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Paper:

Humphreys, I., Thomas, M. & Morgan, K. (2017). Pilot evaluation of the management of chronic oedema in community settings project. *British Journal of Community Nursing*, 22(12), 578-585.
<http://dx.doi.org/10.12968/bjcn.2017.22.12.578>

6 month embargo.

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Pilot Evaluation of the Management of Chronic Oedema in Community Settings Project: Resource use, costs and patient health-related quality of life outcomes.

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Abstract

The burden of managing chronic oedema can be considerable to the National Health Service (NHS). Developing innovative solutions to the care and management of patients with chronic oedema has the potential to deliver prudent, cost-effective and high quality care within NHS Wales.

The aim of this economic analysis was to estimate the economic impact of the On the Ground Education Programme (OGEP) within one local University Health Board (UHB) in Wales. A questionnaire collected health care service use data prior to receiving the OGEP (baseline) and at 3 months follow-up from 97 patients. In addition, we analysed a patient reported health outcome using the EQ-5D 5L which was completed by patients at the same two assessment points. The total cost of managing chronic oedema in the 97 patients recruited was £563,729 (mean patient cost £5,812 SD (£5,870) at baseline and £445,098 (including the addition of intervention costs) (mean patient cost £4,589 (SD £5,465) at 3 months follow up. Improvements in the EQ-5D 5L score increasing from 0.40 (SD 0.25) at baseline to 0.54 (SD 0.23) at 3 months follow-up. Our findings show health care resource use and costs decreased, whilst HRQOL scores increased.

Contribution of the paper

Key messages of the paper:

- Health care resource use and costs decreased
- HRQOL scores increased

What the paper adds to the current literature:

- Evidence for the beneficial effects of delivering best standard of care practice

What new knowledge is added by this study:

- Promotion of proactive care proves beneficial over reactive care
- Patient HRQOL gains

KEY WORDS

Lymphoedema, Cancer, Impact, Wales, Economic,

Introduction and background

Chronic oedema is a debilitating, enduring condition connected with several chronic conditions, primary and secondary lymphoedema, obesity and immobility, with prevalence greatest within the older population (Todd 2013). It is characterised by atypical swelling lasting for more than three months. Those affected may experience skin changes, recurrent cellulitis, superficial ulceration, exudate, lymphoedema and enduring pain, reduced mobility and discomfort (Todd 2013). Evidence suggests that the impact of chronic oedema/leg ulcers on an individual's health, well-being, sense of self and quality of life may be profound and extends to all those who are important to the individual.

As a chronic debilitating condition, chronic oedema can have significant impact on health outcomes and result in a significant burden to the UK National Health Service (NHS). Ineffective prevention and management alongside inappropriate prescribing of dressing and garments have been identified as significant issues and with appropriate management based on clinically and cost-effective technologies, the NHS could make substantial cost savings and

enhance patient outcomes, including health-related quality of life (HRQOL) (Ashby et al, 2014).

Lymphoedema Network Wales have been developing innovative methods to support the management of chronic oedema within the community setting. One innovation has been the development of the OGEP which is a community-based education model involving the use of video prescription film applications as well as an educator training programme to support community health professionals and patients in the management and care of chronic oedema. The management includes daily activity and exercises, compression therapy/ multi layer lymphoedema bandaging, skin care and general public health promotion. Whilst the OGEP intervention requires additional investment in terms of resources to deliver, it could potentially result in more efficient use of health care resources including correct prescribing of dressing and garments from the All-Wales Lymphoedema Compression Garment Formulary (All-Wales Lymphoedema Compression Garment Formulary 2017), alongside improving outcomes and experiences for people living with chronic oedema.

Aim and objectives

The aim of this economic analysis, based on the pilot evaluation of the OGEP was to estimate the economic impact of the OGEP within one local University Health Board (UHB) within Wales. Specific objectives were to:

- Assess the health care resource use and related costs associated with the delivery of the OGEP compared to 'no OGEP' i.e. the *status quo*.
- Estimate changes in the profile of health services delivered to patients as a result of the OGEP model.
- Provide a description of preference – based patient health outcome before and after receiving the OGEP.

The perspective taken was NHS/Personal Social Service (PSS) i.e. we considered direct health care costs across primary and secondary health care and direct costs associated with paid carers/social care (PSS).

Methods

The pilot evaluation design was an observational 'before-after design' with baseline assessment of resource use, costs and outcomes done at the time patients were identified and/or began to receive the OGEP and at 3 months afterwards. All patients were selected and recruited by the OGEP team, based on their eligibility to receive the OGEP during the pilot evaluation period. The estimated sample size within the evaluation period was 100 patients. As this was in effect a single arm study i.e. there was no comparator; the economic evaluation cannot fulfil the essential characteristic of a full economic evaluation in order to address questions of cost-effectiveness. Ethical approval was granted from Swansea University for data analysis on anonymised information. The UHB Research and Development department granted service evaluation approval.

Data collection measures

Data collection was administered by the OGEP team using an appropriate resource utilisation questionnaire (RUQ) to obtain health care resource use over a 3 months period.

The EQ-5D 5L (EUROQOL, 2017) was administered by the OGEP team at baseline and 3 months. The visual analogue scale (VAS) and descriptive system scores were also recorded by the OGEP team.

Resource use associated with the management and care of chronic oedema was summarized into relevant categories (e.g. primary care, secondary care, medication and dressing costs) and valued in £ sterling using a price year of 2016. The costs were determined from national published sources of unit costs [including All Wales Lymphoedema Compression Garment and Wound Care 2017), British National Formulary (BNF 2017), NHS reference costs (NHS 2016) and Personal and Social Services Research Unit (PSSRU 2016). Where costs were unavailable and/or the client wishes to use local costs (e.g. from local financial records or NHS Wales formulary). The currency year used was 2015/2016. If relevant costs were not available for these years, an inflation calculator (Bank of England) was used to convert costs to the price year(s).

Results

One hundred patients were recruited into the pilot evaluation by the OGEP team over the evaluation time period. Three participants died during the study prior to the 3 month follow-up assessment and were excluded from the analysis. The final sample included in the analysis was 97 participants. 64.9% of participants were female and 68% were from the Vale of Glamorgan. 32% were from the Cardiff North & West area with a mix of participants from the cluster of Barry 1 & 2, Cowbridge, Penarth, Rhiwbina and Whitchurch.

Intervention costs

Table 1 presents the overall costs of the OGEP intervention. This was estimated at £35,812 (£358.12 per patient) over the pilot evaluation period. The agreed intervention costs covered the staff resources associated with the delivery of the OGEP model of care.

Table 1: Intervention costs of the OGEP

Costs Item	Unit cost per hr.	Resource Usage	Cost	Unit cost source/Description	Comments/Assumptions made
Training Cost					
Nurse/ Physiotherapist (Band 8a)	£62	14 Hours	£868	PSSRU (2016) Band 8a - Page 137	Banding as advised by Study Team
Intervention cost					
Physiotherapist (Band 7) 0.8 FTE	£52	12 Hours per week	£17,472	PSSRU (2016) Band 7 - Page 137	Banding as advised by Study Team
Nurse (Band 7) 0.8 FTE	£52	12 Hours per week	£17,472	PSSRU (2016) Band 7 - Page 137	Banding as advised by Study Team
Overall cost of OGEP Intervention			£35,812		
Cost of OGEP Intervention per participant			£358.12	Based on 100 participants	

Resource use

At baseline, there was considerable health care input over the 3 months recall period prior to receiving the OGEP; with district nurse visits showing the highest frequency of resource inputs

- mean number of visits per patient 45.6 (SD 37.6). When the median and range is examined, this also further illustrated the wide variation with median visits per patient at baseline 36 (range 2-184). At 3 months, these remained as the highest frequency of resource inputs - mean number of visits per patient 21.8 (SD 21.7), and 20 (0-90) at 3 months. In terms of biggest impact (either increase or decrease in resource use); district nurse visits, number of episodes of cellulitis, visits to see a specialist nurse about vascular problems; number of GP consultations (face-face and telephone) appear to show the most significant decrease in the after period. Again, examination of the median and range of visits showed a similar picture and illustrated the wide variation across patients in terms of resource consumption and associated costs.

With regard to carer costs; there was an observed numerical reduction in paid carer visits at 3 months compared to baseline (mean number of visits per patient at baseline 81 (SD 130.8) versus 73 (SD 123.1) visits per patient at baseline; however there were no observable differences when the median resource use is examined. There was no difference in number of patients who were receiving the OGEP intervention as a full-time resident in either a residential or nursing care home at baseline and 3 months.

Table 2: Summary of direct NHS/PSS health care costs

	Baseline			3 Month Follow Up				
Time Point	n	Sum	Mean (SD)	Time Point	n	Sum	Mean (SD)	Difference if means (95% Confidence Interval)
Total Costs Baseline (including PSS costs)	97	£563,729	£5812 (£5870)	Total Costs 3 Months (Including Intervention Costs)	97	£445,098	£4589 (£5465)	-£1222.9 (-£344.5, -£2101.5)
Total baseline health care costs (excluding PSS costs)	97	£282,539	£2912.77	Total health care Costs 3 Months (Including Intervention Costs)	97	£173,385	£1787	-£1,125.77 (-£1,987, -£264)

The biggest differences at baseline and follow up are seen in district nurse home visits (mean patient cost £1207.8; SD £976.9) vs. £565.8 (SD £563.3); a difference of -£641.9; 95% CI (-

£478.5; -£805.4) at follow up. Other cost differences were seen in GP face-face and telephone visits, costs associated with length of hospital stay and hospital admissions for cellulitis. When costs of dressing are examined there is a difference of £337.7 (95% CI £154, £521.13) between before and after. As would be expected, there were numerical differences seen when comparing the mean and median costs; but overall the pattern of observed differences was similar.

This indicates that health care costs are reduced, in key categories such as district nurse visits and dressing costs, reduction in length of hospital stay by an average of 47%, and 38% respectively when examined in the before and after comparison of the OGEP. Whilst the analysis provides no indication of whether such costs are as a direct result of OGEP (as no randomised comparator) or whether these costs differences are sustained or change over time; this snapshot provides a tentative indication where the potential for OGEP to be made in resource use and associated costs.

The costs were estimated, with a NHS perspective only (i.e. direct health care costs to NHS Wales) and Personal Social Services (PSS) presented alongside. Overall, the total costs were £563,729 at baseline and £445,098 (including the addition of intervention costs) at follow up; indicating a cost difference (reduction) of £118,631 in 97 patients. When a cost per patient was examined, this equated to a mean difference (cost reduction) of £1222.9 (95%CI -£344.5, -£2101.5) between follow up and baseline assessments. A similar numerical difference was seen when direct health care costs were examined separately. However, the confidence intervals are very wide thus caution should be applied in extrapolating these results to any definitive claim of 'cost saving or reduction'.

Patient HRQOL outcome

The results (Table 3) show the mean EQ-5D-5L utility score increased from 0.401 (SD 0.254) to 0.537 (SD 0.231) after the three month follow up. This was a mean difference of 0.136 (95% CI -0.098-0.174) which was statistically significant with p value of >0.001. When looking at the individual domains of the EQ-5D-5L, 43 participants (44%) increased their Mobility Score; 39 participants (40%) increased their Self Care Score; 29 participants (30%) increased

their Usual Activities Score; 47 participants 48 increased their Pain/Discomfort Score; and 28 participants out of the 29 increased their Anxiety/Depression Score.

Further, 49 participants (51% saw no change in their Mobility Score; 53 participants (55%) saw no change in their Self Care Score; 61 participants (63%) saw no change in their Usual Activities Score; 49 participants (51%) saw no change in their Pain/Discomfort Score; and 64 participants (66%) saw no change in their Anxiety/Depression Score.

Finally, 5 participants (5%) decreased in their Mobility Score; 5 participants (5%) decreased in their Self Care Score; 7 participants (7%) decreased in their Usual Activities Score; 1 participant (1%) decreased in their Pain/Discomfort Score; and 5 participants (5%) decreased in their Anxiety/Depression Score.

Table 3: Patient HRQOL outcome at baseline and 3 months

	n	Mean	SD	95% Confidence Interval of the Difference	p-value
EQ-5D 5L Utility Baseline	97	0.401	0.254	-0.136 (-0.098, -0.174)	<0.0001
EQ-5D 5L Utility 3Months	97	0.537	0.231		
	n	Mean	SD	95% Confidence Interval of the Difference	p-value
EQ-5D 5L VAS Baseline	97	47.07	15.17	14.69 (10.75, 18.63)	<0.0001
EQ-5D 5L VAS 3Months	97	61.76	18.41		

The results of the Visual Analogue Scale (VAS) show an increase from 47.07 (SD 15.17) to 61.76 (SD 18.41) after the three month follow up. The mean difference of 14.69 (CIs 10.75, 18.63) was also shown to be statistically significant (p-value >0.001).

Summary

Overall, the results from the pilot intervention suggests an observed picture within a short-term horizon of an overall cost reduction when direct health care and PSS costs are considered; with suggestion that resources (and associated costs) are shifted from key areas such as district nursing and dressings. Whilst the small numbers in secondary care resource and costs are limited; there may be areas where observed trends in cost reductions warrant further exploration. A small improvement in HRQOL score was observed in patients at 3 months compared to baseline.

Discussion

The analysis reported as part of the pilot evaluation has provided a first in-depth examination on the impact that the OGEP model could make in developing and rolling out best 'standard of care' practice in delivering chronic oedema management including promotion of daily exercises within the community. This evidence at grass roots level can provide, from the outset, important preliminary evidence as to where the OGEP could make differences to the management of chronic oedema within NHS Wales. Whilst from a decision makers' perspective this is often 'all about the evidence'; the pilot evaluation as a whole demonstrates that evidence should relate to the local health economy, patient health outcomes and experiences including the staff who are also beneficiaries of the OGEP through up-skilling their skills and competencies in delivering best standard care to this patient population. As

such the evidence should be interpreted not just on the more general 'reduction in costs to NHS Wales'.

The findings show some interesting changes when resource use, costs and patient health outcomes are examined at baseline and 3 months follow-up with some differences shown in what would be potentially considered important and meaningful cost drivers in the management of chronic oedema such as reducing district nurse costs and dressing costs. The pilot evaluation gives some indication of small patient HRQOL gains seen at follow up compared to baseline. The presentation of these discrete categories allows the OGEP team to carefully scrutinise the results in order to a) see where the potential for most impact in reducing costs can be achieved and b) how there might be potential to observe longer-term trends to show shifts in resources and potential for cost-reductions/savings. Further consideration of these results in terms of the potential in terms of how OGEP could optimise service capacity is important for the OGEP team when discussing next steps.

Evidence of understanding where the potential cost drivers could be and whether health gains can be measured using instruments such as the EQ-5D 5L are fundamental components of pilot/feasibility work. A further, subsidiary research question from the analysis which may help future evaluations is formal examination of the validity, reliability and sensitivity of the EQ-5D 5L within this patient population. Whilst this was outside the scope of this current pilot evaluation period, further analysis of the data collected could yield important insights into the psychometric and clinical utility of using this preference-based generic health measure in patients with chronic oedema.

Limitations

From the outset, we have been mindful that some of the methodological and practical constraints have impacted on the strength of the evidence delivered by this evaluation. There is often a challenge in designing and conducting robust, 'academically grounded' evaluations when there is a compelling case for service innovation to respond quickly to meet unmet patient needs. Thus, the limitations often have to be set within context on what could be optimally achieved within real world settings.

Conclusion

The economic analysis has provided a first in-depth examination on the economic and patient impact that the OGEP could make in providing an innovative solution to delivering best standard of care practice. Whilst our findings suggest an observed trend for reductions in cost to NHS Wales; when disaggregated resource use and costs are examined, it also shows the possibility for a possible shift of health care resources across key areas of primary care and secondary care. The promotion of proactive care proves beneficial over reactive care. Further examination is required to assess whether these translate into potential efficiency gains (and important patient HRQOL gains) over the longer term. These findings can be used to inform the direction of any further development and evaluation of the OGEP model of care across NHS Wales.

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