcription and preliminary analysis (coding) before completing all twelve interviews, engaging in iterative reflection on my evolving interpretations of the data. As the interviews progressed, I observed diminishing novelty in the data. The decision to conclude data collection after twelve interviews was made in consultation with the clinical team, as diminishing novelty in the data indicated saturation and the sample size was consistent with typical qualitative research norms

The analytic process was supported by qualitative analysis software, Atlas.ti. Initial coding was primarily inductive and semantic, reflecting my limited engagement with the empirical literature on ACT and holistic neurorehabilitation, and my (then) belief that codes should ‘stay close to the data’. Examples of early codes included *acceptance*, *emotional relief*, *belonging and understanding*, and *gratitude*. The initial coding cycle generated 126 codes, which were iteratively refined (merged, eliminated, or renamed) until approximately one-third of the original codes remained. Notably, during the analytic process, the UK entered lockdown due to the COVID-19 pandemic, temporarily halting progress on the manuscript as the challenges posed by the lockdown were addressed. Work resumed in the summer, during which themes and subthemes were developed and meticulously categorised. Here, I focussed on ensuring clarity and distinctiveness and worked to ensure subthemes were balanced across the themes. Throughout this process, I closely followed Braun and Clarke’s six-step approach to TA. This adherence likely reflected my prior exposure to positivist and empirical traditions during my undergraduate and postgraduate training, where structured, linear processes were emphasised. However, as the analysis progressed, I deepened my understanding of Braun and Clarke’s emphasis on flexibility within TA, recognising that the six steps were proposed as a guiding framework intended to describe a recursive process, rather than rigid, chronological stages for producing ‘good’ TA. I actively engaged with this recursivity, repeatedly refining my analytic output through fortnightly discussions with my supervisors. During these meetings, I provided updates on my progress, articulated my reasoning behind key decisions, and reflected on how my evolving interpretations were shaping the analysis. An example of my early workings is presented in Appendix E. At the time, my understanding of Braun and Clarke’s thematic approach was still developing and the inherent complexities and ambiguities of the field meant that the concept of reflexive practice was not yet fully incorporated into the analysis.

Following the completion of an early manuscript, the clinical team at the health board invited me to take the lead on analysing and reporting the outcomes of the quantitative component of the study. This decision was driven by the team’s significant resource constraints, which had been further exacerbated by the global pandemic. My expanded role involved analysing the data and integrating the findings from the quantitative arm of the study into a cohesive mixed-methods manuscript. The quantitative analysis was completed and woven into the qualitative narrative, enabling a more comprehensive understanding of both objective and subjective outcomes following participants’ engagement in the adapted ACT intervention. The final manuscript underwent review and discussion with members of the clinical team, ensuring alignment with their goals and clinical priorities. Additionally, I delivered a presentation summarising the key findings and highlighting actionable recommendations for enhancing the adapted ACT intervention, further bridging the gap between research and practice. The manuscript was later substantially revised, with the process described in detail in due course. However, in the interest of providing a chronological account of my reflexive and analytic journey, my second interaction with qualitative methodologies is detailed accordingly.

### 10.1.2 Deepening Familiarity but with Room to Grow: A Qualitative Service Evaluation of a Nuanced, Nature-Based Surf Therapy Intervention

The manuscript titled *‘Riding the wave into wellbeing: A qualitative evaluation of surf therapy for individuals living with acquired brain injury’* presented in Chapter Six represents a key milestone in my qualitative research journey. This peer-reviewed publication was produced after deeper engagement with wellbeing theories, specifically, the metatheoretical GENIAL framework, and Braun and Clarke’s approach to reflexive TA. Unlike the exploratory, inductive approach adopted in my earlier qualitative work, this analysis was more deductive and latent, reflecting my expanding knowledge of psychological wellbeing theories, including Seligman's (2011) PERMA model and the *Broaden and Build* theory of positive emotions proposed by Fredrickson's Fredrickson (2004), to name a few. Consequently, the analysis was driven by a more theory-informed lens through which participant insights were critically unpacked.

The analytic process mirrored many of the steps described in the earlier qualitative chapter, beginning with an extensive familiarisation phase. This was particularly critical, as the service evaluation data had been collected several years prior to my candidature. Accordingly, I familiarised myself with the concept of service evaluations, which required careful consideration to ensure ethical data use. The initial cycle of analysis resulted in six overarching themes and 31 subthemes. These early themes included *Engaging with Nature*, *Facilitating Trust and Safety*, *Building a Balanced Mind*, *Establishing a Sense of Community*, *Positive Change*, and *Barriers and Opportunities* (a domain summary theme included to capture considerations critical to informing local clinical practice). As the analysis progressed, these themes underwent considerable refinement to enhance their conceptual clarity and meaningfulness. For example, the theme *Engaging with Nature* was reframed as *Connection to Nature*, emphasising the role of connectedness as a central wellbeing construct within the GENIAL framework and the immersive experience of interacting with the sea's elements. Similarly, *Building a Balanced Mind* was split into two distinct themes: *Managing and Accepting Difficult Emotions* and *Facilitating Positive Emotion, Meaning, and Purpose*. This decision was made during the narrative writing phase, as the original theme was too broad to communicate coherently, which risked undermining conceptual clarity and depth. The new themes more accurately captured the balance between hedonic and eudaimonic aspects of wellbeing, aligning closely with terminology adopted by the GENIAL framework while ensuring accessibility for a broader clinical audience. Additionally, the theme *Establishing a Sense of Community* was redefined as *Building Community through Social Connection* to better convey the active, ongoing process of fostering community, particularly for individuals with ABI. Emphasising 'building' rather than 'establishing' was considered to better reflect the process-oriented nature of connection.

The manuscript was developed to meet the rigorous standards of peer-reviewed journals. Consequently, the analytic output was initially structured into a distinct results and discussion section. Following submission to *PLOS ONE*, two independent reviewers provided positive yet thought-provoking feedback, recommending the integration of these sections to enhance the depth and coherence of the analysis. This merging process provided me with an opportunity to critically reflect on how well the selected quotes evidenced the themes, leading to further refinement and reorganisation of the analytic output. I took the lead in addressing reviewer feedback, demonstrating my growing confidence and expertise as a qualitative researcher. The manuscript was published in early 2022 and subsequently featured as a special article in *PLOS ONE*'s focus on qualitative research, highlighting its nuance and clinical relevance. This achievement marked a defining milestone in my academic journey, solidifying my identity as a qualitative researcher and showcasing my ability to produce impactful, theory-driven qualitative work.

### 10.1.3 Finding My Place and Owning My Space: Conducting a Large-Scale Qualitative Service Evaluation of Ecotherapy for Adults Living with ABI

The final qualitative chapter of this thesis, titled *'Constructing the Conditions for Wellbeing: A Qualitative Evaluation of Group-Based Ecotherapy for Adults Living with Acquired Brain Injury'* (presented in Chapter Eight) marks another milestone in my qualitative journey. This chapter reflects my engagement with the largest dataset of my work to date, encompassing insights from seven focus group discussions involving 48 participants.

The analytic process was more fluid and less labour-intensive compared to earlier evaluations, reflecting my growing confidence in using TA and my deepening immersion in wellbeing science. This theoretical grounding provided the critical lens through which data were interpreted and unpacked. The manuscript was developed with the intent to submit it to a peer-reviewed journal, with the *Journal of Neurorehabilitation* identified as a suitable target to disseminate the findings and highlight the health board's innovative efforts in partnering with a local social enterprise to deliver construction-based ecotherapy interventions to adults living with ABI. The coding approach in this project leaned more heavily on deductive methods than in earlier work, informed by my advanced understanding of wellbeing frameworks. However, inductive coding was also employed to ensure that unique and nuanced insights were captured. The naming of themes and subthemes demonstrated my evolving style, moving away from the conventional and often restrictive terminology common in psychology toward more creative and descriptive labels, inspired by the standards of social science and Braun and Clarke's own thematic examples.

A total of four overarching themes were generated, representing the fewest themes across all projects presented in this thesis, despite this chapter encompassing the largest data set. This may reflect a more sophisticated and nuanced depth of analysis, demonstrating deliberate thematic refinement and avoiding analytic foreclosure. Themes hereby captured the importance of 1) Broadening skills and building for the future in supporting movement towards an engaged and meaningful life; 2) Shared experiences with similar others, which paved the way for belonging in group memberships; 3) Self-acceptance and identity in cultivating resources for personal growth, and 4) Connecting and contributing, which is critical in consideration of community and planetary wellbeing. Consistent with earlier projects, a domain summary theme was included to outline opportunities for enhancing clinical practice, thereby ensuring the practical applicability of the findings.

This manuscript represented a pivotal moment in which I began to fully own both my skills and my identity as a qualitative researcher. Written alongside a thorough reading of Braun and Clarke's *Thematic Analysis: A Practical Guide* published in late 2021, I gained a deeper appreciation of the nuances and complexities inherent in reflexive TA. It illuminated why ambiguity in the field had initially caused confusion, particularly regarding what reflexive TA entails. I came to understand that many researchers, including colleagues, claimed to have conducted TA inspired by Braun and Clarke but were in fact employing 'small-q' qualitative approaches grounded in positivist paradigms. This misalignment produced outputs that looked markedly different from those generated using true reflexive TA. Through this learning process, I developed a deeper understanding of reflexivity, critical realism, and theory of interpretation. I recognised that, while my analysis had always been methodologically appropriate, evidence of reflexive practice - such as maintaining a reflexivity journal - had not been implemented from the outset. This realisation prompted me to draft an extensive methods paper to transparently document my approach and revisit earlier work to embed reflexivity more thoroughly. Accordingly, a detailed overview of my final analytic encounter (within the context of this thesis) is provided below.

### 10.1.4 Back to the Beginning

In recognition of my growth as a qualitative researcher, it was only fitting to revisit my early work. The manuscript '*Promoting Acceptance and Adjustment: A Mixed Methods Evaluation of an Adapted-ACT Intervention for Adults Living with Mild to Moderate Distress Post-ABI'* (presented in Chapter Four) was revisited prior to thesis submission, with the intention of refining themes to better capture the proposed processes underlying change. In the first instance, the theme *'Feeling Supported and Understood'* was renamed *'Supported Self-Disclosure'* to emphasise why feeling supported and understood was meaningful within the context of group-based ACT, particularly in fostering openness and trust. Similarly, the theme *'Finding Acceptance'* was revised to *'Making Room for Difficult Emotions'* to explicitly convey what participants were accepting - i.e., difficult emotions - and to highlight the active effort required in this process. The theme *'Having the Tools to Carry On'* was renamed *'Practicing Strategies for Emotional Regulation'* to reflect the active, ongoing effort participants needed to manage emotional challenges effectively. Additionally, the theme *'Gratitude and Connecting with Values'* was retitled *'Learning That There's Life After Injury'* to better capture the broader realisation of hope and purpose post-injury as participants (re)connected with their values. This theme was also repositioned as the fifth theme to better align with the chronological and conceptual progression of participants' experiences in accordance with principles of PTG, which in itself is considered a process, and not an endpoint or destination. The domain summary was expanded to underscore the importance of tailored delivery in adapted ACT interventions for adults living with stroke and brain injury. This included emphasising the need for sustained support to ensure long-term impact. Any data or contextual details that did not align with the revised themes or contribute meaningfully to answering the research question were removed to enhance the clarity and focus of the narrative. In addition, content was integrated to strengthen the evidence base for specific themes, particularly *'Making Room for Difficult Emotions,'* thus ensuring a more comprehensive analytic output. This was necessary, as previous drafts had prioritised succinctness over substance, given that the qualitative output was just one component of the mixed-methods evaluation.

Aware of the critical importance of reflexivity, I contemplated the theme *'Willingness to Engage,'* sensing that something was amiss. I reflected on how my personal experiences during lockdown may have influenced its generation. During that period, I observed others grappling with mental health difficulties and alcohol dependency, noting that regardless of the support available, an individual must take the first step toward addressing their challenges. This step requires an openness to self-betterment and a willingness to experience difficult emotions, both psychologically and physically. Upon revisiting the manuscript, I critically evaluated the inclusion and representation of this theme. I acknowledged that *'Willingness to Engage'* was conceptually weak as a standalone theme, containing only two subthemes: *Openness to Change* (15 codes) and *Wanting to Help or Better Oneself* (20 codes). In comparison, other themes were supported by at least three subthemes and nearly twice as many codes (e.g., *Acceptance*). However, I recognised that *'Willingness to Engage'* encapsulated a critical aspect of the process of change in any intervention, aligning with Prochaska and DiClemente's (1982) *Stages of Change* model, which describes the stages individuals move through to facilitate behavioural change. To strengthen the conceptual clarity and coherence of the thematic framework, I decided to merge this content with the theme *'Supported Self-Disclosure,'* which was subsequently renamed *'Openness and Supported Self-Disclosure.'* This revision better captured the interplay between participants' initial openness to experience and their willingness to engage, highlighting these elements as foundational to the process of self-disclosure and personal growth within the intervention. Merging of these two themes worked well. However, upon reading through the qualitative narrative with the new theme names in mind, it opened a 'worm hole' and prompted me to make changes to the remaining (then) four themes.

When reviewing the theme *'Making Room for Difficult Emotions,'* I re-examined the dataset in Atlas.ti with the aim of identifying additional quotes to strengthen the evidence supporting my interpretive claims. During this process, it became clear that much of the content coded under the sub-theme *'acceptance'* actually reflected a nuanced form of *self-acceptance,* distinct from the type of acceptance commonly discussed in the ACT literature (i.e., non-judgemental acceptance of mental experiences). Drawing upon recent readings of Fergus Gracey, which rarely feature in ACT discourse, I recognised the importance of integrating this perspective into the qualitative analysis.

Given the conceptual linkages between identity and values, I incorporated this insight into the existing theme, *'Learning that There's Life After Injury,'* and renamed it *'Self-Acceptance, Compassion, and (Re)Connecting with Values.'* This revised theme better captured the processes of accepting oneself, fostering self-compassion, and aligning actions with personally meaningful goals. However, this expansion created a thematic imbalance, as the remaining two themes contained disproportionately fewer quotations. To address this, I merged the themes *'Making Room for Difficult Emotions'* and *'Practicing Strategies for Emotional Regulation,'* as both addressed overlapping aspects of acceptance, emotional balance, and responding flexibility.

The final thematic structure thus comprises three interconnected themes:

1. *Openness and Supported Self-Disclosure,*
2. *Accepting Mental Experiences, Learning to Regulate and Choosing How to Respond,* and

3. *Self-Acceptance, Compassion, and (Re)Connecting with Values.*

This reorganisation has enriched the contextual narrative, ensuring the themes more comprehensively reflect the multifaceted and interconnected processes underpinning positive change in group-based adapted ACT interventions for adults experiencing mild-to-moderate distress post-stroke or brain injury.

In reviewing the manuscript in its entirety, I identified that a small subset of the twelve interview participants were disproportionately represented across the themes, despite efforts to ensure that all participants were cited. This imbalance can be attributed to two key factors inherent to the population: (a) some participants were more willing or able to provide detailed reflections on their experiences and perceived processes during one-to-one interviews with an external researcher, and (b) certain participants demonstrated stronger communication skills, enhancing the clarity and interpretability of their contributions. The quotes selected for inclusion were those that embodied the essence of the overarching themes. These quotes were typically more detailed, descriptive, and reflective, often provided by participants better equipped to articulate and process their experiences, challenges, and learnings. For instance, the contributions of Participant Six were represented only through a brief in-text quote. Upon reviewing this participant's transcript, it became evident that their responses to open-ended questions were limited, often consisting of short statements of agreement rather than substantive reflections. Such variability is expected when working with populations experiencing significant cognitive or speech and language difficulties. Finally, while the qualitative analysis aimed to capture a comprehensive and nuanced representation of insights shared by the participants and interpreted by myself, it is important to acknowledge that the extent to which participants benefited from the intervention or internalised the principles of ACT cannot be fully determined from this data. To this end, I carefully incorporated contrasting evidence into the analysis, ensuring a balanced and nuanced narrative that captures the complexity of change and adaptation following participants' engagement in a group-based adapted-ACT intervention. In a similar vein, I hope that this narrative reflects the multifaceted process of transformation and growth that I have experienced through my engagement with reflexive TA, and that the reader can appreciate and understand the complexities of change inherent to such approaches.

To conclude these reflections: by embracing reflexivity later in my journey, I learned that my unique knowledge, beliefs, and experiences were not limitations, but essential tools for unlocking the true potential of qualitative research. This shift in perspective reinforced my identity as a qualitative researcher and underscored the transformative value of embracing complexity and transparency in qualitative inquiry. Moving forward, I remain committed to continually enhancing my qualitative practice and have developed a deep passion for sharing knowledge about reflexive TA. With gratitude, I offer heartfelt thanks to those who supported me throughout this journey of discovery and growth, and I endeavour to carry forward the lessons of reflexivity, curiosity, and openness that will continue to guide my work as a qualitative researcher.

# Appendices

## Appendix A: Adapted-Act Participant Information Sheet (Chapter Four)

IRAS PROJECT ID: 259095

24.02.2019 v1.3

### The 'Rebuilding your life after Stroke and Brain Injury' Group

### Participant Information Sheet

We would like to invite you to take part in a research study to help us learn more about how to support people after a stroke or brain injury. Before you decide to take part it is important for you to understand *why* the research is being conducted and *what* it will involve for you. There are two parts to this study. There is no obligation to participate in both parts if you do not want to.

Please take the time to read the following information carefully. Discuss it with others if you wish. Please don't hesitate to ask us if there is anything that is not clear or if you would like more information before making your decision.

---

#### What is the study?

For some people having a stroke or brain injury can cause drastic and unexpected changes to their lives. After such an event, people may feel depressed or anxious, be frustrated or feel overwhelmed by their current situation. These feelings are common, and although they usually improve with time, for some people they can persist. We think a model of therapy called Acceptance and Commitment Therapy ("ACT" for short) could be helpful in reducing distress and improving wellbeing after stroke or brain injury.

ACT teaches people to accept what is out of their personal control. It is basedf on the idea that generally trying to rid ourselves of pain or distress only serves to increase it. The alternative then is to accept it – but that doesn't mean being defeated or tolerating suffering. ACT is about learning skills to make room for painful feelings, thoughts, and sensations. That is, allowing them to be there without having to struggle against them. But, it is more than just this, it is also about committing to action that improves and enriches our lives.

*There are two parts to this study.*

## What is involved in Part 1 of the study?

Part 1 will look at how effective ACT is in improving participant's levels of distress and psychological well-being. In order to evaluate the effectiveness of this therapy properly, people who register their interest to participate will be randomly allocated into one of two groups. Group 1: will be invited to attend the ACT group as soon as possible. Group 2: will first go on a waiting list to receive ACT and then will be invited to attend the group six weeks later.

## What is involved in Part 2 of the study?

We are also interested in learning about participants personal experiences of how they found the ACT group. This could help us to gain feedback on what elements were most or least helpful for group members. Part 2 will therefore involve a short interview.

## Why are you doing this?

When conducting research there are lots of factors that may lead to change in how a person feels. For example, a person may simply feel better with time. In part 1, one of the ways we try to 'control' for things like time is to include a 'control' or comparison group in the study. People randomly allocated to the 'control' group serve as a comparison for the group that receive ACT. The two groups are assessed in the same way. Therefore, any difference between the groups can be attributed to the intervention itself. The 'control' group will then be invited to attend the ACT group at a later date.

In part 2, we are keen to gain feedback on the ACT model and its use in supporting people who have had a stroke or brain injury. We recognise that talking to people about their experiences can provide lots of rich and valuable data that we would not necessarily get through questionnaires.

## What will the group be like?

The group is a five-week therapeutic intervention called “Rebuilding your life after stroke or brain injury”. It is very important that you try to commit to all five sessions as they are closely linked. Sessions will last 2.5 hours, with a break included in the middle of each session. The layout of the sessions will be the same. Information will be provided through discussions and a PowerPoint presentation. There will also be opportunities to practice skills that are taught in the group. Groups will be small in size, ranging from 6 – 12 people. You do not have to contribute or speak if you do not wish to do so. However, you may find you take more away from the experience if you do.

## What exactly is involved if I agree to participate in Part 1 of the research?

If you decide to take part in the research there will be four questionnaires to complete. These should take no longer than 20 minutes in total. Everyone will be asked to complete the same questionnaires at the start and end of the group. We would also like you to complete these questionnaires again 10 weeks after you finish, so we can see if any potential benefits of ACT have been maintained. We may contact you via telephone or post to complete these forms for the final time.

If you are allocated to the waiting list (‘control’) group, we will ask you to complete the same questionnaires, at the same time points (as outlined above). We will also ask you to complete a set of questionnaires when the treatment group begins. This allows us to determine if ACT is better than no treatment.

## What exactly is involved if I agree to participate in Part 2 of the research?

You will need to commit to an interview session, which will be held within the first month after the ACT course. Each session should last approximately 45-60 minutes. These sessions will be audio-recorded to support the researcher in transcribing and analysing what you want to tell them.

## Do I have to take part?

There is absolutely no requirement to participate in the research. If you wish to join the course but not take part you will still be welcomed as a valuable member. Whatever you decide it will not impact on the standard of care that you receive.

## How will my information be used?

It is hoped that the data from this research will be published in scientific journals, and presented at stroke and brain injury conferences. It is hoped this research will be rolled-out as a supportive treatment for people living with the effects of stroke or brain injury within the Aneurin Bevan Health-Board. You will be given the opportunity to receive a summary of the finding after the research is complete. You will not be identified in any report/publication related to this research.

## What are the benefits of this research?

We hope you will find some benefit from either attending the ACT group itself or by reflecting on your experiences of the group. We also hope that participation may benefit you and other service-users in the future. As ACT is a new research area in stroke and brain injury we hope your direct feedback and views can help contribute to the development of new psychological and support services.

## Are there any risks in participating in any part of this study?

People vary in how they get on with different kinds of psychological treatments. It is possible that completing questionnaires, the content of our ACT sessions or participating in interviews where issues around stroke/brain injury are discussed might be upsetting to you. To minimise this, if at any point you feel distressed please speak to the researcher or one of the group facilitators who would be happy to support you. If you notice your mood worsens over the group, we expect you to discuss this with the facilitators so that they can arrange extra help and support for you through your GP or local services, as appropriate.

## Will my taking part in the study be kept confidential?

Your participation in the research will be kept strictly confidential. The questionnaires (from part 1) and audio-recordings (from part 2) will only be used by the researcher and their research team. All data will be anonymised to protect your identity. Paperwork will be kept in a locked filing cabinet on NHS premises, whilst audio-recordings will be stored as an encrypted file. Identifiable information will be destroyed within 5 years.

Your GP will also be informed of when you start and finish the ACT group. However, information that you share in the group or in an interview will not be shared back to them. This will be kept private.

NB: The researcher has a duty to protect people from harm. There are some legal and ethical rules they must obey which could require them to override confidentiality in the unlikely event that there is a risk of harm.

### Will I be paid for this study?

No, there is no payment for taking part in this study.

### Who has reviewed the study?

This research has been reviewed by Wales REC 3 (REC reference: 19/WA/0026) who have given it a favourable ethical opinion for conduct.

### Contact for further information

If you are potentially interested in taking part in this study, please either phone Dr Rebecca Large on [redacted] or email [redacted]

## Thank you for taking the time to read this information sheet.

Please feel free to discuss this with others and/or to contact us with any questions if there is anything you are unsure about or would like more information on. We would be most grateful if you could now indicate on the page below if you would like to participate in this study or not. If you agree to take part, you will be asked to sign a consent form and will be given a copy for your own records.

**Research Officer:**

Georgie Radford
Community Brain Injury Specialist Nurse

**Principal Investigator:**

Dr Rebecca Large
Clinical Psychologist
Community Neuro-Rehabilitation Service
County Hospital
Coed-y-Gric Road,
Griffithstown,
Pontypool
NP4 5YA
Email: [redacted]

## Statement In compliance with the General Data Protection Regulation 2018 (EU 2016/679)

Aneurin Bevan University Health Board is the sponsor for this study based in the United Kingdom and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. Aneurin Bevan University Health Board will not keep identifiable information about you.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information by contacting the Data Protection Officer Richard Howells at DPO.ABB@wales.nhs.uk.

Aneurin Bevan University Health Board will collect information from you and/or your medical records for this research study in accordance with our instructions.

Aneurin Bevan University Health Board will use your case record number, to contact you about the research study, and make sure that relevant information about the study is recorded for your care, and to oversee the quality of the study. Individuals from Aneurin Bevan University Health Board and regulatory organisations may look at your medical and research records to check the accuracy of the research study. Aneurin Bevan University Health Board will only receive information without any identifying information. The people who analyse the information will not be able to identify you and will not be able to find out your name, case record number or contact details. The only people in Aneurin Bevan University Health Board who will have access to information that identifies you will be people who need to contact you to about the BBOAC study or audit the data collection process. The people who analyse the information will not be able to identify you and will not be able to find out your name, case record number or contact details.

Aneurin Bevan University Health Board will keep identifiable information about you from this study 10 years after the study has finished.

This information will not identify you and will not be combined with other information in a way that could identify you. The information will only be used for the purpose of health and care research, and cannot be used to contact you or to affect your care. It will not be used to make decisions about future services available to you, such as insurance.

## Appendix B: Activities Booklet for the Adapted-ACT Programme
## (Chapter Four)

# Rebuilding your life after Stroke or Brain Injury

**Community Neuro-Rehabilitation Service**

[redacted]

# Activity Workbook

## A short group based on Acceptance and Commitment Therapy

*Resources extracted or adapted from: Russ Harris (2008) The Happiness Trap; Russ Harris (2012) The Reality Slap. Steven Hayes & Spencer Smith (2005) Get out of your mind and into your life; Ray Owen (2011) Facing the Storm.*

GIG
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WALES

Bwrdd Iechyd
Aneurin Bevan
Health Board

## Conditions to Success

These are group conditions to keep ourselves and others safe, and to ensure the group is productive.

- ***Confidentiality***. This means what's said in the room stays in the room. This includes names of other group members and any information shared by them. Confidentiality will only be broken by group facilitators who have a professional obligation to act if they are concerned about your safety, or the safety of others.

- ***Attendance***. We encourage attendance at every session to get the best out of the group – after all, you only get what you put in. However, we recognise that life goes on outside of the group, so if you are unable to attend a session, please ring [redacted] to let us know.

- ***Time Out***. Talking about the impact of your stroke or brain injury, and ways of managing distress, may feel overwhelming for some people. If you need to take a moment or want to step outside for 5 minutes, please feel free to do this. If you decide to leave, a member of the team will come to check that you are okay.

- ***Respect***. We are all going to have different opinions, experiences and choices, and that is okay.

- ***Sharing Information***. The group is about learning new and effective ways of coping, not about disclosing lots of personal information about yourself or your past unless it is relevant to learning a new skill.

- ***Mobile phones***. To reduce the risk of being interrupted we ask that mobile phones are switched off during the group or remain on silent. If you are expecting a call then please let us know before the group begins.

- ***Looking after yourself.*** Do what you need to do to remain comfortable during the group. If you need to stand up or have a stretch please do. You are also welcome to bring a drink or snack with you. We will aim to have a 15 – 20 minute break halfway through the session.

- ***Press Pause.*** We recognise that group members might want to share their stories or experiences. At times however, the group facilitators may '*press pause*' to either follow up on something important that has been said, or to assist in moving the discussions forward to ensure that all the material is covered each session.

## Group structure

Our group sessions will last for 2.5 hours, with a break half-way through.

- **Recap.** We will briefly talk about what was covered in the previous session to refresh our memories.

- **Home practice feedback.** We will get feedback on the exercises set between each session, as we know this aids learning. Remember, the more you practice these, the more you will take away from the experience.

- **Introduce a new topic.** This will be the focus of the group for this week.

- **Mindfulness Exercise.** Some group sessions will start with a mindfulness exercise. This is a useful skill to help bring us back into the 'present moment'.

- **Coffee Break.** After approximately an hour the group will be encouraged to have a coffee and comfort break.

- **Set home practice.** For the group to be most effective, home practice is essential. As such, we may ask you to practice techniques you have learnt in the group between sessions.

**Week 1:** Getting to know each other
**Week 2:** Exploring thoughts and feelings, and how we cope with them
**Week 3:** Thinking about what's important to you
**Week 4:** Moving more into the 'present moment'
**Week 5:** Getting distance from difficult thoughts and feelings

We may refer to this booklet in each session, therefore please try and bring it with you each week.

# Week 1

## What is the aim of this group?

- To improve *self-awareness*.
- To learn about and practice *skills* that may help to *manage difficult thoughts and/or emotions* more effectively.
- To help you think about *your values* and supporting you to behave in a *way that matters to you*.

## Acceptance and Commitment Therapy (ACT)

This 5-week group is based on a therapy called '**Acceptance and Commitment Therapy**' or '**ACT**' for short.

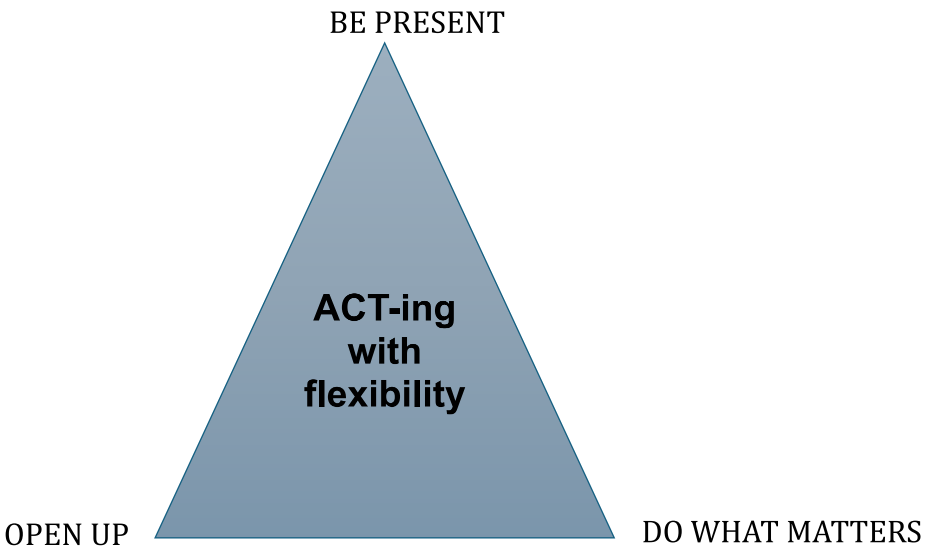
It is a very active therapy – not one where we just talk about problems.

ACT teaches that trying to get rid of our distress and pain only serves to increase it. It is often better to 'accept' or 'adjust' to things we cannot control.

Such acceptance is not easy. This course will teach you ways of accepting or making room for painful and distressing thoughts and feelings.

ACT also shows us how to make a commitment to act in ways that improve and enrich our lives despite having had a stroke or brain injury.

So, there are three main areas we will be focussing on:



1) **BEING OPEN:** Sometimes we can get tangled up in our thoughts or our feelings. Being open to these experiences can stop people getting caught up in these painful thoughts and feelings.

2) **BEING PRESENT:** Often we can lose contact with the present moment and get caught up in the past and/or the future. Shifting our attention onto what we are doing in the 'here and now' can help us to get more fulfilment, enjoyment or satisfaction from the moment.

3) **DOING WHAT MATTERS:** Sometimes we are not sure what matters to us and this may lead us to act ineffectively or in unhelpful ways. Identifying what is important to us can help us to act or behave in meaningful ways, despite the difficult thoughts and feelings.

If we struggle with being open, being present and doing what matters then we may notice we feel *"stuck".*

We hope this course will teach you skills or ways of becoming "*unstuck*".

## Home Practice: Let’s reflect on today’s session!

The first session of a group can sometimes be a daunting experience, particularly if you don’t know what to expect or what type of people you are likely to meet.

Some people may really enjoy this first session. Others might notice their minds throw up unhelpful comments or criticise how they were in the group.

Whatever your experience, it can be helpful to spend some time afterwards to reflect on the event. This might help you to think about what you took from the session. Or what emotions or thoughts came up for you.

Here are a few suggestions of what you might like to reflect on:

The conversations you’ve had today

What thoughts, emotions and/or physical sensations came up for you?

The people you’ve met

Your experiences of the first session

How you think this group might help you

Please write any reflections you have here:

Please write any reflections you have here:

The above sheets are for your **PERSONAL USE ONLY**.

We will not collect these sheets, mark answers or ask you to share what you have written. However, the notes you make may be very sensitive and we would therefore encourage you to keep them in a safe and private place.

# Week 2

## Exploring thoughts and feelings, and how we cope with them

### The Reality Slap

There will be a time in our lives when we have all received a **Reality Slap**. That is, a moment when life suddenly deals us a painful blow. A blow that comes as a shock, that hurts and which sometimes can knock us off balance.

***The reality slap can take different forms.***

Sometimes it's so violent, it's like a right-hook coming at you or a punch to the gut. This might include: the death of a loved one, a fire, a serious illness or injury, a freak accident, or your children moving overseas. At other times the slap might be gentler - a flash of envy when we realise someone else has got something we want; pangs of loneliness when we notice we are disconnected from others or the world around us; or bursts of anger if we are treated wrongly by others.

***The reality slap can also vary in time.***

Sometimes the slap fades quickly, a passing moment that moves into our memory. At other times, it may knock us senseless, leaving us dazed for days or weeks.

Whatever form the reality slap takes, we know that it hurts.
**We don't expect it, we don't like it and we definitely do not want it!**

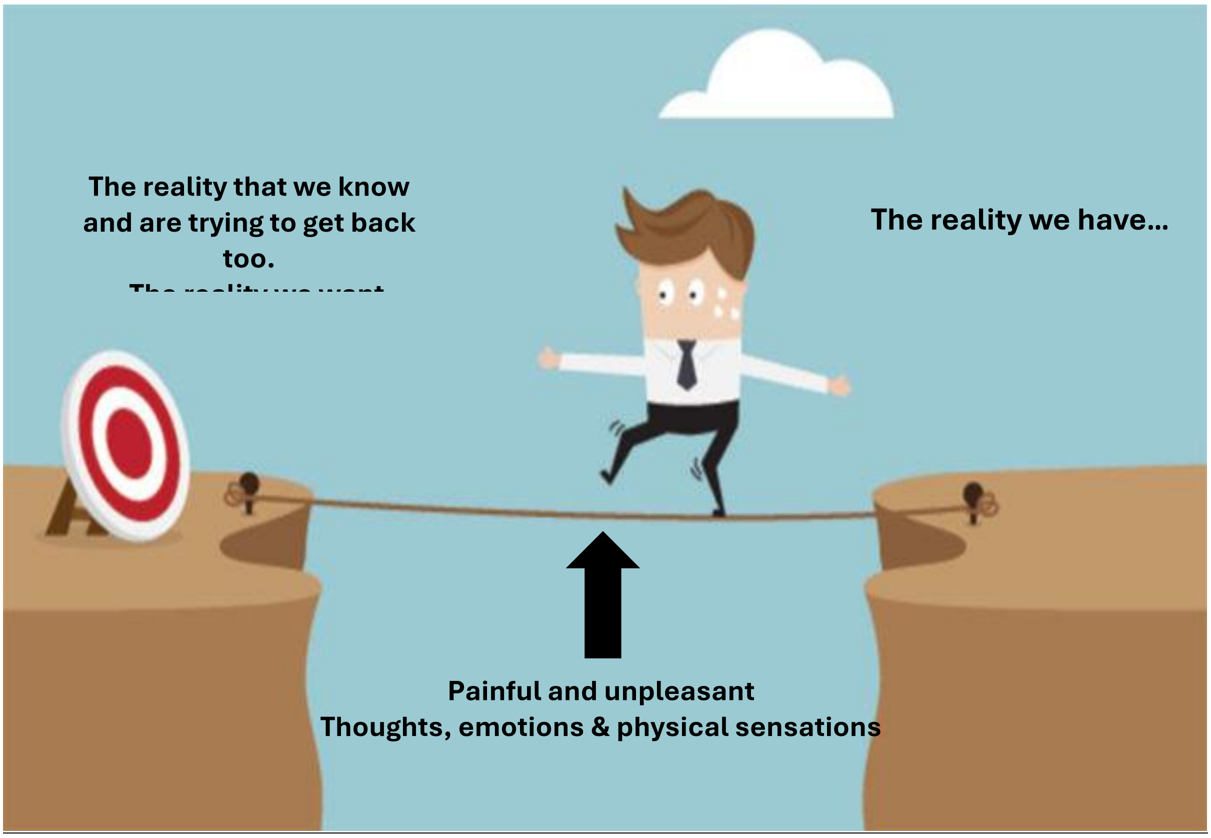
This slap may stir up lots of things for us, but unfortunately it is only the beginning, what comes next is the **reality gap**…

### The Reality Gap

When we talk about the **Reality Gap**, we recognise that on one side we have the reality we are currently living, and on the other is the reality we know or are trying to get back too.

Unfortunately, the bigger the gap between these two realities, the more painful thoughts, feelings and physical sensations we notice arising. For example, fear, shock, disappointment, frustration, sadness, anxiety, or criticising thoughts.

Compared to the reality slap which is usually over quite quickly, the reality gap may persist for much longer (e.g., days, weeks, months, and even years).



Given the pain and distress this reality gap causes, it is understandable that our first instinct is to try and close the gap. We try to do whatever is possible to get us back to where we used to be, and if we succeed in doing this, the gap closes and we feel good.

But what happens if we *can't* get what we want or *can't* close the gap? For example, what happens when our partner leaves us, when a loved one dies, when someone doesn't want to be friends with you, or we are diagnosed with a chronic illness?

Alternatively, what happens if we can close the gap slightly but it *may take a long, long time*? How do we cope in the meantime?

The bigger the gap and the longer it stays open, the **more we tend to struggle**. The difficulty with this, is that struggling also brings up lots of painful or unpleasant thoughts, feelings and/or physical sensations which we also fight against.

**We hope this group will provide you with some skills that may help manage the pain and distress you may notice from your own situation, or reality gap.**

## *Why does this happen? Why do painful thoughts/feelings show up?*

As humans have evolved, our minds have become much better at detecting threats, looking out for danger and helping us to survive in the world. The downside to this is that our minds have not evolved to make us feel good, instead we are constantly on alert for things that may harm us.

Our minds assess, analyse and judge almost everything we encounter. Asking ourselves – is this good or bad? Safe or dangerous? Harmful or helpful?

This innate 'threat-detection' system was enormously useful to our ancestors. Imagine being confronted by a large sabre-tooth tiger… our minds would have recognised this as a threat, and would have helped us to act in a way that promoted our survival. Perhaps to attack it? To run away from it? To hide out of harm's way?

These days, although we are not fighting against sabre-tooth tigers, our modern-day minds will warn us about other things it sees as threatening or dangerous. For example, our minds may cause us to worry about losing our job, being rejected, not being able to pay the bills, or embarrassing ourselves in public. As a result we may find we worry a lot about things, which more often than not, never happen.

In these moments, you may also notice that your mind can be cold and uncaring. As human beings we use and rely on language (compared to other animals), and this unfortunately can often add to our distress. We may compare, evaluate and criticise ourselves; focus on what we are lacking; or we may be dissatisfied with what we have. In a sense, our minds have not only evolved to protect us, but they have evolved to think negatively. Although this functions to 'keep us safe', it is inevitable that it also adds to our pain and/or discomfort.

Not only does our mind criticise and judge, and place us on high alert for danger, it can also conjure up lots of different emotions or feelings.

As part of being human **you will experience a full range of emotions** throughout your life and in different situations that you face. You will experience pleasurable feelings (such as, excitement, enjoyment and satisfaction). However, you will also undoubtedly experience uncomfortable feelings, such as sadness, fear or anger. These emotions are expected. They are **natural and normal responses** for us all, and often provide us with valuable information about what matters to us.

## The Control Dilemma

Although our mind is simply doing its job, it's understandable that when it throws up unhelpful thoughts or painful emotions, our natural reaction is to want to control how we feel.

We are taught from an early age that we should be able to control our thoughts and feelings. Perhaps when you were growing up you heard "*don't cry*" or "*stop feeling sorry for yourself*". Now, as adults perhaps you have also been told to "*get over it*" or to "*pull yourself together*" during hard times. The issue with this is that it implies we should be able to turn our feelings off at will, like a switch, which we know is not possible!

The fact that we may struggle to control our thoughts or feelings can also cause some people to believe that they have failed or that they aren't as good as others who can control them better.

In reality, **no-one can fully control their thoughts and feelings**. People may try to control difficult thoughts and feelings, and they may get some temporary relief from them. However, undoubtedly the mind will start up again sooner or later. We can either continue trying to control or fight against them (using lots of energy and time in the process), or **we can learn how to change our relationship with them**.

**How much control do we have? Well, let's test this out….**

For the next 30 seconds **do not** think about a pink elephant. What happens? What do you notice?

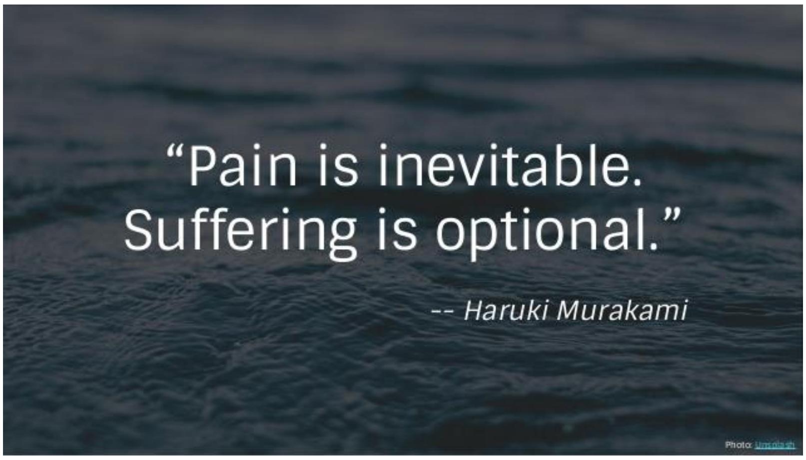
If you can fall madly, passionately, **genuinely** in love with this man, we will give you £1million pounds. Are you able to do it?

The good news is… there is **hope**. Although you cannot control your thoughts and feelings, you can control what to do in the face of difficult thoughts or feelings. We are in control of our actions.

You can learn how to recognise times when your mind might hook you into unhelpful thoughts, emotions and/or physical sensations. Perhaps more importantly, you can also learn how to pull yourself out of these moments and ways to stay out!

## The reality is life involves pain.

There's no getting away from it. Although we cannot avoid pain, we can learn to handle it more effectively – that is, we can try to make room for it, rise above it, and in doing so create a life that is meaningful and fulfilling.



"Pain is inevitable.
Suffering is optional."

-- *Haruki Murakami*

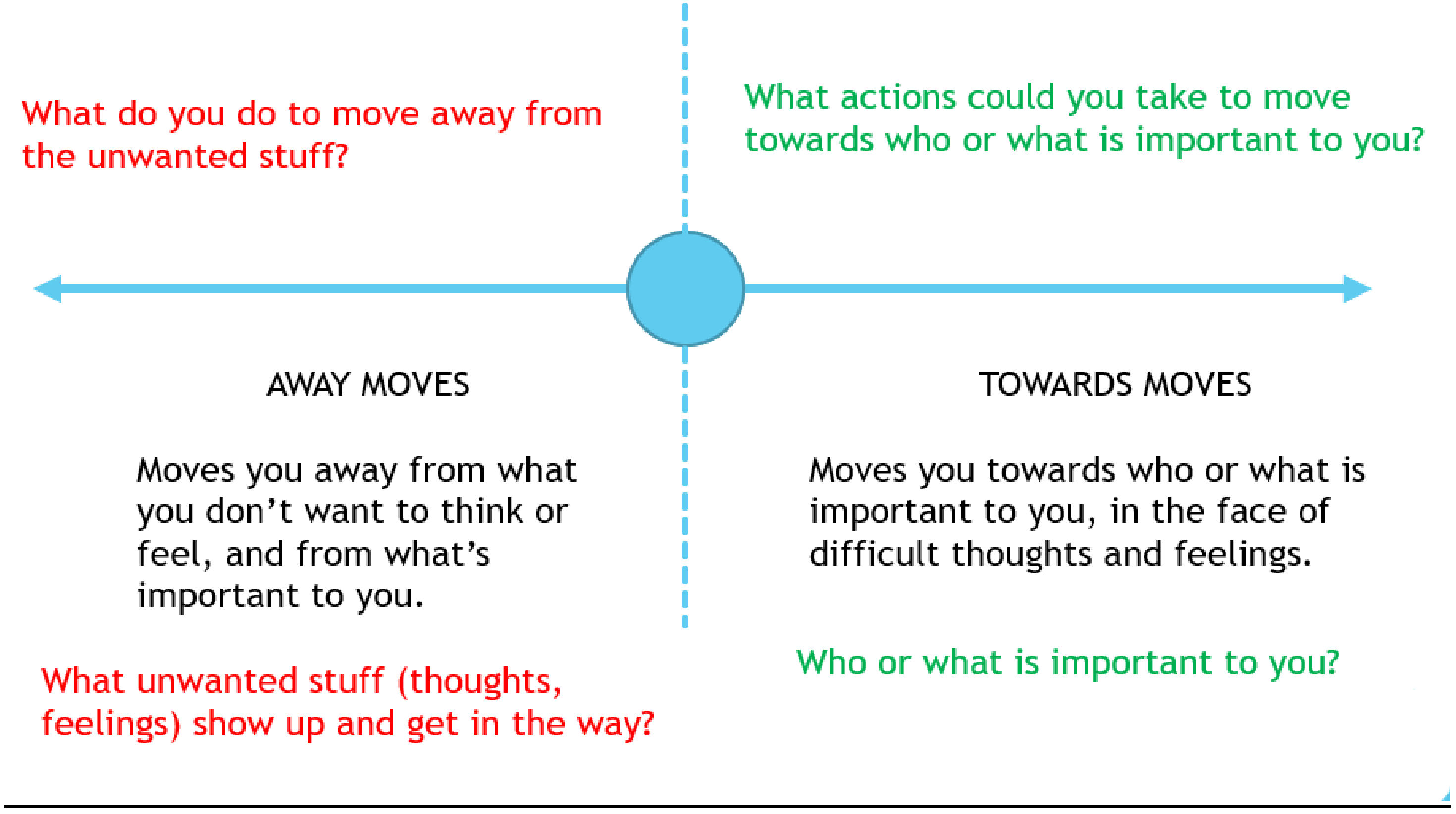
Photo: Unsplash

There is *always a choice* in how you respond or react to these thoughts, emotions and/or physical sensations, and the *choice is always yours*.

## THE ‘ACT’ MATRIX

When faced with distress we can choose to act in a way that moves us towards our values, or we can choose to act in a way that moves us away from them. Neither is right or wrong. Instead, in any given situation, you could ask yourself ‘What is the most workable action I can take right now?’

Remember, you always have a choice over how you act.



What do you do to move away from the unwanted stuff?

What actions could you take to move towards who or what is important to you?

AWAY MOVES

Moves you away from what you don’t want to think or feel, and from what’s important to you.

TOWARDS MOVES

Moves you towards who or what is important to you, in the face of difficult thoughts and feelings.

What unwanted stuff (thoughts, feelings) show up and get in the way?

Who or what is important to you?

## Now, let’s think about your current ways of coping...

It can be helpful to ask yourself the following questions:

1) When you are having a difficult day, what might be going through your mind?
2) When you are having a difficult day, what might you notice in your body? Are there certain emotions showing up? Or physical sensations?
3) When painful thoughts or feelings show up, how do you currently deal with them? How might you act or behave?
4) How effective are these strategies in the short and long-term?
5) Do they get you to where you want to be? Or are there costs to them?

There are **no right or wrong answers** to these questions, and we know that at different times or in different situations, certain strategies may work better than others. The main question is whether we think our coping strategies are helpful or unhelpful, effective or ineffective, in getting us to where we want to be.

Try completing the exercise below so that you can keep a note of what comes up for you during stressful or difficult times, and how you usually cope with them.

## Home Practice:

What are the main thoughts and feelings that are problematic for you? Write these down under ‘Body’ and ‘Mind’

| **BODY** [Physical sensations, emotions] | **MIND** [Thoughts, memories, beliefs, worries] |
|---|---|
| | |

Next, write down *all* the solutions you have tried to get rid of, avoid, escape or distract yourself from these thoughts, emotions or physical sensations.

Now, think about filling in the following table.

Think about the strategies you have identified above and their long-term effects.

| What have I done to get rid of problematic thoughts, emotions, memories or sensations? | A. Did your thoughts & feelings go away?<br>B. Did they return in the long run? | Have these strategies brought you closer to the way you want to be living or have they stopped you doing something important? | What has this cost you? E.g., in terms of wasted time, energy, or money; or negative effects on health, wellbeing, work, leisure & relationships? |
|---|---|---|---|
| | | | |

## Week 3

## Thinking about what's important to YOU

Today, we will spend time trying to work out what's important to you i.e., what your values are. Everyone's values are *unique* to them. Typically, they tend to stay roughly the same throughout our lives. Although sometimes we may prioritise certain values at different times depending on a situation or where we are in life.

It's okay if you feel unsure of what your values might be. This session will hopefully help you to think about what matters to you *right now*.

### What are Values?

A value is like a path or a compass, guiding us through life.

They are qualities you wish to cultivate - things that are very important to you and which give your life purpose and meaning.

Values are personal to us, and as such, you will notice that no two people's values are ever the same.

They also tend to be life-long (unlike goals, which have an end-point).

### What are Goals?

Goals in contrast are usually things we want to achieve, things that indicate we have succeeded, or signs that we are on the right path. For example, we might want to get a degree, become a best-selling author, get married, become a home-owner etc. These are all **goals**. We can tick them off our list as we achieve them, or not.

A goal is a sign we are on the right path, but it is not <u>THE</u> path.

Goals can be helpful and motivating, but if we are over-focussed on goals our lives can feel pressured and restricted. People who are **goal-oriented,** who focus largely on their successes and achievements, often experience more pain and suffering.

**Watch out for the happiness trap**! If we constantly focus on achieving a goal and succeed, it feels great, we feel happy for a short while. But soon after, we are looking for the next goal to achieve, then the next goal and so on. Before long, you are caught in a cycle that offers short-term happiness and this is far less fulfilling than living a life that's in accordance with your values.

## What are *my* values?

To work out what your values are and what really matters to you, **imagine it's your 80th birthday party**. Halfway through the party, the people who are important to you and to whom you are important, have come together to give a speech that celebrates you and your life. During this speech, your friends spend time talking about the kind of person they experienced you to be.

- **What kind of things would you like your friends to say about you?**
- **What qualities would you like to hear about yourself?**

Write down your main values here:

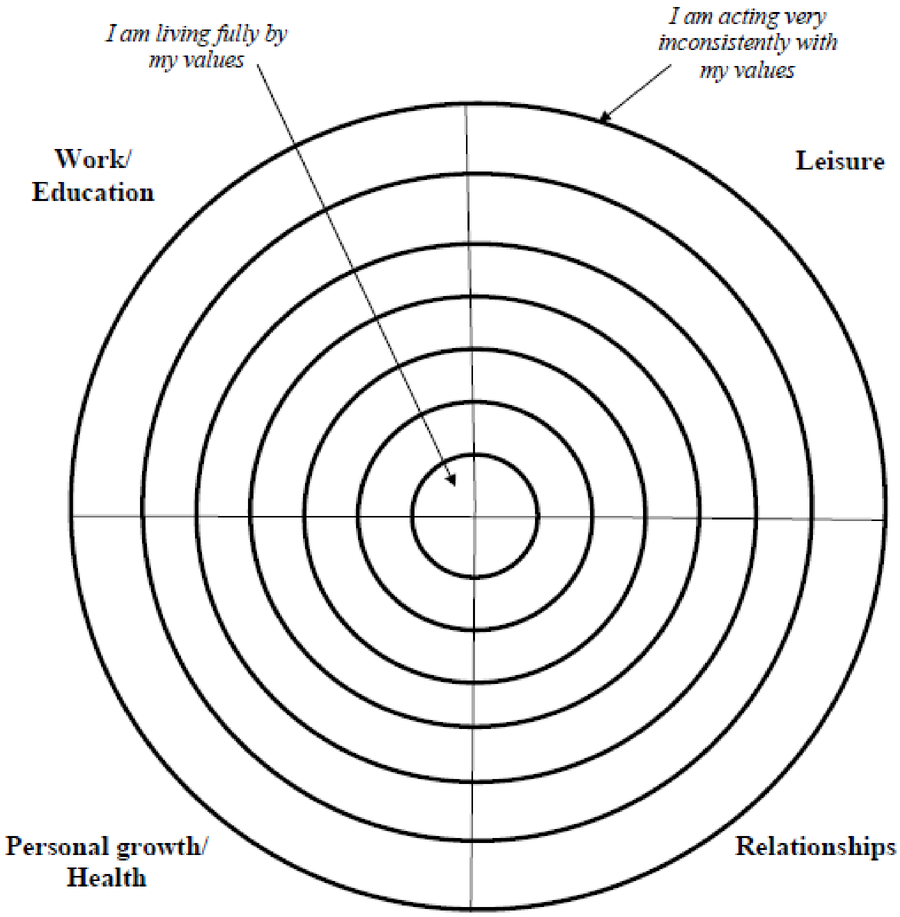
Now you have identified your values, you can now think about how closely you are living towards them. Use the bulls-eye worksheet to help you with this.

**Bulls-Eye: How closely am I living towards my values?**

The values you have identified may fit within a certain life area, for example:

- **Work/Education:** workplace, career, education and skills development.
- **Relationships:** partner, children, parents, friends, co-workers etc.
- **Personal Growth/Health:** religion/spirituality, creativity, life skills, nature, exercise, nutrition etc.
- **Leisure:** how you play, relax, stimulate or enjoy yourself.

Use the bulls-eye below to make an **X** in each area of the dart board to represent where you stand today.



# Acting on your values

(This is also called “Committed Action”)

**Committed action** means acting in line with your values – doing what is truly important to you – even if its feels difficult or uncomfortable.

**It is:**

- *Making a commitment* to a valued direction

- Accepting that sometimes *you may go “off-course*”, again and again, and again…

- Committing to *getting back on track* when you realise what has happened

## Do what it takes

When we act on things that are important to us it can make it easier to open up to difficult thoughts and feelings.

To help you think about setting some goals that are based on your values, it can be helpful to **follow the three steps below**:

(1) Choose an area of your life that is a high priority for change
E.g., relationships, leisure, wellbeing etc.

(2) Choose the values you want to pursue in this life area
E.g., to be caring, to be adventurous, or to be spiritual.

(3) Develop goals, guided by those values.
To do this is can be helpful to ask yourself: What’s the smallest, easiest step I can take in the next 24 hours that will take me a bit further in the direction of my value.

## Barriers to Action

It can take practice to set and act on your values-based goals. It is also inevitable that you will encounter some barriers along the way.

Good preparation can help you to reach your goals and overcome any barriers that threaten to derail your plans. Preparing a list of your goals can help you to identify any potential problems to ensure you stay on track.

Write down any barriers you might come up against as you think about making a commitment to act on something important to you.

**Be aware of these barriers:**

- **Hooking or 'fusing' with unhelpful thoughts** – when we set out to make change, it is normal for our mind to throw up "negative" thoughts. Fusing with these thoughts can stop us moving forward. (More on this in Week 5!)

- **Avoidance of discomfort** – Change usually gives rise to uncomfortable feelings (e.g., anxiety); you need to be willing to allow this discomfort to be there to move forward.

- **Remoteness from values** – If goals aren't meaningful or important to what you value in life, you'll lose motivation.

- **Excessive Goals** – If goals are too big, we either give up or fail. Goals need to be realistic.

- **Emotional Goals:** Setting a goal to feel a certain way is likely to keep you stuck as it is not something we can change. (Remember from the group that we spoke about the fact that we are unable to control our feelings). Instead, focus your goal on *acting* in a certain way that will take you closer to your value.

- **"I'll try but…":** this often shows that your goal is too big, isn't connected to an important value or that you may be caught up with a particular thought/feeling. Think about breaking your goal down into smaller steps or checking in with yourself to see if this goal is connected to an important value of yours. If it's not, you need to change your goal.

- **"But it makes me feel bad":** Setting yourself a goal that connects with something meaningful to you may bring up painful or upsetting thoughts and feelings in the short-term. Ask yourself, would acting on this value add fulfilment, meaning and/or purpose to my life? If you answer yes, are you willing to experience difficult feelings in order to move closer to your chosen value?

- **"I want to stop doing X":** A goal focussed on *stopping* or *doing less* of something is hard to do. Instead, change it to a goal about doing something. Ask yourself… If I was no longer doing X, what would I be doing with my time? How would I be acting differently? Make this your goal.

**TRY TO BREAK DOWN THOSE BARRIERS IF YOU NOTICE THEM!**

## Home Practice

- Try setting yourself some small, realistic goals which are based on your values.

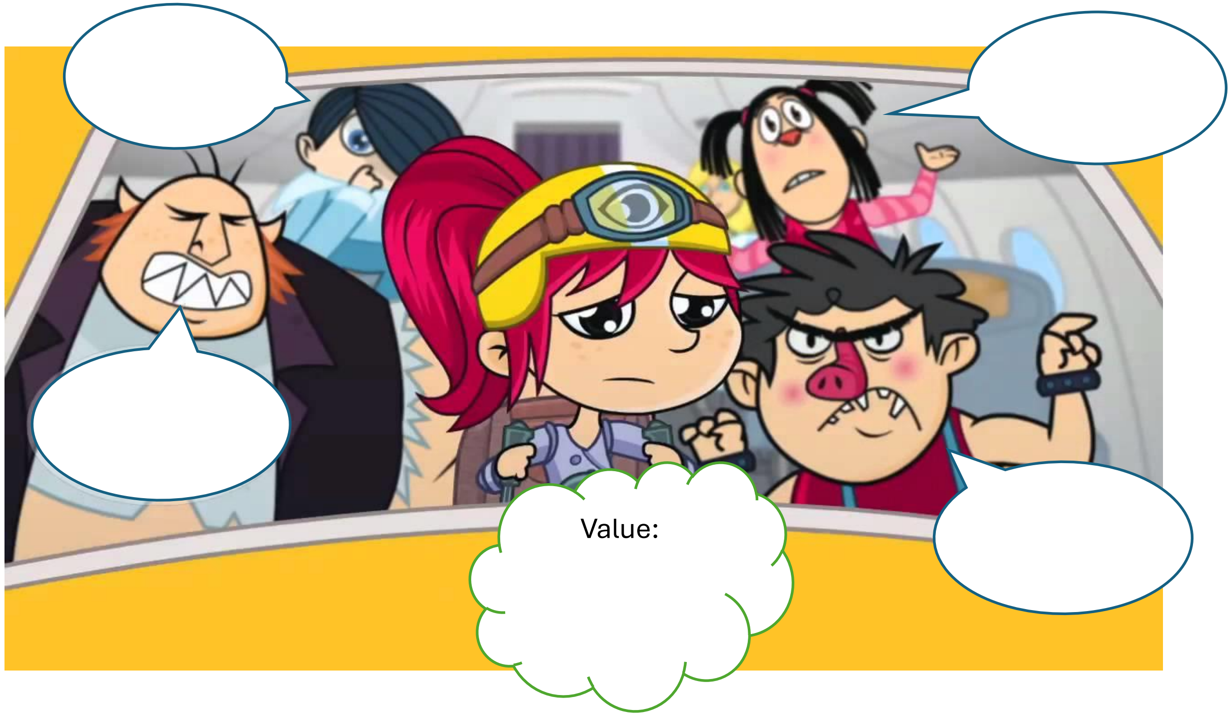
- What is the smallest thing you can do between now and next week that helps you move closer to the value you want to prioritise?

- Make a commitment to act on that goal.

## Struggling with Internal Hijackers

Think of yourself as the pilot of a plane. You want to fly towards the things you value most.

Identify the direction you would like to head in – your value – and write it in the space provided. Now identify the passengers on your plane – these are, the difficult thoughts, feelings, memories, sensations. The passengers that if you listen to them, will guide you off course, off of your valued path.



You have two choices in this situation:

**Choice 1:** Take the detour and may be the passengers will agree to hide in the back of plane for a while. If you do this, you may not be going to where you value, but you get some relief from the unpleasant thoughts and feelings (i.e., the passengers). This gives you a short break from the passengers for a short time, but eventually they will want to come to the front of the plane again.

**Choice 2:** Go in your valued direction. The passengers may come to the front of the plane and be unpleasant, but they cannot push you off your valued path. You may even notice that those passengers get bored of the fact you're not listening to them, and eventually quieten down of their own accord.

# Week 4

## Moving more into the ‘PRESENT’ moment

Being in the **‘Here & Now’** means paying attention in a particular way:

- On purpose
- In the present moment, and
- Non-judgmentally

You might also have heard of this as ‘**Mindfulness**’

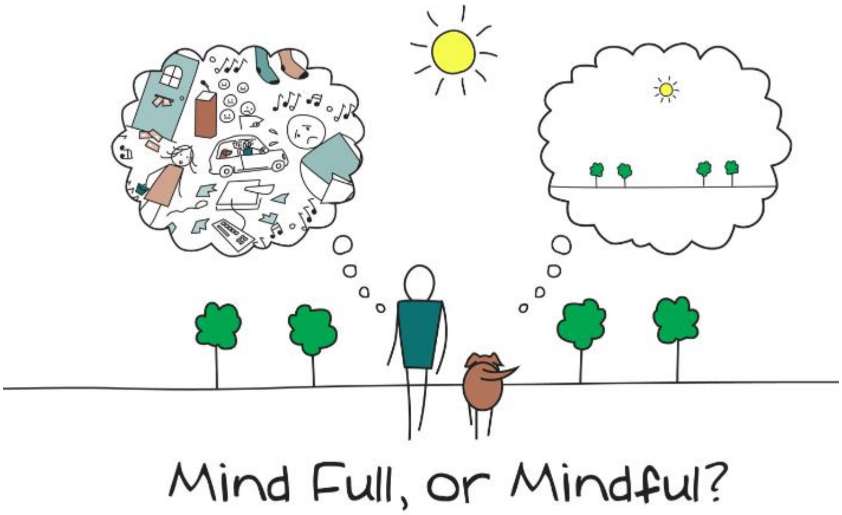
Being open, aware and non-judgemental can allow us to effectively handle even the most difficult feelings, memories, thoughts and sensations.

It is different from relaxation. The aim is not to feel relaxed or to get rid of the distress. It is simply observing and being aware of the present moment.

This includes observing what is going on **externally** (i.e., what you are doing), as well as **internally** (i.e., thoughts, emotions and physical sensations).

If you have ever noticed yourself becoming completely absorbed in what you are doing, paying full attention to the task using all your senses, you have been mindful.

Our physical self, our body, is always present, but often our mind is not.



These ‘present moment’ or ‘mindfulness’ skills might seem simple, but because it is so different to how our minds normally behave, it can take practice.

## Being on Automatic Pilot

Most of us can relate to the idea of functioning on "**automatic pilot**", where we do tasks without giving them much conscious thought. Our brain has repeated the same information so much that it is now hard-wired and therefore happens automatically.

This is pretty convenient when you think about it. However, more often than not it means we can get lost in our thoughts and feelings. We then start to miss out on things going on around us. We move throughout the day without really being present.

It's important that we learn how to switch our auto-pilot on and off. To do this we need to know a bit more about the mind.

## There are two very distinct parts of the mind.

There's the part we are all very familiar with – the part that thinks, remembers, analyses, criticises, plan, and fantasises etc. – the **Thinking Self** or **Thinking Mind**.

Totally caught up in thoughts

OBSERVER MODE

You've probably noticed that the Thinking Self or Thinking Mind is always jabbering away - throwing up thoughts when you're waiting in a line, when you're in an important meeting, when you're trying to sleep, or when you 'tune out' in a conversation with someone. This running commentary in our heads is the thinking self/mind in action.

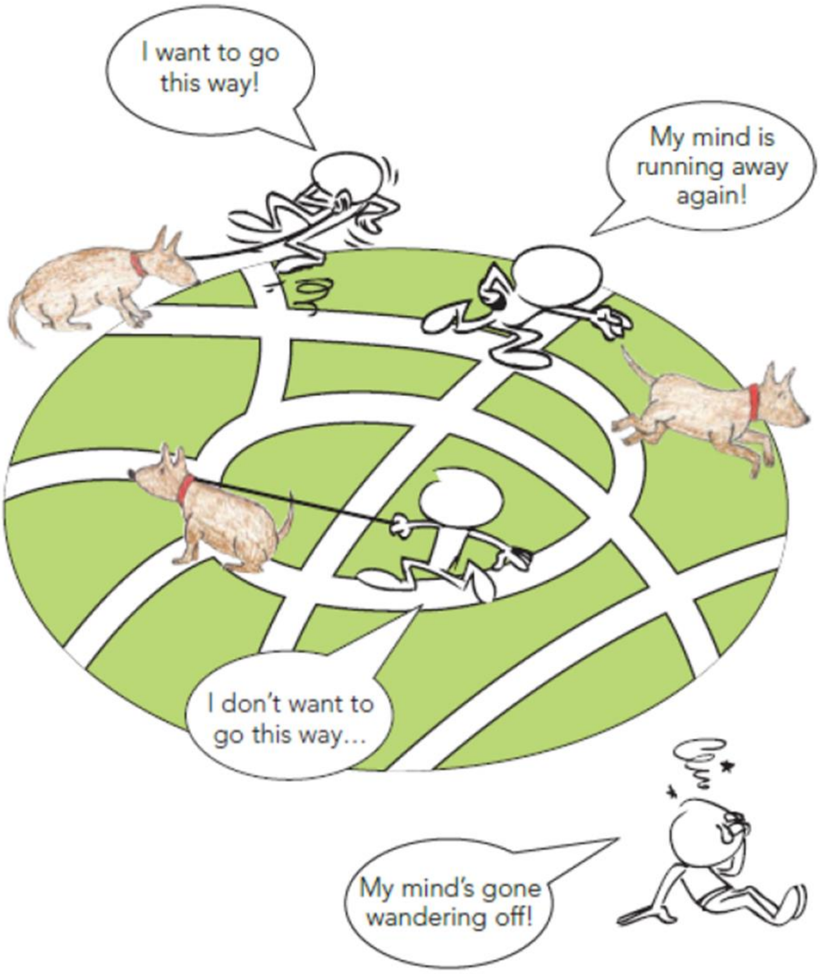
The other part of the mind never really gets talked about – it's a part of your mind that doesn't think, can't think, it just notices. It merely observes whatever you are thinking, feelings, doing, seeing, hearing, tasting and so on. This is called the **Observing Self** or **Observing Mind**.

Tuning into your observing self or mind more regularly can help you to be more aware of the present moment, and therefore help you to switch off your automatic pilot. By doing this with certain activities you may find you experience more enjoyment or satisfaction from them. The exercises you practice in session today will help you to connect more with your observing self.

# Our Puppy Mind

Like a puppy you will notice that your mind will wander away from the present moment and that it will explore different things. It may pull us in directions we do not want to go, it may run away from us and sometimes it may stop still when we want to keep walking.

This is natural behaviour for a puppy and our minds. It is what they do. It is not a mistake, and it is not something that you or the puppy are doing wrong.



When you notice that your mind has wandered away from the present moment, congratulate yourself for noticing this, acknowledge where your mind went and gently bring your mind back to the present moment. Just like you would with a puppy, gently guiding the puppy back.

We spend a lot of your time getting lost in our thoughts, the stories that our mind tells us about the future and the past. In the meantime we are missing the actual moment, the here and now, right this second.

## Anchoring in the Present Moment

We are all busy, and many of us don't have time (or are unwilling to make time) to formally practice 'present moment' skills. However, we can practice informally throughout the day. Here are a few examples:

### Sitting Down

A mindful 'sit' can bring new pleasures; whether you are sitting down in the house, out in the garden or are somewhere else. Rather than "being in our heads", we can look around and notice things with **each of our five senses**. Concentrate on the how the ground feels under your feet. The feel of the seat underneath your bottom. Notice your breathing... Just observe what is around you as you sit there (the view, sounds, smells, etc.), staying IN THE PRESENT. Let other thoughts or feelings pass by. If they return and distract you, gently notice them and bring your attention back to the moment. Enjoy the moment.

### Your Morning Routine e.g., Showering/ Bathing/ Washing

Whether you are in the shower, bath or washing at the sink, notice the sound of the water as it hits your body or as it gurgles down the hole. Notice the temperature of the water, and the feel of it on your hair, body or face. Notice the aroma of the soap or shampoo that you are using. Notice how the water droplets look on your skin or the steam rising upwards from the water. Notice the movements of your arms as you wash your face, or the shampoo out of your hair.

As you are doing this exercise, you will notice thoughts arising. When this happens simply acknowledge them, let them be, and bring your attention back to what you are doing in the bathroom.

# Home Practice: Mindful Activity Record Sheet

Between this week and next week we will be asking you to practice some mindful activities and to reflect on the experience. To do this you may find it helpful to keep a record of your activity in the table below.

| Date & Time | Type of Mindful activity or practice e.g., mindful breathing or washing-up | Record any thoughts, feelings, physical sensations that you noticed during your practice |
|---|---|---|
| | | |

# Week 5

# Getting distance from difficult thoughts and feelings

## ‘Unhooking’ from difficult thoughts

Our mind tells us to believe that every thought we have is important and that we must pay attention to it. If those thoughts are hurtful or distressing, our mind may also tell us that we should control or get rid of them. However, we have learnt that **control over our thoughts and feelings is not possible** (remember, the control dilemma in session 2).

When coping with the challenges of stroke or a brain injury, a range of feelings (e.g., anxiety) can trigger memories about the past, or fears about the future. Our minds can conjure up thoughts, memories, and compare or criticise ourselves (and others) at any moment, leading to experiences of pain.

Sometimes we can get so caught up in these thoughts that it influences our actions and pulls us away from where we really want to be. This is called **Thought Fusion** – i.e., we easily get hooked into them. **Like a fish biting on a bait hook**.

In contrast, stepping back from your thoughts will allow you to see them for what they are - a series of words or images in our mind. It isn’t important if they are true or false. What matters is that we give ourselves some space from them to see whether they are helpful to us in that moment. This is called **Thought Defusion**. With practice, this skill will help you to unhook from difficult thoughts or feelings.

### Fusion versus Defusion

| Fusing with Thoughts - ‘hooking in’ | Defusing from Thoughts - ‘unhooking’ |
|---|---|
| We believe thoughts are 100% true | Thoughts may or may not be true |
| Thoughts are seen as commands you have to obey or rules you must follow | Thoughts are NOT a command or rule. You do NOT have to obey or follow them |
| Thoughts are a threat you need to get rid of as soon as possible | Thoughts are NOT a threat to you |
| Thoughts are very important that require all of your attention | Thoughts may or may not be important. You have a choice as to how much attention you give it |

## What type of thoughts do we tend to fuse with?

**Rules**

These thoughts tend to include the words "should, must, ought, and if – then".

For example: "I should be able to do that" or "If I ask that question, then people will think I'm stupid"

**Reasons**

These tend to come in the form of excuses of why change is impossible.

For example: "I do not have the energy to change", "I am not strong enough" or "It's too hard to do it"

**Judgements**
These come in the form of evaluations, negative or positive.

*For example: "This is unbearable" or "They are doing so much better than I am".*

**Past and Future Thoughts:**
These pull us out of the present moment and tend to hook us quickly.

*For example: "The last time I went there it was a disaster, the next time will be a disaster" or "I'm different to who I used to be".*

**Thoughts about ourself:**
We have stories we tell ourselves about how we are as a person. They often start with the words "I am…." *For example: "I am tough" or "I am not good enough"*

**What type(s) of thoughts do you tend to get fused with?**

### How does fusing or hooking into these thoughts hold us back?

- We avoid things and limit what we do
- We end up missing out on new experiences
- We are taken away from the present moment
- We are blinded by our thoughts, preventing us from seeing other choices we have
- We increase in our suffering
- It may clash with our values and stop us from doing what matters to us.

## Let’s Practice some ways of ‘defusing’ from thoughts

### Exercise 1: “I’m having the thought that….”

1) Identify one anxious or distressing thought that you have noticed coming up regularly for you. The shorter or punchier the thought, the better.
   For example: “*I can’t cope*”, “*I should be doing more*” or “*I am stupid*”

2) Fuse with this thought for 10 seconds, read it over and over… get so caught up in it, you believe it as much as you can.

3) Replay the thought with this phrase in front of it **“I am having the thought that….”** Notice what happens.

4) Now play the thought once more, but this time add “**I notice**, I am having the thought that….” Again, notice what happens.

### Exercise 2: Titchener’s Repetition: Lemons, Lemons, Lemons

**Step 1:** Say the word "lemon" to yourself to start with. When you say this word what pops into your mind? Does a colour, image or taste come to mind? Perhaps a memory of a holiday you went on or of some freshly squeezed lemonade?

**Step 2:** Now you have an image of a lemon in your mind, I want you to say the word "lemons, lemons, lemons" repeatedly **OUT LOUD** for 30 seconds. Say this word as fast as you can during these 30 seconds.

**Step 3:** What did you notice? Did the word lemon remain the same? Did it change? Could you still make out the word or did it sound different? What did this do to the thought of the lemon –did it stay in your mind or did it go?

**Step 4:** Now run though the exercise again with an evocative word – a word you tend to use when you judge yourself harshly. For example, "bad", "stupid", "incompetent". What did you notice?

**Exercise 3: Thank Your Mind** – If you're having a bothersome thought like "I'm so anxious, other people are going to notice", say "Thank you mind. Thank you for trying to keep me safe, but there's nothing I need you to do right now. I'll be okay".

**Exercise 4: Leaves on a Stream** – Try letting your thoughts go by imagining a gently flowing stream with leaves on the surface. Try putting your thoughts onto the leaves and let them float on by. Do this with any thoughts you have, whether pleasant, neutral or painful. Our thoughts are fleeting and they will eventually be replaced by new thoughts.

**Exercise 5: Workability** - We tend to look at the function of thoughts rather than their content. We are not debating whether the thought is true or not. Instead we ask the following *helpful questions for unhelpful thoughts*, and by doing this we can then choose whether to respond or act on this thought or not:

- *Is this thought in anyway useful or helpful?*
- *What would I get for buying into this thought/story?*
- *Could this be helpful? Or is my mind just babbling on?*
- *Does this thought help me to take effective action?*
- *If I let this thought guide my actions, which direction will it take me? Towards valued living, or towards struggle and more pain?*
- *Does this thought help me to be who I want to be?*

## Allowing difficult feelings to be present

At times, despite getting distance from problematic thoughts, we might still have painful emotions or physical sensations lingering around. Unsurprisingly, painful feelings can be painful! This is why so many of us don't sit with them – instead, we try to ignore or push them away. However, as you know from earlier in this booklet, we cannot control our feelings. Doing this will only stop them in the short-term, eventually those feelings will rear up again.

Many of us treat our feelings as if they are dangerous. Yet, if we fight against them, chase them away or try to ignore them, the results are usually bad. Doing this not only takes up lots of energy and drains our vitality, it often causes us more pain and suffering. The main thing we were trying to avoid in the first place!

Instead, we need to **be willing** to sit with our feelings, simply allowing them to be there, resisting the urge to get rid of the pain, and not judging ourselves for having these feelings. We also call this **acceptance**. You do not have to like or want the feelings, and it is not about 'giving in' or 'putting up' with them. It is about accepting that all the feelings we have, whether pleasant or unpleasant, are just part of being human! That they tell us something important about what we care about. It is about recognising that we cannot control how we feel, but we can work with them so we can do what matters to us.

## Sitting with our feelings is like holding a cactus

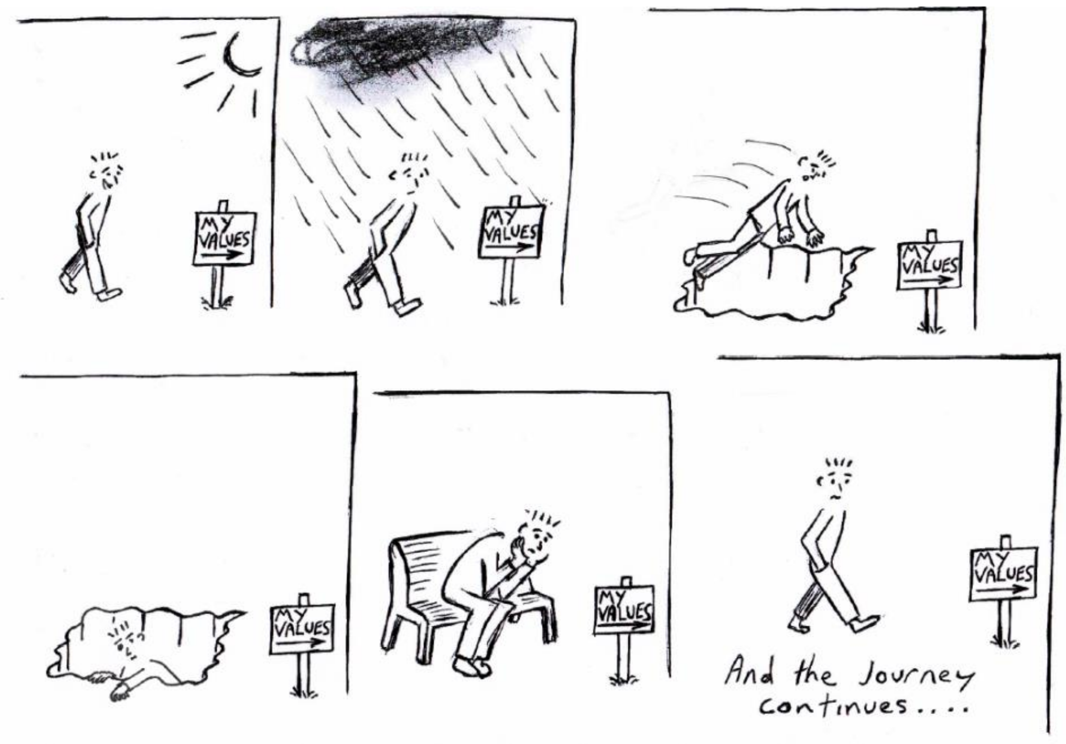
Imagine extending your hand and having a feather placed in your open palm. The feather is soft and pleasant and you can hold it gently.

Now imagine extending your hand and having a small cactus placed in your open palm. The cactus is prickly and unpleasant, AND you can hold it gently. **That's willingness**. Being willing to let the cactus be there, without struggle (you can imagine what happens when you struggle with a cactus!).

**Just like you can hold a cactus gently, even though it is prickly and uncomfortable, you can learn how to hold difficult thoughts and feelings gently.**

**In order to do things that are important to us we need to be willing to hold pain.**

**Being willing to make space and sit with unpleasant feelings can help you to stand back from the emotion or physical sensation, and learn not to fear or struggle against it. By doing this it can allow you to continue moving towards what matters to you (i.e., the things you value) instead of pulling you away from them.**



## How do I make space for unpleasant feelings?

Being mindful of feelings helps us to stand back from the feeling and learn not to fear it or struggle against it. Here are some strategies that can help you to build *willingness* to sit with unpleasant feelings. Do not be disheartened if you find it takes a while to master these skills. They are difficult skills to learn and ones that require practice. Remember, the more you practice these techniques the more you will get from them.

**(1) Granting Yourself Permission**
Some people find it helpful to silently say to themselves:

- *"I don't like this feeling, but I have room for it"*
- *"It's unpleasant, but I can allow it"*

Observe the feeling and grant it permission to be there as it is, without changing or escaping it.

Recognise that if you struggle, fight against it, or try to get rid of it, it will only serve to amplify it instead!

(2) **Expansion.** Take a few moments now or at different times in your day to…

- **Observe:** Quickly scan your body from head to toe. Notice the feelings that come up for you, as if you are noticing them for the first time. Where is that feeling located in your body? Where do you feel it most intensely? Name the emotion or sensation you feel.

- **Breathe:** Breathe slowly and deeply, and imagine your breath flowing into and around the feeling.

- **Expand:** Make room for this feeling. See if you can open up around it a little; give it some space

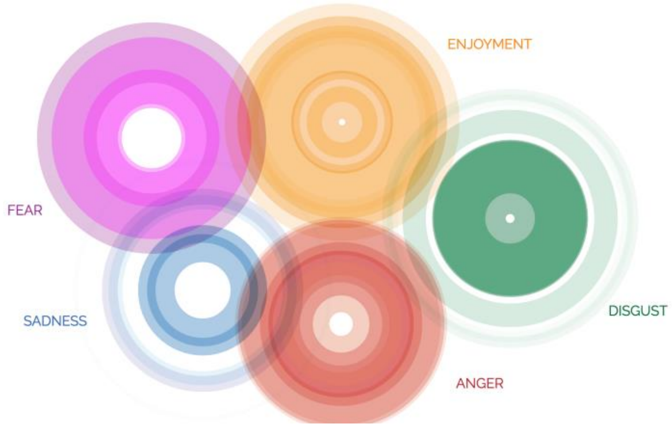
- **Allow:** You don't need to like, want or approve of the feeling. Just see if you can allow it to be there.

- **Objectify:** Imagine the feeling is an object. What shape does it have? What colour or texture does it have e.g., is it smooth or spiky? Does it change or move, is it fluid? Notice that YOU are bigger than this object – no matter how big it gets it can never get bigger than you.

- **Normalise:** This feeling is **normal**. It's part of being human and it tells you about the things that matter to you.

- **Show Self-Compassion:** Treat yourself with compassion and kindness. Place a hand gently over the area you feel the emotion or sensation most strongly and notice the warmth flowing into your body. Hold the feeling gently.

- **Open up your Awareness:** Start to notice other sensations in your body. Notice the sights and sounds around you. In this moment you are not just alone with this feeling – there is you, this feeling, your body, other sensations and emotions, a room, and a world around you…



## (3) Be kind to yourself

Facing uncertainty can be very painful. At these times we often want to feel understood and cared for, yet so often we become caught up with self-critical thoughts (such as 'I'm a burden' or 'I'm not good enough') or stories our mind tells us about how we 'should' feel. It can be tiring to manage these thoughts or feelings, particularly if they hang around for some time. As such, it's important that you take care of yourself during what can be a very stressful time in your life.

Often, we might seek the care and support of others during these times, although it can be tough when the people around us struggle to understand or aren't able to give us the type of care we need. If this is the case, the only person who you can completely rely on to give you that understanding and kindness is… **you**.

In the same way you could care for someone else who is struggling, you could choose to show yourself kindness and understanding in these moments. This can be as simple as acknowledging to yourself… "*This really hurts, this is hard*" or "*I know this hurts, but I can do this*".

### Compassionate Hand Exercise

1. Sit in a comfortable position, straighten your back, drop your shoulders and press your feet gently into the floor.

2. Take a moment to notice the difficult feeling you are experiencing at the moment, and any other thoughts and feelings that arise with it.

3. Now pick one of your hands and imagine it's the hand of someone very kind and caring. Place this hand on the part of your body where you feel the feeling most strongly. Allow your hand to rest gently on this area and feel the warmth flow from your palm into your body.

4. Now imagine your body softening around the difficult feeling, making space for it to be there. Hold the difficult feeling gently, with caring and warmth. As if you are reaching out to someone you care about. Let the kindness flow from your fingers into your body.

5. Now place one of your hands on your chest and the other on your stomach. Let them rest there and hold yourself kindly. Take as long as you wish to sit like this, caring for yourself; giving yourself comfort and support.

### (4) The STOPP Skill

**S**top and step back from your distress

Pause. Don't act immediately.

**T**ake a Breath

**O**bserve

What am I thinking and/or feeling? Is this fact or opinion? Helpful or Unhelpful?

**P**ull Back: Put in some perspective

What might others see in this situation? Is there another way of looking at it? What advice would I give someone else?

**P**ractice what works

Are my actions in line with my values? What is best for me or most helpful in this situation?

## Home Practice:

As we end the group today, try taking these new techniques forward.

Try practicing the defusion techniques to help you get distance from difficult thoughts. Or some of these strategies to sit with and make room for unpleasant or painful emotions.

Remember, some techniques will work better in some situations compared to others. The key is to practice and experiment with them as much as possible, so you can work out what strategy is most helpful to you in a given situation.

## Summary

Over the past 5 weeks, we have thought and spoken about what it might be like to live with the effects of a stroke or brain injury.

- We have discussed the thoughts and emotional experiences that may arise for people living with these conditions.
- We have asked you to notice your own responses to these experiences and whether those strategies keep you acting towards what is important to you, or pull you away.
- We have practiced a number of strategies that can allow you to sit with difficult or painful experiences, whilst still helping you to move towards what is important to you.

Putting the skills you have learnt together can help create a flexible way of coping when things get difficult.

… Be Present

… Be Open

… Do What Matters!

These skills, strategies and ways of thinking may have been familiar to you or not. You may find them helpful straight away, or recognise that you need to spend time practicing them, either alone or with support from others. The aim is that they continue to strengthen the resilience you already have, in whatever way works for you.

**♣ THANK YOU FOR YOUR COMMITTED ACTION! ♣**

## Acknowledgements & References

This Activity Work-Booklet is based on a model of therapy known as **Acceptance and Commitment Therapy (ACT)** – if you wish to know more about it you may find the following books interesting:

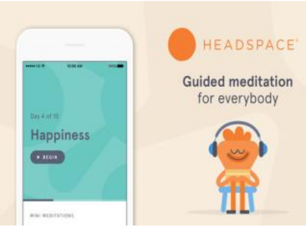
- The Happiness Trap, by Russ Harris
- The Reality Slap, by Russ Harris
- Living with the Enemy, by Ray Owen
- Get out of your mind and into your life, by Steven Hayes & Spencer Smith

If you would like more information on **'how to get into the present moment'**, the following may also be of interest to you:

- Mindfulness: A practical guide to finding peace in a frantic world, by Mark Williams & Danny Penman
- Full Catastrophe Living, by Jon Kabat-Zinn

## USEFUL MINDFULNESS APPS (for IPhone and/or Android)

These apps are free to download. They include some free mindfulness scripts/guided meditations, with optional in-app purchases.



Headspace

Calm

The Mindfulness app

Stop, Breathe & Think

## VIDEO LINKS – YOU TUBE

You will have watched different video clips during the group that demonstrated different ACT ideas. If you would like to watch these again you can use the following links or search the names on You Tube.

**The Struggle Switch**

https://www.youtube.com/watch?v=rCp1l16GCXI

**The Unwelcome Party Guest**

https://www.youtube.com/watch?v=VYht-guymF4

**Struggling with Internal Hijackers?**

https://www.youtube.com/watch?v=NdaCEO4Wt

If you are interested in more video clips like the ones above you can search for Russ Harris or Joe Oliver on You Tube.

## Appendix C: Semi-structured Topic Guide for Individual Interviews (Chapter Four)

# Adapted-ACT Project in Partnership with ABUHB

### Topic Guide for Individual Interviews

FIRST: Reiterate confidentiality policy and check that the consent form has been signed. Ensure that the participant is comfortable, aware of right to withdraw and answer queries.

**1. What were your initial expectations of the group?**

- *What did you think would happen?*

**2. How would you describe your experience of attending the ACT group?**

- What was your experience of the material?
- How might this compare to other groups you have attended?

**3. How did you feel about the way the intervention was delivered?**

**-** How did you find the group exercises?

**4. Was there a part of the programme that you particularly enjoyed? If so, what was your favourite activity or session?**

**5. What did you like least about the programme? Do you think that there was anything that could have been improved so that we could better support you?**

**6. Was there anything that made taking part in the group difficult?**

- Did you have any difficulty in understanding the material?

**7. Do you feel that the material was relevant to you and your circumstances?**

**8. What, if anything, do you think you took away from the group?**

**A** - *(If something)* What helped you to understand these ideas? Do you think that you could apply what you have learnt through the ACT intervention to dealing with events in everyday life?

**B** - *(If nothing)* What could have been changed to make the group more useful to you?

**9. Have you noticed any changes in your life since taking part in the ACT group?** If ‘yes’, what are these differences?

**10. How, if at all, has your way of coping with life after stroke/ABI changed since attending the group?**

- Do the group ideas differ from how you would usually approach difficult situations?
- What does coping look like now?
- How does this compare to the way you were coping before the group?

**11. Were there any negative effects that arose from taking part in the intervention?**

**-** Do you feel that the intervention may have made difficulties with stress or coping worse?

**12. If you could sum up what it was like being part of the group to someone considering attending, what would you say?**

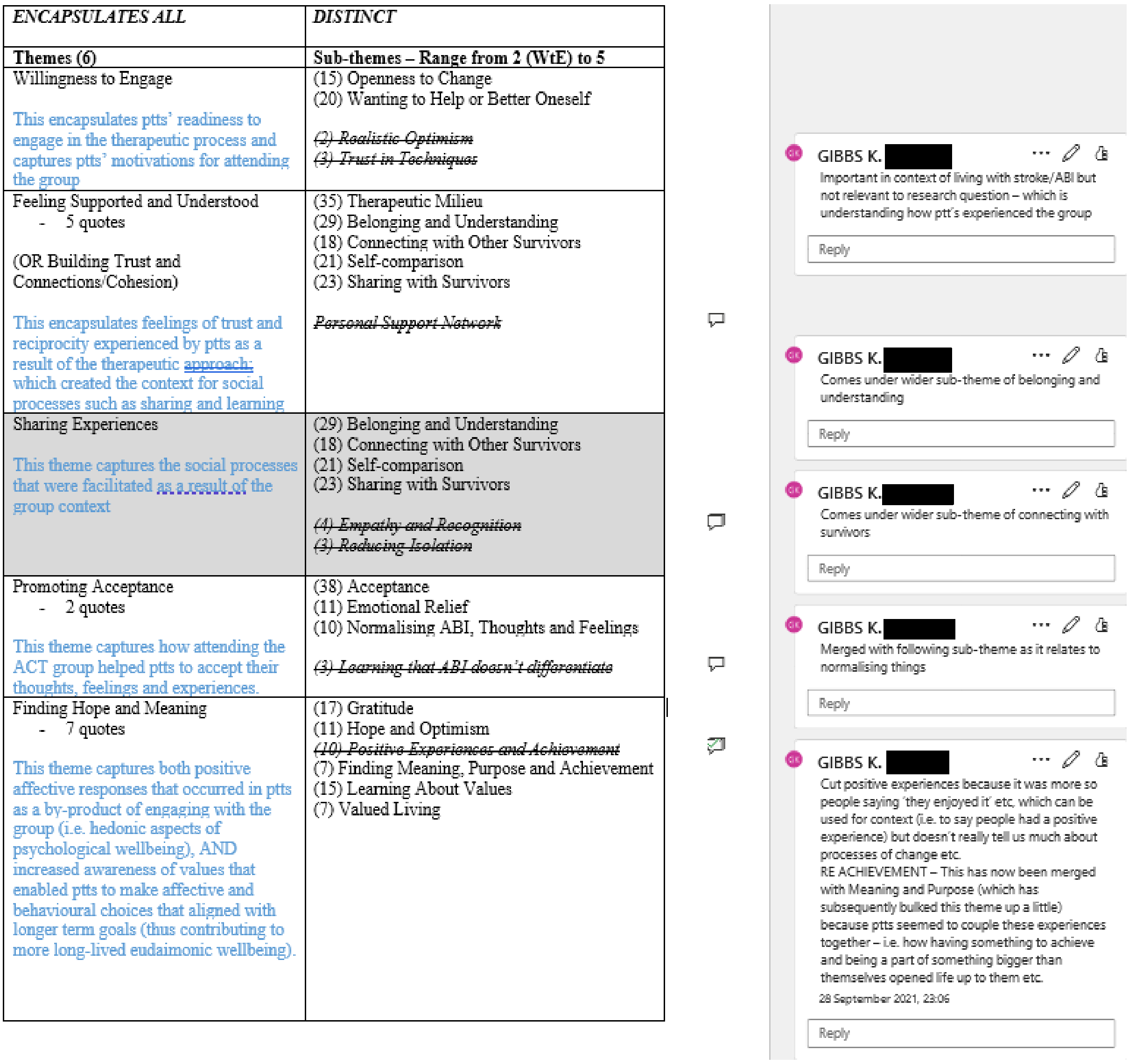
- Would you recommend this intervention to someone you care about?

Finish with: Is there anything else I have missed that you think I should know to understand your experience of the group better? Or is there anything I have missed that you would like to add?

# Appendix D: Raw CompACT Data (Chapter Four)

https://docs.google.com/spreadsheets/d/1Jti0KUzQXa35n-8aYWS56X29v8p99j7zZB1AOj3URVc/edit?usp=sharing

# Appendix E: An Example of the Development of Themes and Subthemes Early in the Analytic Process (Chapter Four)



| ***ENCAPSULATES ALL*** | ***DISTINCT*** |
|---|---|
| **Themes (6)** | **Sub-themes – Range from 2 (WtE) to 5** |
| Willingness to Engage<br>This encapsulates ptts' readiness to engage in the therapeutic process and captures ptts' motivations for attending the group | (15) Openness to Change<br>(20) Wanting to Help or Better Oneself<br>~~*(2) Realistic Optimism*~~<br>~~*(3) Trust in Techniques*~~ |
| Feeling Supported and Understood<br>- 5 quotes<br>(OR Building Trust and Connections/Cohesion)<br>This encapsulates feelings of trust and reciprocity experienced by ptts as a result of the therapeutic approach; which created the context for social processes such as sharing and learning | (35) Therapeutic Milieu<br>(29) Belonging and Understanding<br>(18) Connecting with Other Survivors<br>(21) Self-comparison<br>(23) Sharing with Survivors<br>~~*Personal Support Network*~~ |
| Sharing Experiences<br>This theme captures the social processes that were facilitated as a result of the group context | (29) Belonging and Understanding<br>(18) Connecting with Other Survivors<br>(21) Self-comparison<br>(23) Sharing with Survivors<br>~~*(4) Empathy and Recognition*~~<br>~~*(3) Reducing Isolation*~~ |
| Promoting Acceptance<br>- 2 quotes<br>This theme captures how attending the ACT group helped ptts to accept their thoughts, feelings and experiences. | (38) Acceptance<br>(11) Emotional Relief<br>(10) Normalising ABI, Thoughts and Feelings<br>~~*(3) Learning that ABI doesn't differentiate*~~ |
| Finding Hope and Meaning<br>- 7 quotes<br>This theme captures both positive affective responses that occurred in ptts as a by-product of engaging with the group (i.e. hedonic aspects of psychological wellbeing), AND increased awareness of values that enabled ptts to make affective and behavioural choices that aligned with longer term goals (thus contributing to more long-lived eudaimonic wellbeing). | (17) Gratitude<br>(11) Hope and Optimism<br>~~*(10) Positive Experiences and Achievement*~~<br>(7) Finding Meaning, Purpose and Achievement<br>(15) Learning About Values<br>(7) Valued Living |

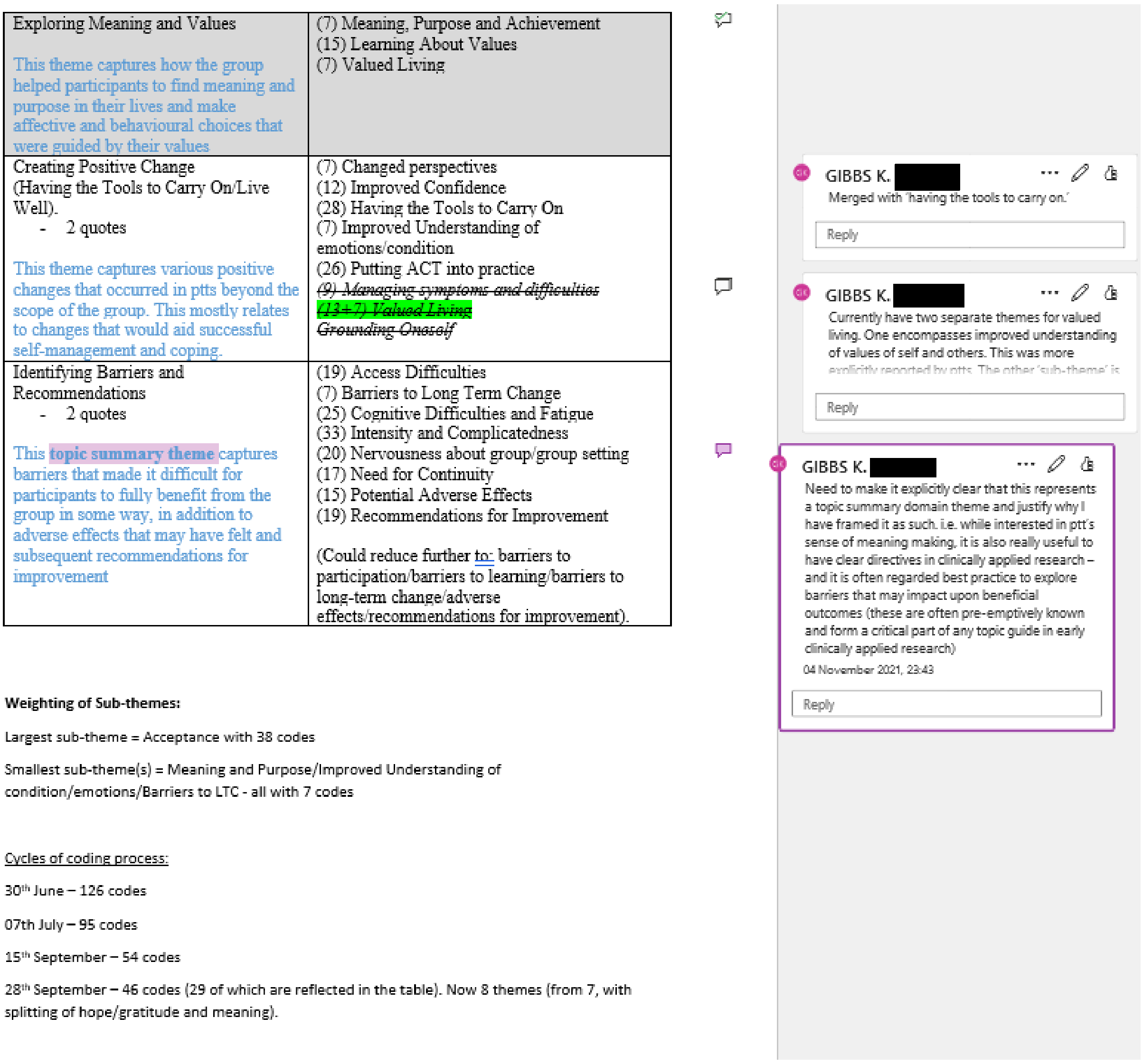
GIBBS K. [redacted]
Important in context of living with stroke/ABI but not relevant to research question – which is understanding how ptt's experienced the group

GIBBS K. [redacted]
Comes under wider sub-theme of belonging and understanding

GIBBS K. [redacted]
Comes under wider sub-theme of connecting with survivors

GIBBS K. [redacted]
Merged with following sub-theme as it relates to normalising things

GIBBS K. [redacted]
Cut positive experiences because it was more so people saying 'they enjoyed it' etc, which can be used for context (i.e. to say people had a positive experience) but doesn't really tell us much about processes of change etc.
RE ACHIEVEMENT – This has now been merged with Meaning and Purpose (which has subsequently bulked this theme up a little) because ptts seemed to couple these experiences together – i.e. how having something to achieve and being a part of something bigger than themselves opened life up to them etc.
28 September 2021, 23:06



| | |
|---|---|
| Exploring Meaning and Values<br>This theme captures how the group helped participants to find meaning and purpose in their lives and make affective and behavioural choices that were guided by their values | (7) Meaning, Purpose and Achievement<br>(15) Learning About Values<br>(7) Valued Living |
| Creating Positive Change (Having the Tools to Carry On/Live Well).<br>- 2 quotes<br>This theme captures various positive changes that occurred in ptts beyond the scope of the group. This mostly relates to changes that would aid successful self-management and coping. | (7) Changed perspectives<br>(12) Improved Confidence<br>(28) Having the Tools to Carry On<br>(7) Improved Understanding of emotions/condition<br>(26) Putting ACT into practice<br>~~*(9) Managing symptoms and difficulties*~~<br>~~*(13+7) Valued Living*~~<br>~~*Grounding Oneself*~~ |
| Identifying Barriers and Recommendations<br>- 2 quotes<br>This **topic summary theme** captures barriers that made it difficult for participants to fully benefit from the group in some way, in addition to adverse effects that may have felt and subsequent recommendations for improvement | (19) Access Difficulties<br>(7) Barriers to Long Term Change<br>(25) Cognitive Difficulties and Fatigue<br>(33) Intensity and Complicatedness<br>(20) Nervousness about group/group setting<br>(17) Need for Continuity<br>(15) Potential Adverse Effects<br>(19) Recommendations for Improvement<br>(Could reduce further to: barriers to participation/barriers to learning/barriers to long-term change/adverse effects/recommendations for improvement). |

**Weighting of Sub-themes:**

Largest sub-theme = Acceptance with 38 codes

Smallest sub-theme(s) = Meaning and Purpose/Improved Understanding of condition/emotions/Barriers to LTC - all with 7 codes

Cycles of coding process:

30th June – 126 codes

07th July – 95 codes

15th September – 54 codes

28th September – 46 codes (29 of which are reflected in the table). Now 8 themes (from 7, with splitting of hope/gratitude and meaning).

GIBBS K. [redacted]

Merged with 'having the tools to carry on.'

GIBBS K. [redacted]

Currently have two separate themes for valued living. One encompasses improved understanding of values of self and others. This was more explicitly reported by ptts. The other 'sub-theme' is

GIBBS K. [redacted]

Need to make it explicitly clear that this represents a topic summary domain theme and justify why I have framed it as such. i.e. while interested in ptt's sense of meaning making, it is also really useful to have clear directives in clinically applied research – and it is often regarded best practice to explore barriers that may impact upon beneficial outcomes (these are often pre-emptively known and form a critical part of any topic guide in early clinically applied research)

04 November 2021, 23:43

# Appendix F: An Example of Generic Patient Consent Forms Used by the Community Neurorehabilitation Service for Service Evaluation Work (Chapters Six and Eight)

## CONSENT FORM

[Insert Title of Service Evaluation]

We have invited you to meet with us to ask you for feedback about the [project title] intervention you have attended with our service. We are interested in your experiences so we can learn about what was helpful and what was unhelpful. Your feedback will be used to inform the development of future interventions. We may also write up and publish this feedback if we feel that this would be helpful to other clinicians and researchers with an interest in this area. It may also be included as part of any MSc or PhD thesis at Swansea University.

1. I understand that my participation is **voluntary** and that I am **free to withdraw** at any time, without giving any reason, without any future medical care or legal rights being affected.

   **I understand that I do not have to take part.**

   Yes/no

2. I consent for conversations had during the focus group to be **audio recorded**.

   Yes/no

3. I understand that following the focus group the recording will be stored on a secure NHS network until it is transcribed. The recording will be deleted once it has been typed up and the typed up version will be anonymised.

   Yes/no

4. I understand that some of what is learnt during the focus group may be **written up for an educational qualification and/or may be written up for publication in a scientific journal**. I understand how my contributions may be used in publications – including quotes.

   **I am happy for my anonymised data to be used in publications.**

   Yes/no

5. I understand that absolute anonymity cannot be guaranteed due to the use of direct quotes but **great care** will be taken to **anonymise** and **remove identifying information**.

   Yes/no

6. I understand that I **can change my mind** and withdraw my consent **without giving any reason**. I will need to **contact the researcher** if I want to withdraw my information.

7. **I agree to take part in the service evaluation.**

   Yes/no

To electronically sign the consent form, please type your name:

___________________ Date: _____________

Consent taken by:

Date of consent:

## Appendix G: Service Evaluation Topic Guide for Individual Interviews (Chapter Six)

# Surfability Project

### Semi-structured Topic Guide

1. Tell me about how your life has changed following your brain injury?

2. Tell me about how the brain injury has affected your approach to new situations or activities?

3. When you first heard about Surfability, what was your initial reaction?

4. What did you hope to get from attending Surfability?

    - Why was this important to you?

5. What was your experience of being involved with Surfability?

6. What did it feel like when you got in the water for the first time? (- got on the surfboard?)

7. Tell me about how you felt after each session? Did you notice feeling anything different in yourself or towards other, or the world/environment?

8. Has being part of this group changed how you feel or think about yourself after your brain injury? If so in what ways?

9. People living with brain injury often report feeling socially isolated. What are your thoughts about that, and do you feel Surfability changed that at all?

10. People living with brain injury often report feeling restricted in terms of their ability to engage in sport and exercise. Did you feel like that and has attending Surfability changed that at all?

11. People living with brain injury often report feeling low in mood or anxious or having few opportunities for positive emotion. What are your thoughts about this and did attending Surfability do anything to change this?

12. Is there anything you would like to change from your experience of this group?
    - Time/Day
    - Length of sessions
    - Group format?
    - Changing facilities?
    - Access difficulties?

13. Would you like to say anything to other people who might be in a similar situation and were given the opportunity to go surfing?

14. Has attending Surfability resulted in any changes for you outside of the group or not?

15. Is there anything you would like to add, or anything you think I should know to fully understand your experiences of the group?

## Appendix H: Service Evaluation Topic Guide for Focus Group Discussions (Chapter Eight)

# Down to Earth Project

### Focus Group Topic Guide

1) Could you tell me a little bit about how your life has changed since you've had your brain injury?
- *How has it affected the ways in which you approach new situations or new activities?*

2) What were your expectations of the project?
- *Did you know anyone or anything about the project before you started?*
- *What did you hope to gain from attending?*

3) What was your experience of the Down to Earth project?
- *What have you enjoyed most about the project or found the most useful?*
- *How did you feel at the end of each session and after the project?*
- *Was there anything that you didn't enjoy?*

4) Were the activities within your skill ability?
- *Did you like having a choice about which activities to engage in?*

5) Had you ever built with natural materials before?

6) Has the project lead to any changes for you?
- *Thinking about where you were when you started and where you are now, has the project changed how you think about yourself, or others?*
- *Has the group led to any changes for you outside of the project?*

7) How did you feel about the group format?

8) Is there anything you would have changed about the group/project in terms of its practicalities (i.e., timings/duration)?

9) Does anyone have anything else they would like to say or add as feedback that they think we need to know to fully understand your experiences?

# References

Alimujiang, A., Wiensch, A., Boss, J., Fleischer, N. L., Mondul, A. M., McLean, K., Mukherjee, B., & Pearce, C. L. (2019). Association Between Life Purpose and Mortality Among US Adults Older Than 50 Years. *JAMA Netw Open*, *2*(5), e194270. https://doi.org/10.1001/jamanetworkopen.2019.4270

Allen, N., Hevey, D., Carton, S., & O'Keeffe, F. (2022). Life is about "constant evolution": the experience of living with an acquired brain injury in individuals who report higher or lower posttraumatic growth. *Disability and Rehabilitation*, *44*(14), 3479-3492. https://doi.org/10.1080/09638288.2020.1867654

Almedom, A. M. (2005). RESILIENCE, HARDINESS, SENSE OF COHERENCE, AND POSTTRAUMATIC GROWTH: ALL PATHS LEADING TO "LIGHT AT THE END OF THE TUNNEL"? *Journal of Loss and Trauma*, *10*(3), 253-265. https://doi.org/10.1080/15325020590928216

Amarshi, F., Artero, L., & Reid, D. (2006). Exploring social and leisure participation among stroke survivors: Part two. *International Journal of Therapy and Rehabilitation*, *13*, 199-208. https://doi.org/10.12968/ijtr.2006.13.5.21376

Andelic, N., Røe, C., Tenovuo, O., Azouvi, P., Dawes, H., Majdan, M., Ranta, J., Howe, E. I., Wiegers, E. J. A., Tverdal, C., Borgen, I., Forslund, M. V., Kleffelgaard, I., Dahl, H. M., Jacob, L., Cogné, M., Lu, J., von Steinbuechel, N., & Zeldovich, M. (2021). Unmet Rehabilitation Needs after Traumatic Brain Injury across Europe: Results from the CENTER-TBI Study. *Journal of Clinical Medicine*, *10*(5), 1035. https://www.mdpi.com/2077-0383/10/5/1035

Andelic, N., Soberg, H. L., Berntsen, S., Sigurdardottir, S., & Roe, C. (2014). Self-Perceived Health Care Needs and Delivery of Health Care Services 5 Years After Moderate-to-Severe Traumatic Brain Injury. *PM&R*, *6*(11), 1013-1021. https://doi.org/https://doi.org/10.1016/j.pmrj.2014.05.005

Andrews, K. (1991). The limitations of randomized controlled trials in rehabilitation research. *Clinical Rehabilitation*, *5*(1), 5-8. https://doi.org/10.1177/026921559100500102

Anson, K., & Ponsford, J. (2006). Evaluation of a coping skills group following traumatic brain injury. *Brain Inj*, *20*(2), 167-178. https://doi.org/10.1080/02699050500442956

Antó, J. M., Martí, J. L., Casals, J., Bou-Habib, P., Casal, P., Fleurbaey, M., Frumkin, H., Jiménez-Morales, M., Jordana, J., Lancelotti, C., Llavador, H., Mélon, L., Solé, R., Subirada, F., & Williams, A. (2021). The Planetary Wellbeing Initiative: Pursuing the Sustainable Development Goals in Higher Education. *Sustainability*, *13*(6), 3372. https://www.mdpi.com/2071-1050/13/6/3372

Antonovsky, A. (1979). Health, stress, and coping. *New perspectives on mental and physical well-being*, 12-37.

Antonovsky, A. (1987). Health promoting factors at work: The sense of coherence. *Psychosocial factors at work and their relation to health*, 153-167.

Arch, J. J., Fishbein, J. N., Finkelstein, L. B., & Luoma, J. B. (2023). Acceptance and Commitment Therapy Processes and Mediation: Challenges and How to Address Them. *Behavior Therapy*, *54*(6), 971-988. https://doi.org/https://doi.org/10.1016/j.beth.2022.07.005

Archer, M., Bhaskar, R., Collier, A., Lawson, T., & Norrie, A. (2013). *Critical realism: Essential readings*. Routledge.

Armenta, C. N., Fritz, M. M., & Lyubomirsky, S. (2017). Functions of Positive Emotions: Gratitude as a Motivator of Self-Improvement and Positive Change. *Emotion Review*, *9*(3), 183-190. https://doi.org/10.1177/1754073916669596

Arroyo, P., Wilkie, L., Davies, E., Fisher, Z., & Kemp, A. H. (2024). Thriving in the wake of a storm: A systematic qualitative review & meta-synthesis on facilitating post-traumatic growth in patients living with Acquired Brain Injury. *Neuropsychological Rehabilitation*, 1-27. https://doi.org/10.1080/09602011.2024.2356891

Ayerbe, L., Ayis, S., Crichton, S., Wolfe, C. D. A., & Rudd, A. G. (2014). The long-term outcomes of depression up to 10 years after stroke; the South London Stroke Register. *Journal of Neurology, Neurosurgery &amp; Psychiatry*, *85*(5), 514-521. https://doi.org/10.1136/jnnp-2013-306448

Ayerbe, L., Ayis, S., Wolfe, C. D. A., & Rudd, A. G. (2013). Natural history, predictors and outcomes of depression after stroke: systematic review and meta-analysis. *The British Journal of Psychiatry*, *202*(1), 14-21. https://doi.org/10.1192/bjp.bp.111.107664

Baer, R., Smith, G., & Allen, K. (2004). Assessment of Mindfulness by Self-Report: The Kentucky Inventory of Mindfulness Skills. *Assessment*, *11*, 191-206. https://doi.org/10.1177/1073191104268029

Baird, B., Charles, A., Honeyman, M., Maguire, D., & Das, P. (2016). *Understanding pressures in general practice*. King's Fund London.

Bandura, A., & Wessels, S. (1997). *Self-efficacy*. Cambridge University Press Cambridge.

Barber, S., Bate, A., Adcock, A., Harker, R., Roberts, N., & Woodhouse, J. (2018). House of Commons Library, debate pack: Acquired brain injury. In: House of Commons.

Barker, C., Pistrang, N., & Elliott, R. (2015). *Research methods in clinical psychology: An introduction for students and practitioners*. John Wiley & Sons.

Barton, J., & Pretty, J. (2010). What is the best dose of nature and green exercise for improving mental health? A multi-study analysis. *Environ Sci Technol*, *44*(10), 3947-3955. https://doi.org/10.1021/es903183r

Beadle, E. J., Ownsworth, T., Fleming, J., & Shum, D. (2016). The Impact of Traumatic Brain Injury on Self-Identity: A Systematic Review of the Evidence for Self-Concept Changes. *The Journal of Head Trauma Rehabilitation*, *31*(2), E12-E25. https://doi.org/10.1097/htr.0000000000000158

Beaulieu-Bonneau, S., & Ouellet, M. C. (2017). Fatigue in the first year after traumatic brain injury: course, relationship with injury severity, and correlates. *Neuropsychol Rehabil*, *27*(7), 983-1001. https://doi.org/10.1080/09602011.2016.1162176

Ben-Yishay, Y. (1996). Reflections on the Evolution of the Therapeutic Milieu Concept. *Neuropsychological Rehabilitation*, *6*(4), 327-343. https://doi.org/10.1080/713755514

Ben-Yishay, Y. (2000). Postacute neuropsychological rehabilitation: A holistic perspective. *International handbook of neuropsychological rehabilitation*, 127-135.

Ben-Yishay, Y., & Diller, L. (2011). *Handbook of holistic neuropsychological rehabilitation: outpatient rehabilitation of traumatic brain injury*. Oxford University Press.

Ben-Yishay, Y., & Prigatano, G. P. (1990). Cognitive remediation. In *Rehabilitation of the adult and child with traumatic brain injury, 2nd ed.* (pp. 393-409). F A Davis.

Ben-Yishay, Y., Rattok, J., Lakin, P., Piasetsky, E. B., Ross, B., Silver, S., Zide, E., & Ezrachi, O. (1985). Neuropsychologic rehabilitation: Quest for a holistic approach. Seminars in Neurology,

Berger, R., & McLeod, J. (2006). Incorporating Nature into Therapy: A Framework for Practice. *Journal of Systemic Therapies*, *25*(2), 80-94. https://doi.org/10.1521/jsyt.2006.25.2.80

Berman, M. G., Jonides, J., & Kaplan, S. (2008). The Cognitive Benefits of Interacting With Nature. *Psychological Science*, *19*(12), 1207-1212. https://doi.org/10.1111/j.1467-9280.2008.02225.x

Berman, M. G., Kross, E., Krpan, K. M., Askren, M. K., Burson, A., Deldin, P. J., Kaplan, S., Sherdell, L., Gotlib, I. H., & Jonides, J. (2012). Interacting with nature improves cognition and affect for individuals with depression. *J Affect Disord*, *140*(3), 300-305. https://doi.org/10.1016/j.jad.2012.03.012

Berto, R. (2005). Exposure to restorative environments helps restore attentional capacity. *Journal of Environmental Psychology*.

Bethelmy, L. C., & Corraliza, J. A. (2019). Transcendence and Sublime Experience in Nature: Awe and Inspiring Energy. *Frontiers in psychology*, *10*, 509. https://doi.org/10.3389/fpsyg.2019.00509

Bhaskar, R. (1975). Forms of realism. *Philosophica*, *15*.

Bhaskar, R., Collier, A., Lawson, T., & Norrie, A. (1998). Critical realism. Proceedings of the Standing Conference on Realism and Human Sciences, Bristol, UK,

Bird, C. M. (2005). How I Stopped Dreading and Learned to Love Transcription. *Qualitative Inquiry*, *11*(2), 226-248. https://doi.org/10.1177/1077800404273413

Birgit, Donker-Cools, Wind, H., & Frings-Dresen, M. H. W. (2016). Prognostic factors of return to work after traumatic or non-traumatic acquired brain injury. *Disability and Rehabilitation*, *38*(8), 733-741. https://doi.org/10.3109/09638288.2015.1061608

Blackburn, J., Pereira, A., Jefferies, L., Kemp, A. H., & Isham, A. (2025). Nature-based interventions for individual, collective and planetary wellbeing: A protocol for a scoping review. *PLoS ONE*, *20*(4), e0314591. https://doi.org/10.1371/journal.pone.0314591

Blom Johansson, M., Carlsson, M., Östberg, P., & Sonnander, K. (2012). Communication changes and SLP services according to significant others of persons with aphasia. *Aphasiology*, *26*(8), 1005-1028. https://doi.org/10.1080/02687038.2012.671927

Boehm, J., & Kubzansky, L. (2012). The Heart's Content: The Association Between Positive Psychological Well-Being and Cardiovascular Health. *Psychological bulletin*, *138*, 655-691. https://doi.org/10.1037/a0027448

Bolnick, H. J., Bui, A. L., Bulchis, A., Chen, C., Chapin, A., Lomsadze, L., Mokdad, A. H., Millard, F., & Dieleman, J. L. (2020). Health-care spending attributable to modifiable risk factors in the USA: an economic attribution analysis. *The Lancet Public Health*, *5*(10), e525-e535.

Bowler, D. E., Buyung-Ali, L. M., Knight, T. M., & Pullin, A. S. (2010). A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC public health*, *10*, 456. https://doi.org/10.1186/1471-2458-10-456

Boyle, P. A., Barnes, L. L., Buchman, A. S., & Bennett, D. A. (2009). Purpose in life is associated with mortality among community-dwelling older persons. *Psychosom Med*, *71*(5), 574-579. https://doi.org/10.1097/PSY.0b013e3181a5a7c0

Bradburn, N. M. (1969). The structure of psychological well-being.

Brady, M. C., Kelly, H., Godwin, J., Enderby, P., & Campbell, P. (2016). Speech and language therapy for aphasia following stroke. *Cochrane Database Syst Rev*, *2016*(6), Cd000425. https://doi.org/10.1002/14651858.CD000425.pub4

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2013). *Successful Qualitative Research: A Practical Guide for Beginners*.

Braun, V., & Clarke, V. (2014). What can “thematic analysis” offer health and wellbeing researchers? *International Journal of Qualitative Studies on Health and Well-being*, *9*(1), 26152. https://doi.org/10.3402/qhw.v9.26152

Braun, V., & Clarke, V. (2021). Thematic analysis: A practical guide.

Breen, L. J., & Darlaston-Jones, D. (2010). Moving beyond the enduring dominance of positivism in psychological research: Implications for psychology in Australia. *Australian Psychologist*, *45*(1), 67-76. https://doi.org/https://doi.org/10.1080/00050060903127481

Bright, F., Kayes, N., McCann, C., & McPherson, K. (2011). Understanding Hope After Stroke: A Systematic Review of the Literature Using Concept Analysis. *Topics in stroke rehabilitation*, *18*, 490-508. https://doi.org/10.1310/tsr1805-490

Britton, E., Kindermann, G., & Carlin, C. (2020). Surfing and the Senses: Using Body Mapping to Understand the Embodied and Therapeutic Experiences of Young Surfers with Autism.

Britton, E., Kindermann, G., Domegan, C., & Carlin, C. (2020). Blue care: a systematic review of blue space interventions for health and wellbeing. *Health promotion international*, *35*(1), 50-69. https://doi.org/10.1093/heapro/day103

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American psychologist*, *32*(7), 513.

Brown, A., Barth, D. C., & Leslie, A. R. (2024). "You're Someone Different Now": An Autoethnography on Identity and Occupational Identity Disruption After Traumatic Brain Injury. *Am J Occup Ther*, *78*(2). https://doi.org/10.5014/ajot.2024.050411

Brymer, E., Freeman, E., & Richardson, M. (2019). Editorial: One Health: The Well-being Impacts of Human-Nature Relationships [Editorial]. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.01611

Bryson-Campbell, M., Shaw, L., O'Brien, J., Holmes, J., & Magalhaes, L. (2013). A scoping review on occupational and self identity after a brain injury. *Work*, *44*(1), 57-67. https://doi.org/10.3233/wor-2012-01561

Buecker, S., Simacek, T., Ingwersen, B., Terwiel, S., & Simonsmeier, B. A. (2020). Physical activity and subjective well-being in healthy individuals: a meta-analytic review. *Health Psychol Rev*, 1-19. https://doi.org/10.1080/17437199.2020.1760728

Buecker, S., Simacek, T., Ingwersen, B., Terwiel, S., & Simonsmeier, B. A. (2021). Physical activity and subjective well-being in healthy individuals: a meta-analytic review. *Health Psychol Rev*, *15*(4), 574-592. https://doi.org/10.1080/17437199.2020.1760728

Byrne, C., Salas, C. E., Coetzer, R., & Ramsey, R. (2022). Understanding Loneliness in Brain Injury: Linking the Reaffiliation Motive Model of Loneliness With a Model of Executive Impairment. *Front Integr Neurosci*, *16*, 883746. https://doi.org/10.3389/fnint.2022.883746

Byrne, C., Saville, C., Coetzer, R., & Ramsey, R. (2021). Stroke Survivors Experience Elevated Levels of Loneliness: A Multi-Year Analysis of the National Survey for Wales. *Archives of Clinical Neuropsychology*, *37*. https://doi.org/10.1093/arclin/acab046

Cacioppo, J. T., & Cacioppo, S. (2018). Chapter Three - Loneliness in the Modern Age: An Evolutionary Theory of Loneliness (ETL). In J. M. Olson (Ed.), *Advances in Experimental Social Psychology* (Vol. 58, pp. 127-197). Academic Press. https://doi.org/https://doi.org/10.1016/bs.aesp.2018.03.003

Cacioppo, J. T., & Patrick, W. (2008). *Loneliness: Human nature and the need for social connection*. WW Norton & Company.

Caddick, N., Smith, B., & Phoenix, C. (2014). The Effects of Surfing and the Natural Environment on the Well-Being of Combat Veterans. *Qualitative Health Research*, *25*(1), 76-86. https://doi.org/10.1177/1049732314549477

Calhoun, L. G., & Tedeschi, R. G. (2013). *Posttraumatic growth in clinical practice*. Routledge/Taylor & Francis Group.

Campbell-Sills, L., Barlow, D. H., Brown, T. A., & Hofmann, S. G. (2006). Effects of suppression and acceptance on emotional responses of individuals with anxiety and mood disorders. *Behaviour Research and Therapy*, *44*(9), 1251-1263. https://doi.org/https://doi.org/10.1016/j.brat.2005.10.001

Canguilhem, G. (1943). *On the Normal and the Pathological*.

Cantor, J. B., Ashman, T., Gordon, W., Ginsberg, A., Engmann, C., Egan, M., Spielman, L., Dijkers, M., & Flanagan, S. (2008). Fatigue After Traumatic Brain Injury and Its Impact on Participation and Quality of Life. *The Journal of Head Trauma Rehabilitation*, *23*(1), 41-51. https://doi.org/10.1097/01.HTR.0000308720.70288.af

Cantor, J. B., Ashman, T. A., Schwartz, M. E., Gordon, W. A., Hibbard, M. R., Brown, M., Spielman, L., Charatz, H. J., & Cheng, Z. (2005). The role of self-discrepancy theory in understanding post-traumatic brain injury affective disorders: a pilot study. *J Head Trauma Rehabil*, *20*(6), 527-543. https://doi.org/10.1097/00001199-200511000-00005

Cantor, J. B., Bushnik, T., Cicerone, K., Dijkers, M. P., Gordon, W., Hammond, F. M., Kolakowsky-Hayner, S. A., Lequerica, A., Nguyen, M., & Spielman, L. A. (2012). Insomnia, fatigue, and sleepiness in the first 2 years after traumatic brain injury: an NIDRR TBI model system module study. *J Head Trauma Rehabil*, *27*(6), E1-14. https://doi.org/10.1097/HTR.0b013e318270f91e

Capaldi, C., Passmore, H.-A., Nisbet, E., Zelenski, J., & Dopko, R. (2015). Flourishing in nature: A review of the benefits of connecting with nature and its application as a wellbeing intervention. *International Journal of Wellbeing*, *in press*. https://doi.org/10.5502/ijw.v5i4.1

Capaldi, C. A., Dopko, R. L., & Zelenski, J. M. (2014). The relationship between nature connectedness and happiness: a meta-analysis [Original Research]. *Frontiers in Psychology*, *5*. https://doi.org/10.3389/fpsyg.2014.00976

Capaldi, C. A., Dopko, R. L., & Zelenski, J. M. (2014). The relationship between nature connectedness and happiness: a meta-analysis [Original Research]. *Frontiers in Psychology*, *5*(976). https://doi.org/10.3389/fpsyg.2014.00976

Capaldi, C. A., Passmore, H.-A., Ishii, R., Chistopolskaya, K. A., Vowinckel, J., Nikolaev, E. L., & Semikin, G. I. (2017). Engaging with Natural Beauty May Be Related to Well-Being Because It Connects People to Nature: Evidence from Three Cultures. *Ecopsychology*, *9*(4), 199-211. https://doi.org/10.1089/eco.2017.0008

Capaldi, C. A., Passmore, H.-A., Nisbet, E. K., Zelenski, J. M., & Dopko, R. L. (2015). Flourishing in nature: A review of the benefits of connecting with nature and its application as a wellbeing intervention. *International Journal of Wellbeing*, *5*(4).

Cardaciotto, L., Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V. (2008). The assessment of present-moment awareness and acceptance: the Philadelphia Mindfulness Scale. *Assessment*, *15*(2), 204-223. https://doi.org/10.1177/1073191107311467

Carmichael, J., Hicks, A. J., Gould, K. R., Spitz, G., & Ponsford, J. (2023). Network analysis of anxiety and depressive symptoms one year after traumatic brain injury. *Psychiatry Research*, *326*, 115310. https://doi.org/https://doi.org/10.1016/j.psychres.2023.115310

Castriotta, R. J., & Murthy, J. N. (2011). Sleep disorders in patients with traumatic brain injury: a review. *CNS Drugs*, *25*(3), 175-185. https://doi.org/10.2165/11584870-000000000-00000

Cattelani, R., Zettin, M., & Zoccolotti, P. (2010). Rehabilitation treatments for adults with behavioral and psychosocial disorders following acquired brain injury: a systematic review. *Neuropsychol Rev*, *20*(1), 52-85. https://doi.org/10.1007/s11065-009-9125-y

Chapin, F. S., Weber, E. U., Bennett, E. M., Biggs, R., van den Bergh, J., Adger, W. N., Crépin, A.-S., Polasky, S., Folke, C., Scheffer, M., Segerson, K., Anderies, J. M., Barrett, S., Cardenas, J.-C., Carpenter, S. R., Fischer, J., Kautsky, N., Levin, S. A., Shogren, J. F., . . . de Zeeuw, A. (2022). Earth stewardship: Shaping a sustainable future through interacting policy and norm shifts. *Ambio*, *51*(9), 1907-1920. https://doi.org/10.1007/s13280-022-01721-3

Chatterjee, H. J., Camic, P. M., Lockyer, B., & Thomson, L. J. M. (2018). Non-clinical community interventions: a systematised review of social prescribing schemes. *Arts & Health*, *10*(2), 97-123. https://doi.org/10.1080/17533015.2017.1334002

Chekroud, S., Gueorguieva, R., Zheutlin, A., Paulus, M., Krumholz, H., Krystal, J., & Chekroud, A. (2018). Association between physical exercise and mental health in 1·2 million individuals in the USA between 2011 and 2015: a cross-sectional study. *The Lancet Psychiatry*, *5*. https://doi.org/10.1016/S2215-0366(18)30227-X

Cherry, K. M., Hoeven, E. V., Patterson, T. S., & Lumley, M. N. (2021). Defining and measuring "psychological flexibility": A narrative scoping review of diverse flexibility and rigidity constructs and perspectives. *Clin Psychol Rev*, *84*, 101973. https://doi.org/10.1016/j.cpr.2021.101973

Cicerone, K. D., & Azulay, J. (2007). Perceived self-efficacy and life satisfaction after traumatic brain injury. *The Journal of Head Trauma Rehabilitation*, *22*(5), 257-266. https://doi.org/10.1097/01.HTR.0000290970.56130.81

Cicerone, K. D., Langenbahn, D. M., Braden, C., Malec, J. F., Kalmar, K., Fraas, M., Felicetti, T., Laatsch, L., Harley, J. P., Bergquist, T., Azulay, J., Cantor, J., & Ashman, T. (2011). Evidence-based cognitive rehabilitation: updated review of the literature from 2003 through 2008. *Arch Phys Med Rehabil*, *92*(4), 519-530. https://doi.org/10.1016/j.apmr.2010.11.015

Cicerone, K. D., Mott, T., Azulay, J., & Friel, J. C. (2004). Community integration and satisfaction with functioning after intensive cognitive rehabilitation for traumatic brain injury. *Arch Phys Med Rehabil*, *85*(6), 943-950. https://doi.org/10.1016/j.apmr.2003.07.019

Cicerone, K. D., Mott, T., Azulay, J., Sharlow-Galella, M. A., Ellmo, W. J., Paradise, S., & Friel, J. C. (2008). A randomized controlled trial of holistic neuropsychologic rehabilitation after traumatic brain injury. *Arch Phys Med Rehabil*, *89*(12), 2239-2249. https://doi.org/10.1016/j.apmr.2008.06.017

Clarke, D. J., & Forster, A. (2015). Improving post-stroke recovery: the role of the multidisciplinary health care team. *Journal of multidisciplinary healthcare*, 433-442.

Clarke, P., & Smith, J. (2011). Aging in a Cultural Context: Cross-national Differences in Disability and the Moderating Role of Personal Control Among Older Adults in the United States and England. *The Journals of Gerontology: Series B*, *66B*(4), 457-467. https://doi.org/10.1093/geronb/gbr054

Code, C., Papathanasiou, I., Rubio-Bruno, S., Cabana Mde, L., Villanueva, M. M., Haaland-Johansen, L., Prizl-Jakovac, T., Leko, A., Zemva, N., Patterson, R., Berry, R., Rochon, E., Leonard, C., & Robert, A. (2016). International patterns of the public awareness of aphasia. *Int J Lang Commun Disord*, *51*(3), 276-284. https://doi.org/10.1111/1460-6984.12204

Coetzer, R. (2008). Holistic neuro-rehabilitation in the community: Is identity a key issue? *Neuropsychological Rehabilitation*, *18*(5-6), 766-783. https://doi.org/10.1080/09602010701860266

Coffey, Y., Bhullar, N., Durkin, J., Islam, M. S., & Usher, K. (2021). Understanding Eco-anxiety: A Systematic Scoping Review of Current Literature and Identified Knowledge Gaps. *The Journal of Climate Change and Health*, *3*, 100047. https://doi.org/https://doi.org/10.1016/j.joclim.2021.100047

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2 ed.). Routledge. https://doi.org/10.4324/9780203771587

Cohen, S. (2004). Social relationships and health. *Am Psychol*, *59*(8), 676-684. https://doi.org/10.1037/0003-066x.59.8.676

Colantonio, A., Ratcliff, G., Chase, S., Kelsey, S., Escobar, M., & Vernich, L. (2004). Long-term outcomes after moderate to severe traumatic brain injury. *Disabil Rehabil*, *26*(5), 253-261. https://doi.org/10.1080/09638280310001639722

Corrigan, J. D., & Hammond, F. M. (2013). Traumatic brain injury as a chronic health condition. *Arch Phys Med Rehabil*, *94*(6), 1199-1201. https://doi.org/10.1016/j.apmr.2013.01.023

Coventry, P. A., Brown, J. E., Pervin, J., Brabyn, S., Pateman, R., Breedvelt, J., Gilbody, S., Stancliffe, R., McEachan, R., & White, P. L. (2021). Nature-based outdoor activities for mental and physical health: Systematic review and meta-analysis. *SSM - Population Health*, *16*, 100934. https://doi.org/https://doi.org/10.1016/j.ssmph.2021.100934

Coventry, P. A., Brown, J. E., Pervin, J., Brabyn, S., Pateman, R., Breedvelt, J., Gilbody, S., Stancliffe, R., McEachan, R., & White, P. L. (2021). Nature-based outdoor activities for mental and physical health: Systematic review and meta-analysis. *SSM Popul Health*, *16*, 100934. https://doi.org/10.1016/j.ssmph.2021.100934

Coyle, C. E., & Dugan, E. (2012). Social isolation, loneliness and health among older adults. *J Aging Health*, *24*(8), 1346-1363. https://doi.org/10.1177/0898264312460275

Coyne, J. C., & Tennen, H. (2010). Positive psychology in cancer care: bad science, exaggerated claims, and unproven medicine. *Ann Behav Med*, *39*(1), 16-26. https://doi.org/10.1007/s12160-009-9154-z

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Creswell, J. W., & Zhang, W. (2009). The application of mixed methods designs to trauma research. *Journal of Traumatic Stress: Official publication of the international society for traumatic stress studies*, *22*(6), 612-621.

Crisp, R. (1993). Personal responses to traumatic brain injury: A qualitative study. *Disability, Handicap & Society*, *8*(4), 393-404.

Csikszentmihalyi, M., Abuhamdeh, S., & Nakamura, J. (2014). Flow. In *Flow and the foundations of positive psychology* (pp. 227-238). Springer.

Csikszentmihalyi, M., & Nakamura, J. (2010). Effortless attention in everyday life: A systematic phenomenology. In *Effortless attention: A new perspective in the cognitive science of attention and action*. (pp. 179-189). Boston Review. https://doi.org/10.7551/mitpress/9780262013840.003.0009

Cullen, B., Pownall, J., Cummings, J., Baylan, S., Broomfield, N., Haig, C., Kersel, D., Murray, H., & Evans, J. J. (2018). Positive PsychoTherapy in ABI Rehab (PoPsTAR): A pilot randomised controlled trial. *Neuropsychol Rehabil*, *28*(1), 17-33. https://doi.org/10.1080/09602011.2015.1131722

Cunsolo, A., & Ellis, N. R. (2018). Ecological grief as a mental health response to climate change-related loss. *Nature Climate Change*, *8*(4), 275-281. https://doi.org/10.1038/s41558-018-0092-2

Cutler, M., Nelson, M. L. A., Nikoloski, M., & Kuluski, K. (2016). Mindful Connections: The Role of a Peer Support Group on the Psychosocial Adjustment for Adults Recovering From Brain Injury. *Journal of Social Work in Disability & Rehabilitation*, *15*(3-4), 260-284. https://doi.org/10.1080/1536710X.2016.1220879

Daffner, K. R., Mesulam, M. M., Scinto, L. F., Acar, D., Calvo, V., Faust, R., Chabrerie, A., Kennedy, B., & Holcomb, P. (2000). The central role of the prefrontal cortex in directing attention to novel events. *Brain*, *123 ( Pt 5)*, 927-939. https://doi.org/10.1093/brain/123.5.927

Davies, J., McKenna, M., Bayley, J., Denner, K., & Young, H. (2020). Using engagement in sustainable construction to improve mental health and social connection in disadvantaged and hard to reach groups: a new green care approach. *Journal of Mental Health*, *29*(3), 350-357. https://doi.org/10.1080/09638237.2020.1714001

Davis, D. E., Rice, K., Hook, J. N., Van Tongeren, D. R., DeBlaere, C., Choe, E., & Worthington, E. L., Jr. (2015). Development of the Sources of Spirituality Scale. *J Couns Psychol*, *62*(3), 503-513. https://doi.org/10.1037/cou0000082

de Bell, S., Graham, H., Jarvis, S., & White, P. (2017). The importance of nature in mediating social and psychological benefits associated with visits to freshwater blue space. *Landscape and Urban Planning*, *167*, 118-127. https://doi.org/https://doi.org/10.1016/j.landurbplan.2017.06.003

Deci, E. L., & Ryan, R. M. (2014). Autonomy and need satisfaction in close relationships: Relationships motivation theory. In *Human motivation and interpersonal relationships: Theory, research, and applications*. (pp. 53-73). Springer Science + Business Media. https://doi.org/10.1007/978-94-017-8542-6_3

Deci, E. L., & Ryan, R. M. (2015). Self-Determination Theory. In J. D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences (Second Edition)* (pp. 486-491). Elsevier. https://doi.org/https://doi.org/10.1016/B978-0-08-097086-8.26036-4

Dehbozorgi, M., Maghsoudi, M. R., Mohammadi, I., Firouzabadi, S. R., Mohammaditabar, M., Oraee, S., Aarabi, A., Goodarzi, M., Shafiee, A., & Bakhtiyari, M. (2024). Incidence of anxiety after traumatic brain injury: a systematic review and meta-analysis. *BMC Neurology*, *24*(1), 293. https://doi.org/10.1186/s12883-024-03791-0

Demerouti, E. (2006). Job characteristics, flow, and performance: the moderating role of conscientiousness. *J Occup Health Psychol*, *11*(3), 266-280. https://doi.org/10.1037/1076-8998.11.3.266

Denneman, R. P. M., van Bezeij, T., Kal, E. C., Marshall, J., & Pisters, M. F. (2024). Riding waves to improve functioning: a quantitative evaluation of a Surf Week in individuals with chronic phase brain injury with six months follow-up. *Disability and Rehabilitation*, *46*(25), 6097-6107. https://doi.org/10.1080/09638288.2024.2320265

Denzin, N. K. (2008). The new paradigm dialogs and qualitative inquiry. *International journal of qualitative studies in education*, *21*(4), 315-325.

DeVille, N., Tomasso, L., Stoddard, O., Wilt, G., Horton, T., Wolf, K., Brymer, E., Kahn, P., & James, P. (2021). Time Spent in Nature Is Associated with Increased Pro-Environmental Attitudes and Behaviors. *International Journal of Environmental Research and Public Health*, *18*, 7498. https://doi.org/10.3390/ijerph18147498

Diener, E. (1984). Subjective well-being. *Psychological bulletin*, *95*(3), 542.

Diener, E., & Chan, M. Y. (2011). Happy People Live Longer: Subjective Well-Being Contributes to Health and Longevity. *Applied Psychology: Health and Well-Being*, *3*(1), 1-43. https://doi.org/https://doi.org/10.1111/j.1758-0854.2010.01045.x

Diener, E., Lucas, R. E., & Oishi, S. (2002). Subjective well-being: The science of happiness and life satisfaction. In *Handbook of positive psychology.* (pp. 463-473). Oxford University Press.

Dienes, Z. (2011). Bayesian versus orthodox statistics: Which side are you on? *Perspectives on Psychological Science*, *6*(3), 274-290.

Dijkers, M. P. (2004). Quality of life after traumatic brain injury: a review of research approaches and findings. *Arch Phys Med Rehabil*, *85*(4 Suppl 2), S21-35. https://doi.org/10.1016/j.apmr.2003.08.119

Domensino, A.-F., Verberne, D., Prince, L., Fish, J., Winegardner, J., Bateman, A., Wilson, B., Ponds, R., & van Heugten, C. (2022). Client experiences with holistic neuropsychological rehabilitation: “It is an ongoing process”. *Neuropsychological Rehabilitation*, *32*(8), 2147-2169. https://doi.org/10.1080/09602011.2021.1976222

Donker-Cools, B. H. P. M., Wind, H., & Frings-Dresen, M. H. W. (2016). Prognostic factors of return to work after traumatic or non-traumatic acquired brain injury. *Disability and Rehabilitation*, *38*(8), 733-741. https://doi.org/10.3109/09638288.2015.1061608

Douglas, J. (2013). Conceptualizing self and maintaining social connection following severe traumatic brain injury. *Brain injury : [BI]*, *27*, 60-74. https://doi.org/10.3109/02699052.2012.722254

Douglas, J. (2020). Loss of friendship following traumatic brain injury: A model grounded in the experience of adults with severe injury. *Neuropsychol Rehabil*, *30*(7), 1277-1302. https://doi.org/10.1080/09602011.2019.1574589

DuBois, C. M., Beach, S. R., Kashdan, T. B., Nyer, M. B., Park, E. R., Celano, C. M., & Huffman, J. C. (2012). Positive Psychological Attributes and Cardiac Outcomes: Associations, Mechanisms, and Interventions. *Psychosomatics*, *53*(4), 303-318. https://doi.org/https://doi.org/10.1016/j.psym.2012.04.004

Duffy, J. R. (2012). *Motor speech disorders: Substrates, differential diagnosis, and management*. Elsevier Health Sciences.

Dunn, L., Henry, J., & Beard, D. (2003). Social deprivation and adult head injury: a national study. *Journal of Neurology, Neurosurgery &amp;amp; Psychiatry*, *74*(8), 1060. https://doi.org/10.1136/jnnp.74.8.1060

Ellis-Hill, C. S., & Horn, S. (2000). Change in identity and self-concept: a new theoretical approach to recovery following a stroke. *Clin Rehabil*, *14*(3), 279-287. https://doi.org/10.1191/026921500671231410

Eriksson, M. (2022). Key concepts in the Salutogenic model of health. *The handbook of Salutogenesis*, 59-60.

Fadyl, J. K., & McPherson, K. M. (2009). Approaches to vocational rehabilitation after traumatic brain injury: a review of the evidence. *J Head Trauma Rehabil*, *24*(3), 195-212. https://doi.org/10.1097/HTR.0b013e3181a0d458

Fadyl, J. K., Theadom, A., Channon, A., & McPherson, K. M. (2019). Recovery and adaptation after traumatic brain injury in New Zealand: Longitudinal qualitative findings over the first two years*. *Neuropsychological Rehabilitation*, *29*(7), 1095-1112. https://doi.org/10.1080/09602011.2017.1364653

Fann, J. R., Hart, T., & Schomer, K. G. (2009). Treatment for depression after traumatic brain injury: a systematic review. *J Neurotrauma*, *26*(12), 2383-2402. https://doi.org/10.1089/neu.2009.1091

Fatisson, J., Oswald, V., & Lalonde, F. (2016). Influence Diagram of Physiological and Environmental Factors Affecting Heart Rate Variability: An Extended Literature Overview. *Heart International*, *11*(1), heartint.5000232. https://doi.org/10.5301/heartint.5000232

Faul, M., Xu, L., Wald, M., Coronado, V., & Dellinger, A. (2010). Faul, M. , Xu, L. , Wald, M.M. , Coronado, V. & Dellinger, A.M. Traumatic brain injury in the United States: national estimates of prevalence and incidence, 2002-2006. Inj. Prev. 16, A268. *Injury Prevention - INJ PREV*, *16*. https://doi.org/10.1136/ip.2010.029215.951

Feigin, V. L., Stark, B. A., Johnson, C. O., Roth, G. A., Bisignano, C., Abady, G. G., Abbasifard, M., Abbasi-Kangevari, M., Abd-Allah, F., Abedi, V., Abualhasan, A., Abu-Rmeileh, N. M. E., Abushouk, A. I., Adebayo, O. M., Agarwal, G., Agasthi, P., Ahinkorah, B. O., Ahmad, S., Ahmadi, S., . . . Murray, C. J. L. (2021). Global, regional, and national burden of stroke and its risk factors, 1990&#x2013;2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet Neurology*, *20*(10), 795-820. https://doi.org/10.1016/S1474-4422(21)00252-0

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*, 117-140. https://doi.org/10.1177/001872675400700202

Finset, A., Dyrnes, S., Krogstad, J. M., & Berstad, J. (1995). Self-reported social networks and interpersonal support 2 years after severe traumatic brain injury. *Brain Inj*, *9*(2), 141-150. https://doi.org/10.3109/02699059509008187

Fish, J., Prince, L., & Winegardner, J. (2018). Finding the confidence to crack on with things": A qualitative study of client reflections on holistic neuropsychological rehabilitation several years post-programme. *15th Neuropsychological Rehabilitation Special Interest Group of the WFNR*.

Fisher, Z., Galloghly, E., Boglo, E., Gracey, F., & Kemp, A. H. (2022). Emotion, Wellbeing and the Neurological Disorders. In S. Della Sala (Ed.), *Encyclopedia of Behavioral Neuroscience, 2nd edition (Second Edition)* (pp. 220-234). Elsevier. https://doi.org/https://doi.org/10.1016/B978-0-12-819641-0.00013-X

Fledderus, M., Bohlmeijer, E. T., Fox, J.-P., Schreurs, K. M. G., & Spinhoven, P. (2013). The role of psychological flexibility in a self-help acceptance and commitment therapy intervention for psychological distress in a randomized controlled trial. *Behaviour Research and Therapy*, *51*(3), 142-151. https://doi.org/https://doi.org/10.1016/j.brat.2012.11.007

Flegal, K. M., Kit, B. K., Orpana, H., & Graubard, B. I. (2013). Association of all-cause mortality with overweight and obesity using standard body mass index categories: a systematic review and meta-analysis. *JAMA*, *309*(1), 71-82. https://doi.org/10.1001/jama.2012.113905

Fleischmann, D., Michalewicz, B., Stedje-Larsen, E., Neff, J., Murphy, J., Browning, K., Nebeker, B., Cronin, A., Sauve, W., & Stetler, C. (2011). Surf medicine: Surfing as a means of therapy for combat-related polytrauma. *JPO: Journal of Prosthetics and Orthotics*, *23*(1), 27-29.

Fleminger, S., & Ponsford, J. (2005). Long term outcome after traumatic brain injury. *BMJ*, *331*(7530), 1419. https://doi.org/10.1136/bmj.331.7530.1419

Fletcher, K., Wydera, S., Thorpe, N., Radford, K., das Nair, R., & Booth, V. (2024). A rapid realist review of clinical neuropsychology rehabilitation programmes to improve psychological wellbeing and quality of life for people with acquired brain injuries. *Neuropsychol Rehabil*, *34*(8), 1035-1070. https://doi.org/10.1080/09602011.2023.2273580

Foley, R., & Kistemann, T. (2015). Blue space geographies: Enabling health in place. *Health Place*, *35*, 157-165. https://doi.org/10.1016/j.healthplace.2015.07.003

Folkman, S., & Moskowitz, J. T. (2000). Positive affect and the other side of coping. *Am Psychol*, *55*(6), 647-654. https://doi.org/10.1037//0003-066x.55.6.647

Ford, B. Q., Karnilowicz, H. R., & Mauss, I. B. (2017). Understanding reappraisal as a multicomponent process: The psychological health benefits of attempting to use reappraisal depend on reappraisal success. *Emotion (Washington, D.C.)*, *17*(6), 905-911. https://doi.org/10.1037/emo0000310

Ford, B. Q., Lam, P., John, O. P., & Mauss, I. B. (2018). The psychological health benefits of accepting negative emotions and thoughts: Laboratory, diary, and longitudinal evidence. *J Pers Soc Psychol*, *115*(6), 1075-1092. https://doi.org/10.1037/pspp0000157

Fordington, S., & Manford, M. (2020). A review of seizures and epilepsy following traumatic brain injury. *J Neurol*, *267*(10), 3105-3111. https://doi.org/10.1007/s00415-020-09926-w

Forslund, M. V., Perrin, P. B., Røe, C., Sigurdardottir, S., Hellstrøm, T., Berntsen, S. A., Lu, J., Arango-Lasprilla, J. C., & Andelic, N. (2019). Global Outcome Trajectories up to 10 Years After Moderate to Severe Traumatic Brain Injury. *Front Neurol*, *10*, 219. https://doi.org/10.3389/fneur.2019.00219

Francis, A., Dawson, D., & Golijani-Moghaddam, N. (2016). The Development and Validation of the Comprehensive Assessment of Acceptance and Commitment Therapy Processes (CompACT). *Journal of Contextual Behavioral Science*. https://doi.org/10.1016/j.jcbs.2016.05.003

Frankl, V. E. (1959). The spiritual dimension in existential analysis and logotherapy. *Journal of Individual Psychology*, *15*(2), 157.

Frankl, V. E. (1985). *Man's search for meaning*. Simon and Schuster.

Frankl, V. E. (1988). *The will to meaning: Foundations and applications of logotherapy*. Penguin.

Fredrickson, B. L. (1998). What Good Are Positive Emotions? *Rev Gen Psychol*, *2*(3), 300-319. https://doi.org/10.1037/1089-2680.2.3.300

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology. The broaden-and-build theory of positive emotions. *Am Psychol*, *56*(3), 218-226. https://doi.org/10.1037//0003-066x.56.3.218

Fredrickson, B. L. (2004). The broaden-and-build theory of positive emotions. *Philosophical transactions of the Royal Society of London. Series B, Biological sciences*, *359*(1449), 1367-1378. https://doi.org/10.1098/rstb.2004.1512

Fredrickson, B. L., & Joiner, T. (2002). Positive Emotions Trigger Upward Spirals Toward Emotional Well-Being. *Psychological Science*, *13*(2), 172-175. https://doi.org/10.1111/1467-9280.00431

Fullagar, C. J., & Kelloway, E. K. (2009). Flow at work: An experience sampling approach. *Journal of Occupational and Organizational Psychology*, *82*(3), 595-615. https://doi.org/https://doi.org/10.1348/096317908X357903

Gallagher, M., Muldoon, O. T., & Pettigrew, J. (2015). An integrative review of social and occupational factors influencing health and wellbeing [Review]. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.01281

García-Quijano, C., Poggie, J., Pitchón, A., & Del Pozo, M. (2012). Investigating coastal resource use, quality of life, and well-being in southeastern Puerto Rico. *Anthropology News*, *53*(3), 6-7.

Garland, E. L., Farb, N. A., Goldin, P. R., & Fredrickson, B. L. (2015). The mindfulness-to-meaning theory: Extensions, applications, and challenges at the attention–appraisal–emotion interface. *Psychological Inquiry*, *26*(4), 377-387. https://doi.org/10.1080/1047840X.2015.1092493

Garrett, J. K., Rowney, F. M., White, M. P., Lovell, R., Fry, R. J., Akbari, A., Geary, R., Lyons, R. A., Mizen, A., Nieuwenhuijsen, M., Parker, C., Song, J., Stratton, G., Thompson, D. A., Watkins, A., White, J., Williams, S. A., Rodgers, S. E., & Wheeler, B. W. (2023). Visiting nature is associated with lower socioeconomic inequalities in well-being in Wales. *Sci Rep*, *13*(1), 9684. https://doi.org/10.1038/s41598-023-35427-7

Gascon, M., Zijlema, W., Vert, C., White, M. P., & Nieuwenhuijsen, M. J. (2017). Outdoor blue spaces, human health and well-being: A systematic review of quantitative studies. *Int J Hyg Environ Health*, *220*(8), 1207-1221. https://doi.org/10.1016/j.ijheh.2017.08.004

Gaspar de Matos, M., Santos, A., Fauvele, C., Marta, F., Evangelista, E., Ferreira, J., Moita, M., Conibear, T., & Mattila, M. (2017). Surfing for Social Integration: Mental Health and Well-Being promotion through Surf Therapy among Institutionalized Young People. *HSOA Journal of Community Medicine and Public Health Care*, *4*, 026. https://doi.org/10.24966/CMPH-1978/100026

Geary, R. S., Thompson, D., Mizen, A., Akbari, A., Garrett, J. K., Rowney, F. M., Watkins, A., Lyons, R. A., Stratton, G., Lovell, R., Nieuwenhuijsen, M., Parker, S. C., Song, J., Tsimpida, D., White, J., White, M. P., Williams, S., Wheeler, B. W., Fry, R., & Rodgers, S. E. (2023). Ambient greenness, access to local green spaces, and subsequent mental health: a 10-year longitudinal dynamic panel study of 2·3 million adults in Wales. *Lancet Planet Health*, *7*(10), e809-e818. https://doi.org/10.1016/s2542-5196(23)00212-7

Geary, R. S., Thompson, D. A., Garrett, J. K., Mizen, A., Rowney, F. M., Song, J., White, M. P., Lovell, R., Watkins, A., Lyons, R. A., Williams, S., Stratton, G., Akbari, A., Parker, S. C., Nieuwenhuijsen, M. J., White, J., Wheeler, B. W., Fry, R., Tsimpida, D., & Rodgers, S. E. (2023). Green-blue space exposure changes and impact on individual-level well-being and mental health: a population-wide dynamic longitudinal panel study with linked survey data. *Public Health Res (Southampt)*, *11*(10), 1-176. https://doi.org/10.3310/lqpt9410

Genter, C., Roberts, A., Richardson, J., & Sheaff, M. (2015). The contribution of allotment gardening to health and wellbeing: A systematic review of the literature. *British Journal of Occupational Therapy*, *78*(10), 593-605. https://doi.org/10.1177/0308022615599408

Geurtsen, G. J., van Heugten, C. M., Martina, J. D., Rietveld, A. C., Meijer, R., & Geurts, A. C. (2011). A prospective study to evaluate a residential community reintegration program for patients with chronic acquired brain injury. *Arch Phys Med Rehabil*, *92*(5), 696-704. https://doi.org/10.1016/j.apmr.2010.12.022

Ghosh-Cannell, C., Fisher, P., Ajayi, J., & Gracey, F. (2023). The experiences of wives following acquired brain injury (ABI). A qualitative analysis exploring realisations of change following the ABI of a "loved one.". *Neuropsychol Rehabil*, *33*(2), 356-377. https://doi.org/10.1080/09602011.2021.2017982

Gibbs, K., Fisher, Z., & Kemp, A. H. (2022). Towards a Culture of Care for Societal Wellbeing: A Perspective from the Healthcare Sector. In A. H. Kemp & D. J. Edwards (Eds.), *Broadening the Scope of Wellbeing Science: Multidisciplinary and Interdisciplinary*

*Perspectives on Human Flourishing and Wellbeing* (pp. 43-58). Springer International Publishing. https://doi.org/10.1007/978-3-031-18329-4_4

Gibbs, K., Wilkie, L., Jarman, J., Barker-Smith, A., Kemp, A. H., & Fisher, Z. (2022). Riding the wave into wellbeing: A qualitative evaluation of surf therapy for individuals living with acquired brain injury. *PLoS ONE*, *17*(4), e0266388. https://doi.org/10.1371/journal.pone.0266388

Gil, N. (2014). Loneliness: A silent plague that is hurting young people most. *The guardian*, *20*.

Gillen, G. (2005). Positive Consequences of Surviving a Stroke. *The American journal of occupational therapy : official publication of the American Occupational Therapy Association*, *59*, 346-350. https://doi.org/10.5014/ajot.59.3.346

Gillen, R., Tennen, H., McKee, T. E., Gernert-Dott, P., & Affleck, G. (2001). Depressive symptoms and history of depression predict rehabilitation efficiency in stroke patients. *Archives of Physical Medicine and Rehabilitation*, *82*(12), 1645-1649. https://doi.org/10.1053/apmr.2001.26249

Gilworth, G., Eyres, S., Carey, A., Bhakta, B. B., & Tennant, A. (2008). Working with a brain injury: personal experiences of returning to work following a mild or moderate brain injury. *J Rehabil Med*, *40*(5), 334-339. https://doi.org/10.2340/16501977-0169

Glenn, M., O'Neil-Pirozzi, T., Goldstein, R., Burke, D., & Jacob, L. (2001). Depression amongst outpatients with traumatic brain injury. *Brain Injury*, *15*(9), 811-818. https://doi.org/10.1080/02699050120330

Godfrey, C., Devine-Wright, H., & Taylor, J. (2015). The positive impact of structured surfing courses on the wellbeing of vulnerable young people. *Community Practitioner*, *88*.

Goldstein, K. (1942). Aftereffects of brain injuries in war: their evaluation and treatment. The application of psychologic methods in the clinic.

Gómez-de-Regil, L., Estrella-Castillo, D. F., & Vega-Cauich, J. (2019). Psychological Intervention in Traumatic Brain Injury Patients. *Behav Neurol*, *2019*, 6937832. https://doi.org/10.1155/2019/6937832

Gomez-Hernandez, R., Max, J. E., Kosier, T., Paradiso, S., & Robinson, R. G. (1997). Social impairment and depression after traumatic brain injury. *Arch Phys Med Rehabil*, *78*(12), 1321-1326. https://doi.org/10.1016/s0003-9993(97)90304-x

Goodman, F. R., Disabato, D. J., Kashdan, T. B., & Kauffman, S. B. (2018). Measuring well-being: A comparison of subjective well-being and PERMA. *The Journal of Positive Psychology*, *13*(4), 321-332. https://doi.org/10.1080/17439760.2017.1388434

Goverover, Y., Genova, H., Smith, A., Chiaravalloti, N., & Lengenfelder, J. (2017). Changes in activity participation following traumatic brain injury. *Neuropsychol Rehabil*, *27*(4), 472-485. https://doi.org/10.1080/09602011.2016.1168746

Grace, J. J., Kinsella, E. L., Muldoon, O. T., & Fortune, D. G. (2015). Post-traumatic growth following acquired brain injury: a systematic review and meta-analysis. *Frontiers in psychology*, *6*, 1162. https://doi.org/10.3389/fpsyg.2015.01162

Gracey, F., Evans, J., & Malley, D. (2009). Capturing process and outcome in complex rehabilitation interventions: A “Y-shaped” model. *Neuropsychological Rehabilitation*, *19*, 867-890. https://doi.org/10.1080/09602010903027763

Gracey, F., Palmer, S., Rous, B., Psaila, K., Shaw, K., O'Dell, J., Cope, J., & Mohamed, S. (2008). “Feeling part of things”: Personal construction of self after brain injury. *Neuropsychological Rehabilitation*, *18*(5-6), 627-650. https://doi.org/10.1080/09602010802041238

Granerud, A., & Eriksson, B. G. (2014). Mental Health Problems, Recovery, and the Impact of Green Care Services: A Qualitative, Participant-Focussed Approach. *Occupational Therapy in Mental Health*, *30*(4), 317-336. https://doi.org/10.1080/0164212X.2014.938558

Grant, C., Goodenough, T., Harvey, I., & Hine, C. (2000). A randomised controlled trial and economic evaluation of a referrals facilitator between primary care and the voluntary sector. *BMJ (Clinical research ed.)*, *320*(7232), 419-423. https://doi.org/10.1136/bmj.320.7232.419

Grant, E., Bowman, A., & Johnson, L. (2025). Effectiveness of interventions for psychological distress following traumatic injury: A systematic review. *Injury*, *56*(2), 112090. https://doi.org/https://doi.org/10.1016/j.injury.2024.112090

Grayer, J., Cape, J., Orpwood, L., Leibowitz, J., & Buszewicz, M. (2008). Facilitating access to voluntary and community services for patients with psychosocial problems: a before-after evaluation. *BMC Family Practice*, *9*(1), 27. https://doi.org/10.1186/1471-2296-9-27

Griffin, S. M., Kinsella, E. L., Bradshaw, D., McMahon, G., Nightingale, A., Fortune, D. G., & Muldoon, O. T. (2022). New group memberships formed after an acquired brain injury and posttraumatic growth: A prospective study. *Neuropsychological Rehabilitation*, *32*(8), 2054-2076. https://doi.org/10.1080/09602011.2021.2021950

Hackett, M. L., Yapa, C., Parag, V., & Anderson, C. S. (2005). Frequency of depression after stroke: a systematic review of observational studies. *Stroke*, *36*(6), 1330-1340. https://doi.org/10.1161/01.Str.0000165928.19135.35

Hagerty, B. M. K., Lynch-Sauer, J., Patusky, K. L., Bouwsema, M., & Collier, P. (1992). Sense of belonging: A vital mental health concept. *Archives of Psychiatric Nursing*, *6*(3), 172-177. https://doi.org/https://doi.org/10.1016/0883-9417(92)90028-H

Hagger, B. F., & Riley, G. A. (2017). The social consequences of stigma-related self-concealment after acquired brain injury. *Neuropsychological Rehabilitation*, *29*(7), 1129-1148. https://doi.org/10.1080/09602011.2017.1375416

Haig, B. D. (2005). An abductive theory of scientific method. *Psychol Methods*, *10*(4), 371-388. https://doi.org/10.1037/1082-989x.10.4.371

Halcomb, E. J., & Davidson, P. M. (2006). Is verbatim transcription of interview data always necessary? *Applied Nursing Research*, *19*(1), 38-42. https://doi.org/https://doi.org/10.1016/j.apnr.2005.06.001

Halvorsrud, K., Kucharska, J., Adlington, K., Rüdell, K., Brown Hajdukova, E., Nazroo, J., Haarmans, M., Rhodes, J., & Bhui, K. (2019). Identifying evidence of effectiveness in the co-creation of research: a systematic review and meta-analysis of the international healthcare literature. *Journal of Public Health*, *43*(1), 197-208. https://doi.org/10.1093/pubmed/fdz126

Hamel, R. N., & Smoliga, J. M. (2019). Physical Activity Intolerance and Cardiorespiratory Dysfunction in Patients with Moderate-to-Severe Traumatic Brain Injury. *Sports Medicine*, *49*(8), 1183-1198. https://doi.org/10.1007/s40279-019-01122-9

Hamilton, M., Khan, M., Clark, R., Williams, G., & Bryant, A. (2016). Predictors of physical activity levels of individuals following traumatic brain injury remain unclear: A systematic review. *Brain Inj*, *30*(7), 819-828. https://doi.org/10.3109/02699052.2016.1146962

Hansen, M. M., Jones, R., & Tocchini, K. (2017). Shinrin-Yoku (Forest Bathing) and Nature Therapy: A State-of-the-Art Review. *International Journal of Environmental Research and Public Health*, *14*(8), 851. https://www.mdpi.com/1660-4601/14/8/851

Hansmann, R., Hug, S.-M., & Seeland, K. (2007). Restoration and stress relief through physical activities in forests and parks. *Urban Forestry & Urban Greening*, *6*, 213-225. https://doi.org/10.1016/j.ufug.2007.08.004

Harris, R. (2013). *Getting unstuck in ACT: A clinician's guide to overcoming common obstacles in acceptance and commitment therapy*. New Harbinger Publications.

Harris, R. (2019). *ACT made simple: An easy-to-read primer on acceptance and commitment therapy, 2nd ed*. New Harbinger Publications.

Harrison, H., Burns, M., Darko, N., & Jones, C. (2023). Exploring the benefits of nature-based interventions in socio-economically deprived communities: a narrative review of the evidence to date. *Perspectives in Public Health*, *143*(3), 156-172. https://doi.org/10.1177/17579139231170768

Harrison, M., Ryan, T., Gardiner, C., & Jones, A. (2017). Psychological and emotional needs, assessment, and support post-stroke: a multi-perspective qualitative study. *Topics in stroke rehabilitation*, *24*(2), 119-125. https://doi.org/10.1080/10749357.2016.1196908

Harrod, A., von Benzon, N., & Limmer, M. (2023). 'It's probably more about the people': For a person-centred approach to understanding benefits of nature-based interventions. *Area*, *n/a*(n/a). https://doi.org/https://doi.org/10.1111/area.12867

Hartig, T., Mitchell, R., de Vries, S., & Frumkin, H. (2014). Nature and health. *Annu Rev Public Health*, *35*, 207-228. https://doi.org/10.1146/annurev-publhealth-032013-182443

Haslam, C., Cruwys, T., Haslam, S. A., Dingle, G., & Chang, M. X. (2016). Groups 4 Health: Evidence that a social-identity intervention that builds and strengthens social group membership improves mental health. *J Affect Disord*, *194*, 188-195. https://doi.org/10.1016/j.jad.2016.01.010

Haslam, C., Holme, A., Haslam, S. A., Iyer, A., Jetten, J., & Williams, W. H. (2008). Maintaining group memberships: social identity continuity predicts well-being after stroke. *Neuropsychol Rehabil*, *18*(5-6), 671-691. https://doi.org/10.1080/09602010701643449

Haslam, C., Jetten, J., Cruwys, T., Dingle, G., & Haslam, S. A. (2018). *The new psychology of health: Unlocking the social cure*. Routledge.

Hawley, C. A., & Joseph, S. (2008). Predictors of positive growth after traumatic brain injury: a longitudinal study. *Brain Inj*, *22*(5), 427-435. https://doi.org/10.1080/02699050802064607

Hayes, S., & Smith, S. (2005). *Get out of Your Mind and into Your Life*.

Hayes, S., Strosahl, K., & Wilson, K. (2011). *Acceptance and Commitment Therapy: The Process and Practice of Mindful Change*.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and Commitment Therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, *44*(1), 1-25. https://doi.org/https://doi.org/10.1016/j.brat.2005.06.006

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. Guilford Press.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experimental avoidance and behavioral disorders: a functional dimensional approach to diagnosis and treatment. *J Consult Clin Psychol*, *64*(6), 1152-1168. https://doi.org/10.1037//0022-006x.64.6.1152

Headway. (2019). https://www.headway.org.uk/about-brain-injury/further-information/statistics/

Helgeson, V. S., Reynolds, K. A., & Tomich, P. L. (2006). A meta-analytic review of benefit finding and growth. *J Consult Clin Psychol*, *74*(5), 797-816. https://doi.org/10.1037/0022-006x.74.5.797

Helmich, M. A., Wichers, M., Olthof, M., Strunk, G., Aas, B., Aichhorn, W., Schiepek, G., & Snippe, E. (2020). *Sudden gains in day-to-day change: Revealing nonlinear patterns of individual improvement in depression* [doi:10.1037/ccp0000469].

Hennink, M. M., Kaiser, B. N., & Weber, M. B. (2019). What Influences Saturation? Estimating Sample Sizes in Focus Group Research. *Qualitative Health Research*, *29*(10), 1483-1496. https://doi.org/10.1177/1049732318821692

Hesse-Biber, S., & Leavy, P. (2006). The Practice of Qualitative Research.

Hjelmblink, F., Bernsten, C. B., Uvhagen, H., Kunkel, S., & Holmström, I. (2007). Understanding the meaning of rehabilitation to an aphasic patient through phenomenological analysis

– a case study. *International Journal of Qualitative Studies on Health and Well-being*, *2*(2), 93-100. https://doi.org/10.1080/17482620701296358

Hofmann, S. G., & Asmundson, G. J. G. (2008). Acceptance and mindfulness-based therapy: new wave or old hat? *Clin Psychol Rev*, *28*(1), 1-16. https://doi.org/10.1016/j.cpr.2007.09.003

Hofmann, S. G., Asmundson, G. J. G., & Beck, A. T. (2013). The Science of Cognitive Therapy. *Behavior Therapy*, *44*(2), 199-212. https://doi.org/https://doi.org/10.1016/j.beth.2009.01.007

Hofmann, S. G., Asnaani, A., Vonk, I. J., Sawyer, A. T., & Fang, A. (2012). The Efficacy of Cognitive Behavioral Therapy: A Review of Meta-analyses. *Cognit Ther Res*, *36*(5), 427-440. https://doi.org/10.1007/s10608-012-9476-1

Holahan, C. J., Moos, R. H., & Bonin, L. A. (1999). *Social context and depression: An integrative stress and coping framework* [doi:10.1037/10311-002].

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspect Psychol Sci*, *10*(2), 227-237. https://doi.org/10.1177/1745691614568352

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social Relationships and Mortality Risk: A Meta-analytic Review. *PLOS Medicine*, *7*(7), e1000316. https://doi.org/10.1371/journal.pmed.1000316

Huber, M., Knottnerus, J. A., Green, L., Horst, H. v. d., Jadad, A. R., Kromhout, D., Leonard, B., Lorig, K., Loureiro, M. I., Meer, J. W. M. v. d., Schnabel, P., Smith, R., Weel, C. v., & Smid, H. (2011). How should we define health? *BMJ*, *343*, d4163. https://doi.org/10.1136/bmj.d4163

Huebner, R. A., Johnson, K., Bennett, C. M., & Schneck, C. (2003). Community Participation and Quality of Life Outcomes After Adult Traumatic Brain Injury. *The American Journal of Occupational Therapy*, *57*(2), 177-185. https://doi.org/10.5014/ajot.57.2.177

Hughes, R., Fleming, P., & Henshall, L. (2020). Peer support groups after acquired brain injury: a systematic review. *Brain Inj*, *34*(7), 847-856. https://doi.org/10.1080/02699052.2020.1762002

Husk, K., Blockley, K., Lovell, R., Bethel, A., Bloomfield, D., Warber, S., Pearson, M., Lang, I., Byng, R., & Garside, R. (2016). What approaches to social prescribing work, for whom, and in what circumstances? A protocol for a realist review. *Syst Rev*, *5*, 93. https://doi.org/10.1186/s13643-016-0269-6

Huta, V. (2015). An overview of hedonic and eudaimonic well-being concepts. In.

Huta, V., & Ryan, R. M. (2010). Pursuing pleasure or virtue: The differential and overlapping well-being benefits of hedonic and eudaimonic motives. *Journal of Happiness Studies*, *11*(6), 735-762.

Hutton, L., & Ownsworth, T. (2019). A qualitative investigation of sense of self and continuity in younger adults with stroke. *Neuropsychol Rehabil*, *29*(2), 273-288. https://doi.org/10.1080/09602011.2017.1292922

Isen, A. M. (2008). Some ways in which positive affect influences decision making and problem solving. *Handbook of emotions*, *3*, 548-573.

Isham, A., Jefferies, L., Blackburn, J., Fisher, Z., & Kemp, A. H. (2025). Green healing: Ecotherapy as a transformative model of health and social care. *Curr Opin Psychol*, *62*, 102005. https://doi.org/10.1016/j.copsyc.2025.102005

Isham, A., Morgan, G., & Kemp, A. H. (2023). Nurturing wellbeing amidst the climate crisis: on the need for a focus on wellbeing in the field of climate psychology. *Frontiers in psychology*, *14*, 1205991. https://doi.org/10.3389/fpsyg.2023.1205991

Jacobsson, L., & Lexell, J. (2013). Life satisfaction 6-15 years after a traumatic brain injury. *J Rehabil Med*, *45*(10), 1010-1015. https://doi.org/10.2340/16501977-1204

Jennings, V., & Bamkole, O. (2019). The Relationship between Social Cohesion and Urban Green Space: An Avenue for Health Promotion. *International Journal of Environmental Research and Public Health*, *16*(3), 452. https://www.mdpi.com/1660-4601/16/3/452

Johnstone, L., & Boyle, M. (2018). The power threat meaning framework: An alternative nondiagnostic conceptual system. *Journal of Humanistic Psychology*, 0022167818793289.

Jones, J., Williams, W., Jetten, J., Haslam, S., Harris, A., & Gleibs, I. (2012). The role of psychological symptoms and social group memberships in the development of post-traumatic stress after traumatic injury. *British journal of health psychology*, *17*, 798-811. https://doi.org/10.1111/j.2044-8287.2012.02074.x

Jordan, M., & Hinds, J. (2016). *Ecotherapy: Theory, Research and Practice*. Macmillan Education UK. https://books.google.co.uk/books?id=qztGjwEACAAJ

Jordan, M., & Hinds, J. (2017). *Ecotherapy: Theory, research and practice*. Bloomsbury Publishing.

Jorge, R. E., Robinson, R. G., Moser, D., Tateno, A., Crespo-Facorro, B., & Arndt, S. (2004). Major Depression Following Traumatic Brain Injury. *Archives of General Psychiatry*, *61*(1), 42-50. https://doi.org/10.1001/archpsyc.61.1.42

Jorge, R. E., & Starkstein, S. E. (2005). Pathophysiologic Aspects of Major Depression Following Traumatic Brain Injury. *The Journal of Head Trauma Rehabilitation*, *20*(6), 475-487. https://journals.lww.com/headtraumarehab/Fulltext/2005/11000/Pathophysiologic_Aspects_of_Major_Depression.1.aspx

Joseph, S., & Linley, P. A. (2006). Growth following adversity: Theoretical perspectives and implications for clinical practice. *Clinical Psychology Review*, *26*(8), 1041-1053. https://doi.org/https://doi.org/10.1016/j.cpr.2005.12.006

Kagan, J. (2022). Temperamental and theoretical contributions to clinical psychology. *Annual Review of Clinical Psychology*, *18*(1), 1-18.

Kahana, E., Bhatta, T., Lovegreen, L., Kahana, B., & Midlarsky, E. (2013). Altruism, Helping, and Volunteering. *Journal of Aging and Health*, *25*, 159-187. https://doi.org/10.1177/0898264312469665

Kangas, M., & McDonald, S. (2011). Is it time to act? The potential of acceptance and commitment therapy for psychological problems following acquired brain injury. *Neuropsychological Rehabilitation*, *21*(2), 250-276. https://doi.org/10.1080/09602011.2010.540920

Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. CUP Archive.

Kaplan, R., & Talbot, J. F. (1988). Ethnicity and preference for natural settings: A review and recent findings. *Landscape and Urban Planning*, *15*(1), 107-117. https://doi.org/https://doi.org/10.1016/0169-2046(88)90019-9

Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology*, *15*(3), 169-182. https://doi.org/https://doi.org/10.1016/0272-4944(95)90001-2

Karagiorgou, O., Evans, J. J., & Cullen, B. (2018). Post-traumatic growth in adult survivors of brain injury: a qualitative study of participants completing a pilot trial of brief positive psychotherapy. *Disability and Rehabilitation*, *40*(6), 655-659. https://doi.org/10.1080/09638288.2016.1274337

Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review*, *30*(7), 865-878. https://doi.org/https://doi.org/10.1016/j.cpr.2010.03.001

Kellert, S. R., & Wilson, E. O. (1993). *The biophilia hypothesis*. Island press.

Kemp, A., Arias, J., & Fisher, Z. (2017). Social Ties, Health and Wellbeing: A Literature Review and Model. In. https://doi.org/10.1007/978-3-319-68421-5_17

Kemp, A., Arias, J., & Fisher, Z. (2018). Social Ties, Health and Wellbeing: A Literature Review and Model. In. https://doi.org/10.1007/978-3-319-68421-5_17

Kemp, A. H., Arias, J. A., & Fisher, Z. (2017). Social Ties, Health and Wellbeing: A Literature Review and Model. In A. Ibáñez, L. Sedeño, & A. M. García (Eds.), *Neuroscience and Social Science: The Missing Link* (pp. 397-427). Springer International Publishing. https://doi.org/10.1007/978-3-319-68421-5_17

Kemp, A. H., & Edwards, D. J. (2022). *Broadening the Scope of Wellbeing Science: Multidisciplinary and Interdisciplinary Perspectives on Human Flourishing and Wellbeing*. Springer International Publishing AG. https://doi.org/10.1007/978-3-031-18329-4

Kemp, A. H., & Fisher, Z. (2022). Wellbeing, Whole Health and Societal Transformation: Theoretical Insights and Practical Applications. *Global Advances in Health and Medicine*, *11*, 21649561211073077. https://doi.org/10.1177/21649561211073077

Kemp, A. H., & Quintana, D. S. (2013). The relationship between mental and physical health: Insights from the study of heart rate variability. *International Journal of Psychophysiology*, *89*(3), 288-296. https://doi.org/https://doi.org/10.1016/j.ijpsycho.2013.06.018

Kemp, A. H., & Quintana, D. S. (2013). The relationship between mental and physical health: insights from the study of heart rate variability. *Int J Psychophysiol*, *89*(3), 288-296. https://doi.org/10.1016/j.ijpsycho.2013.06.018

Kendall, E. (1996). Psychosocial Adjustment Following Closed Head Injury: A Model for Understanding Individual Differences and Predicting Outcome. *Neuropsychological Rehabilitation*, *6*(2), 101-132. https://doi.org/10.1080/713755502

Keng, S. L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: a review of empirical studies. *Clin Psychol Rev*, *31*(6), 1041-1056. https://doi.org/10.1016/j.cpr.2011.04.006

Kennedy, P. (2002). Health Psychology: Theory, Research and Practice David F. Marks, Michael Murray, Brian Evans and Carla Willig London: Sage, 2000. pp.422. ISBN: 0-8039-7608-9. *Behavioural and Cognitive Psychotherapy*, *30*(1), 117-122. https://doi.org/10.1017/S135246580221111X

Kessler, D., Egan, M., & Kubina, L. A. (2014). Peer support for stroke survivors: a case study. *BMC Health Serv Res*, *14*, 256. https://doi.org/10.1186/1472-6963-14-256

Keyes, C., & Annas, J. (2009). Feeling good and functioning well: Distinctive concepts in ancient philosophy and contemporary science. *The Journal of Positive Psychology*, *4*, 197-201. https://doi.org/10.1080/17439760902844228

Keyes, C., Shmotkin, D., & Ryff, C. (2002). Optimizing Well-Being: The Empirical Encounter of Two Traditions. *Journal of Personality and Social Psychology*, *82*, 1007-1022. https://doi.org/10.1037/0022-3514.82.6.1007

Kiken, L. G., Garland, E. L., Bluth, K., Palsson, O. S., & Gaylord, S. A. (2015). From a state to a trait: Trajectories of state mindfulness in meditation during intervention predict changes in trait mindfulness. *Pers Individ Dif*, *81*, 41-46. https://doi.org/10.1016/j.paid.2014.12.044

Kilgarriff-Foster, A., & O'Cathain, A. (2015). Exploring the components and impact of social prescribing. *Journal of Public Mental Health*, *14*(3), 127-134.

King, D., Wittenberg, R., Patel, A., Quayyum, Z., Berdunov, V., & Knapp, M. (2020). The future incidence, prevalence and costs of stroke in the UK. *Age and ageing*, *49*(2), 277-282.

Klayman, J. (1995). Varieties of confirmation bias. *Psychology of learning and motivation*, *32*, 385-418.

Kleim, J. A. (2011). Neural plasticity and neurorehabilitation: teaching the new brain old tricks. *J Commun Disord*, *44*(5), 521-528. https://doi.org/10.1016/j.jcomdis.2011.04.006

Klonoff, P. S., Watt, L. M., Dawson, L. K., Henderson, S. W., Gehrels, J. A., & Wethe, J. V. (2006). Psychosocial outcomes 1-7 years after comprehensive milieu-oriented neurorehabilitation: the role of pre-injury status. *Brain Inj*, *20*(6), 601-612. https://doi.org/10.1080/02699050600744301

Knight, E., Norman, A., & Simpson, G. K. (2020). Living with suicidality following traumatic brain injury: a qualitative study. *Brain Inj*, *34*(8), 1010-1019. https://doi.org/10.1080/02699052.2020.1763463

Kohls, N., Sauer, S., & Walach, H. (2009). Facets of mindfulness – Results of an online study investigating the Freiburg mindfulness inventory. *Personality and Individual Differences*, *46*, 224-230. https://doi.org/10.1016/j.paid.2008.10.009

Kok, B., Coffey, K., Cohn, M., Catalino, L., Vacharkulksemsuk, T., Algoe, S., Brantley, M., & Fredrickson, B. (2013). How Positive Emotions Build Physical Health: Perceived Positive Social Connections Account for the Upward Spiral Between Positive Emotions and Vagal Tone. *Psychological Science*, *24*. https://doi.org/10.1177/0956797612470827

Konrad, C., Geburek, A. J., Rist, F., Blumenroth, H., Fischer, B., Husstedt, I., Arolt, V., Schiffbauer, H., & Lohmann, H. (2011). Long-term cognitive and emotional consequences of mild traumatic brain injury. *Psychol Med*, *41*(6), 1197-1211. https://doi.org/10.1017/s0033291710001728

Koskinen, S. (1998). Quality of life 10 years after a very severe traumatic brain injury (TBI): the perspective of the injured and the closest relative. *Brain Inj*, *12*(8), 631-648. https://doi.org/10.1080/026990598122205

Kronish, I. M., Edmondson, D. E., Goldfinger, J. Z., Fei, K., & Horowitz, C. R. (2012). Posttraumatic Stress Disorder and Adherence to Medications in Survivors of Strokes and Transient Ischemic Attacks. *Stroke*, *43*, 2192 2197.

Kubzansky, L. D., & Thurston, R. C. (2007). Emotional vitality and incident coronary heart disease: benefits of healthy psychological functioning. *Arch Gen Psychiatry*, *64*(12), 1393-1401. https://doi.org/10.1001/archpsyc.64.12.1393

Kuenemund, A., Zwick, S., Rief, W., & Exner, C. (2016). (Re-)defining the self - Enhanced posttraumatic growth and event centrality in stroke survivors: A mixed-method approach and control comparison study. *J Health Psychol*, *21*(5), 679-689. https://doi.org/10.1177/1359105314535457

Kumar, R. G., Ornstein, K. A., Bollens-Lund, E., Watson, E. M., Ankuda, C. K., Kelley, A. S., & Dams-O'Connor, K. (2020). Lifetime history of traumatic brain injury is associated with increased loneliness in adults: A US nationally representative study. *Int J Geriatr Psychiatry*, *35*(5), 553-563. https://doi.org/10.1002/gps.5271

Kuo, M. (2015). How might contact with nature promote human health? Promising mechanisms and a possible central pathway [Mini Review]. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.01093

Kwasnicka, D., Dombrowski, S. U., White, M., & Sniehotta, F. (2016). Theoretical explanations for maintenance of behaviour change: a systematic review of behaviour theories. *Health Psychol Rev*, *10*(3), 277-296. https://doi.org/10.1080/17437199.2016.1151372

Lam, C. S., McMahon, B. T., Priddy, D. A., & Gehred-Schultz, A. (1988). Deficit awareness and treatment performance among traumatic head injury adults. *Brain Injury*, *2*(3), 235-242. https://doi.org/10.3109/02699058809150947

Lambert, I., Wright, N., Gardner, A., Fyson, R., Abubakar, A., & Clawson, R. (2025). Cognitive Impairment as A Vulnerability for Exploitation: A Scoping Review. *Trauma, Violence, & Abuse*, *26*(3), 468-482. https://doi.org/10.1177/15248380241282993

Langhorne, P., Coupar, F., & Pollock, A. (2009). Motor recovery after stroke: a systematic review. *Lancet Neurol*, *8*(8), 741-754. https://doi.org/10.1016/s1474-4422(09)70150-4

Langhorne, P., & Ramachandra, S. (2020). Organised inpatient (stroke unit) care for stroke: network meta-analysis. *Cochrane Database Syst Rev*, *4*(4), Cd000197. https://doi.org/10.1002/14651858.CD000197.pub4

Large, R., Samuel, V., & Morris, R. (2020). A changed reality: Experience of an acceptance and commitment therapy (ACT) group after stroke. *Neuropsychological Rehabilitation*, *30*(8), 1477-1496. https://doi.org/10.1080/09602011.2019.1589531

Larson, J. S. (1999). The Conceptualization of Health. *Medical Care Research and Review*, *56*(2), 123-136. https://doi.org/10.1177/107755879905600201

Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, *1*(3), 141-169. https://doi.org/10.1002/per.2410010304

Lee, A. C., Jordan, H. C., & Horsley, J. (2015). Value of urban green spaces in promoting healthy living and wellbeing: prospects for planning. *Risk Manag Healthc Policy*, *8*, 131-137. https://doi.org/10.2147/rmhp.S61654

Leeson, R., Collins, M., & Douglas, J. (2023). Interventions that aim to increase social participation through recreation or leisure activity for adults with moderate to severe traumatic brain injury: a scoping review. *Disability and Rehabilitation*, *46*, 1-17. https://doi.org/10.1080/09638288.2023.2246377

Lefebvre, H., Cloutier, G., & Josée Levert, M. (2008). Perspectives of survivors of traumatic brain injury and their caregivers on long-term social integration. *Brain Inj*, *22*(7-8), 535-543. https://doi.org/10.1080/02699050802158243

Leonardi, F. (2018). The Definition of Health: Towards New Perspectives. *International Journal of Health Services*, *48*(4), 735-748. https://doi.org/10.1177/0020731418782653

Leplege, A., Gzil, F., Cammelli, M., Lefeve, C., Pachoud, B., & Ville, I. (2007). Person-centredness: conceptual and historical perspectives. *Disabil Rehabil*, *29*(20-21), 1555-1565. https://doi.org/10.1080/09638280701618661

Levack, W. M. M., Boland, P., Taylor, W. J., Siegert, R. J., Kayes, N. M., Fadyl, J. K., & McPherson, K. M. (2014). Establishing a person-centred framework of self-identity after traumatic brain injury: a grounded theory study to inform measure development. *BMJ Open*, *4*(5), e004630. https://doi.org/10.1136/bmjopen-2013-004630

Levack, W. M. M., Kayes, N. M., & Fadyl, J. K. (2010). Experience of recovery and outcome following traumatic brain injury: a metasynthesis of qualitative research. *Disability and Rehabilitation*, *32*(12), 986-999. https://doi.org/10.3109/09638281003775394

Levy, B. B., Luong, D., Perrier, L., Bayley, M. T., & Munce, S. E. P. (2019). Peer support interventions for individuals with acquired brain injury, cerebral palsy, and spina bifida: a systematic review. *BMC Health Serv Res*, *19*(1), 288. https://doi.org/10.1186/s12913-019-4110-5

Leyro, T. M., Zvolensky, M. J., & Bernstein, A. (2010). Distress tolerance and psychopathological symptoms and disorders: a review of the empirical literature among adults. *Psychol Bull*, *136*(4), 576-600. https://doi.org/10.1037/a0019712

Lindström, B., & Eriksson, M. (2005). Salutogenesis. *Journal of Epidemiology & Community Health*, *59*(6), 440-442.

Linehan, T., Bottery, S., Kaye, A., Millar, L., Sinclair, D., & Watson, J. (2014). 2030 vision: The best and worst futures for older people in the UK. *London, England: Independent Age and International Longevity Centre-UK*.

Linley, P. A., & Joseph, S. (2004). Positive change following trauma and adversity: a review. *J Trauma Stress*, *17*(1), 11-21. https://doi.org/10.1023/B:JOTS.0000014671.27856.7e

Little, A., Byrne, C., & Coetzer, R. (2021). The effectiveness of cognitive behaviour therapy for reducing anxiety symptoms following traumatic brain injury: A meta-analysis and systematic review. *NeuroRehabilitation*, *48*, 67-82. https://doi.org/10.3233/NRE-201544

Liu, Y.-E., Lv, J., Sun, F.-Z., Liang, J.-J., Zhang, Y.-Y., Chen, J., & Jiang, W.-J. (2023). Effectiveness of group acceptance and commitment therapy in treating depression for acute stroke patients. *Brain and Behavior*, *13*(12), e3260. https://doi.org/https://doi.org/10.1002/brb3.3260

Lolk, K., Dreier, J. W., & Christensen, J. (2021). Repeated traumatic brain injury and risk of epilepsy: a Danish nationwide cohort study. *Brain*, *144*(3), 875-884. https://doi.org/10.1093/brain/awaa448

Long, G. (1890). *The Discourses of Epictetus: With the Encheiridion and Fragments*. G. Bell and sons.

Lovell, R., Husk, K., Cooper, C., Stahl-Timmins, W., & Garside, R. (2015). Understanding how environmental enhancement and conservation activities may benefit health and wellbeing: a systematic review. *BMC public health*, *15*(1), 864. https://doi.org/10.1186/s12889-015-2214-3

Lovell, R., Wheeler, B. W., Higgins, S. L., Irvine, K. N., & Depledge, M. H. (2014). A Systematic Review of the Health and Well-Being Benefits of Biodiverse Environments. *Journal of Toxicology and Environmental Health, Part B*, *17*(1), 1-20. https://doi.org/10.1080/10937404.2013.856361

Lowe, N., Crawley, L., Wilson, C., & Waldron, B. (2021). 'Lonely in my head': The experiences of loneliness in individuals with brain injury. *British journal of health psychology*, *26*(2), 444-463. https://doi.org/https://doi.org/10.1111/bjhp.12481

Lowenstein, D. H. (2009). Epilepsy after head injury: an overview. *Epilepsia*, *50 Suppl 2*, 4-9. https://doi.org/10.1111/j.1528-1167.2008.02004.x

Lu, J., Rasmussen, M. S., Sigurdardottir, S., Forslund, M. V., Howe, E. I., Fure, S. C. R., Løvstad, M., Overeem, R., Røe, C., & Andelic, N. (2023). Community Integration and Associated Factors 10 Years after Moderate-to-Severe Traumatic Brain Injury. *J Clin Med*, *12*(2). https://doi.org/10.3390/jcm12020405

Lukow, H. R. I., Godwin, E. E., Marwitz, J. H., Mills, A., Hsu, N. H., & Kreutzer, J. S. (2015). Relationship Between Resilience, Adjustment, and Psychological Functioning After Traumatic Brain Injury: A Preliminary Report. *The Journal of Head Trauma Rehabilitation*, *30*(4), 241-248. https://doi.org/10.1097/htr.0000000000000137

Lumber, R., Richardson, M., & Sheffield, D. (2017). Beyond knowing nature: Contact, emotion, compassion, meaning, and beauty are pathways to nature connection. *PLoS ONE*, *12*(5), e0177186. https://doi.org/10.1371/journal.pone.0177186

Lyon, I., Fisher, P., & Gracey, F. (2021). "Putting a new perspective on life": a qualitative grounded theory of posttraumatic growth following acquired brain injury. *Disabil Rehabil*, *43*(22), 3225-3233. https://doi.org/10.1080/09638288.2020.1741699

Mach, L., Rothrock, E., Stark, S., & Nahmias, J. (2024). Place attachment, wellbeing, and conservation in surf destination communities. *Frontiers in Sustainable Tourism*, *3*. https://doi.org/10.3389/frsut.2024.1387081

Mackay, C. M. L., & Schmitt, M. T. (2019). Do people who feel connected to nature do more to protect it? A meta-analysis. *Journal of Environmental Psychology*, *65*, 101323. https://doi.org/https://doi.org/10.1016/j.jenvp.2019.101323

Mackelprang, J. L., Bombardier, C. H., Fann, J. R., Temkin, N. R., Barber, J. K., & Dikmen, S. S. (2014). Rates and Predictors of Suicidal Ideation During the First Year After Traumatic Brain Injury. *American Journal of Public Health*, *104*(7), e100-e107. https://doi.org/10.2105/ajph.2013.301794

MacQueen, K. M., McLellan, E., Metzger, D. S., Kegeles, S., Strauss, R. P., Scotti, R., Blanchard, L., & Trotter, R. T., 2nd. (2001). What is community? An evidence-based definition for participatory public health. *Am J Public Health*, *91*(12), 1929-1938. https://doi.org/10.2105/ajph.91.12.1929

Mahar, C., & Fraser, K. (2012). Strategies to Facilitate Successful Community Reintegration Following Acquired Brain Injury (ABI). *The International Journal of Disability Management Research*, *6*, 68-78. https://doi.org/10.1375/jdmr.6.1.68

Majumdar, S., & Morris, R. (2019). Brief group-based acceptance and commitment therapy for stroke survivors. *British Journal of Clinical Psychology*, *58*(1), 70-90. https://doi.org/https://doi.org/10.1111/bjc.12198

Malia, K., Powell, G., & Torode, S. (1995). Coping and psychosocial function after brain injury. *Brain Inj*, *9*(6), 607-618. https://doi.org/10.3109/02699059509008219

Mamman, R., Mortenson, W. B., Fleming, J., & Schmidt, J. (2022). Living in a reshaped reality: Exploring social participation and self-identity after TBI. *Neuropsychological Rehabilitation*, *32*(8), 2102-2124. https://doi.org/10.1080/09602011.2022.2113100

Marmot, M. (2020). Health equity in England: the Marmot review 10 years on. *BMJ*, *368*.

Marshall, J., Ferrier, B., Ward, P. B., & Martindale, R. (2020). “When I was surfing with those guys I was surfing with family.” A Grounded Exploration of Program Theory within the Jimmy Miller Memorial Foundation Surf Therapy Intervention. *Global Journal of Community Psychology Practice*, *11*(2).

Marshall, J., Kelly, P., & Niven, A. (2019). “When I Go There, I Feel Like I Can Be Myself.” Exploring Programme Theory within the Wave Project Surf Therapy Intervention. *International Journal of Environmental Research and Public Health*, *16*(12). https://doi.org/http://dx.doi.org/10.3390/ijerph16122159

Martin, L., White, M. P., Hunt, A., Richardson, M., Pahl, S., & Burt, J. (2020). Nature contact, nature connectedness and associations with health, wellbeing and pro-environmental behaviours. *Journal of Environmental Psychology*, *68*, 101389. https://doi.org/https://doi.org/10.1016/j.jenvp.2020.101389

Maslow, A. (1968). Some educational implications of the humanistic psychologies. *Harvard educational review*, *38*(4), 685-696.

McCabe, P., Lippert, C., Weiser, M., Hilditch, M., Hartridge, C., & Villamere For The Erabi Group, J. (2007). Community reintegration following acquired brain injury. *Brain Injury*, *21*(2), 231-257. https://doi.org/10.1080/02699050701201631

McCabe, P., Lippert, C., Weiser, M., Hilditch, M., Hartridge, C., & Villamere, J. (2007). Community reintegration following acquired brain injury. *Brain Injury*, *21*(2), 231-257. https://doi.org/10.1080/02699050701201631

McCarthy, M. J., Lyons, K. S., Schellinger, J., Stapleton, K., & Bakas, T. (2020). Interpersonal relationship challenges among stroke survivors and family caregivers. *Soc Work Health Care*, *59*(2), 91-107. https://doi.org/10.1080/00981389.2020.1714827

McGrath, J. C. (2011). Posttraumatic Growth and Spirituality After Brain Injury. *Brain Impairment*, *12*(2), 82-92. https://doi.org/10.1375/brim.12.2.82

McKay, D., & O'Donohue, W. (2023). Conceptual, Psychometric, Methodological and Value Problems in Acceptance and Commitment Therapy: Introduction to the Special Section, “A Critical Appraisal of Acceptance and Commitment Therapy”. *Behavior Therapy*, *54*(6), 929-938. https://doi.org/https://doi.org/10.1016/j.beth.2023.07.004

McKevitt, C., Fudge, N., Redfern, J., Sheldenkar, A., Crichton, S., Rudd, A. R., Forster, A., Young, J., Nazareth, I., Silver, L. E., Rothwell, P. M., & Wolfe, C. D. A. (2011). Self-Reported Long-Term Needs After Stroke. *Stroke*, *42*(5), 1398-1403. https://doi.org/doi:10.1161/STROKEAHA.110.598839

McKinlay, A., Corrigan, J., Horwood, L. J., & Fergusson, D. M. (2014). Substance abuse and criminal activities following traumatic brain injury in childhood, adolescence, and early adulthood. *J Head Trauma Rehabil*, *29*(6), 498-506. https://doi.org/10.1097/htr.0000000000000001

McLean, A. M., Jarus, T., Hubley, A. M., & Jongbloed, L. (2014). Associations between social participation and subjective quality of life for adults with moderate to severe traumatic brain injury. *Disability and Rehabilitation*, *36*(17), 1409-1418. https://doi.org/10.3109/09638288.2013.834986

McMahan, E. A., & Estes, D. (2015). The effect of contact with natural environments on positive and negative affect: A meta-analysis. *The Journal of Positive Psychology*, *10*(6), 507-519. https://doi.org/10.1080/17439760.2014.994224

McNamara, N., Stevenson, C., & Muldoon, O. T. (2013). Community identity as resource and context: A mixed method investigation of coping and collective action in a disadvantaged community. *European Journal of Social Psychology*, *43*(5), 393-403. https://doi.org/https://doi.org/10.1002/ejsp.1953

Mead, J. (2023). Introducing a New Model of Wellbeing: Applications to the General Public and Student Population.

Mead, J., Fisher, Z., & Kemp, A. (2021). Moving Beyond Disciplinary Silos Towards a Transdisciplinary Model of Wellbeing: An Invited Review. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.642093

Mead, J., Gibbs, K., Fisher, Z., & Kemp, A. H. (2023). What's next for wellbeing science? Moving from the Anthropocene to the Symbiocene. *Frontiers in psychology*, *14*, 1087078. https://doi.org/10.3389/fpsyg.2023.1087078

Menhas, R., Yang, L., Saqib, Z. A., Younas, M., & Saeed, M. M. (2024). Does nature-based social prescription improve mental health outcomes? A systematic review and meta-analysis. *Front Public Health*, *12*, 1228271. https://doi.org/10.3389/fpubh.2024.1228271

Meredith, G. R., Rakow, D. A., Eldermire, E. R. B., Madsen, C. G., Shelley, S. P., & Sachs, N. A. (2020). Minimum Time Dose in Nature to Positively Impact the Mental Health of College-Aged Students, and How to Measure It: A Scoping Review [Systematic Review]. *Frontiers in Psychology*, *10*(2942). https://doi.org/10.3389/fpsyg.2019.02942

Michael, K. (2002). Fatigue and stroke. *Rehabil Nurs*, *27*(3), 89-94, 103. https://doi.org/10.1002/j.2048-7940.2002.tb01995.x

Milders, M., Fuchs, S., & Crawford, J. R. (2003). Neuropsychological Impairments and Changes in Emotional and Social Behaviour Following Severe Traumatic Brain Injury. *Journal of Clinical and Experimental Neuropsychology*, *25*(2), 157-172. https://doi.org/10.1076/jcen.25.2.157.13642

Mitchell, P. H., Veith, R. C., Becker, K. J., Buzaitis, A., Cain, K. C., Fruin, M., Tirschwell, D., & Teri, L. (2009). Brief Psychosocial–Behavioral Intervention With Antidepressant Reduces Poststroke Depression Significantly More Than Usual Care With Antidepressant. *Stroke*, *40*(9), 3073-3078. https://doi.org/doi:10.1161/STROKEAHA.109.549808

Mitchell, R., & Popham, F. (2008). Effect of exposure to natural environment on health inequalities: An observational population study. *Lancet*, *372*, 1655-1660. https://doi.org/10.1016/S0140-6736(08)61689-X

Moffatt, S., Steer, M., Lawson, S., Penn, L., & O'Brien, N. (2017). Link Worker social prescribing to improve health and well-being for people with long-term conditions: qualitative study of service user perceptions. *BMJ Open*, *7*(7), e015203. https://doi.org/10.1136/bmjopen-2016-015203

Molina, J. A. (1983). Understanding the biopsychosocial model. *Int J Psychiatry Med*, *13*(1), 29-36. https://doi.org/10.2190/0uhq-bxne-6ggy-n1tf

Molineux, M. (2017). *A dictionary of occupational science and occupational therapy*. Oxford University Press.

Moneta, G. (2012). Advances in flow research. *On the measurement and conceptualization of flow*, 23-50.

Moorman, C., & Matulich, E. (1993). A model of consumers' preventive health behaviors: The role of health motivation and health ability. *Journal of Consumer Research*, *20*(2), 208-228. https://doi.org/10.1086/209344

Morgan, G., Barnwell, G., Johnstone, L., Shukla, K., & Mitchell, A. (2022). The power threat meaning framework and the climate and ecological crises.

Morgan, L. P. K., Graham, J. R., Hayes-Skelton, S. A., Orsillo, S. M., & Roemer, L. (2014). Relationships between amount of post-intervention mindfulness practice and follow-up outcome variables in an acceptance-based behavior therapy for Generalized Anxiety Disorder: The importance of informal practice. *Journal of Contextual Behavioral Science*, *3*(3), 173-178. https://doi.org/https://doi.org/10.1016/j.jcbs.2014.05.001

Moroz, M., & Dunkley, D. (2019). Self-critical Perfectionism, experiential avoidance, and depressive and anxious symptoms over two years: A three-wave longitudinal study. *Behaviour Research and Therapy*, *112*, 18-27. https://doi.org/10.1016/j.brat.2018.11.006

Morris, S. (2004). Rebuilding Identity Through Narrative Following Traumatic Brain Injury.

Morton, M. V., & Wehman, P. (1995). Psychosocial and emotional sequelae of individuals with traumatic brain injury: a literature review and recommendations. *Brain Injury*, *9*(1), 81-92. https://doi.org/10.3109/02699059509004574

Muenchberger, H., Kendall, E., & Neal, R. (2008). Identity transition following traumatic brain injury: a dynamic process of contraction, expansion and tentative balance. *Brain Inj*, *22*(12), 979-992. https://doi.org/10.1080/02699050802530532

Muldoon, O. T., Haslam, S. A., Haslam, C., Cruwys, T., Kearns, M., & Jetten, J. (2019). *The social psychology of responses to trauma: Social identity pathways associated with divergent traumatic responses* [doi:10.1080/10463283.2020.1711628]. Taylor & Francis.

Muldoon, O. T., Walsh, R. S., Curtain, M., Crawley, L., & Kinsella, E. L. (2019). Social cure and social curse: Social identity resources and adjustment to acquired brain injury. *European Journal of Social Psychology*, *49*(6), 1272-1282. https://doi.org/https://doi.org/10.1002/ejsp.2564

Nakamura, J., Tse, D. C. K., & Shankland, S. (2019). 168Flow: The Experience of Intrinsic Motivation. In R. M. Ryan (Ed.), *The Oxford Handbook of Human Motivation* (pp. 0). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780190666453.013.10

Nakamura, Y. M., & Orth, U. (2005). Acceptance as a coping reaction: Adaptive or not? *Swiss Journal of Psychology / Schweizerische Zeitschrift für Psychologie / Revue Suisse de Psychologie*, *64*(4), 281-292. https://doi.org/10.1024/1421-0185.64.4.281

Nalder, E., Hartman, L., Hunt, A., & King, G. (2019). Traumatic brain injury resiliency model: a conceptual model to guide rehabilitation research and practice. *Disability and Rehabilitation*, *41*(22), 2708-2717. https://doi.org/10.1080/09638288.2018.1474495

Nejade, R. M., Grace, D., & Bowman, L. R. (2022). What is the impact of nature on human health? A scoping review of the literature. *J Glob Health*, *12*, 04099. https://doi.org/10.7189/jogh.12.04099

Nelson, K. (2015). Quantitative and qualitative research in psychological science. *Biological Theory*, *10*, 263-272.

Newsome, D., Newsome, K., Fuller, T. C., & Meyer, S. (2019). How contextual behavioral scientists measure and report about behavior: A review of JCBS. *Journal of Contextual Behavioral Science*, *12*, 347-354. https://doi.org/https://doi.org/10.1016/j.jcbs.2018.11.005

Nils, F., & Rimé, B. (2012). Beyond the myth of venting: Social sharing modes determine the benefits of emotional disclosure. *European Journal of Social Psychology*, *42*(6), 672-681. https://doi.org/10.1002/ejsp.1880

Nilsson, C., Bartfai, A., & Löfgren, M. (2011). Holistic group rehabilitation – a short cut to adaptation to the new life after mild acquired brain injury. *Disability and Rehabilitation*, *33*(12), 969-978. https://doi.org/10.3109/09638288.2010.528141

Nisbet, E. K., & Zelenski, J. M. (2011). Underestimating Nearby Nature:Affective Forecasting Errors Obscure the Happy Path to Sustainability. *Psychological Science*, *22*(9), 1101-1106. https://doi.org/10.1177/0956797611418527

Nordin, L., & Rorsman, I. (2012). Cognitive behavioural therapy in multiple sclerosis: a randomized controlled pilot study of acceptance and commitment therapy. *J Rehabil Med*, *44*(1), 87-90. https://doi.org/10.2340/16501977-0898

Northcott, S., & Hilari, K. (2011). Why do people lose their friends after a stroke? *Int J Lang Commun Disord*, *46*(5), 524-534. https://doi.org/10.1111/j.1460-6984.2011.00079.x

Norton, C. L., & Watt, T. T. (2014). Exploring the Impact of a Wilderness-Based Positive Youth Development Program for Urban Youth. *Journal of Experiential Education*, *37*(4), 335-350. https://doi.org/10.1177/1053825913503113

Norwood, M., Aplin, T., & Gustafsson, L. (2025). Nature-based interventions and nature interaction for people with acquired brain injury: A systematic scoping review. *Journal of Environmental Psychology*, *104*, 102612. https://doi.org/10.1016/j.jenvp.2025.102612

Nyumba, T. O., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution*, *9*(1), 20-32. https://doi.org/https://doi.org/10.1111/2041-210X.12860

O'Connor, K., & Chamberlain, K. (1996). Dimensions of life meaning: A qualitative investigation at mid-life. *British Journal of Psychology*, *87*(3), 461-477. https://doi.org/https://doi.org/10.1111/j.2044-8295.1996.tb02602.x

Ong, C., Pierce, B. G., Petersen, J. M., Barney, J., Fruge, J. E., Levin, M., & Twohig, M. P. (2020). A Psychometric Comparison of Psychological Inflexibility Measures. *Journal of Contextual Behavioral Science*, *18*. https://doi.org/10.1016/j.jcbs.2020.08.007

Osborn, A. J., Mathias, J. L., & Fairweather-Schmidt, A. K. (2014). Depression following adult, non-penetrating traumatic brain injury: A meta-analysis examining methodological variables and sample characteristics. *Neuroscience & Biobehavioral Reviews*, *47*, 1-15. https://doi.org/https://doi.org/10.1016/j.neubiorev.2014.07.007

Østergaard, E. B., Sparre, P. W., & Dahlgaard, J. (2024). Two-and-a-Half-Year Follow-Up Study with Freedom on Water through Stand-Up Paddling: Exploring Experiences in Blue Spaces and Their Long-Term Impact on Mental Well-Being. *Healthcare*, *12*.

Østergaard, T., Lundgren, T., Zettle, R. D., Landrø, N. I., & Haaland, V. (2020). Psychological Flexibility in Depression Relapse Prevention: Processes of Change and Positive Mental Health in Group-Based ACT for Residual Symptoms. *Frontiers in psychology*, *11*, 528. https://doi.org/10.3389/fpsyg.2020.00528

Ownsworth, T. (2014). *Self-identity after brain injury*. Psychology Press.

Ownsworth, T., Fleming, J., Shum, D., Kuipers, P., & Strong, J. (2008). Comparison of individual, group and combined intervention formats in a randomized controlled trial for facilitating goal attainment and improving psychosocial function following acquired brain injury. *Journal of Rehabilitation Medicine*, *40*(2), 81-88.

Ownsworth, T., Mols, H., O'Loghlen, J., Xie, Y., Kendall, M., Nielsen, M., Mitchell, J., Jones, R., & Geraghty, T. (2024). Stigma following acquired brain injury and spinal cord injury: relationship to psychological distress and community integration in the first-year post-discharge. *Disability and Rehabilitation*, *46*(9), 1796-1806. https://doi.org/10.1080/09638288.2023.2205173

Pantell, M., Rehkopf, D., Jutte, D., Syme, S. L., Balmes, J., & Adler, N. (2013). Social isolation: a predictor of mortality comparable to traditional clinical risk factors. *Am J Public Health*, *103*(11), 2056-2062. https://doi.org/10.2105/ajph.2013.301261

Park, C., Edmondson, D., Fenster, J., & Blank, T. (2008). Meaning Making and Psychological Adjustment Following Cancer: The Mediating Roles of Growth, Life Meaning, and

Restored Just-World Beliefs. *Journal of consulting and clinical psychology*, *76*, 863-875. https://doi.org/10.1037/a0013348

Park, C. L. (2022). Meaning Making Following Trauma. *Frontiers in psychology*, *13*, 844891. https://doi.org/10.3389/fpsyg.2022.844891

Pasanen, T. P., Tyrväinen, L., & Korpela, K. M. (2014). The Relationship between Perceived Health and Physical Activity Indoors, Outdoors in Built Environments, and Outdoors in Nature [https://doi.org/10.1111/aphw.12031]. *Applied Psychology: Health and Well-Being*, *6*(3), 324-346. https://doi.org/https://doi.org/10.1111/aphw.12031

Passarelli, A., Hall, E., & Anderson, M. (2010). A Strengths-Based Approach to Outdoor and Adventure Education: Possibilities for Personal Growth. *Journal of Experiential Education*, *33*, 120-135. https://doi.org/10.5193/JEE33.2.120

Passmore, H.-A., Lutz, P. K., & Howell, A. J. (2023). Eco-Anxiety: A Cascade of Fundamental Existential Anxieties. *Journal of Constructivist Psychology*, *36*(2), 138-153. https://doi.org/10.1080/10720537.2022.2068706

Patterson, F., Fleming, J., & Doig, E. (2016). Group-based delivery of interventions in traumatic brain injury rehabilitation: a scoping review. *Disability and Rehabilitation*, *38*(20), 1961-1986. https://doi.org/10.3109/09638288.2015.1111436

Patton, M. Q. (1999). Enhancing the quality and credibility of qualitative analysis. *Health Serv Res*, *34*(5 Pt 2), 1189-1208.

Patton, M. Q. (2002). *Qualitative research & evaluation methods*. sage.

Peifer, C., Schulz, A., Schächinger, H., Baumann, N., & Antoni, C. H. (2014). The relation of flow-experience and physiological arousal under stress — Can u shape it? *Journal of Experimental Social Psychology*, *53*, 62-69. https://doi.org/https://doi.org/10.1016/j.jesp.2014.01.009

Penley, J. A., Tomaka, J., & Wiebe, J. S. (2002). The association of coping to physical and psychological health outcomes: a meta-analytic review. *J Behav Med*, *25*(6), 551-603. https://doi.org/10.1023/a:1020641400589

Peplau, L. A., & Perlman, D. (1982). Loneliness: A sourcebook of current theory, research, and therapy. *(No Title)*.

Perissinotto, C. M., & Covinsky, K. E. (2014). Living alone, socially isolated or lonely--what are we measuring? *Journal of general internal medicine*, *29*(11), 1429-1431. https://doi.org/10.1007/s11606-014-2977-8

Perrin, P. B., Klyce, D. W., Fisher, L. B., Juengst, S. B., Hammond, F. M., Gary, K. W., Niemeier, J. P., Bergquist, T. F., Bombardier, C. H., Rabinowitz, A. R., Zafonte, R. D., & Wagner, A. K. (2022). Relations Among Suicidal Ideation, Depressive Symptoms, and Functional Independence During the 10 Years After Traumatic Brain Injury: A Model Systems Study. *Archives of Physical Medicine and Rehabilitation*, *103*(1), 69-74. https://doi.org/https://doi.org/10.1016/j.apmr.2021.07.790

Perumparaichallai, R. K., Lewin, R. K., & Klonoff, P. S. (2020). Community reintegration following holistic milieu-oriented neurorehabilitation up to 30 years post-discharge. *NeuroRehabilitation*, *46*, 243-253. https://doi.org/10.3233/NRE-192968

Peterson, C., Park, N., & Seligman, M. E. P. (2005). Orientations to happiness and life satisfaction: The full life versus the empty life. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, *6*(1), 25-41. https://doi.org/10.1007/s10902-004-1278-z

Phelan, J. C., Link, B. G., & Tehranifar, P. (2010). Social conditions as fundamental causes of health inequalities: theory, evidence, and policy implications. *Journal of Health and Social Behavior*, *51*(1_suppl), S28-S40.

Phillips, V. L., Greenspan, A. I., Stringer, A. Y., Stroble, A. K., & Lehtonen, S. (2004). Severity of Injury and Service Utilization Following Traumatic Brain Injury: The First 3 Months. *The Journal of Head Trauma Rehabilitation*, *19*(3), 217-225.

https://journals.lww.com/headtraumarehab/fulltext/2004/05000/severity_of_injury_and_service_utilization.3.aspx

Pihkala, P. (2020). Anxiety and the Ecological Crisis: An Analysis of Eco-Anxiety and Climate Anxiety. *Sustainability*, *12*. https://doi.org/10.3390/su12197836

Pihkala, P. (2022). Toward a Taxonomy of Climate Emotions [Original Research]. *Frontiers in Climate*, *3*. https://www.frontiersin.org/articles/10.3389/fclim.2021.738154

Pollock, A., Baer, G., Campbell, P., Choo, P. L., Forster, A., Morris, J., Pomeroy, V. M., & Langhorne, P. (2014). Physical rehabilitation approaches for the recovery of function and mobility following stroke. *Cochrane Database Syst Rev*, *2014*(4), Cd001920. https://doi.org/10.1002/14651858.CD001920.pub3

Ponsford, J., Olver, J., Ponsford, M., & Nelms, R. (2003). Long-term adjustment of families following traumatic brain injury where comprehensive rehabilitation has been provided. *Brain Inj*, *17*(6), 453-468. https://doi.org/10.1080/0269905031000070143

Ponsford, J. L., Downing, M. G., Olver, J., Ponsford, M., Acher, R., Carty, M., & Spitz, G. (2014). Longitudinal follow-up of patients with traumatic brain injury: outcome at two, five, and ten years post-injury. *J Neurotrauma*, *31*(1), 64-77. https://doi.org/10.1089/neu.2013.2997

Ponsford, J. L., Ziino, C., Parcell, D. L., Shekleton, J. A., Roper, M., Redman, J. R., Phipps-Nelson, J., & Rajaratnam, S. M. (2012). Fatigue and sleep disturbance following traumatic brain injury--their nature, causes, and potential treatments. *J Head Trauma Rehabil*, *27*(3), 224-233. https://doi.org/10.1097/HTR.0b013e31824ee1a8

Ponterotto, J. G. (2005). Qualitative research in counseling psychology: A primer on research paradigms and philosophy of science. *Journal of counseling psychology*, *52*(2), 126.

Porges, S. W. (2007). The polyvagal perspective. *Biological psychology*, *74*(2), 116-143.

Porges, S. W. (2011). *The polyvagal theory: neurophysiological foundations of emotions, attachment, communication, and self-regulation (Norton Series on Interpersonal Neurobiology)*. WW Norton & Company.

Porges, S. W. (2015). Making the world safe for our children: Down-regulating defence and up-regulating social engagement to'optimise'the human experience. *Children Australia*, *40*(2), 114.

Powell, T., Gilson, R., & Collin, C. (2012). TBI 13 years on: factors associated with post-traumatic growth. *Disabil Rehabil*, *34*(17), 1461-1467. https://doi.org/10.3109/09638288.2011.644384

Prang, K. H., Ruseckaite, R., & Collie, A. (2012). Healthcare and disability service utilization in the 5-year period following transport-related traumatic brain injury. *Brain Inj*, *26*(13-14), 1611-1620. https://doi.org/10.3109/02699052.2012.698790

Prati, G., & Pietrantoni, L. (2009). Optimism, Social Support, and Coping Strategies As Factors Contributing to Posttraumatic Growth: A Meta-Analysis. *Journal of Loss and Trauma*, *14*(5), 364-388. https://doi.org/10.1080/15325020902724271

Pressman, S. D., Cohen, S., Miller, G. E., Barkin, A., Rabin, B. S., & Treanor, J. J. (2005). *"Loneliness, social network size, and immune response to influenza vaccination in college freshman": Correction to Pressman et al. (2005)* [doi:10.1037/0278-6133.24.4.348]. American Psychological Association.

Price, S., Hookway, A., & King, S. (2017). Social prescribing evidence map: technical report. *Public Health Wales Observatory. Primary & Community Care Development and Innovation Hub. Public Health Wales NHS Trust*.

Prigatano, G. P. (1999). *Principles of neuropsychological rehabilitation*. Oxford University Press.

Prigatano, G. P., Fordyce, D. J., Zeiner, H. K., Roueche, J. R., Pepping, M., & Wood, B. C. (1984). Neuropsychological rehabilitation after closed head injury in young adults. *Journal of Neurology, Neurosurgery & Psychiatry*, *47*(5), 505-513.

Prince, M., Patel, V., Saxena, S., Maj, M., Maselko, J., Phillips, M. R., & Rahman, A. (2007). No health without mental health. *The Lancet*, *370*(9590), 859-877. https://doi.org/10.1016/S0140-6736(07)61238-0

Pritchard, A., Richardson, M., Sheffield, D., & McEwan, K. (2020). The Relationship Between Nature Connectedness and Eudaimonic Well-Being: A Meta-analysis. *Journal of Happiness Studies*, *21*. https://doi.org/10.1007/s10902-019-00118-6

Prochaska, J. O., & Diclemente, C. C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy*, *19*, 276-288.

Puchalski, C., Ferrell, B., Virani, R., Otis-Green, S., Baird, P., Bull, J., Chochinov, H., Handzo, G., Nelson-Becker, H., Prince-Paul, M., Pugliese, K., & Sulmasy, D. (2009). Improving the quality of spiritual care as a dimension of palliative care: the report of the Consensus Conference. *J Palliat Med*, *12*(10), 885-904. https://doi.org/10.1089/jpm.2009.0142

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community* [doi:10.1145/358916.361990]. Touchstone Books/Simon & Schuster. https://doi.org/10.1145/358916.361990

Qualter, P., Vanhalst, J., Harris, R., Van Roekel, E., Lodder, G., Bangee, M., Maes, M., & Verhagen, M. (2015). Loneliness across the life span. *Perspect Psychol Sci*, *10*(2), 250-264. https://doi.org/10.1177/1745691615568999

Rabinowitz, A. R., & Levin, H. S. (2014). Cognitive sequelae of traumatic brain injury. *Psychiatr Clin North Am*, *37*(1), 1-11. https://doi.org/10.1016/j.psc.2013.11.004

Rauchman, S. H., Zubair, A., Jacob, B., Rauchman, D., Pinkhasov, A., Placantonakis, D. G., & Reiss, A. B. (2023). Traumatic brain injury: Mechanisms, manifestations, and visual sequelae. *Front Neurosci*, *17*, 1090672. https://doi.org/10.3389/fnins.2023.1090672

Rauwenhoff, J. C., Bol, Y., Peeters, F., & van Heugten, C. M. (2024). Acceptance and Commitment Therapy is feasible for people with acquired brain injury: A process evaluation of the BrainACT treatment. *Clinical Rehabilitation*, *38*(4), 530-542. https://doi.org/10.1177/02692155231218813

Rauwenhoff, J. C. C., Bol, Y., Peeters, F., Smits, P., Duits, A., Wijenberg, M., Blok, A., & van Heugten, C. M. (2024). Acceptance and commitment therapy for people with depressive and anxiety symptoms following acquired brain injury: Results of the BrainACT randomized controlled trial. *J Psychosom Res*, *187*, 111933. https://doi.org/10.1016/j.jpsychores.2024.111933

Rauwenhoff, J. C. C., Bol, Y., Peeters, F., van den Hout, A. J. H. C., Geusgens, C. A. V., & van Heugten, C. M. (2022). Acceptance and commitment therapy for individuals with depressive and anxiety symptoms following acquired brain injury: A non-concurrent multiple baseline design across four cases. *Neuropsychological Rehabilitation*, 1-31. https://doi.org/10.1080/09602011.2022.2053169

Ray, H., & Jakubec, S. L. (2014). Nature-based experiences and health of cancer survivors. *Complement Ther Clin Pract*, *20*(4), 188-192. https://doi.org/10.1016/j.ctcp.2014.07.005

Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily Well-Being: The Role of Autonomy, Competence, and Relatedness. *Personality and Social Psychology Bulletin*, *26*(4), 419-435. https://doi.org/10.1177/0146167200266002

Reker, G. T., & Woo, L. C. (2011). Personal Meaning Orientations and Psychosocial Adaptation in Older Adults. *SAGE Open*, *1*(1), 2158244011405217. https://doi.org/10.1177/2158244011405217

Rich, G. J. (2014). Positive Institutions, Communities, and Nations: Methods and Internationalizing Positive Psychology Concepts. In H. Águeda Marujo & L. M. Neto (Eds.), *Positive Nations and Communities: Collective, Qualitative and Cultural-Sensitive Processes in Positive Psychology* (pp. 17-32). Springer Netherlands. https://doi.org/10.1007/978-94-007-6869-7_2

Richardson, M., Dobson, J., Abson, D. J., Lumber, R., Hunt, A., Young, R., & Moorhouse, B. (2020). Applying the pathways to nature connectedness at a societal scale: a leverage points perspective. *Ecosystems and People*, *16*(1), 387-401. https://doi.org/10.1080/26395916.2020.1844296

Richardson, M., Passmore, H.-A., Barbett, L., Lumber, R., Thomas, R., & Hunt, A. (2020). The green care code: How nature connectedness and simple activities help explain pro-nature conservation behaviours. *People and Nature*, *2*(3), 821-839. https://doi.org/https://doi.org/10.1002/pan3.10117

Riessman, C. K. (1993). *Narrative analysis*. Sage Publications, Inc.

Robertson, I. H., & Murre, J. M. (1999). Rehabilitation of brain damage: brain plasticity and principles of guided recovery. *Psychol Bull*, *125*(5), 544-575. https://doi.org/10.1037/0033-2909.125.5.544

Robinson, J. M., & Breed, M. F. (2019). Green Prescriptions and Their Co-Benefits: Integrative Strategies for Public and Environmental Health. *Challenges*, *10*(1), 9. https://www.mdpi.com/2078-1547/10/1/9

Rochat, L., Ammann, J., Mayer, E., Annoni, J. M., & Van der Linden, M. (2009). Executive disorders and perceived socio-emotional changes after traumatic brain injury. *J Neuropsychol*, *3*(Pt 2), 213-227. https://doi.org/10.1348/174866408x397656

Rogers, C. R. (1962). Toward becoming a fully functioning person. *Perceiving, behaving, becoming: A new focus for education*, 21-33.

Rohling, M. L., Faust, M. E., Beverly, B., & Demakis, G. (2009). Effectiveness of cognitive rehabilitation following acquired brain injury: a meta-analytic re-examination of Cicerone et al.'s (2000, 2005) systematic reviews. *Neuropsychology*, *23*(1), 20-39. https://doi.org/10.1037/a0013659

Rook, K. S., & Charles, S. T. (2017). Close social ties and health in later life: Strengths and vulnerabilities. *Am Psychol*, *72*(6), 567-577. https://doi.org/10.1037/amp0000104

Roscigno, C. I., & Van Liew, K. (2008). Pushed to the margins and pushing back: a case study of one adult's reflections on social interactions after a traumatic brain injury sustained as an adolescent. *J Neurosci Nurs*, *40*(4), 212-221. https://doi.org/10.1097/01376517-200808000-00005

Roser, M., Ritchie, H., Ortiz-Ospina, E., & Rodés-Guirao, L. (2013). World population growth. *Our world in data*, *412*, 543.

Roth, G. A., Mensah, G. A., Johnson, C. O., Addolorato, G., Ammirati, E., Baddour, L. M., Barengo, N. C., Beaton, A. Z., Benjamin, E. J., & Benziger, C. P. (2020). Global burden of cardiovascular diseases and risk factors, 1990–2019: update from the GBD 2019 study. *Journal of the American college of cardiology*, *76*(25), 2982-3021.

Rubenstein, L. Z. (2006). Falls in older people: epidemiology, risk factors and strategies for prevention. *Age Ageing*, *35 Suppl 2*, ii37-ii41. https://doi.org/10.1093/ageing/afl084

Ryan, R. M., & Deci, E. L. (2001). On Happiness and Human Potentials: A Review of Research on Hedonic and Eudaimonic Well-Being. *Annual Review of Psychology*, *52*(1), 141-166. https://doi.org/10.1146/annurev.psych.52.1.141

Ryff, C. (2014). Self Realization and Meaning Making in the Face of Adversity: A Eudaimonic Approach to Human Resilience. *Journal of psychology in Africa (south of the Sahara, the Caribbean, and Afro-Latin America)*, *24*, 1-12. https://doi.org/10.1080/14330237.2014.904098

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*(6), 1069-1081. https://doi.org/10.1037//0022-3514.57.6.1069

Ryff, C. D. (2013). Psychological Well-Being Revisited: Advances in the Science and Practice of Eudaimonia. *Psychotherapy and Psychosomatics*, *83*(1), 10-28. https://doi.org/10.1159/000353263

Ryff, C. D., Boylan, J. M., & Kirsch, J. A. (2021). 92Eudaimonic and Hedonic Well-Being: An Integrative Perspective with Linkages to Sociodemographic Factors and Health. In M. T. Lee, L. D. Kubzansky, & T. J. VanderWeele (Eds.), *Measuring Well-Being: Interdisciplinary Perspectives from the Social Sciences and the Humanities* (pp. 0). Oxford University Press. https://doi.org/10.1093/oso/9780197512531.003.0005

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*(4), 719.

Ryff, C. D., & Singer, B. H. (2008). Know thyself and become what you are: A eudaimonic approach to psychological well-being. *Journal of Happiness Studies*, *9*(1), 13-39.

Rzezak, P., Caxa, L., Santolia, P., Antunes, H., Suriano, I., Tufik, S., & De Mello, M. (2015). Affective responses after different intensities of exercise in patients with traumatic brain injury. *Frontiers in psychology*, *6*, 839. https://doi.org/10.3389/fpsyg.2015.00839

Sady, M. D., Sander, A. M., Clark, A. N., Sherer, M., Nakase-Richardson, R., & Malec, J. F. (2010). Relationship of Preinjury Caregiver and Family Functioning to Community Integration in Adults With Traumatic Brain Injury. *Archives of Physical Medicine and Rehabilitation*, *91*(10), 1542-1550. https://doi.org/https://doi.org/10.1016/j.apmr.2010.07.012

Salas, C. E., Casassus, M., Rowlands, L., Pimm, S., & Flanagan, D. A. J. (2018). “Relating through sameness”: a qualitative study of friendship and social isolation in chronic traumatic brain injury. *Neuropsychological Rehabilitation*, *28*(7), 1161-1178. https://doi.org/10.1080/09602011.2016.1247730

Salas, C. E., Rojas-Líbano, D., Castro, O., Cruces, R., Evans, J., Radovic, D., Arévalo-Romero, C., Torres, J., & Aliaga, Á. (2022). Social isolation after acquired brain injury: Exploring the relationship between network size, functional support, loneliness and mental health. *Neuropsychological Rehabilitation*, *32*(9), 2294-2318. https://doi.org/10.1080/09602011.2021.1939062

Sander, A. M., Clark, A., & Pappadis, M. R. (2010). What Is Community Integration Anyway?: Defining Meaning Following Traumatic Brain Injury. *The Journal of Head Trauma Rehabilitation*, *25*(2), 121-127. https://doi.org/10.1097/HTR.0b013e3181cd1635

Sander, A. M., Clark, A. N., Arciniegas, D. B., Tran, K., Leon-Novelo, L., Ngan, E., Bogaards, J., Sherer, M., & Walser, R. (2021). A randomized controlled trial of acceptance and commitment therapy for psychological distress among persons with traumatic brain injury. *Neuropsychological Rehabilitation*, *31*(7), 1105-1129. https://doi.org/10.1080/09602011.2020.1762670

Sander, A. M., Fuchs, K. L., High, W. M., Hall, K. M., Kreutzer, J. S., & Rosenthal, M. (1999). The community integration questionnaire revisited: An assessment of factor structure and validity. *Archives of Physical Medicine and Rehabilitation*, *80*(10), 1303-1308. https://doi.org/https://doi.org/10.1016/S0003-9993(99)90034-5

Sander, A. M., Seel, R. T., Kreutzer, J. S., Hall, K. M., High, W. M., & Rosenthal, M. (1997). Agreement between persons with traumatic brain injury and their relatives regarding psychosocial outcome using the community integration questionnaire. *Archives of Physical Medicine and Rehabilitation*, *78*(4), 353-357. https://doi.org/https://doi.org/10.1016/S0003-9993(97)90225-2

Saracci, R. (1997). The World Health Organisation needs to reconsider its definition of health. *BMJ*, *314*(7091), 1409-1410. https://doi.org/10.1136/bmj.314.7091.1409

Schaefer, J. A., & Moos, R. H. (1998). The context for posttraumatic growth: Life crises, individual and social resources, and coping. In *Posttraumatic growth: Positive changes in the aftermath of crisis.* (pp. 99-125). Lawrence Erlbaum Associates Publishers.

Scholten, A. C., Haagsma, J. A., Cnossen, M. C., Olff, M., van Beeck, E. F., & Polinder, S. (2016). Prevalence of and Risk Factors for Anxiety and Depressive Disorders after Traumatic Brain Injury: A Systematic Review. *Journal of Neurotrauma*, *33*(22), 1969-1994. https://doi.org/10.1089/neu.2015.4252

Schöttke, H., & Giabbiconi, C. M. (2015). Post-stroke depression and post-stroke anxiety: prevalence and predictors. *Int Psychogeriatr*, *27*(11), 1805-1812. https://doi.org/10.1017/s1041610215000988

Schueller, S. M., & Seligman, M. E. P. (2010). Pursuit of pleasure, engagement, and meaning: Relationships to subjective and objective measures of well-being. *The Journal of Positive Psychology*, *5*(4), 253-263. https://doi.org/10.1080/17439761003794130

Schultz, P. W., Shriver, C., Tabanico, J. J., & Khazian, A. M. (2004). Implicit connections with nature. *Journal of Environmental Psychology*, *24*(1), 31-42. https://doi.org/https://doi.org/10.1016/S0272-4944(03)00022-7

Seligman, M. E. (2002). *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfillment*. Simon and Schuster.

Seligman, M. E. P. (2011). *Flourish : a new understanding of happiness and well-being--and how to achieve them / Martin E.P. Seligman*. London : Nicholas Brealey Pub.

Shaikh, N. M., Kersten, P., Siegert, R. J., & Theadom, A. (2019). Developing a comprehensive framework of community integration for people with acquired brain injury: a conceptual analysis. *Disability and Rehabilitation*, *41*(14), 1615-1631. https://doi.org/10.1080/09638288.2018.1443163

Shallcross, A. J., Troy, A. S., Boland, M., & Mauss, I. B. (2010). Let it be: Accepting negative emotional experiences predicts decreased negative affect and depressive symptoms. *Behav Res Ther*, *48*(9), 921-929. https://doi.org/10.1016/j.brat.2010.05.025

Shay, J. J. (2021). Terrified of Group Therapy: Investigating Obstacles to Entering or Leading Groups. *American Journal of Psychotherapy*, *74*(2), 71-75. https://doi.org/10.1176/appi.psychotherapy.20200033

Shields, C., Ownsworth, T., O'Donovan, A., & Fleming, J. (2016). A transdiagnostic investigation of emotional distress after traumatic brain injury. *Neuropsychological Rehabilitation*, *26*(3), 410-445. https://doi.org/10.1080/09602011.2015.1037772

Shorland, J., & Douglas, J. M. (2010). Understanding the role of communication in maintaining and forming friendships following traumatic brain injury. *Brain Inj*, *24*(4), 569-580. https://doi.org/10.3109/02699051003610441

Silva, A., Matos, M., & Gonçalves, M. (2023). Nature and human well-being: a systematic review of empirical evidence from nature-based interventions. *Journal of Environmental Planning and Management*, 1-58. https://doi.org/10.1080/09640568.2023.2227761

Singer, A. R., & Dobson, K. S. (2007). An experimental investigation of the cognitive vulnerability to depression. *Behaviour Research and Therapy*, *45*(3), 563-575.

Sirgy, J. M., & Wu, J. (2009). The Pleasant Life, the Engaged Life, and the Meaningful Life: What about the Balanced Life? *Journal of Happiness Studies*, *10*(2), 183-196. https://doi.org/10.1007/s10902-007-9074-1

Sirgy, M. J. (2018). What Types of Indicators Should Be Used to Capture Community Well-Being Comprehensively? *International Journal of Community Well-Being*, *1*(1), 3-9. https://doi.org/10.1007/s42413-018-0002-4

Smith, B. (2018). Generalizability in qualitative research: misunderstandings, opportunities and recommendations for the sport and exercise sciences. *Qualitative Research in Sport, Exercise and Health*, *10*(1), 137-149. https://doi.org/10.1080/2159676X.2017.1393221

Sniehotta, F. F., Scholz, U., & Schwarzer, R. (2005). Bridging the intention–behaviour gap: Planning, self-efficacy, and action control in the adoption and maintenance of physical exercise. *Psychology & Health*, *20*(2), 143-160. https://doi.org/10.1080/08870440512331317670

Soberg, H. L., Finset, A., Roise, O., & Bautz-Holter, E. (2008). Identification and comparison of rehabilitation goals after multiple injuries: an ICF analysis of the patients', physiotherapists' and other allied professionals' reported goals. *Journal of Rehabilitation Medicine*, *40*(5), 340-346. https://doi.org/10.2340/16501977-0174

Soga, M., & Gaston, K. J. (2016). Extinction of experience: the loss of human–nature interactions. *Frontiers in Ecology and the Environment*, *14*(2), 94-101. https://doi.org/https://doi.org/10.1002/fee.1225

Sparkes, A. C., & Smith, B. (2013). *Qualitative research methods in sport, exercise and health: From process to product*. Routledge.

Stagg, K., Douglas, J., & Iacono, T. (2022). Living with stroke during the first year after onset: an instrumental case study exploring the processes that influence adjustment. *Disability and Rehabilitation*, 1-10. https://doi.org/10.1080/09638288.2022.2131005

Steger, M. F. (2012). Experiencing meaning in life: Optimal functioning at the nexus of well-being, psychopathology, and spirituality. In *The human quest for meaning: Theories, research, and applications, 2nd ed.* (pp. 165-184). Routledge/Taylor & Francis Group.

Stellar, J. E., Gordon, A. M., Piff, P. K., Cordaro, D., Anderson, C. L., Bai, Y., Maruskin, L. A., & Keltner, D. (2017). Self-transcendent emotions and their social functions: Compassion, gratitude, and awe bind us to others through prosociality. *Emotion Review*, *9*(3), 200-207. https://doi.org/10.1177/1754073916684557

Steptoe, A., Deaton, A., & Stone, A. A. (2015). Subjective wellbeing, health, and ageing. *Lancet*, *385*(9968), 640-648. https://doi.org/10.1016/s0140-6736(13)61489-0

Stringhini, S., Carmeli, C., Jokela, M., Avendaño, M., Muennig, P., Guida, F., Ricceri, F., d'Errico, A., Barros, H., & Bochud, M. (2017). Socioeconomic status and the 25× 25 risk factors as determinants of premature mortality: a multicohort study and meta-analysis of 1· 7 million men and women. *The Lancet*, *389*(10075), 1229-1237.

Stuss, D. T. (2011). Traumatic brain injury: relation to executive dysfunction and the frontal lobes. *Current Opinion in Neurology*, *24*(6), 584-589. https://doi.org/10.1097/WCO.0b013e32834c7eb9

Stuss, D. T., & Levine, B. (2002). Adult Clinical Neuropsychology: Lessons from Studies of the Frontal Lobes. *Annual Review of Psychology*, *53*(Volume 53, 2002), 401-433. https://doi.org/https://doi.org/10.1146/annurev.psych.53.100901.135220

Styrke, J., Stålnacke, B. M., Sojka, P., & Björnstig, U. (2007). Traumatic brain injuries in a well-defined population: epidemiological aspects and severity. *J Neurotrauma*, *24*(9), 1425-1436. https://doi.org/10.1089/neu.2007.0266

Sugavanam, T., Mead, G., Bulley, C., Donaghy, M., & van Wijck, F. (2013). The effects and experiences of goal setting in stroke rehabilitation – a systematic review. *Disability and Rehabilitation*, *35*(3), 177-190. https://doi.org/10.3109/09638288.2012.690501

Sveen, U., Guldager, R., Soberg, H. L., Andreassen, T. A., Egerod, I., & Poulsen, I. (2022). Rehabilitation interventions after traumatic brain injury: a scoping review. *Disability and Rehabilitation*, *44*(4), 653-660. https://doi.org/10.1080/09638288.2020.1773940

Swift, J. K., & Greenberg, R. P. (2012). Premature discontinuation in adult psychotherapy: a meta-analysis. *J Consult Clin Psychol*, *80*(4), 547-559. https://doi.org/10.1037/a0028226

Szczepanski, S. M., & Knight, R. T. (2014). Insights into human behavior from lesions to the prefrontal cortex. *Neuron*, *83*(5), 1002-1018. https://doi.org/10.1016/j.neuron.2014.08.011

Tajfel, H., Turner, J. C., Austin, W. G., & Worchel, S. (1979). An integrative theory of intergroup conflict. In M. Hatch, & Schultz, M. (Ed.), *Organizational Identity: A Reader*.

Tamir, M. (2009). What Do People Want to Feel and Why?: Pleasure and Utility in Emotion Regulation. *Current Directions in Psychological Science*, *18*(2), 101-105. https://doi.org/10.1111/j.1467-8721.2009.01617.x

Taylor, E. M., Robertson, N., Lightfoot, C. J., Smith, A. C., & Jones, C. R. (2022). Nature-Based Interventions for Psychological Wellbeing in Long-Term Conditions: A Systematic Review. *Int J Environ Res Public Health*, *19*(6). https://doi.org/10.3390/ijerph19063214

Teasdale, T. W., & Engberg, A. W. (2001). Suicide after traumatic brain injury: a population study. *Journal of Neurology, Neurosurgery &amp;amp; Psychiatry*, *71*(4), 436. https://doi.org/10.1136/jnnp.71.4.436

Teasell, R., Bayona, N., Marshall, S., Cullen, N., Bayley, M., Chundamala, J., Villamere, J., Mackie, D., Rees, L., Hartridge, C., Lippert, C., Hilditch, M., Welch-West, P., Weiser, M., Ferri, C., McCabe, P., McCormick, A., Aubut, J.-A., Comper, P., . . . Tu, L. (2007). A systematic review of the rehabilitation of moderate to severe acquired brain injuries. *Brain Injury*, *21*(2), 107-112. https://doi.org/10.1080/02699050701201524

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Sage.

Tedeschi, R. G., & Calhoun, L. G. (1995). *Trauma & transformation: Growing in the aftermath of suffering* [doi:10.4135/9781483326931]. Sage Publications, Inc. https://doi.org/10.4135/9781483326931

Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: measuring the positive legacy of trauma. *J Trauma Stress*, *9*(3), 455-471. https://doi.org/10.1007/bf02103658

Tedeschi, R. G., & Calhoun, L. G. (2004). *Target Article: "Posttraumatic Growth: Conceptual Foundations and Empirical Evidence"* [doi:10.1207/s15327965pli1501_01]. Lawrence Erlbaum.

Thompson Coon, J., Boddy, K., Stein, K., Whear, R., Barton, J., & Depledge, M. H. (2011). Does participating in physical activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. *Environ Sci Technol*, *45*(5), 1761-1772. https://doi.org/10.1021/es102947t

Tiersky, L. A., Anselmi, V., Johnston, M. V., Kurtyka, J., Roosen, E., Schwartz, T., & DeLuca, J. (2005). A Trial of Neuropsychologic Rehabilitation in Mild-Spectrum Traumatic Brain Injury. *Archives of Physical Medicine and Rehabilitation*, *86*(8), 1565-1574. https://doi.org/https://doi.org/10.1016/j.apmr.2005.03.013

Tinetti, M. E., & Fried, T. (2004). The end of the disease era. *Am J Med*, *116*(3), 179-185. https://doi.org/10.1016/j.amjmed.2003.09.031

Tistad, M., Hultman, L., Wohlin Wottrich, A., & von Koch, L. (2025). The Lived Experience of Participating in Online Peer-To-Peer Groups After Acquired Brain Injury: Phenomenological Study. *Journal of Medical Internet Research*, *27*. https://doi.org/https://doi.org/10.2196/67658

Todhunter-Brown, A., Baer, G., Campbell, P., Choo, P. L., Forster, A., Morris, J., Pomeroy, V. M., & Langhorne, P. (2014). Physical rehabilitation approaches for the recovery of function and mobility following stroke. *Cochrane Database of Systematic Reviews*(4). https://doi.org/10.1002/14651858.CD001920.pub3

Tomaka, J., Thompson, S., & Palacios, R. (2006). The relation of social isolation, loneliness, and social support to disease outcomes among the elderly. *J Aging Health*, *18*(3), 359-384. https://doi.org/10.1177/0898264305280993

Tomberg, T., Toomela, A., Pulver, A., & Tikk, A. (2005). Coping strategies, social support, life orientation and health-related quality of life following traumatic brain injury. *Brain Inj*, *19*(14), 1181-1190. https://doi.org/10.1080/02699050500150153

Towfighi, A., Ovbiagele, B., El Husseini, N., Hackett, M. L., Jorge, R. E., Kissela, B. M., Mitchell, P. H., Skolarus, L. E., Whooley, M. A., & Williams, L. S. (2017). Poststroke Depression: A Scientific Statement for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*, *48*(2), e30-e43. https://doi.org/10.1161/STR.0000000000000113

Tracy, S. J. (2010). Qualitative Quality: Eight “Big-Tent” Criteria for Excellent Qualitative Research. *Qualitative Inquiry*, *16*(10), 837-851. https://doi.org/10.1177/1077800410383121

Tracy, S. J., & Hinrichs, M. M. (2017). Big Tent Criteria for Qualitative Quality. In *The International Encyclopedia of Communication Research Methods* (pp. 1-10). https://doi.org/https://doi.org/10.1002/9781118901731.iecrm0016

Tsunetsugu, Y., Park, B.-J., & Miyazaki, Y. (2009). Trends in research related to “Shinrin-yoku” (taking in the forest atmosphere or forest bathing) in Japan. *Environmental Health and Preventive Medicine*, *15*(1), 27. https://doi.org/10.1007/s12199-009-0091-z

Tulip, C., Fisher, Z., Bankhead, H., Wilkie, L., Pridmore, J., Gracey, F., Tree, J., & Kemp, A. H. (2020). Building Wellbeing in People With Chronic Conditions: A Qualitative Evaluation of an 8-Week Positive Psychotherapy Intervention for People Living With an Acquired Brain Injury [Original Research]. *Frontiers in Psychology*, *11*(66). https://doi.org/10.3389/fpsyg.2020.00066

Tull, M. T., & Roemer, L. (2007). Emotion regulation difficulties associated with the experience of uncued panic attacks: evidence of experiential avoidance, emotional nonacceptance, and decreased emotional clarity. *Behav Ther*, *38*(4), 378-391. https://doi.org/10.1016/j.beth.2006.10.006

Turner-Stokes, L., Dzingina, M., Shavelle, R., Bill, A., Williams, H., & Sephton, K. (2019). Estimated Life-Time Savings in the Cost of Ongoing Care Following Specialist Rehabilitation for Severe Traumatic Brain Injury in the United Kingdom. *J Head Trauma Rehabil*, *34*(4), 205-214. https://doi.org/10.1097/htr.0000000000000473

Turner-Stokes, L., Pick, A., Nair, A., Disler, P. B., & Wade, D. T. (2015). Multi-disciplinary rehabilitation for acquired brain injury in adults of working age. *Cochrane Database Syst Rev*, *2015*(12), Cd004170. https://doi.org/10.1002/14651858.CD004170.pub3

Turner, B. J., Fleming, J. M., Ownsworth, T. L., & Cornwell, P. L. (2008). The transition from hospital to home for individuals with acquired brain injury: A literature review and research recommendations. *Disability and Rehabilitation*, *30*(16), 1153-1176. https://doi.org/10.1080/09638280701532854

Twohig, M., Abramowitz, J., Bluett, E., Fabricant, L., Jacoby, R., Morrison, K., Reuman, L., & Smith, B. (2014). Exposure therapy for OCD from an acceptance and commitment therapy (ACT) framework. *Journal of Obsessive-Compulsive and Related Disorders*, *6*. https://doi.org/10.1016/j.jocrd.2014.12.007

Twohig, M. P., & Levin, M. E. (2017). Acceptance and Commitment Therapy as a Treatment for Anxiety and Depression: A Review. *Psychiatr Clin North Am*, *40*(4), 751-770. https://doi.org/10.1016/j.psc.2017.08.009

Uchida, Y., & Oishi, S. (2016). The Happiness of Individuals and the Collective. *Japanese Psychological Research*, *58*(1), 125-141. https://doi.org/https://doi.org/10.1111/jpr.12103

Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, *11*(3), 201-230.

Ulrichsen, K. M., Kaufmann, T., Dørum, E. S., Kolskår, K. K., Richard, G., Alnæs, D., Arneberg, T. J., Westlye, L. T., & Nordvik, J. E. (2016). *Clinical utility of mindfulness training in the treatment of fatigue after stroke, traumatic brain injury and multiple sclerosis: A systematic literature review and meta-analysis*. Frontiers Media S.A.

Umberson, D., & Karas Montez, J. (2010). Social Relationships and Health: A Flashpoint for Health Policy. *Journal of Health and Social Behavior*, *51*(1_suppl), S54-S66. https://doi.org/10.1177/0022146510383501

Vaghela, R., Santoro, C., & Braham, L. (2021). The psychological adjustment needs of individuals following an acquired brain injury: A systematic review. *Applied Neuropsychology: Adult*, 1-14. https://doi.org/10.1080/23279095.2021.1956927

Van Cappellen, P., Rice, E. L., Catalino, L. I., & Fredrickson, B. L. (2018). Positive affective processes underlie positive health behaviour change. *Psychol Health*, *33*(1), 77-97. https://doi.org/10.1080/08870446.2017.1320798

van den Berg, M., van Poppel, M., van Kamp, I., Andrusaityte, S., Balseviciene, B., Cirach, M., Danileviciute, A., Ellis, N., Hurst, G., Masterson, D., Smith, G., Triguero-Mas, M., Uzdanaviciute, I., de Wit, P., van Mechelen, W., Gidlow, C., Grazuleviciene, R., Nieuwenhuijsen, M. J., Kruize, H., & Maas, J. (2016). Visiting green space is associated with mental health and vitality: A cross-sectional study in four european cities. *Health Place*, *38*, 8-15. https://doi.org/10.1016/j.healthplace.2016.01.003

van den Berg, M., Wendel-Vos, W., van Poppel, M., Kemper, H., van Mechelen, W., & Maas, J. (2015). Health benefits of green spaces in the living environment: A systematic review of epidemiological studies. *Urban Forestry & Urban Greening*, *14*(4), 806-816. https://doi.org/https://doi.org/10.1016/j.ufug.2015.07.008

van der Linden, D., Tops, M., & Bakker, A. B. (2021). Go with the flow: A neuroscientific view on being fully engaged. *Eur J Neurosci*, *53*(4), 947-963. https://doi.org/10.1111/ejn.15014

van Eeden, M., van Mastrigt, G. A., Evers, S. M., van Raak, E. P., Driessen, G. A., & van Heugten, C. M. (2016). The economic impact of mental healthcare consumption before and after stroke in a cohort of stroke patients in the Netherlands: a record linkage study. *BMC Health Serv Res*, *16*(1), 688. https://doi.org/10.1186/s12913-016-1915-3

van Heugten, C., Caldenhove, S., Crutsen, J., & Winkens, I. (2020). An overview of outcome measures used in neuropsychological rehabilitation research on adults with acquired brain injury. *Neuropsychological Rehabilitation*, *30*(8), 1598-1623. https://doi.org/10.1080/09602011.2019.1589533

van Heugten, C. M., & Wilson, B. A. (2021). Cognition, Emotion and Fatigue Post-stroke. In T. Platz (Ed.), *Clinical Pathways in Stroke Rehabilitation: Evidence-based Clinical Practice Recommendations* (pp. 219-242). Springer International Publishing. https://doi.org/10.1007/978-3-030-58505-1_12

van Velzen, J. M., van Bennekom, C. A., Edelaar, M. J., Sluiter, J. K., & Frings-Dresen, M. H. (2009). How many people return to work after acquired brain injury?: a systematic review. *Brain Inj*, *23*(6), 473-488. https://doi.org/10.1080/02699050902970737

Versace, J., Tazrin, S., O'Connor, E., Sekibo, J., Morey, E., Kasinopoulou, A., O'Donoghue, D., & Simblett, S. K. (2024). The role of spirituality and identity formation in personal recovery from traumatic brain injury: A qualitative analysis through the personal experiences of survivors. *Neuropsychological Rehabilitation*, *34*(8), 1110-1140. https://doi.org/10.1080/09602011.2023.2274624

Vescovelli, F., Minotti, S., & Ruini, C. (2021). Exploring Post-traumatic Growth in Parkinson's Disease: A Mixed Method Study. *J Clin Psychol Med Settings*, *28*(2), 267-278. https://doi.org/10.1007/s10880-020-09713-9

Vibholm, A. P., Hanne, P., Reffstrup, C. J., & and Varning Poulsen, D. (2024). Nature-based rehabilitation—experiences from patients with acquired brain injury: an explorative qualitative study. *Disability and Rehabilitation*, *46*(19), 4384-4393. https://doi.org/10.1080/09638288.2023.2274874

Villa, D., Causer, H., & Riley, G. A. (2021). Experiences that challenge self-identity following traumatic brain injury: a meta-synthesis of qualitative research. *Disabil Rehabil*, *43*(23), 3298-3314. https://doi.org/10.1080/09638288.2020.1743773

Vingerhoets, C., Hay-Smith, J., & Graham, F. (2023). Getting to know our patients and what matters: exploring the elicitation of patient values, preferences, and circumstances in neurological rehabilitation. *Disability and Rehabilitation*, *45*(9), 1444-1452. https://doi.org/10.1080/09638288.2022.2063416

Wade, D. T. (1992). Measurement in neurological rehabilitation. *Curr Opin Neurol Neurosurg*, *5*(5), 682-686.

Waldron, B., Casserly, L. M., & O'Sullivan, C. (2013). Cognitive behavioural therapy for depression and anxiety in adults with acquired brain injury: what works for whom? *Neuropsychol Rehabil*, *23*(1), 64-101. https://doi.org/10.1080/09602011.2012.724196

Walter, K. H., Sarkisian, G. V., Martínez, G., & Ward, P. B. (2020). Surf Therapy Practice, Research, and Coalition Building: Future Directions. *Global Journal of Community Psychology Practice*, *11*(2).

Wamsler, C., & Brink, E. (2018). Mindsets for Sustainability: Exploring the Link Between Mindfulness and Sustainable Climate Adaptation. *Ecological Economics*, *151*, 55-61. https://doi.org/https://doi.org/10.1016/j.ecolecon.2018.04.029

Wan, C., Shen, G. Q., & Choi, S. (2021). Underlying relationships between public urban green spaces and social cohesion: A systematic literature review. *City, Culture and Society*, *24*, 100383. https://doi.org/https://doi.org/10.1016/j.ccs.2021.100383

Wang, B., Zeldovich, M., Rauen, K., Wu, Y.-J., Covic, A., Muller, I., Haagsma, J. A., Polinder, S., Menon, D., Asendorf, T., Andelic, N., von Steinbuechel, N., Participants, C.-T., & Investigators. (2021). Longitudinal Analyses of the Reciprocity of Depression and Anxiety after Traumatic Brain Injury and Its Clinical Implications. *Journal of Clinical Medicine*, *10*(23), 5597. https://www.mdpi.com/2077-0383/10/23/5597

Warburton, D. E., Nicol, C. W., & Bredin, S. S. (2006). Health benefits of physical activity: the evidence. *Cmaj*, *174*(6), 801-809. https://doi.org/10.1503/cmaj.051351

Weinstein, A. A., Chin, L. M. K., Collins, J., Goel, D., Keyser, R. E., & Chan, L. (2017). Effect of Aerobic Exercise Training on Mood in People With Traumatic Brain Injury: A Pilot Study. *The Journal of Head Trauma Rehabilitation*, *32*(3). https://journals.lww.com/headtraumarehab/Fulltext/2017/05000/Effect_of_Aerobic_Exercise_Training_on_Mood_in.12.aspx

Weinstein, N., & Ryan, R. M. (2010). When helping helps: Autonomous motivation for prosocial behavior and its influence on well-being for the helper and recipient. *Journal of Personality and Social Psychology*, *98*(2), 222-244. https://doi.org/10.1037/a0016984

Wellings, K., Branigan, P., & Mitchell, K. (2000). Wellings J, Branigan P, Mitchell KDiscomfort, discord and discontinuity as data: using focus groups to research sensitive topics. Culture Health Sexuality 2: 255-267. *Culture Health & Sexuality - CULT HEALTH SEX*, *2*, 255-267. https://doi.org/10.1080/136910500422241

White, M. P., Alcock, I., Grellier, J., Wheeler, B. W., Hartig, T., Warber, S. L., Bone, A., Depledge, M. H., & Fleming, L. E. (2019). Spending at least 120 minutes a week in nature is associated with good health and wellbeing. *Scientific Reports*, *9*(1), 7730. https://doi.org/10.1038/s41598-019-44097-3

Whiting, D., Deane, F., McLeod, H., Ciarrochi, J., & Simpson, G. (2019). Can acceptance and commitment therapy facilitate psychological adjustment after a severe traumatic brain injury? A pilot randomized controlled trial. *Neuropsychological Rehabilitation*, *30*(7), 1348-1371. https://doi.org/https://doi.org/10.1080/09602011.2019.1583582

Whiting, D. L., Deane, F. P., Ciarrochi, J., McLeod, H. J., & Simpson, G. K. (2015). Validating measures of psychological flexibility in a population with acquired brain injury. *Psychol Assess*, *27*(2), 415-423. https://doi.org/10.1037/pas0000050

Whiting, D. L., Deane, F. P., Simpson, G. K., McLeod, H. J., & Ciarrochi, J. (2017). Cognitive and psychological flexibility after a traumatic brain injury and the implications for treatment in acceptance-based therapies: A conceptual review. *Neuropsychological Rehabilitation*, *27*(2), 263-299. https://doi.org/10.1080/09602011.2015.1062115

Whiting, D. L., Simpson, G. K., Deane, F. P., Chuah, S. L., Maitz, M., & Weaver, J. (2021). Protocol for a Phase Two, Parallel Three-Armed Non-inferiority Randomized Controlled Trial of Acceptance and Commitment Therapy (ACT-Adjust) Comparing Face-to-Face and Video Conferencing Delivery to Individuals With Traumatic Brain Injury Experiencing

Psychological Distress [Study Protocol]. *Frontiers in Psychology*, *12*(580). https://doi.org/10.3389/fpsyg.2021.652323

Wierzbicki, M., & Pekarik, G. (1993). A meta-analysis of psychotherapy dropout. *Professional Psychology: Research and Practice*, *24*(2), 190-195. https://doi.org/10.1037/0735-7028.24.2.190

Wijaya Mulya, T., Harijanto, T., W., P. C., & and Sutanto, N. (2025). Ecotherapy through a discursive lens: nature-based activities, mental health, and local constructions of human-nature relationship. *Journal of Adventure Education and Outdoor Learning*, *25*(1), 9-25. https://doi.org/10.1080/14729679.2024.2384729

Wildman, J. M., Moffatt, S., Steer, M., Laing, K., Penn, L., & O'Brien, N. (2019). Service-users' perspectives of link worker social prescribing: a qualitative follow-up study. *BMC public health*, *19*(1), 98. https://doi.org/10.1186/s12889-018-6349-x

Wildschut, T., Sedikides, C., Arndt, J., & Routledge, C. (2006). Nostalgia: Content, triggers, functions. *Journal of Personality and Social Psychology*, *91*(5), 975-993. https://doi.org/10.1037/0022-3514.91.5.975

Wilkie, L., Arroyo, P., Conibeer, H., Kemp, A. H., & Fisher, Z. (2021). The Impact of Psycho-Social Interventions on the Wellbeing of Individuals With Acquired Brain Injury During the COVID-19 Pandemic [Original Research]. *Frontiers in Psychology*, *12*(793). https://doi.org/10.3389/fpsyg.2021.648286

Wilkie, L., Fisher, Z., & Kemp, A. H. (2022). The 'Rippling' Waves of Wellbeing: A Mixed Methods Evaluation of a Surf-Therapy Intervention on Patients with Acquired Brain Injury. *Sustainability*.

Williams, L. S., Kroenke, K., Bakas, T., Plue, L. D., Brizendine, E., Tu, W., & Hendrie, H. (2007). Care Management of Poststroke Depression. *Stroke*, *38*(3), 998-1003. https://doi.org/doi:10.1161/01.STR.0000257319.14023.61

Williams, M. W., Rapport, L. J., Millis, S. R., & Hanks, R. A. (2014). Psychosocial outcomes after traumatic brain injury: life satisfaction, community integration, and distress. *Rehabil Psychol*, *59*(3), 298-305. https://doi.org/10.1037/a0037164

Willig, C. (2017). Interpretation in qualitative research. *The SAGE handbook of qualitative research in psychology*, *2*, 274-288.

Wilson, B., Gracey, F., Evan, J., & Bateman, A. (2009). *Neuropsychological Rehabilitation: Theory, Models, Therapy and Outcome* (Vol. 21). https://doi.org/10.1017/CBO9780511581083.005

Wilson, B. A. (2002). Cognitive Rehabilitation in the 21st Century. *Neurorehabilitation and Neural Repair*, *16*(2), 207-210. https://doi.org/10.1177/0888439002016002003

Wilson, B. A. (2010). Brain injury: recovery and rehabilitation [https://doi.org/10.1002/wcs.15]. *WIREs Cognitive Science*, *1*(1), 108-118. https://doi.org/https://doi.org/10.1002/wcs.15

Wilson, B. A. (2013). Neuropsychological rehabilitation: State of the science. *South African Journal of Psychology*, *43*(3), 267-277. https://doi.org/10.1177/0081246313494156

Wilson, B. A., Rous, R., & Sopena, S. (2008). The Current Practice of Neuropsychological Rehabilitation in the United Kingdom. *Applied Neuropsychology*, *15*(4), 229-240. https://doi.org/10.1080/09084280802325017

Wilson, B. A., Winegardner, J., van Heugten, C., & Ownsworth, T. (2017). *Neuropsychological rehabilitation: The international handbook*. Psychology Press.

Winkler, D., Unsworth, C., & Sloan, S. (2005). Time Use Following a Severe Traumatic Brain Injury. *Journal of Occupational Science*, *12*(2), 69-81. https://doi.org/10.1080/14427591.2005.9686550

Wise, E. K., Mathews-Dalton, C., Dikmen, S., Temkin, N., Machamer, J., Bell, K., & Powell, J. M. (2010). Impact of traumatic brain injury on participation in leisure activities. *Arch Phys Med Rehabil*, *91*(9), 1357-1362. https://doi.org/10.1016/j.apmr.2010.06.009

Wiseman, J., & Brasher, K. (2008). Community wellbeing in an unwell world: trends, challenges, and possibilities. *J Public Health Policy*, *29*(3), 353-366. https://doi.org/10.1057/jphp.2008.16

Woiwode, C., Schäpke, N., Bina, O., Veciana, S., Kunze, I., Parodi, O., Schweizer-Ries, P., & Wamsler, C. (2021). Inner transformation to sustainability as a deep leverage point: fostering new avenues for change through dialogue and reflection. *Sustainability Science*, *16*(3), 841-858. https://doi.org/10.1007/s11625-020-00882-y

Wolf, T. J., Chuh, A., Floyd, T., McInnis, K., & Williams, E. (2014). Effectiveness of Occupation-Based Interventions to Improve Areas of Occupation and Social Participation After Stroke: An Evidence-Based Review. *The American Journal of Occupational Therapy*, *69*(1), 6901180060p6901180061-6901180060p6901180011. https://doi.org/10.5014/ajot.2015.012195

Wong, P. T. P. (2011). Positive psychology 2.0: Towards a balanced interactive model of the good life. *Canadian Psychology / Psychologie canadienne*, *52*, 69-81. https://doi.org/10.1037/a0022511

Wong, P. T. P. (2013). Toward a Dual-Systems Model of What Makes Life Worth Living.

Wood, A. M., Froh, J. J., & Geraghty, A. W. A. (2010). Gratitude and well-being: A review and theoretical integration. *Clinical Psychology Review*, *30*(7), 890-905. https://doi.org/https://doi.org/10.1016/j.cpr.2010.03.005

Wood, A. M., Joseph, S., & Maltby, J. (2009). Gratitude predicts psychological well-being above the Big Five facets. *Personality and Individual Differences*, *46*(4), 443-447. https://doi.org/https://doi.org/10.1016/j.paid.2008.11.012

Yeates, G., Henwood, K., Gracey, F., & Evans, J. (2007). Awareness of disability after acquired brain injury and the family context. *Neuropsychological Rehabilitation*, *17*(2), 151-173. https://doi.org/10.1080/09602010600696423

Zavaleta, D., Samuel, K., & Mills, C. (2014). Social isolation: A conceptual and measurement proposal.

Zhang, G., Chen, M., Xiao, P., & Peng, Z. (2023). Prevalence and risk factors of elder abuse in survivors of stroke: A cross-sectional study. *Health Science Reports*, *6*(10), e1616. https://doi.org/https://doi.org/10.1002/hsr2.1616