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‘A Mindful ACT’- testing the feasibility and acceptability of a brief psychosocial intervention designed to accompany osteopathy treatment for people who live with persistent pain

Madalina Jäger [a,*], Julia Terry [b], Jaynie Rance [c]

[a] Research Unit for Musculoskeletal Function and Physiotherapy, Institute of Sports Science and Clinical Biomechanics, University of Southern Denmark, Odense, Denmark
[b] College of Human & Health Sciences, Swansea University, Swansea, UK
[c] Health Psychology, College of Human and Health Sciences, Swansea University, Swansea, UK

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ABSTRACT

Background: Persistent pain represents a significant burden for individuals and society, exerting a profound effect on quality of life and posing a significant strain on healthcare resources. Novel interventions are needed to reduce the impact of psychological comorbidities on people who live with pain but also to improve pain self-management.
Objectives: The aim of this research was to investigate the feasibility and acceptability of a brief group-based ACT intervention designed to osteopathy for people who live with persistent pain and psychological comorbidities.
Methods: A mixed-method approach has been utilized that comprised of qualitative interviews providing an insight into peoples’ experiences of participating and quantitative data including psychological flexibility, depression, anxiety, fear avoidance and general health status. This preliminary report will only present the qualitative findings.
Results: A total of 9 participants took part in the intervention. The participants engaged well with the exercises and with the ACT model in general. Program attendance was high (4 out of the 9 participants attended all the 6 sessions, (further attendance is shown in the Supplementary file 7); all 9 took part in the post-intervention interview). Three major themes were identified from the interview data: Engaging with the ACT model, Experiences of taking part in the intervention and Perceived changes. The participants reported positive experiences: they found being able to connect with people who experience similar issues valuable and expressed that they liked the content and structure of the program. The intervention appeared to be feasible with the support of the osteopaths.
Conclusion: Delivering a brief ACT-based intervention for people living with persistent pain was found to be feasible and acceptable. The collaboration between osteopaths and psychologists in supporting people who live with persistent pain demonstrates potential and should be further explored in the future.

Implications for practice

- Delivering a brief ACT-based intervention for people living with persistent pain was feasible with the collaboration of osteopaths and considered acceptable by the participants.
- Osteopaths can be successfully trained to facilitate brief psychosocial interventions designed for people experiencing persistent pain.
- The collaboration between osteopaths and psychologists in supporting people living with persistent pain contributes to recent innovative research initiatives in the field and should be further explored in the future.

Introduction

Pain has been recognised as a major clinical, social, and economic problem that has a profound effect on people’s quality of life [1]. Persistent pain exerts a significant burden worldwide. A study conducted by Ref. [2] revealed that nearly 28 million adults (43% of the

* Corresponding author. Campusvej 55, DK-5230 Odense M, Odense, Denmark.
E-mail address: msaracutu@health.sdu.dk (M. Jäger).

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general population of the United Kingdom) are experiencing persistent pain, and this number is likely to increase in the future, congruent with an ageing population. In addition, persistent pain seems to be highly prevalent among adolescents as well, according to a prevalence study based on data from 42 countries (Gobina et al., 2019).

In Wales, an estimated 600,000 people are living with long-term pain [3]. Persistent pain contributes to a substantial loss of quality of life by limiting people' s normal functioning. The economic burden of pain and the overwhelming impact of pain on individuals' physical, psychological, and social wellbeing make research in this domain a priority.

Persistent pain is currently understood as a complex biopsychosocial phenomenon, therefore, the interventions required for managing it must also have biological, psychological, and social dimensions [4]. The biopsychosocial approach regards persistent pain as an illness rather than a disease, recognizing its subjective nature and emphasizing that treatments are aimed at managing rather than curing pain [5,6]. Recently, pain disorders have been also categorized systematically into the 11th version of the International Classification of Diseases [7], aiming to strengthen the representation of these conditions in clinical practice and research [8,9]. In this context, psychological based interventions have received increased popularity and recognition as adjunctive treatments. One of the most recent psychological approaches to pain management aims to increase self-management and target cognitive, emotional, and behavioural components of pain rather than trying to eliminate pain itself.

Acceptance and Commitment Therapy (ACT) is a therapy emerging from cognitive-behavioural therapies, built upon both the first and second wave of behaviour therapy but nevertheless different from these [10]. ACT advances a treatment model consisting of awareness and non-judgmental acceptance of both positive and negative experiences and the identification of meaningful values and appropriate actions towards goals that are consistent with those values [11]. ACT stems from Relational Frame Theory (RFT) and is based on the psychological flexibility model, a framework according to which the content, form and intensity of thoughts and emotions alone are not sufficient to explain behaviour, instead behaviour is determined by the function of these experiences in a particular context [12,13]. In the context of persistent pain, the ACT model centres on the idea that attempting to change aversive internal experiences is futile and may lead to increased distress [14].

The efficacy of Acceptance and Commitment Therapy (ACT) has been evaluated in many randomized controlled trials across a broad range of chronic conditions. ACT has been associated with improved health outcomes [15–18]. A recent meta-analytic review comprising 20 meta-analyses found that ACT is efficacious for anxiety, depression, substance use, pain and transdiagnostic groups [19]. ACT has been shown to be particularly efficacious for older people [20] or those with co-occurring mood disorders [21]. A study exploring the mechanisms of ACT for persistent pain revealed statistically significant improvements in depression, satisfaction with social role and pain acceptance pre-to-post ACT [22]. The results pointed to significant decreases in pain interference and significant increases in the willingness of individuals to engage in activities despite pain.

Over the past decade, there has been increasing interest in integrating different approaches and modalities to improve outcomes for people living with pain and establish a novel pathway in line with the biopsychosocial paradigm. Developing a novel intervention combining osteopathy and ACT can be justified by the evidence supporting the effectiveness of ACT for people with persistent pain as well as the body of evidence emphasizing the effects of osteopathic treatment in managing persistent pain. Integrating concepts and principles from ACT may lead to an increase in the effectiveness of osteopathic care and moderate the impact of psychological comorbidities. Furthermore, non-primary care health practitioners (such as osteopaths) may be ideally positioned to provide self-management and psychological support for people with persistent pain [23]. Osteopaths can be trained to deliver ACT-based interventions, leading to minimizing the costs related to training specialist staff or accessing psychological therapy. Finally, osteopathy and ACT are compatible at a conceptual level [24,25]. While ACT aims to enhance psychological flexibility, osteopaths work to improve physical flexibility [26]. Also, ACT focuses on increasing people's willingness to engage in meaningful activities in the presence of pain, which is similar to osteopaths' efforts to improve people's ability to perform more activities.

We developed a brief 6-week ACT-based program tailored for people living with persistent pain and psychological comorbidities, following the Medical Research Council (MRC) guidance for developing complex interventions [27]. This ACT-based intervention aimed to empower people to develop more acceptance and self-compassion, be more mindful and clarify their personal values with the goal of living a richer and more meaningful life.

The MRC framework emphasizes the importance of assessing feasibility and acceptability prior to embarking on a definitive trial [28]. The purpose of conducting feasibility studies is to decide whether an intervention is appropriate for further testing, therefore enabling researchers to determine whether the intervention can be relevant and sustainable, by identifying if the methods and protocols employed need modification but also by elucidating the process of change [29].

In addition, determining how well an intervention will be perceived by its facilitators and recipients and the extent to which it might meet the needs of the target population is essential. Acceptability is known to be a key factor in the successful implementation of interventions [30]. Furthermore, findings might be useful in elucidating potential reasons for low retention and have implications for the fidelity of both facilitating and receiving the intervention [31].

Aim

This study aimed to investigate the feasibility and acceptability of a brief ACT-based intervention designed to accompany osteopathy for people who live with persistent pain.

Method

Study design

The protocol for this study is described in detail elsewhere [23]. An early evaluation of the acceptability of a complex intervention is imperative, as it can highlight aspects of the interventions that can be modified before a trial [32,33]. The early evaluation stage is very useful in providing insights regarding the appropriateness of the procedures, the recruitment process, participant retention and how acceptable the participants find the program [28].

This study was undertaken to test the following methodological components: feasibility of the recruitment process and the measurement tools, acceptability of the intervention for the participants and the osteopaths and adherence to the program. Qualitative interviews were conducted by the primary researcher two weeks post-intervention to provide an insight into peoples' experiences of participating. This enabled the participants to reflect on what they learned during the program and on the changes they implemented in their daily lives.

Qualitative data was analyzed using Framework Analysis, in NVIVO 10. Quantitative data was collected at baseline, on completion of the program and at 1 month and 3 months follow-up and included the following: psychological flexibility, depression, anxiety, fear avoidance and general health status.

Recruitment and retention

Recruitment for 'A Mindful Act' occurred in partnership with an Osteopathic clinic situated in a university setting and consisted of two stages. The first stage involved osteopaths identifying adult patients

living with persistent pain from the clinic who met the inclusion and exclusion criteria provided by the researcher. Osteopaths informed patients about the study and obtained permission for the researcher to contact them. The second stage consisted of a preintervention conversation where the researcher asked potential participants initial questions about their current state of health. The researcher consented interested participants who were eligible.

Over a period of six weeks, the Osteopaths practicing in the clinic referred twenty of their patients who were considered eligible to the program. The osteopathy clinic routinely collected data from their patients (e.g., HADS), which aided osteopaths in identifying potential participants for the intervention. Prior to the recruitment, the psychologist introduced the Osteopaths to ACT through a workshop where they could familiarize themselves with the core concepts of ACT and with the intervention itself (see Table 1).

Fifteen potential participants attended a brief pre-intervention discussion with the researcher, who informed them about the nature of the program and gave them the chance to ask questions. Nine of these patients accepted the invitation to participate in the intervention study. Six potential participants did not take part in 'A Mindful Act' due to several reasons including: currently receiving psychological therapy, time limitations, living with PTSD, feeling uncomfortable with sharing experiences with a group. Recruitment rate was 45%.

Participants

Patients attending the osteopathy clinic were eligible if they were over 18, lived with persistent pain and experienced one or more of the following: depression, anxiety, fear avoidance, catastrophizing (according to their medical record). They had to be able to read, write and speak English and commit to six consecutive weekly sessions.

A total of 9 participants took part in the intervention, most of whom were women (eight). Almost half of the participants were aged between 30 and 39 range (four), while three others were aged between 50 and 69 years and one aged between 21 and 29 range. Most of the participants were married (56%), White (89%) and had obtained at least an undergraduate degree (44%). Most participants were in employment (four employed, two self-employed) while two were retired and one was receiving disability allowance. In terms of persistent pain, the group was heterogeneous: five out of the nine experienced either back or lower back pain and two of them also lived with neck pain in addition. Other participants reported living with endometriosis, neuropathic pain, and central sensitization, as well as chronic fatigue, sciatic pain, and arthritis. Many participants experienced three or more types of pain and associated physical or psychological issues, which is in line with previous literature pointing out that individuals with pain often present with more than one pain condition [34].

Intervention

Table 1
Description of the intervention (following TIDieR checklist)[a].

Description of the intervention (following TIDieR checklist)
A Mindful Act
This is a brief program composed of six 2-h sessions that took place over six weeks. Based on ACT principles, this intervention focused on increasing psychological flexibility. The intervention centered on basic ACT tenets, mindfulness practice, holding self-stories lightly, practicing self-compassion and self-care, acceptance, identifying values and committing to actions in line with one's values in pursuit of a fuller and more meaningful life (see Supplementary file 1). This intervention was developed using the MRC framework and informed through a systematic review [23] using the best available evidence and appropriate theory.
Content
A Mindful Act' was largely built up of freely accessible materials adapted for people living with pain from Russ Harris and Kelly Wilson (see Supplementary file 2). The sessions consisted of ACT education, group activities and discussions, mindfulness exercises, reflections on the homework practice. All the participants received a workbook containing homework exercises based on each week's topic.
Intervention facilitators
The primary researcher has a background in health psychology and was trained in delivering ACT-based interventions. The primary researcher (M.J) designed and coordinated the whole intervention, developed the necessary materials, and delivered the intervention making sure that all the ethical principles were adhered to. A qualified osteopath, experienced in treating people with persistent pain (C.T), worked collaboratively with the psychologist to facilitate the ACT-based program. He helped to welcome the participants, handed out materials, explained take-home messages, answered questions related to the intervention and facilitated two out of the six sessions. Training and supervision were provided by the primary researcher through 6 intervention-planning meetings prior to the program and 6 debrief meetings (one after each session).
Setting
A Mindful ACT' was delivered at the Health and Wellbeing Academy within University S. A multipurpose room with plenty of space to move around, natural light, comfortable chairs within a modern, state of the art building was chosen to host the six sessions.
Delivery
The intervention included six 2-h group sessions delivered over a period of six consecutive weeks. The participants took part in the intervention and continued their osteopathic treatment in parallel.
Tailoring
The intervention was tailored to the needs and preferences of people living with persistent pain, both in terms of content and structure but also by adapting the environment (providing padded chairs, cushions, and mats) and making sure there were enough breaks throughout the sessions.

[a] All names used are pseudonyms.

Data analysis

The analysis followed the five stages outlined by Ritchie and Spencer, [35]: familiarization, identifying a framework, indexing, charting, and mapping and interpretation. NVIVO 12 was the chosen software package to assist with data management and analysis. The average length of interviews was 25 min, which made it possible to familiarize with each transcript in depth. A second researcher read a selection of verbatim transcriptions to gain familiarity with the data and contribute to the development and validation of the themes. The team met to discuss the data and agree on initial codes and subsequent themes. A total of 200 initial codes were refined and grouped into themes that were then clustered under three major themes: Engaging with the ACT model, Experiences of taking part in the intervention and Perceived changes. The final framework was developed after several iterations and was constructed by using matrix coding. All the data indexed to the different categories was summarized for each of the participants in an Excel document. The mapping and interpretation stage consisted in identifying patterns and write the narrative.

Several techniques such as prolonged engagement with the data and researcher triangulation were employed to meet the trustworthiness criteria. Moreover, the research team ensured that the analysis process was traceable and clearly outlined and emphasis was placed on establishing a clear and logical link between researchers' interpretations and the original data. Each theme was described in detail and quotes were provided to highlight salient themes and illustrate the link between the data collected from the participants and the interpretations of the data proposed by the researchers. In addition, the observations recorded during the interviews were also explored and utilized in the analysis process.

Outcome measures

The primary outcomes of the program included the feasibility of recruitment and measurement and the adherence to the intervention (see Ref. [23]. The secondary outcomes were intended to provide some preliminary data on outcomes such as depression and anxiety, acceptance of pain, mindfulness, fear avoidance and quality of life.

This preliminary report will only present the findings related to the feasibility and acceptability of the intervention and will also include

qualitative findings illustrating experiences of taking part.

Results

Feasibility

The feasibility of the intervention was determined by assessing the recruitment process (number of participants recruited by osteopaths, number of people attending a pre-intervention interview with the researcher) and the measurement tools (by recording the time taken by participants to fill in the questionnaires, the number of items missing and the follow-up rates) [23]. Recruitment was feasible with the help of seven osteopaths practicing in the clinic, who identified 20 eligible patients and invited them to a pre-intervention interview with the researcher, to gauge their interest and provide information about the program. 15 potential participants attended the interview and nine consented to take part. Recruitment rate was 45%. Measurement tools were also found to be feasible. The participants took an average of 11.6 min to fill in the questionnaires and did not consider this burdensome. There was no missing data. The follow-up response rate at one month was 100%.

Acceptability

The intervention was found to be acceptable by those taking part, who reported that there were no barriers to participating and that they had positive experiences. The overall attendance over the six weeks of the program and the research interview following the intervention was high (4 out of the 9 participants attended all the 6 sessions, (further attendance is shown in the Supplementary file 7); all 9 took part in the post-intervention interview two weeks later). None of the nine participants dropped out. The participants were sent reminders the day before each session. The participants dedicated on average 30 min each week to fill in the homework exercises. Some of them expanded on the homework, for example, one participant designed her own healthy self-care practices chart, and another started a mindfulness journal with entries about bodily sensations and emotions, and creative ideas and drawings. All the participants actively contributed to the group discussions about homework that took place at the beginning of each session. By the end of the program, all the nine participants became familiar with the ACT tenets and were able to correctly link six statements to the corresponding ACT principles (see Supplementary file 3). At one-month follow-up, despite sharing that there were some difficulties in practising the skills acquired during the program (e.g., finding time to practice mindfulness, symptoms worsening) the intervention participants reported that they continued to practice mindfulness and applying their knowledge of ACT to their personal circumstances (see Supplementary file 6).

Qualitative findings

Three major themes identified from the interview data: Engaging with the ACT model, Experiences of taking part in the intervention and Perceived changes (see Table 2). The participants reported positive experiences: they found being able to connect with people who experience similar issues valuable and expressed that they liked the content and structure of the program. The framework analysis summary for each of the nine participants can be found in Supplementary file 4.

Table 2
Framework categories identified in the analysis.

1. Engaging with ACT	2. Taking part in the program	3. Perceived changes following the program
Understanding and practicing acceptance	Expectations	A different perspective on living with pain
'Acceptance physical exercise'	Views on content and structure	Increased confidence in own abilities
Learning about defusion	Facilitators	Slowing down and being more mindful
Experiences of practicing mindfulness	Practical aspects of the program	From self-criticism to self-compassion
Developing self-care and self-compassion	'Gelling together'	osteopathy & ACT work well together
Understanding and identifying values	Suggestions for improvement	

1. Engaging with ACT

All nine participants were proactive in trying to familiarize themselves with and make some changes in their lives in line with the ACT model. Several participants expressed that it was not always easy to understand ACT and that they needed some clarification or additional time to think about it. One example is Hannah, who talked about some specific principles as being slightly abstract. '*When you're talking about things like defusion, it's not a concept that you use in everyday life is it? You wouldn't say to somebody 'well, I'm going through a period of defusion*'. […] *Obviously, values and commitment are, and self as context as well.*' (Hannah[2], Intervention participant).

A good example of acceptance was expressed by Emily, who decided to focus on things that she could do, that were meaningful. *'I know I won't recover fully, but I– I think in my head I still always search for something that would make it better. Um, but it's okay to accept it and- and actually you feel-you feel better accepting that you-you're gonna live with this. So, I now go to the gym and I do what I can do and then if it's easier next time I do a little bit more. But I've accepted that I'm not getting back on the running machine or rowing machine or lift weights*.' (Emily, intervention participant).

A strong emerging category consisted of participants' account of engaging in mindfulness practice. In the beginning some participants talked about a sense of skepticism towards mindfulness (*'this new, fangled thing'* (Hannah), '*stuff for hippies*' (Emily), ' … *before I didn't believe it in. I did use to think oh, it's not really for me. I didn't really believe in it to be honest.*' (Diane). Taking part in the session dedicated to mindfulness and having first-hand experience of practising the Body Scan led to a different understanding and perception of it. The participants reported beneficial effects of using mindfulness to manage pain. Danielle described practising mindfulness in situations where pain has worsened, bringing with it stress, anxiety and panic. '*The breathing, the breathing is something I really concentrate on. When I get anxious or stressed or in pain I get short of breath and I think about having a heart attack. It feels like it and now, if I'm getting that anxious feeling I can just say right, 10 min out, I don't need to do the full body scan, but I can just concentrate on my breathing, being in the present moment and then talking myself out of it, which I could never do before.* (Danielle, intervention participant).

2. Taking part in the program

Participants in 'A Mindful Act' described their experiences as being very rewarding. Although some of them did not know what to expect initially, the participants engaged well with the course and liked its content and structure. They also expressed that they '*gelled together*' as a group and formed meaningful friendships. There were some suggestions for improvement, however, all the people who took part expressed their satisfaction with the program, adding that they would recommend it to someone they cared about. The participants appear to have engaged well with the material and appreciate the variety of activities and the holistic approach (the program went beyond talking about pain management). '*Yeah. I felt like it– Because the session was, um, some of it– Looking at the, um, the board, some of it doing things, some of it chatting. I think it was nicely broken up*.' (Emily, intervention participant).

'It was holistic, it really helped your whole being really, so I think I wasn't expecting that side of it.' (Hannah, intervention participant).

The group setting seemed to have benefited the participants. They

expressed having '*gelled well together*' despite living with different types of pain.'*The group for a start, the group was good … Just in the three weeks I was there I felt as though we gelled together and there were people there that you could sit and chat to.*' (Kevin, intervention participant).

Furthermore, the experience of pain became somehow 'normalized' and they felt that they were not alone. '*So, yeah, because sometimes you feel like it's just you and you're the only person who can feel it and it's good to be reminded that it's not just you and you're not alone. There are other-are other people that feel like it.*' (Naomi, intervention participant).

3. Perceived changes following the program

This category describes the changes that occurred during and after the program seen from the perspective of the participants. Not only did the participants learn about the ACT model but they also provided examples of how they applied it to their circumstances. Most of the changes revolve around participant's perspectives on life in general but also on moving forward with their pain and shifting their attention towards their values.

'*Because I'm feeling less pain, I feel that I can do more things, I have the confidence to do more things, whereas before, I think 'oh, it's really painful, I can't do this and I can't do that […] This morning I had a bit of pain, but then you breathe and think about yourself, put yourself in a good place and this is going to pass over, you don't need painkillers you don't need anything else, just you know go with it.*' (Hannah, intervention participant).

'*I really enjoyed the program and I felt like I got a lot out of it um … and I do feel like it moved me forward in terms of my relationship with pain um … and I … my perception of it and my also about my feeling about myself as well … if that makes sense.*' (Sara, intervention participant).

It appears that taking part in the program enhanced the participants' confidence in engaging in social activities, which may be linked to a certain extent to the increased trust in one's own physical abilities. '*Well, I did more walking, I used to work quite a lot but then I stopped. So, yes I've been out walking more. And I've gone back to do more social activities that I was involved in before, I go to sewing class, I go to my local church and I've been more involved in the social activities there then I was before. I used to say 'I'm not able to come and so and so because my back is not really good 'you know.*' (Hannah, intervention participant).

Discussion

'A Mindful Act' brings a valuable contribution to recent research initiatives in ACT-based interventions for people living with persistent pain such as OsteoMap [24,25] or PACT [36]. 'A Mindful Act' was carried out in the unique setting of a Health and Wellbeing Academy, which fostered the interdisciplinary collaboration between osteopathy and psychology. The 6-week intervention was delivered with the support and collaboration of an osteopathic clinic and its staff in a structured manner, incorporating flexibility to accommodate clinic and patient requirements. The participants attended the intervention sessions and continued their osteopathic treatment in parallel. Many of the people living with persistent pain do not have the physical or mental resources to engage in intensive programs; therefore, this brief intervention was well suited for this population. Some of the common barriers identified in the literature such as scheduling, travel distance, high cost of treatment and out-of-pocket costs have been considered when designing the intervention (the program was offered for free, the location was easily reachable by public transport and travel expenses were expected to be low, the schedule was designed in a way to facilitate attendance).

The intervention was found to be acceptable by those taking part, who reported that there were no barriers to participating and that they had positive experiences. The participants in 'A Mindful Act' became more confident in their self-management abilities and thus engaged in social activities more, were more self-compassionate and devoted more efforts to self-care. The attendance rate was high, and the participants engaged well with the homework exercises and with the ACT model in general (see Supplementary files 5,6, 7). At one-month follow-up, despite sharing that there were some difficulties in practising the skills acquired during the program, the participants reported that they continued to practice mindfulness, and applied their knowledge of ACT to their personal circumstances.

To our knowledge there are very few interventions combining osteopathy and ACT. One of them is 'Living Well with Persistent Pain' (LWWP) a group -based intervention piloted at the University College of Osteopathy integrating osteopathic manual therapy, mindfulness concepts and ACT [37]. At a conceptual level, both LWWP and 'A Mindful Act' are based on the same principle: integrating osteopathy and ACT in a program designed for people who live with persistent pain. Both interventions touched upon understanding persistent pain, developing acceptance, learning about defusion, mindfulness and personal values, practising self-compassion and self-care and both programs fostered a collaboration between osteopathy and psychology. The findings of the two studies are similar to a certain extent. The experiences of the participants in OsteoMap were described by four themes: increased awareness and acceptance, engagement with valued activities, peer group experiences and unhelpful aspects of the course [37]. The major categories resulting from the analysis of 'A Mindful Act 'were similar: engaging with ACT, experiences of taking part and perceived changes. Both interventions were feasible and considered acceptable by the participants, who reported improvements in psychological flexibility. Another comparable intervention is PACT [36], a physiotherapist-delivered intervention designed for people with persistent low back pain. Both interventions were informed by ACT, were brief (six sessions and two sessions followed by a phone call respectively) and had the same number of participants (nine), who reported positive experiences of taking part and found the intervention acceptable.

The findings of this study must be seen in light of some limitations. It is essential to acknowledge the limited number of participants in the intervention and their heterogeneity. Running more than one group would have been a better test of feasibility, however, it was not possible due to time and resource requirements. Nevertheless, the research conducted represents merely the initial groundwork needed in developing an intervention. Assessing feasibility and acceptability is crucial in uncovering potential issues related to acceptability, compliance, recruitment, retention, and delivery of the intervention. Regarding the heterogeneity of the participants and the type of pain their experienced, we need to emphasize that pain is a very complex and subjective experience. Previous literature acknowledged that people with persistent pain have different coping styles and different levels of psychosocial and functional impairment, which is also true for the participants in this study [38].

Another limitation stems from the fact that the intervention was delivered free of charge to people who were motivated to take part and with a moderate to high socioeconomic status.

Past research acknowledged that people who are marginalized (such as immigrants, refugees, or people of colour), less educated, living with mental health issues or who experienced of trauma are vulnerable to a higher prevalence of persistent pain (Craig et al., 2020). Most of the participants who took part in the intervention were white women who were married and had at least an undergraduate degree and were currently in employment. Sampling a more diverse group of people with different cultural and ethnic backgrounds would have been beneficial; however, the demographic characteristics of the participants reflect to some extent the population of Wales. In addition, the main facilitator was the person who interviewed the participants about their experiences of taking part in 'A Mindful Act', which may represent a confounding factor. Due to the rapport built between the participants and the main facilitator, they might have been inclined to share greater improvements resulting from taking part in the intervention.

The present study contributes to the advancement of knowledge concerning the role of osteopathy in the management of persistent pain.

osteopathy has historically been built on holistic principles [39], however research suggests that osteopaths are still strongly biomedical in their approach and their ability to engage with the psychosocial factors of the pain experience still needs to be improved [40]. There is growing evidence supporting the importance of psychosocial factors in musculoskeletal pain, putting the 'biopsychosocial' model at the centre of managing pain [41].

To understand pain from a biopsychosocial perspective, osteopaths need to update their repertoire of knowledge with the current advances in psychology and neuroscience.

This has implications for education but also for developing professional networks to support osteopaths in adopting a more biopsychosocial, evidence-based approach [42]. In addition, given that in general, most osteopaths work in isolation, in private practice [43] it is paramount that they work collaboratively with other healthcare professionals to better meet the complex needs of people who live with persistent pain.

There are also important implications in terms of improving pairing osteopathic treatment with psychological interventions to enhance the health and wellbeing of people with persistent pain. The collaboration between osteopaths and psychologists in supporting people who live with pain is demonstrates potential but needs to be explored further. Future research needs to investigate whether a combined course of osteopathic treatment paired with a brief ACT intervention is more cost-effective than the standard treatment for persistent pain.

This type of pairing might have a strong synergistic effect, compared to standard care alone. In fact, there are recommendations to combine different types of treatment (physical, psychological, rehabilitative) to match patients' characteristics and individual needs [44]. It is known that psychological processes influence the experience of pain and the treatment outcomes; therefore, there is a chance that integrating psychological approaches into physical therapy could enhance outcomes [45]. Osteopaths in this study were eager to collaborate and played an important role, not only in recruiting participants for the intervention but also in facilitating some ACT-based sessions.

In addition, an experienced osteopath assisted the main facilitator in delivering 'Mindful Act'. The level of involvement they demonstrated suggests that osteopaths are interested in this type of collaboration. However, this view may not be representative of all osteopaths and this needs to be further examined.

In conclusion, the collaboration between psychology and osteopathy yielded some useful insights into novel ways to support and empower people living with persistent pain. A six-week group-based ACT intervention was feasible with the help of osteopaths and found to be acceptable by the participants, who shared positive experiences. The collaboration between osteopaths and psychologists in supporting people living with persistent pain contributes to recent innovative research initiatives in the field and should be further explored in the future.

Ethical approval

The College of Human and Health Sciences (CHHS) Ethics Committee within Swansea University granted ethical approval to conduct this study.

Conflict of interests

I declare that we have no significant competing financial, professional, or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

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Declaration of competing interest

I declare that we have no significant competing financial, professional, or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijosm.2021.12.004.

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