

EVIDENCE FOR PERSON-CENTRED CARE IN CHRONIC WOUND CARE

A SYSTEMATIC
REVIEW AND
RECOMMENDATIONS
FOR PRACTICE



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Abstract

Background

Chronic wounds affect an estimated 2.21 per 1000 population. They are a significant source of morbidity and affect individuals physically, psychologically, socially and financially. Person-centered care is one approach to improve patient outcomes in wound care as it values patients' perspectives, beliefs and autonomy and considers the person as a whole within the cultural context in which care is provided.

Aim

We aimed to review the evidence on the use of person-centered care (PCC) in chronic wound care management and provide recommendations for practice and future research.

Method

Using a systematic review methodology, we searched six databases for full-text papers from 2009–2019 published in peer-reviewed journals with no limits on language.

Results

Eighteen articles on studies involving 3149 patients from nine countries were identified. Studies were conducted under three broad intervention categories: healthcare professional education (n=1); patient education (n=14) and telemedicine (n=3). Studies were equally focused on prevention and treatment of chronic wounds. Significant improvements were reported in patient knowledge, pain and self-care behaviours. Only two studies evaluated the impact on wound healing and one study estimated the cost of implementing person-centered care.

Conclusions

The evidence base to support PCC in wound management is developing and based on our review has shown improved outcomes in areas of pressure ulcer prevention, patient satisfaction, patient knowledge and quality of life, but clinical outcomes such as wound healing were less well explored. Further research with more objective outcome measures are required

Introduction

It is estimated that the prevalence of chronic wounds of mixed aetiologies is 2.21 per 1000 population.¹ Of these, venous leg ulcers (VLU), diabetic foot ulcers (DFU) and pressure ulcers (PU) are the most protracted in nature, having an impact on the individual in the physical, psychological and psychosocial domains.² It is estimated that the incidence and prevalence of chronic wounds will continue to rise in the coming decades in line with the projected increase in the prevalence of chronic illness, risk factors for chronic illness, advances in healthcare increasing survivorship and changing demographics across Europe, where an increasing percentage of the population is predicted to be over the age of 65 years.^{3,4} Indeed, the prevalence of chronic wounds has been described as a 'silent epidemic and threat to public health'.⁴ Commensurate with the increasing incidence and prevalence of chronic wounds are associated healthcare costs. It has been estimated that wound management accounts for up to 4% of total healthcare expenditures, in addition to the hidden costs to individuals and their families.⁴⁻⁶

Significant advances have occurred over the last few decades in our understanding of the chronic wound environment and the healing process. In addition, the development of new therapies and interventions to promote healing, and a greater awareness of the need for proactive measures to prevent a first ulcer and then increase the number of ulcer-free days, have been seen. Healing rates of VLUs remain at around 60% after six months of treatment and have recurrence rates of up to 70% within 12 months; people with diabetes have a lifetime risk of developing a foot ulcer of 25%, and those that are affected carry a five-year mortality rate of 50%.^{7, 8} There is, therefore, a critical clinical need to develop and test interventions that could lead to improved patient outcomes and reduce costs and resource use.

Changing models for the provision of healthcare have evolved over the last number of years. There is a greater focus on preventive medicine, primary care and the provision of services in patients' own homes. This, when taken together with a reduction in length of hospital stay, has seen healthcare move away from the traditional hospital-based approach toward a more integrated system.³

Currently, there is growing public interest in understanding diseases, symptoms, treatment and care packages. For example, in the United Kingdom (UK) the National Health Service NHS Choices website, www.nhs.uk, received 23.4 million unique visitors in 2014, the majority of whom were looking for information about their own or their family's health problems.⁹ Healthcare professionals are no longer the custodians of health information, as the democratisation of health information, the use of social media, rapid growth of networked patient communities and new technologies have changed the landscape and, in so doing, provided new opportunities to harness patients' energy and expertise.¹⁰

Funding bodies for health research now require public and patient involvement in setting the research agenda.¹¹ Organisations such as the James Lind Alliance in the UK,¹² working with the public and other stakeholders, prioritise research questions. National governments now advocate for a person-centred approach to the development and delivery of services, with many also introducing policy reforms to support people-centered and integrated health services, accompanied by the development of a set of quality indicators to monitor system performance.^{4, 13-15} Examples of organisations involved in person-centered care include: the European Society for Person Centred Healthcare;¹⁶ the International College of Person-centred Medicine;¹⁷ the University of Gothenburg Centre for Person-centred Care (GPCC),¹⁸ and the Ida Institute (an independent,

non-profit organisation working to integrate person-centered care in hearing rehabilitation).¹⁹ Additionally, researchers are providing evidence that demonstrates considerable cost saving and improved quality of care and quality of life through person-centred care in different clinical areas of practice.²⁰⁻²⁴ For example, a person-centred care approach helped reduce length of hospital stay by 30% for patients with chronic heart failure,^{22,25} contributed to the improvement of quality of life and reduction of symptoms in cancer treatment and palliative care^{25, 26} and facilitated a more efficient use of resources while providing a higher quality of care to persons affected by chronic inflammatory arthritis.²⁷

What is person-centred care (PCC)?

Person-centered care and patient-centered care are frequently used interchangeably in the health science literature, both definitions implying that patients should be included as partners in their care and treatment²⁸ and, critically, that the needs of the individual are at the core of the decision-making process. PCC implies that the patients are, first, persons and they should not be reduced to their disease alone; instead, their plans, beliefs, strengths and personality should be carefully considered.²⁹

A concept analysis of patient-centered care based on a synthesis of the health professional literature recognised first that patient-centered care is defined from multiple perspectives.³⁰ Lusk and Fater³⁰ describe the critical attributes of the concept of patient-centered care from a nursing perspective as: encouraging patient autonomy, caring attitude and individualising patient care and noted that these attributes are overlapping and continuous. They identify behaviours that surround the attributes, which include: context of the experience, respecting values, responding to

needs, treating the patient as a unique individual, listening, communicating, teaching and learning.

³⁰ Although this concept was designed to be applicable to nursing, it can reasonably be applied to all health professionals. These key attributes and behaviours share those promoted by the World Health Organization (WHO) in its global strategy for people-centred and integrated health services.³¹

In 2015, the WHO advocated for ‘person-centred health services’ calling it a paradigm shift toward an approach where ‘people have the education and support they need to make decisions and participate in their own care’, which is based on people’s health needs and expectations, rather than diseases.³¹ The WHO suggests that people-centred and integrated services are essential components for building universal health coverage and bringing improvements to health status. It defines person-centered care as those approaches and practices that consider the person as a whole with many levels of needs and goals, with these needs coming from their own personal social determinants of health.¹³ Salcido, in an editorial, concluded that patient-centered care, as applied to wound care, is a ‘philosophical anchor to remind us that the patient comes first, as they should, and that the principle of patient-centered care is simply: what does the patient want?’.³² While the preferences of the patient are an important consideration, we must be careful not to over-simplify the complex relationship between evidenced-informed practice, the patient’s beliefs and autonomy and the cultural context within which healthcare is provided. In addition to understanding the concept of patient-centered care, we must also recognise that providing such care requires leadership and resources, plus the energy to challenge ‘systems’ inertia and inherent paternalism.³²

The Institute of Medicine, in the United States of America (USA), takes a public policy perspective and describes PCC as a way of providing care

that incorporates valuing patients' perspectives, including the patient in decision-making, listening, and advocating and coordinating care, as well as promoting health, wellness and disease prevention.¹⁵ The WHO has identified five strategic directions for the provision of PCC: empowering and engaging people, strengthening governance and accountability, reorienting the model of care, coordinating services and creating an enabling environment.¹³

A theory-based approach helps to understand what we mean by a patient-centered care approach. Mid-range theories are used in nursing science to reduce the gap between nursing science theories and practice, helping to test and generate clear questions for study or specific interventions for practice.^{33,34} The mid-range framework of person-centred nursing developed by McCormack and McCance,^{35,36} focuses on four constructs of person-centred practice (see Table 1): prerequisites, care environment, person-centred process and outcomes.³⁵ McCormack and McCance's framework can be applied in a broader healthcare system beyond nursing, as it contains four important constructs that enable the delivery of quality patient care rooted in person-centeredness through sharing a culture of values and principles.

These four constructs could be used as a reference system for implementing PCC into practice, as they provide a structured and systematic path to implementation. There are many eminent discussion papers on the theoretical construct of what patient- or person-centered care is,^{28,29,37,38} but following a review of the literature, discussions with our patient panel and with members of EWMA, and commensurate with the goals of this document, we believe the framework as described by McCormack and McCance^{35,36} provides a basis to present this work.

The concept of PCC in wound management is relatively new and still evolving; consequently, there

Table 1. The four constructs of person-centred practice according to McCormack and McCance^{35,36}

Prerequisites imply that the healthcare professionals possess the knowledge and skills to do their jobs, relying on clear beliefs and values.
The care environment includes the system in which care is delivered, ranging from organisational systems and the physical environment to staff relationships.
Person-centred processes focus on delivering care that encompasses patients' perspectives and values, facilitating shared decision-making.
Outcomes focuses on the results of the implementation of PCC; namely, the creation of good care and a healthful caring environment for the patients.

are other terms that refer to similar principles and activities.³⁸ In this document, we will only use the term 'person-centred care' to bring consistency to the discussion. The concept is 'underpinned by the values of respect for persons, individual right to self-determination, mutual respect and understanding'.³⁵

Understanding concepts connected to PCC

Other concepts that are related to PCC, and which are often conflated with one another, are patient empowerment, patient participation and the co-creation of care. Castro et al.,³⁹ in their concept analysis, clarified the interrelationships among most of these concepts, concluding that patient empowerment is a meta-paradigm, where patient-centeredness is seen as a precondition for patient empowerment.³⁹ Moreover, they emphasise that by embracing patient participation as a strategy, patient-centred care can be achieved, which in turn will facilitate patient empowerment.³⁹ They also emphasise the individual and collective sides of patient empowerment, which are reflected in the definition of this concept (Table 2).³⁹ The co-creation of care is defined as the 'establishment

of productive interaction between patients and healthcare professionals' based on patient-centred interactions and communication for improving outcomes.⁴⁰ To summarise, PCC is an important tool that can facilitate patient empowerment and secure co-creation, and by embracing patient participation as a strategy, healthcare can become more person-centred.

Patient 'compliance' and 'concordance' are used within the literature as key elements for managing chronic wounds (see Table 2). Although these concepts have a similar final goal, which is to benefit the patient, there is a tangible difference between these concepts and person-centred care.^{35, 37} Patient-centred care is rooted in holistic healthcare and is a shift away from the traditional disease-oriented model with a staff-centred approach.^{41,42} Patient compliance is defined as 'a willingness to follow or consent to the wishes of another person', which implies clinicians' expectations that the patient will follow the prescribed treatment.³⁸ Patient adherence is closely linked to patient compliance, as it describes the patient's decision to accept, reject or modify their treatment.⁴³ These two definitions are reflective of the paternalistic approach to healthcare and do not necessary focus on the co-creation of care.⁴⁴ Patient concordance, by contrast, can be

synergistically combined with a person-centred approach to practice, as it implies that the clinician and patient should come to an agreement about the treatment plan.⁴⁵ Concordance places a bigger emphasis on factors that might not be linked to a patient's condition, but which can influence his or her decision to follow or not follow a treatment plan.⁴⁶ Thus, a person-centred approach can be actively applied to build patient concordance, as it can help to establish a trusting relationship between clinicians and patients, where the latter, when possible, are co-responsible for their own treatment and can shape it according to their values and needs.

Aims

This EWMA document aims to review the evidence on the use of person-centered care in chronic wound care management and provide recommendations for practice and future research.

Search strategy

Using the keywords: chronic wound care, chronic wounds, diabetic foot, non-healing wounds, palliative wound care, patient concordance, patient-centred care, patient empowerment, patient involvement, person-centred care, pressure

Table 2. Definitions of the concepts.

Concept	Definition
Patient empowerment	Individual patient empowerment is a process that enables patients to exert more influence over their individual health by increasing their capacities to gain more control over issues they themselves define as important ⁽³⁹⁾ . Collective patient empowerment is a process that gives groups the power to express their needs and take action to meet those needs and improve their quality of life ⁽³⁹⁾
Co-creation	Co-creation of care is the establishment of productive interactions between patients and healthcare professionals ^(40,47) .
Patient compliance	Compliance is defined as: the extent to which a person's behaviour (in terms of taking medications, following diets, or executing lifestyle changes) coincides with the clinical advice ^(38,48) .
Patient adherence	The extent to which the patient's behaviour matches agreed recommendations from the prescriber ⁽⁴⁴⁾
Patient concordance	The process of successful planning and delivery of health care based on partnership ⁽⁴⁹⁾

ulcer, venous ulcer and wound healing, our search was tailored for and run in the following databases: Pubmed, Embase, Cochrane Library, CINAHL, Web of Science and Scopus. We limited consideration to original research papers published in peer-reviewed journals between 2009 and 2019, without any language restrictions. Conference abstracts, case studies, commentaries, reviews and opinion pieces were excluded. The date of the last search was August 2019.

Inclusion criteria

Chronic wounds or chronic wound prevention; describe the evaluation of, or testing of, a person-centred intervention; the intervention must be individualised to the patient

Exclusion criteria

Acute wounds; sole focus is the development of an intervention without associated testing in clinical practice settings

Screening

Retrieved titles and abstracts were exported into Rayyan QCRI⁵⁰ and screened in duplicate and independently by all authors. Full-text articles for eligible titles and abstracts were sourced and screened for inclusion in duplicate, by all authors, each working independently. Disagreements were resolved by discussion among all authors.

Data extraction

Relevant data were extracted from included studies by JS and PP and verified by NC.

Search results

The original search yielded 2517 articles, of which 527 duplicates were removed, leaving 1995 for screening with four additional articles identified through other sources. On screening, 1888 articles

were not related to person-centred wound care and chronic wounds and thus were excluded, yielding 107 full-text articles for review. Of these, a further 90 were excluded. The main reason for exclusion was related to the absence of PCC interventions. Some of the articles (n=10) covered emerging areas within person-centred wound care, but they did not report any outcomes. Other articles (n=10) were excluded, as they described patient education programmes that were not personalised/individualised for patients. Additionally, some articles (n=6) focused only on the quality of life of the patients, which is outside the scope of this document (see more details in Fig 1). Eighteen articles met our inclusion criteria and were included in the analysis (see Fig 1).

Results

Although eighteen articles were identified, one study reported on two outcomes in two separate publications but included the same patient cohort (see supplementary material), thus leaving seventeen unique studies. These seventeen studies included a total of 3149 patients and 36 healthcare professionals. Seven randomised controlled trials (RCTs),⁵¹⁻⁵⁷ four pre-test post-test design,⁵⁸⁻⁶¹ and others that included quasi-experimental studies,⁶²⁻⁶⁵ studies within an RCT,⁶⁶ retrospective studies⁶⁷ and outcomes monitoring⁴⁶ were reported on. Sample sizes varied from 20 to 1598 patients in the studies included in the review. The 17 studies were conducted in Australia (n=5), USA (n=3), UK (n=2), Iran (n=2) and one each in Morocco, Germany, Brazil, Switzerland and China. All studies focused on chronic wounds, including diabetic foot ulcers, venous leg ulcer, pressure ulcers; in some studies, the focus was on wound prevention.

Due to significant variations in interventions, wound aetiology and outcomes reported within the studies, a meta-analysis of results based on interventions was not possible. The results are grouped into three broad categories based on

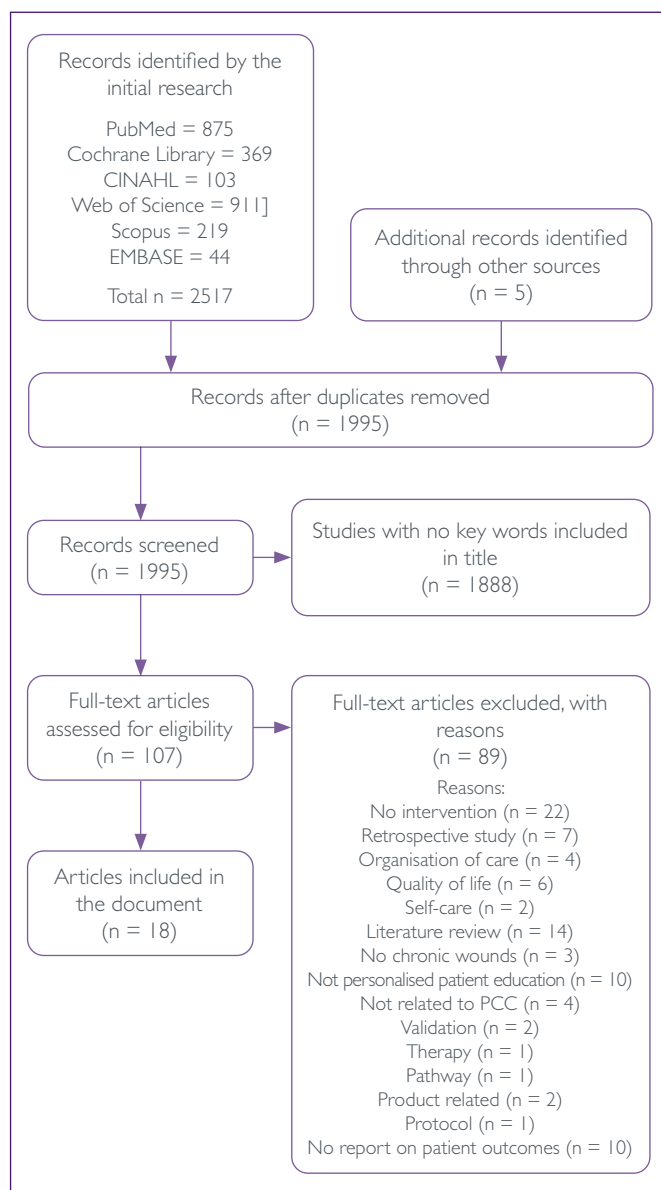


Fig 1. Literature search results

interventions identified in the articles: healthcare professional (HCP) education (n=1), patient education (n=14) and telemedicine (n=2).

Healthcare professional education

A longitudinal pre- and post-test study from Australia aimed to evaluate the impact of a new

nurse-led, interdisciplinary model of care in patients with a range of wound types attending co-operative wound clinics in general practitioner practices.⁵⁸ The intervention was based on training and coaching the staff in a patient-centered care approach by a local wound expert-nurse practitioner. The study included 36 HCPs and 81 patients. Only nine HCPs completed both the pre- and post-test surveys, therefore results should be interpreted with caution. The results showed an increase in knowledge and confidence on all measures: confidence in assessment increased from 56% to 100%; using investigations to diagnose increased from 22% to 100%; knowledge of the roles of other HCPs increased from 78% to 89%; documenting a treatment plan increased from 67% to 89%; implementing a plan increased from 56% to 100% and patient monitoring increased from 67% to 100%. Only 15 patients completed the questionnaires, but of these, 11 reported being more satisfied and more able to help themselves. Data on healing outcomes were only available for 23 patients and showed that all 23 had healed.

Patient education

Fourteen studies described an individual PCC approach. They were conducted in Australia, USA, Iran, UK, Germany, Morocco and Brazil. A total of 2959 patients with different wound aetiologies were included. All results are presented according to wound aetiology.

Risk of pressure ulcer development

Two studies from Australia, with 1598 and 317 patients, respectively, at a high risk of developing a pressure ulcer were randomised to either a patient-centred pressure ulcer care bundle (intervention group) or to standard care (control group).^{52,66} The training aids for patients consisted of DVD recordings, brochure and poster to learn how to keep patients moving, how to look after their skin and eat a healthy diet. HCPs

were trained in partnering with patients in their pressure ulcer preventing care. The study by Chaboyer et al.⁵² analysed 1598 patients across eight tertiary hospitals and reported that 6.1% (n=49) in the intervention group and 10.5% (n=84) in the control group developed a pressure ulcer. The incidence rate was 9.6 per 1000 person-days in the intervention, versus 20.1 per 1000 person-days in the control group (incidence rate ratio 0.48; 95% confidence interval (CI): 0.33 to 0.69). The crude hazard ratio of 0.48 (95% CI: 0.20 to 1.21) indicated a 52% reduction in the risk of pressure ulcers associated with the intervention, compared with control group. There were no differences between the intervention and the control groups in regard to the severity of new pressure ulcers or in patient participation in pressure ulcer prevention (mean (standard deviation (SD)) scores on the PU care scale: Intervention 3.3 (0.77), Control 3.0 (0.97).

The second study, by Whitty et al.,⁶⁶ was a sub-study of that by Chaboyer et al.,⁵² (above) and evaluated the cost-effectiveness of a patient-centred pressure ulcer prevention care bundle, containing active patient participation in pressure ulcer prevention by helping them understand more about pressure ulcers including preventative strategies (intervention) compared to standard care (control) in 317 patients. The intervention cost AU\$144.91 (95% CI: \$74.96 to \$246.08) more per patient than standard care. The intervention was estimated to cost an additional \$3296 per PU case avoided (95% CI: dominant to \$144,525), or \$151 per additional day free of PU (95% CI \$57 to \$313) per patient. In a cost-benefit analysis, the net monetary benefit for the intervention compared with the control was estimated to be -\$2,320 (95%CI -\$3900, -\$1175) per patient, suggesting the care bundle was not a cost-effective PU prevention strategy.

A pilot RCT of patients in a hospital setting at risk of developing a PU (n=80) compared a nutrition

intervention tailored to individual patients' circumstances (intervention) with standard care (control) to improve dietary intake over three days.⁵¹ Sixty-six patients were included in the final analysis. Patients were educated on the role of nutrition for pressure ulcer prevention. They also participated in their nutritional care (self-monitoring of oral intake, guided nutrition-related goal setting). No statistically significant differences in the percentage of estimated energy requirements or estimated protein requirements met between the intervention and control groups on any study day were reported. There were more patients in the intervention group whose energy intakes improved (n=12 versus n=4) (p=0.032), and protein intake improved (n=9 versus n=3) (p<0.05) from study days one to three. More than one-third (38.7%) of the patients completed all three days' food charts. There was a very good correlation between the researchers' observed energy and protein intakes and patients' documented energy and protein intakes over the three study days (Pearson's correlation 0.965–0.993, p<0.001).

Venous leg ulcers

In seven studies, individualised patient education was offered to patients with venous leg ulcers. In three of these studies, patients received a brochure and individual counselling by nurses.^{61,62,67}

All three studies demonstrated a significantly higher knowledge level post intervention. In Protz et al.'s quasi-experimental study of 136 patients,⁶² a knowledge gain about compression therapy was reported (p<0.001), as were gains in self-care and vein support activities (p<0.001), and of the effects of compression therapy and the care of compression (p<0.001). Gonzalez demonstrated, in a pre-post study, with 30 participants, a knowledge gain from baseline to post intervention (p=0.002).⁶¹ A knowledge gain was also highlighted in Gonzalez's study with 95 participants in three groups (two intervention groups and one control) and followed up at

36 weeks ($p=0.003$).⁶⁷ Increases in patient learning scores were noted for the disease ($p=0.02$) and self-care knowledge subscales ($p=0.02$) at 36-week follow-up. None of these studies reported wound healing outcomes.

An RCT in Australia among 67 participants compared a weekly leg club with peer support, goal setting and social interaction plus standard care (intervention), with standard care alone consisting of ankle to brachial pressure index (ABPI) assessment, treatment and advice with follow up and prevention strategies (control).⁵³ The intervention included weekly leg club visits, peer support, goal setting and social interaction promotion. The results showed an increase in quality of life domains across a 10-point scale of 1.35, versus 0.25 ($p=0.014$); activities of daily living on a 6-point scale of 0.46, versus 0.07 ($p=0.044$); Philadelphia Geriatric Center morale on a 17-point scale of 3.57, versus 0.27 ($p<0.001$); self-esteem on a 10–40 scale +1.52, versus +0.62; an ulcer area reduction of 6.37cm², versus 2.14 cm² ($p=0.004$); and an overall pain reduction on a 100-point scale of 31.48, versus 8.74 ($p=0.003$).

Kelechi et al. described in their comparative 8-week study, a nurse-directed and patient-centred educational programme among 21 patients.⁶³ The educational intervention included a 6-week motivational enhancement programme and conditioning activity for leg function plus two additional visits in weeks 6–8 without active motivational enhancement. The control group completed conditioning activities along with a handout at baseline and weekly visits. The results showed an overall pain reduction on a 10-point scale of 0.5±2.0, versus 2.4±2.0 ($p=0.046$); a motivation difference of 3.8±3.1, versus 4.4±2.9; and a self-efficacy difference of 1.2±3.6, versus 0.6±6.0.

A single-blind RCT in Brazil with 102 participants compared the effect of an orientation programme

on the lifestyles of persons with a VLU and the wound-healing process.⁵⁴ Participants in the intervention group ($n=49$) followed four face-to-face meetings of 40 minutes and two telephone interviews about specific physical exercises for the lower extremities, especially daily repetitive movements of the calves and feet for 3 to 4 times each day, intermittent rest throughout the day and the importance of compression therapy in the wound-healing process. Members of the control group ($n=53$) were provided with routine guidelines and returned every 15 days, according to local protocols. The results showed a statistically significant higher quality of life score in favour of the intervention ($p=0.03$), as well as a statistically significant improvement in wound healing at 30 ($p=0.019$), 60 ($p=0.047$) and 90 days ($p=0.011$), when compared with the control group.

One study in the UK reported on the monitoring of service key performance indicators over 35 months among 438 patients.⁴⁶ The study included the development of a therapeutic relationship with patients to increase concordance with compression via staff training and encouraging patients to report negative aspects of compression treatment, so that these could be amended.⁴⁶ The outcomes demonstrated concordance scores at the start equal to 80%; these increased to 90%, and the healing rates for all patients was a mean of 84 days, with an average of 15 appointments.

Patients with diabetes without active ulceration

Three studies reported on face-to-face educational interventions.^{55,59,65}

Fardazar et al. undertook an RCT of four educational sessions measuring diabetic foot care behaviour and patient empowerment about diabetic foot prevention, compared with routine care, among 104 patients with diabetes but no

foot ulcer.⁵⁵ During these sessions, patients had the opportunity to participate in an individual counselling session to learn about their disease, the care of their feet and suitable socks for a diabetic foot, how to conduct a foot examination and how to conduct special foot exercises. The results demonstrated a statistically significant higher mean score of diabetic foot care behaviour after one month and at three months ($p < 0.001$). A higher mean score was also reported on the diabetic foot prevention empowerment scale ($p < 0.001$).

A pre- post single group study carried out by Kafaie et al. in Iran also showed a statistically significant higher knowledge level of diabetic patients ($p < 0.001$) regarding foot care.⁶⁵ These patients were followed once a month for 3 months through by a dermatologist.⁶⁵

One pre-post test, prospective quasi-experimental study with 133 patients in Morocco, evaluated a culturally tailored self-management education practice through an interactive, educator-led group discussion.⁵⁹ The results showed mean foot care scores increased from 3.5 ± 2.9 days to 5.9 ± 1.8 days ($p < 0.001$) one month following the intervention. Health literacy was associated with a higher likelihood of a favourable variation of foot-care practices (OR=2.82; 95% CI: 1.09–7.31), while previous education about diabetic foot was associated with a lower likelihood of a favourable variation of foot-care practices (OR=0.26; 95% CI: 0.08–0.78).

Patients with a diabetic foot ulcer

Two randomised controlled pilot studies were identified.^{56,57} One study with 56 patients evaluated a multi-component intervention to facilitate shared decision making, including a treatment decision aid, personalised goals, trained assistant psychology support, audio recordings and written summaries of consultations, versus a control that included usual care.⁵⁶ The pilot study was

conducted in an outpatient clinic in the UK over one month using decision navigation. The results showed no statistically significant differences in decision self-efficacy ($p = 0.272$), adherence ($p = 0.1$), decision regret ($p = 0.625$) or health-related quality of life ($p = 0.47$), with the exception of decision conflict, which increased over time (12 weeks), from 18.09 to 24.28 for those receiving the multi-component intervention.

Keller-Senn et al. tested an evidence-based education programme with 19 patients using a brochure and individual counselling by nurses to promote short-term foot care-related self-efficacy.⁵⁷ The 5-week programme had a mean of 184 minutes' (SD ± 57) intervention per participant, consisting of 52% education, 32% counselling and 16% skills. After five weeks, there was no significant difference between groups in the median score on the Foot Care Confidence Scale ($p = 0.55$), whereas self-efficacy in the intervention group was significantly higher after five weeks ($p = 0.02$), compared to the control group ($p = 0.92$). There was a significant increase in self-efficacy in the intervention group ($m = 9.5$, SD ± 7.6) and a decrease in the control group ($m = 0.64$, SD ± 8.4 , $p = 0.031$).

Telemedicine

Two studies focused on telemedicine, one each from China and Australia, with 29 outpatients (with VLU) and 80 inpatients (diabetics with retinopathy without active foot ulcer).^{60,64} The studies were focused on patient education in ulcer-prevention matters and the individualised delivery of complex treatment to the patients.

Li et al. conducted a quasi-experimental single-group prospective study among 80 patients with diabetic retinopathy and their caregivers to assess the effectiveness of a 12-week educational intervention on foot self-care behaviours.⁶⁴ An individualised foot self-care educational programme embraced one-

on-one training during bedside visits, leaflets, DVD or WeChat video records,⁶⁸ telephone follow-ups and home visits. The results indicated significant improvements on foot self-care behaviours from 54.19±8.01 at baseline to 75.84±5.04 (p<0.001). However, there were no significant differences in the incidence of foot problems.

Tulleners et al. studied the impact of a new transdisciplinary specialist service supplemented with telehealth consultations offered to 29 patients with VLU. After detailed diagnostics and causal treatment, all participants received a tailored dressing plan upon completion of their appointment, with directions on dressing type, application and exercises if appropriate. The average quality of life score based on a 0–1 scale with 1 representing the 'best health you can imagine', increased from 0.69 to 0.84 (p<0.001) after three months; wound size decreased by 85.4%; and pain, reported using a 10-point scale, reduced from a mean of 6.35 to 4.74 (p<0.001).

Discussion

We reviewed the evidence on the use of PCC in chronic wound care management but the variations in study design, care setting, wound aetiology and outcomes reported in our studies mean that the strength of the conclusions that PCC approaches improve patient outcomes is weak. However, this has to be considered within the context that this is an emerging area of interest, and it may be too early in its trajectory to expect an evidence base suited to meta-analysis and evidence synthesis. Additionally, it is often difficult to get funding for this type of research as it takes a considerable amount of time for new concepts, such as PCC, to be accepted with extensive follow-up periods needed to demonstrate clinical outcomes. Indeed, funding of skin disorders often needs compelling persuasive arguments in its favour⁶⁹ and funding

bodies often look for RCTs on more traditional types of interventions such as pharmacological agents. Nonetheless, we have identified and reported on 17 studies that have included 3149 patients across the globe.

The constructs of PCC, as proposed by McCormack and McCance,³⁶ have not been well explored by the studies identified. Instead, the focus has predominantly been on person-centred processes, with only one study focused on HCPs' education and significant variations in outcomes reported across all studies. There is a strong emphasis throughout the studies on self-care behaviours and patient knowledge; although important, these can be subjective in nature and are not always associated with improved healing outcomes or with wound prevention.^{70,71} Only four studies had more objective outcomes, such as change in wound size or wound healing.^{53,58,60,61} There is a need to include more objective measures of the impact of PCC in order to build the evidence base to support changes in practice.

The results will be discussed using four constructs of PCC set out by McCormack and McCance.

Pre-requisites

A prerequisite is the first construct in the PCC model and, arguably, the least-explored within our studies. Only one study focused on education of healthcare professionals.⁵⁸ However, although it was a small study including just 36 HCPs, it also included 81 patients. This pre- and post-test study reported improvements in all domains, including the development and implementation of treatment plans and confidence in assessment.

Care environment

The care environment and creating an enabling environment is one of the constructs in the PCC model and in the WHO strategy.^{13,31,35,36} The environment within which care is delivered

will undoubtedly influence the approach to the development of a PCC ethos. It is therefore reassuring that the studies included here are from a broad range of health systems, including China, Australia, Morocco and the UK, and included both inpatient and outpatient settings. It should also be noted that, within these studies, care was delivered in an environment that was open to change and that challenged current practices; this, in and of itself, achieves one of the constructs of delivering PCC.

Creating an enabling environment is key to achieving PCC and requires strong leadership and a shared vision, dedicated resources for implementing change, a supportive organisational culture and reorientation of the health workforce together with supportive regulatory frameworks and payment reform.^{13, 31} While we would concur with these strategic directions, evidence of their implementation at an organisational level with an evaluation of their impact on patient clinical outcomes have not been identified in our review. Leadership and change has primarily been driven by individuals or multidisciplinary teams without evidence of organisational change. This should be explored in future research in this area.

Research in different clinical areas outside wound management has provided evidence that PCC can lead to considerable cost savings and facilitate the improved quality of care and quality of life among patients.^{4, 14, 15, 20} We have identified only one study that explored the cost-effectiveness of this approach in the management of patients at risk of pressure ulcers.⁶⁶ However, its conclusions are at odds with those in other areas of practice, as they reported that a patient-centred pressure ulcer prevention care bundle may promote best-practice nursing care, yet may not be a cost-effective tool in the prevention of hospital-acquired pressure ulcers.⁶⁶ Further studies related to wound management are required to explore this area further.

Person-centred processes

Person-centered processes can secure shared decision-making between the patient and the HCP, where telemedicine can help in delivering of this knowledge to a patient. We identified two studies using telemedicine to deliver PCC. The term 'telemedicine' comprises different communication technologies and devices that support remote interactions between HCPs and patients.⁷² Telemedicine uses telecommunication systems to deliver healthcare at a distance, or to enable counselling and communication between nurses in the community and specialist healthcare (interactive telemedicine platforms with web-based ulcer records, communication via phone, video records published online or saved on various data carriers, telehealth consultations, etc.). These methods of delivering healthcare may improve patient health outcomes, access to healthcare and reduce costs.⁷³ Although nurses tend to have a positive attitude toward this technology in general, many fear its dehumanising effect on patient care.⁷⁴ However, it may not be the technology in itself that dehumanises, depersonalises or objectifies care, but rather the manner in which it operates within a specific user context.⁷⁵ Telehealth can provide a feasible environment for the delivery of PCC for patients with chronic diseases, and long-term relationships between the HCP and the patient can be developed over a distance.⁷⁶

Since inception of this document the COVID-19 global pandemic has required health systems and HCPs to change the way they practice. Anecdotal evidence suggested far greater uptake of telemedicine in wound care at this time. Future research should explore patients experiences of this approach and how this aligns with PCC.

Outcomes

All of the studies focused in some way on the fourth PCC construct, 'outcomes'. The studies included in this review have shown that the

interventions are feasible and the majority of patients responded positively to them; however, larger trials and longer intervention periods are required.^{51,64} According to Rademakers et al.⁷⁷ patients experience PCC positively and find it important, those with lower levels of literacy have a lower preference for a person-centred communication style compared with those with higher literacy levels. This is supported in one of our studies, which focused on educational interventions among DFU patients in Morocco and reported that health literacy was associated with a higher likelihood of a favourable variation of foot-care practices, while previous education about diabetic foot was associated with a lower likelihood of a favourable variation.⁵⁹ Thus, the roles of education and health literacy are important and should be taken into consideration by HCPs when developing and delivering PCC, and future research should focus on understanding the process through which education levels impact patient–HCP interactions.

Use of an optimal form and method of patient education is a challenging issue when applying a PCC approach. Education is a more traditional intervention; there is a 'common understanding' that education is beneficial which is supported by long standing research which highlights that without the right information people cannot be more involved in their own care. Whilst education-based research can demonstrate an increase in education, this is not necessarily associated with beneficial clinical outcomes.^{71,78}

Collective education represents an emerging way of handing on the knowledge and information from HCPs to patients. Meta-analysis of 47 studies published by Odgers-Jewell concluded that group-based education interventions are more effective than usual care, waiting list control and individual education at improving clinical, lifestyle and psychosocial outcomes in people with type 2

diabetes.⁷⁹ The opportunity to talk with other people with diabetes provides support as well as learning to the individual. Educators experienced in collective education can use varying tools and techniques to affect patients' health-related behaviours and habits: conversation maps (a series of educational tools that aim to enable people with diabetes to learn about behaviour changes and improved self-management with regard to their condition), and other activating educational methods, such as thoughtway maps, expectation cards, decision-making cards, demonstrations and roleplays.⁸⁰

There are ethical and cultural considerations in implementing PCC. This is most notable in the paper by McBride et al. in which the Decision Navigation intervention significantly increased decision conflict over time.⁵⁶ For these patients, the intervention resulted in them being more conflicted despite the aim of easing the decision process. The authors speculate that the intervention may have increased decision conflict via challenging personal controllability beliefs. The outcome here, although only from one pilot study, underscores the need to consider the patient's readiness and capability to embrace a person-centered approach. Not all people will want to be empowered and would prefer their HCP to make treatment decisions for them, particularly during the acute phases of care. However, long-term management of chronic conditions requires us all to explore how best to maintain healthy professional relationships with patients while encouraging them to participate in the long-term maintenance of their health.⁸¹

How effective is PCC in improving patient concordance?

A study by Stanton et al. among patients with VLU's argued that the following elements are required for supporting a person-centred approach:

development of strong relationships with patients and their families, patient education and encouraging patients to report negative aspects of compression treatment.⁴⁶ This has resulted in improved concordance scores and healing rates in their practice.⁴⁶ The study by Protz et al. explored patient education in people with venous leg ulcer, where the authors suggested that better knowledge and understanding of the disease from the patient's perspective may strengthen their empowerment and adherence.⁶²

Emerging research

Our literature search revealed many papers reporting on efforts to develop PCC but that did not meet our criteria for evaluation. For example, two studies by Green et al. reported on efforts to develop a consultation process for patients with chronic wounds.^{82,83}

The first report was a prospective study among 13 nurses and five patients that aimed to develop a checklist for patient consultations in order to deliver patient-centred care.⁸² In that study, patients did not raise 38% of their concerns. Of the 62% of concerns that were raised, 8% were either not acknowledged or were disregarded by their community nurse, 30% were discussed but not managed and 24% were managed. More than half (56%) of patients' emotional and daily living issues were not raised, and 91% of patients' wound care issues were raised. Patients did not raise concerns regarding previously identified pain, exudate or odour on 40% of occasions.

A second study by the same author group used unstructured interviews to elicit patients' lived experiences with the aim of developing a leg ulcer consultation template.⁸³ A 28-item checklist was used to review the consultations. The study included 13 district nurses and nine patients with VLU in a community setting in the UK. Key issues identified from interviews included pain, exudate and odour,

emotional effects, wound management and the effects of the wound on activities of daily living.

Although related to acute wounds and not chronic the impact of receiving personalised information through an empathic patient-centred interview among 104 patients undergoing general ambulatory surgery was examined.⁸⁴ The results showed that an empathic patient-centred approach applied at the pre-operative nursing appointment significantly reduces patients' preoperative anxiety (State Trait Anxiety Inventory Form (38.7 vs 33.9, $p < 0.001$)), improves surgical recovery (1.2 vs 0.8; $p < 0.001$) and increases patient satisfaction with the quality of the information provided (2.4 vs 2.7; $p < 0.001$).

Recommendations

- Focusing on the needs of the individual is central to developing and delivering PCC approaches.
- PCC is influenced by the local/national culture, the context in which it is applied including the health care system, and the ability and/or willingness of the patient to engage in this. Each of these factors should be considered when developing PCC approaches.
- Future research should focus on understanding the process through which education levels of individual patients, cultural context and health service configuration impact patient–healthcare professionals' interactions.
- Future studies may wish to consider the association between PCC and patient education and how it affects patient outcomes.
- Although patient education is recognised as one element in enabling people to be more involved in their care, there is a need to consider different types of education as people will respond differently to different methods. Remember that

patients will not always be ready to learn when the clinician is ready to teach, so consideration of the individual's ability and willingness and the context in which this is provided should be considered at the outset.

- Engagement with patients through public patient involvement initiatives should be encouraged and further developed so that outcomes of relevance to patients are addressed.
- There is a need to include more objective outcome measures on the impact of PCC, in order to build the evidence base to support changes in practice.

Conclusions

Person-centered care is an evolving approach to delivering healthcare in the context of changing

healthcare systems. Patient involvement in setting research priorities and informing healthcare systems and research is increasingly promoted by healthcare policy makers and research funding agencies. The four constructs of PCC should be considered as one approach when developing interventions for a local setting. The evidence base to support PCC in wound management is developing and based on our review has shown improved outcomes in areas of pressure ulcer prevention, patient satisfaction, patient knowledge and quality of life, but clinical outcomes such as wound healing were less well explored. Further research with more objective outcome measures are required.

Supplementary material

Further additional tables on included articles can be accessed at the EWMA's [website](#).⁸⁵

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Glossary

Abbreviations

ABPI:	ankle–brachial pressure index	PUPCB:	patient-centred pressure ulcer prevention care bundle
ADL:	Activities of Daily Living (Scale)	QoL:	quality of life
CALF:	conditioning activity for leg function	RCT:	randomised controlled trial
CWC:	Cooperative wound clinic	SME:	self-management education
DFU:	diabetic foot ulcer	VLU:	venous leg ulcer
EB:	evidence-based		
GP:	general practitioner		
LUCT:	leg ulcer consultation template		
KPI:	key performance indicator		
MECALF:	motivational enhancement and conditioning activity for leg function		
OR:	odds ratio		
PCC:	person-centred care		
PGC:	Philadelphia Geriatric Centre Morale (Scale)		
PUSH:	pressure ulcer scale for healing		
PU:	pressure ulcer		
PUP:	pressure ulcer prevention		

Notes

