The Wound Care Pathway: a Danish effect study

Abstract

The Wound Care Pathway (WCP) is a five-step guide to wound healing that was developed to overcome the challenges generalist nurses face during wound management. **Aims:** To investigate how the implementation and training in the WCP affects the behaviour of generalist nurses, focusing on four specific endpoints: motivation, confidence, critical thinking and knowledge. **Methods:** A total of 89 generalist nurses received 6 hours of training in the WCP, over a period of 10–16 weeks. The participants filled a questionnaire before and after the training. Data were collected between January 2023 and January 2024. **Findings:** There was a significant improvement in the participants' wound care knowledge, motivation and self-efficacy. The participants' confidence in their wound care skills also increased after the training. A notable improvement was seen in nurses' critical thinking when treating wounds and delivering wound care. **Conclusions:** The WCP guide supports healthcare professionals in their day-to-day work and strengthens their critical thinking and knowledge of wound care management.

■ chronic wound management ■ critical thinking ■ evidence-based guidelines ■ healthcare professionals ■ wound care pathway

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Wound management presents a significant challenge, particularly for generalist healthcare providers (HCPs) (Patel et al, 2008; Friman et al, 2021; Poacher et al, 2023). The prevalence of chronic wounds is escalating, with approximately 10.5 million cases in the US (Sen, 2021) and 2.2 million in the UK (Guest et al, 2020). Wounds are primarily handled in the community because of their chronic nature, their prevalence in older people and increasing pressure within the acute healthcare system, resulting in early discharge (Probst et al, 2014).

Community nurses spend between 35% and 68% of their time on wound care (Probst et al, 2014; Welsh, 2018). Yet, there is a lack of evidence-based practice among nurses and, even though their knowledge may be sufficient, their practice competencies are often low. The scarcity of specialised wound care in community settings, coupled with insufficient training and experience, leads to extended wound healing durations (Welsh, 2018). This precipitates a substantial surge in community-based wound care visits, significantly inflating healthcare expenditures (Guest et al, 2020). In 2019, an anthropological study of wound care professionals was conducted in Spain, the UK, France and Germany, highlighting three main challenges for HCPs working in wound care (Dowsett, 2021). These challenges stemmed from limited training and resulted in insecurity and a lack of clear guidelines for making evidence-based treatment decisions. The study findings indicated a need for better access to education and guidance, specifically more simplified evidence-based guidance for wound care management (Dowsett, 2021). However, the value of additional education lies in its ability to be measured through the implementation of new knowledge in clinical practice, ultimately enhancing the standardisation of care (Harding and Queen, 2017). An inspection of training is recommended to evaluate its true value in the clinics (Harding and Queen, 2017). For example, using pre- and post-education tests, along with supervisor observation of tasks performed on patients, can help measure newly acquired knowledge and skills. However, standardised evaluations are still needed to assess the actual benefits for patients (Harding and Queen, 2017).

Objective

The Wound Care Pathway (WCP) is designed to simplify the complex field of wound management, providing accessible and evidence-based practical treatment guidelines. The aim is to shift the paradigm from 'treating a wound' to actively 'healing a wound' (Dowsett, 2021). This shift acknowledges that HCPs are often influenced by their prior education, experiences and generalisations, potentially leading to habitual treatment tendencies.

Aims

This study examined whether WCP training can improve HCPs' motivation, knowledge, confidence and critical thinking in wound care, and the extent to which this guide can provide generalist nurses with the necessary skills and mindset to improve and reduce wound healing times (Dowsett, 2021).

Methods

A total of 190 generalist nurses and healthcare assistants were invited to participate in the study. They received the WCP as a quick guide and 6 hours of training over 10–16 weeks. The sessions included face-to-face training in the WCP, case-related work and the use of the WCP in their daily work (*Figure 1*). The participants completed a questionnaire before and after the training. These questionnaires assessed four endpoints about knowledge, confidence/self-efficacy, motivation and critical thinking. The training session included three modules. Module 1 covered training on defining chronic wounds, the WCP and wound assessment. Module 2 addressed stages of wound healing, wound types and case work with the WCP. Module 3 included wound infection and additional case work with the WCP. The questionnaire included 15 questions that covered knowledge and techniques related to the best practices that the pathway was meant to impart. The same questions were re-used in the pre- and post-test, changing the order of the questions and response categories to avoid recall. The confidence part of the questionnaire included seven questions focusing on self-efficacy that can influence nurses' beliefs, actions and behaviours in wound care (Abu Sharour et al, 2022). The questions were based on best practices for self-efficacy scales (Bandura, 2006), using a scale from 0 (not sure at all) to 10 (very sure). These were inspired by an existing self-efficacy scale for pressure ulcers (Dellafiore et al, 2019). The motivation section of the questionnaire consisted of six questions focusing on the HCPs' desire and strive to engage in behaviours that lead to best practice wound care. The scale ranged from 0 (not motivated at all) to 10 (very motivated).

Questions related to knowledge, confidence and motivation were asked before and after the training to compare any improvements following the WCP training. For statistical analyses on knowledge and confidence, a paired t-test was performed to compare pre- and post-measurement means. Effect sizes for these comparisons were calculated using Pearson's correlation coefficient (r), as recommended for non-parametric tests. For motivation, a paired Wilcoxon signed-rank test was used to assess differences between pre- and post-measurements. Normality of the data was assessed using a Shapiro-Wilk test. Questions covering their feelings regarding the WCP and how it had impacted their work after the training were asked at the end of the study. The questions also focused on critical thinking and behaviours leading to the change in perception from dressing changers to wound healers. The participants' experience with the WCP was also documented. The study was prepared, conducted and analysed using Design Psychology. Statistical analyses were performed in R (R Core Team 2013).

Findings

In total, 189 generalist nurses and other HCAs participated in some parts of the WCP training. However, not everyone

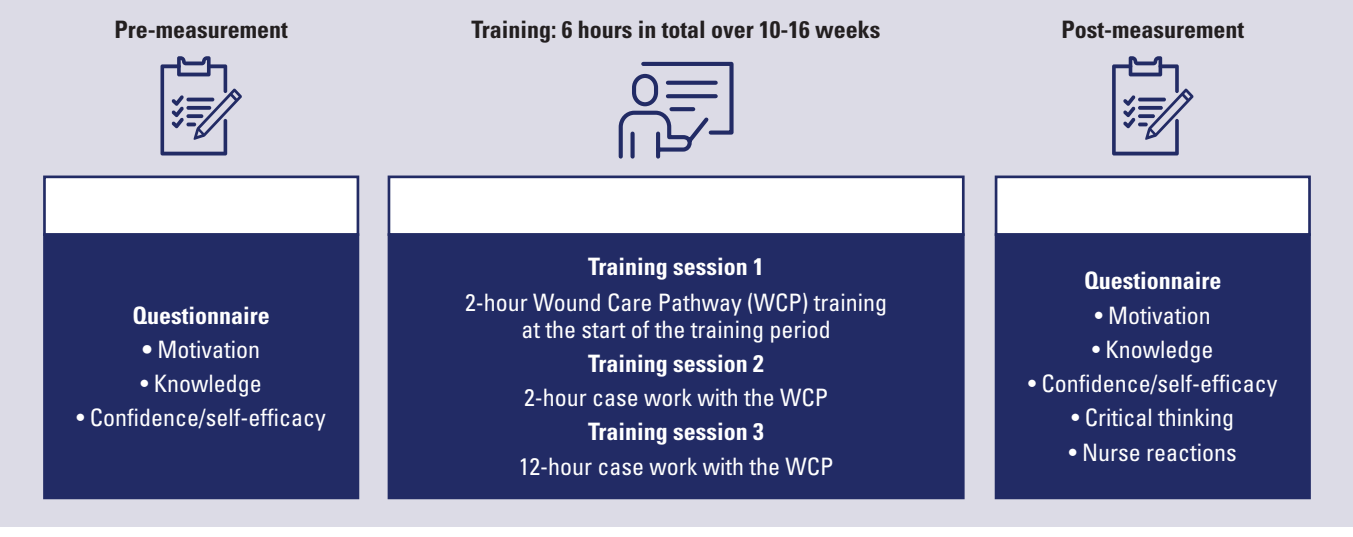

Figure 1. Study design overview and training in the Wound Care Pathway (WCP). The participants used the WCP in their daily work.

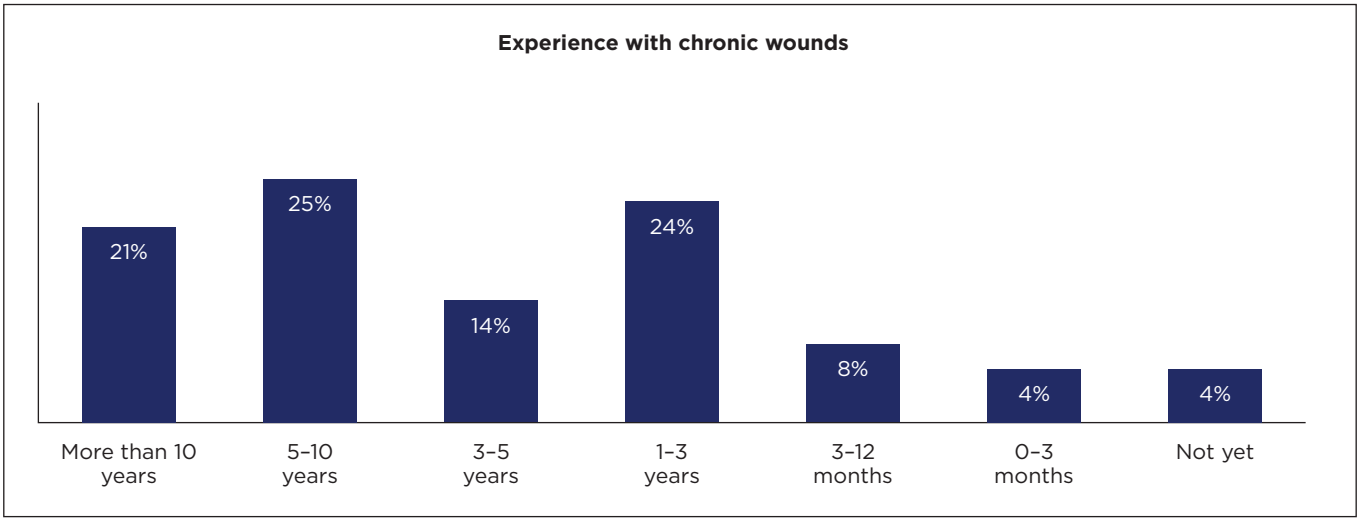

Figure 2. Years of experience with chronic wounds.

was able to participate in all the training sessions and some participants did not complete the questionnaires both before and after the training, which was a prerequisite for the study analyses. Therefore, the results reflect the effect of training on the 89 participants who underwent the entire training and answered both questionnaires (pre- and post-test). Participants worked in various sectors: 58% in home care, 25% in nursing homes and 17% in other areas, such as rehabilitation centres. Most of the participants had more than three years of experience working with chronic wounds (60%), whereas 16% had less than a year of experience (*Figure 2*). Moreover, 83% worked with wounds at least weekly, whereas 17% worked with wounds monthly or rarely (*Figure 3*). On average, one patient is referred to a specialist each month.

Although most participants worked with chronic wounds on a daily or weekly basis, only half of the participants had previous wound care training and the majority had no experience with guidelines or the WCP (80% and 94%, respectively) (*Figure 4*). The most frequently used sources of wound care knowledge were wound nurses (83%) and other colleagues (80%). A smaller proportion used more people-independent sources, such as online sources (36%), books (21%), other literature (11%) or other sources (7%) (complete data are available from the authors on reasonable request).

Knowledge

The average wound care knowledge of the participants improved significantly after the training. The participants answered an average of 64.7% (SD=13.3) of the questions correctly before receiving training in the WCP. After the training, participants answered an average of 88.5% (SD=10.9) of the questions correctly. This corresponded to a significant knowledge improvement in the WCP (t[88]=-14.11, p<0.0001, r=0.83). Knowledge questions with the largest improvement after the WCP training included choosing the right dressing size, cleaning a chronic wound, wound types that should not be debrided and when not to refer to a specialist (*Figure 5*). Complete data are available from the authors on reasonable request.

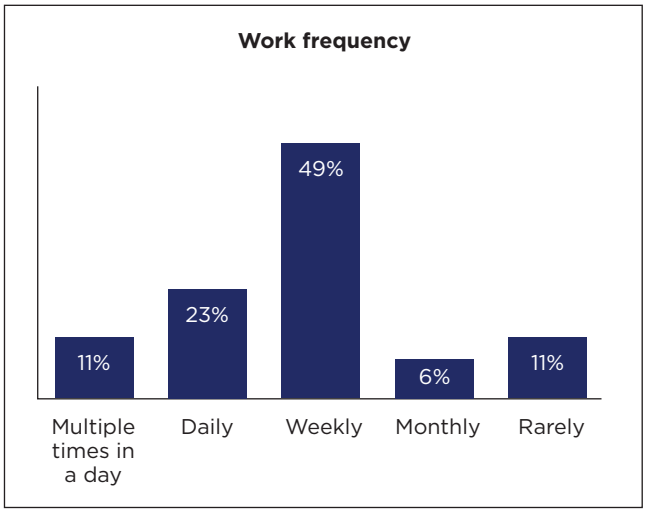

Figure 3. How often participants worked with chronic wounds

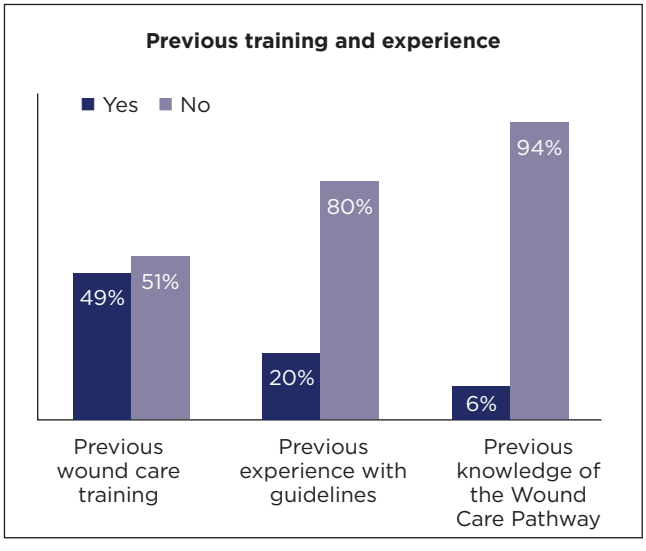

Figure 4. Previous training, experience and knowledge of the participating nurses and healthcare assistants.

Confidence

The participants' self-efficacy or confidence in different aspects of best practice wound care management was tested (*Figure 6*). On average, they were significantly more confident after the training than before ($t[88]=-11.7$, $p<0.0001$, $r=0.78$). This corresponded to a mean overall increase of 41%, from an average score of 5.4 (SD=1.8) before training to 7.6 (SD=1.5) after training on a scale of 0 (low confidence) to 10 (high confidence). Specifically, participants' confidence increased by 53% for making a holistic evaluation, by 44% for preparing a treatment plan and by 41% for choosing the right dressing (*Figure 6*). Additionally, participants became more confident in evaluating patients, formulating a treatment plan over time and deciding when to consult a specialist.

Motivation

The median score for the participants' motivation regarding their desire to engage in best practice wound care behaviours before the training was 7.8 on a scale of 0–10, showing a high motivation. These levels were significantly higher after the training ($p<0.0001$, $r=0.53$) with a 15% increase. Nurses experienced a 22% motivational increase in terms of making a

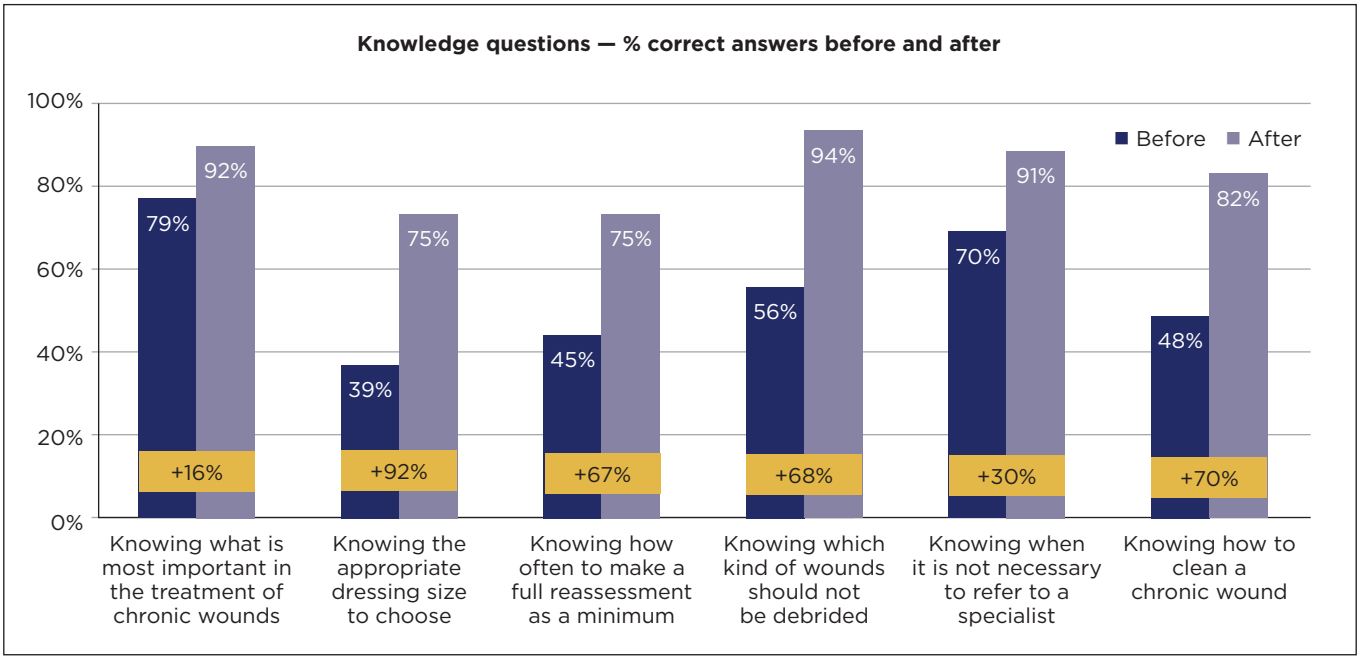

Figure 5. Knowledge scores before and after the training, for 6 out of 15 questions.

Figure 6. The participants' confidence in their wound care skills and knowledge.

holistic assessment, 17% for creating a treatment plan, 16% for re-evaluating the treatment plan over time and a 10% increase for working independently. Motivation to seek advice and guidance from a specialist did not show a high impact (*Figure 7*).

Critical thinking

At the end of the study, participants shared their perceived change in critical thinking related to knowledge and wound care skills. A total of 89% believed they were better at assessing holistic factors beyond the wound, 81% thought that they were more prone to assess the wound at every dressing change, 71% were more likely to involve the patient more and 79% reported being better at knowing when to ask for help from other colleagues or specialists (*Figure 8*). When asked about their experience with the WCP, 93% of the participants found it to be a helpful resource in their everyday work, 82% believed that it helped them work independently and 92% felt that it allowed them to deliver better treatment (*Figure 9*). Overall, the intervention successfully got

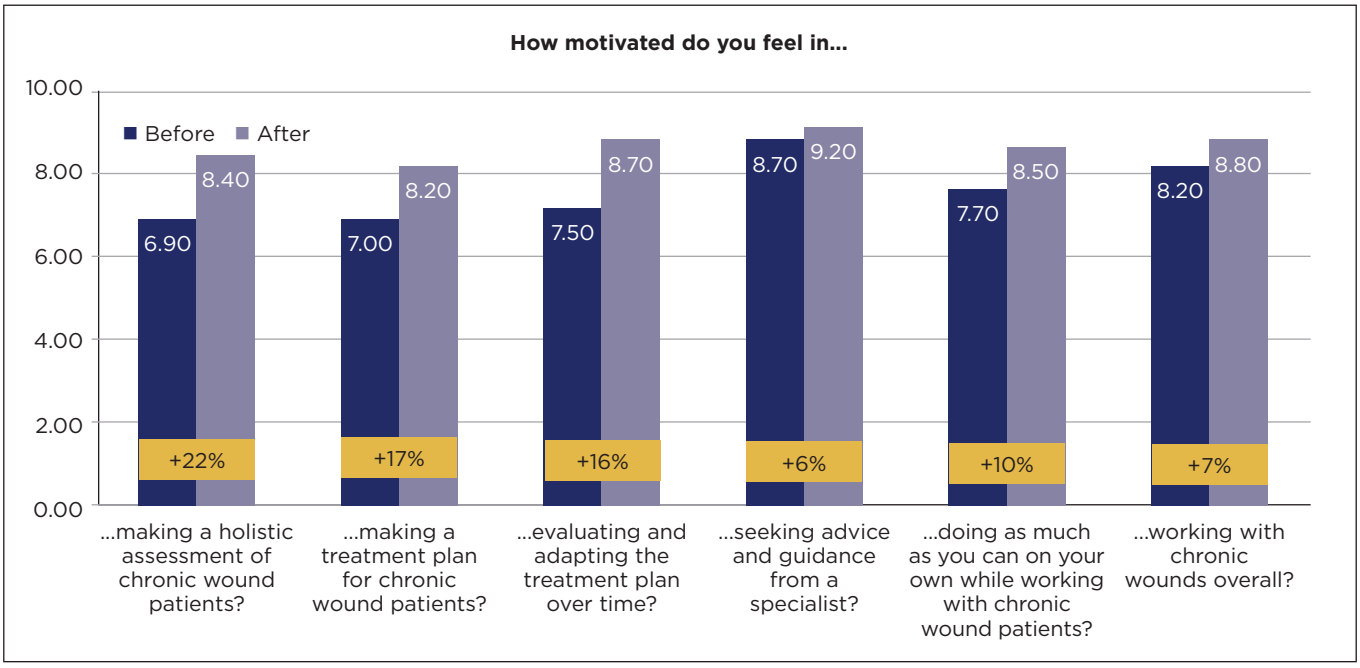

Figure 7. Motivation before and after training.

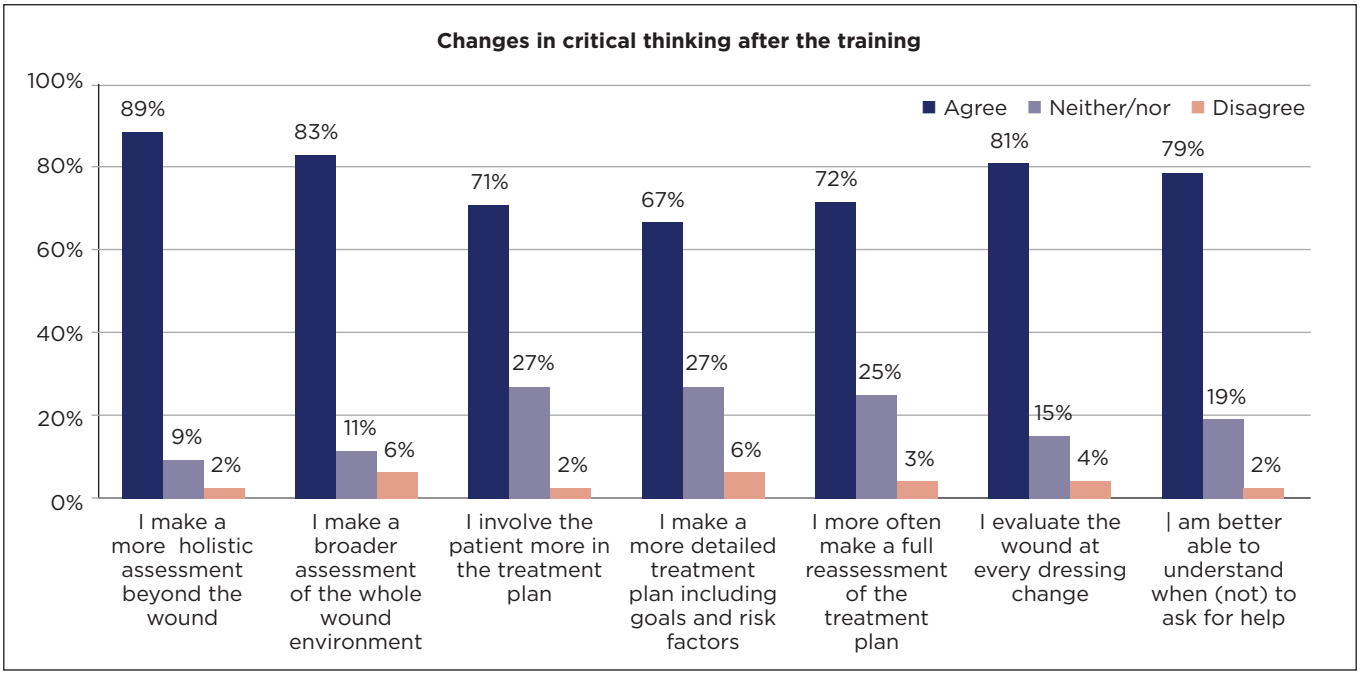

Figure 8. Perceived changes in critical thinking after the training. The participants were asked how much they agreed or disagreed to statements regarding their knowledge about wound care.

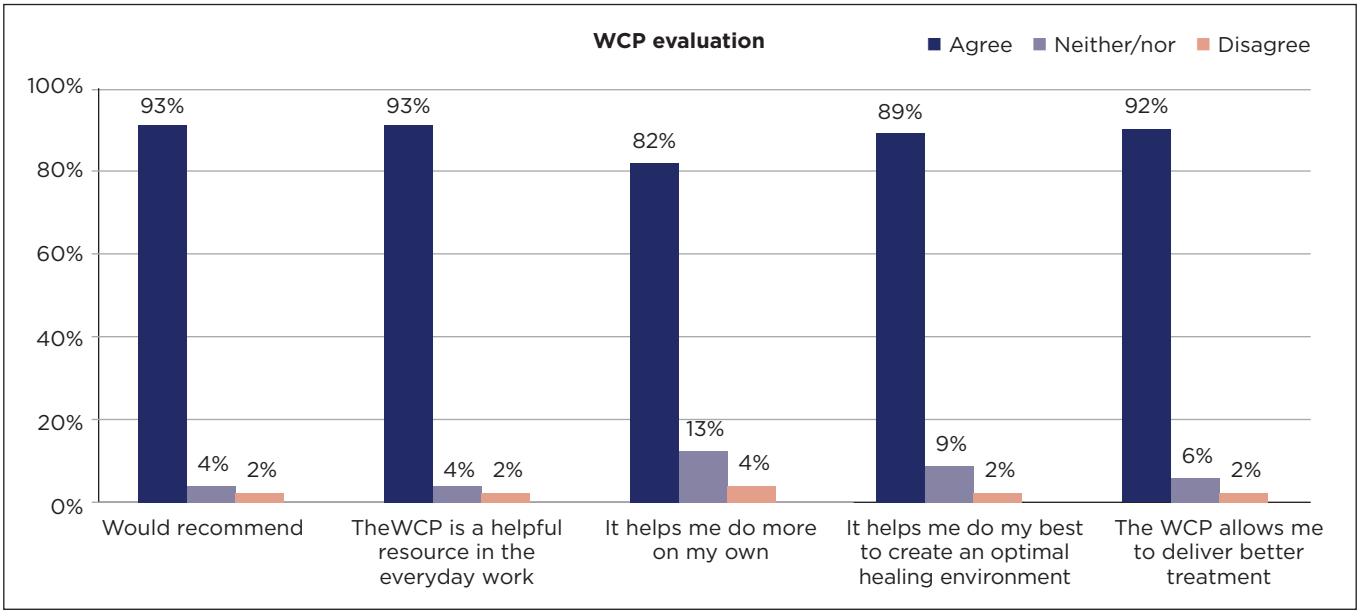

Figure 9. Nurse evaluations of the Wound Care Pathway.

62% of participants to use the WCP as a new way of working at least monthly and only 9% reported not using it since the beginning of the training (*Figure 10*).

Discussion

A quantitative randomised survey conducted in 1991 examined the implementation of research among nurses. The challenges revolved around lack of understanding and appreciation of research within their practice area and barriers to implementing new evidence-based practices because of lack of authority (Funk et al, 1991). This may lead to a lack of critical research appraisal and insufficient confidence in distinguishing between low and high quality evidence (Flanagan, 2005). However, growing awareness of the lack of standardised wound care education across Europe has resulted in the development of educational material for both pre- and post-registered nurses by the European Wound Management Association (Lindahl et al, 2021).

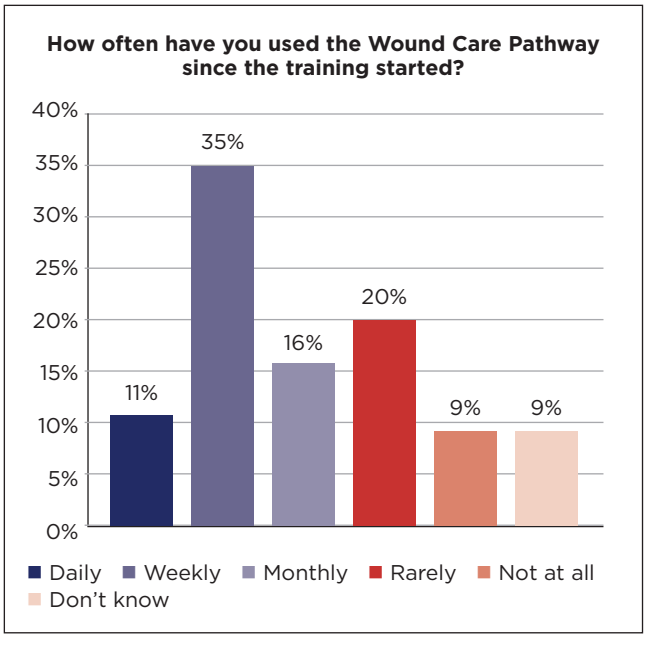

Figure 10. Participants who used the Wound Care Pathway after training.

To accommodate for different educational backgrounds, a pre-registration curriculum—the European Qualification Framework (EQF) 4—has been developed as a starting point, including a framework on skin integrity and skin care as part of the general nurse education. The EQF5 and 6 have been developed as part of the bachelor's degree in nursing, whereas EQF7 involves an extended curriculum for nurses requiring a minimum of 18–24 months of training beyond level 6, and 12 months of clinical practice in wound management (Holloway et al, 2020). Generalist caregivers face significant challenges in adopting evidence-based wound care because of heavy workloads, ingrained practice patterns and extensive product marketing (Guyatt et al, 2000; Flanagan, 2005). They often rely on personal experience and peer advice rather than research (Flanagan, 2005). The sheer volume of wound care advancements in terms of new wound care products, services and decision-making tools can be overwhelming, impeding their ability to stay informed and apply new knowledge (Welsh, 2018). Complex research language (Hendricks and Cope, 2017) and the potentially challenging home settings of patients present further obstacles, despite nurses' willingness to implement best practices (Grothier, 2018a; 2018b).

Wound infections or further wound deterioration requires a holistic approach, where the wound's progress is monitored and the treatment plan is reassessed on a continuous basis to accommodate for any underlying changes. Micro-organisms may colonise inside the wound and create a variety of infections, which maintains the wound in a chronic and non-healing condition (Swanson et al, 2020). Therefore, it is crucial to stay

vigilant towards signs and symptoms of wound infection and to know when a patient should be referred to specialist wound care. Worsening of the wound condition, lack of wound healing progression within 14 days, suspicion or signs of systemic infection or biofilms should prompt referral to a wound specialist (Swanson et al, 2020). Nonetheless, referral from primary care to secondary specialist wound care (such as a tissue viability nurse) varies greatly (Probst et al, 2014). Depending on the wound type, failure to refer or a delayed referral can have detrimental consequences, including increased risk of foot amputations for diabetic patients and elevated hospital admissions and healthcare costs (Probst et al, 2014; Manu et al, 2018). Education related to risk factors for complex wounds and when to refer patients to a wound care specialist is crucial for avoiding wound deterioration at high costs for both patients and healthcare systems.

The overall results of the current study demonstrated that an easy and simplified guide with practical tools helped nurses identify and improve their wound care skills and significantly enhanced their knowledge, motivation, confidence and critical thinking related to wound care. Subsequent training and re-testing reinforced those positive experiences and enhanced the nurses' engagement, leading to better uptake of new, evidence-based wound care practices. This was demonstrated through a high percentual increase before to after training. Nurses believed they were better equipped to deliver improved treatment to their patients. Additionally, more nurses knew when to refer to a wound specialist and felt more confident in making those decisions.

Overall, implementation of new information and updated evidence-based practices requires a holistic approach where generalist nurses are provided with a multitude of strategies for behavioural change. For example, when nurses were asked to engage in new learning modules related to evidence-based practice in a qualitative research study, both previous experience and perception of their own proficiency impacted their knowledge and confidence (Hines et al, 2022). Therefore, boosting generalist nurses' confidence to holistically assess and treat wounds (through a variety of learning tools) may secure more accurate and faster referrals in addition to improving patient outcomes. Furthermore, it may reduce inappropriate referrals, allowing specialist wound care nurses to dedicate more time to patients with complex wounds (Welsh, 2018). It is also crucial to watch out for early signs of infection, delayed healing or deterioration of underlying conditions to secure timely referral and optimal healing (Gohil, 2021).

Treatment administered by nurses with advanced wound care expertise and the requisite experience to support patients at home with appropriate treatment plans can result in substantial cost savings for communities and hospitals, and improved quality of life for patients (Morrell et al, 2022). When a wound contact nurse is involved, the possibility to create a liaison between the community nurse and the hospital may support and improve overall wound outcomes (Bergersen et al, 2016). Another key element in improving healing outcomes is enhancing patients' wound knowledge, which has been shown to significantly boost patient adherence (World Union of Wound Healing Societies, 2020). As demonstrated in the current study, enhancing participants critical thinking leads to improved patient involvement for 71% of the participants. Additionally, fostering an understanding of the treatment plan's rationale can encourage lifestyle changes that may positively impact healing outcomes (Van Hecke et al, 2011; Dowsett, 2021).

Without continuous training for healthcare professionals, there is an increased risk of evidence-based options not being included in treatment plans. In some situations, patients spend significant proportions of their income on wound care products in addition to dealing with delayed healing (Pacella et al, 2018). Therefore, it is crucial that healthcare providers receive continuous education through targeted training, audits, feedback, specialist advice and computerised alerts, all of which have been suggested to enhance evidence-based practice (Guyatt et al, 2000). When tissue-viability nurses received structured, specialised and focused education, their evidence-based practice improved (Welsh, 2018). This underscores the importance of a research-oriented environment for educational growth (Hines et al, 2022). Furthermore, when examining the relationship between nurses' practice in ulcer prevention and related factors, key influences included nurses' knowledge, attitudes, educational level, previous experience with ulcer prevention, self-efficacy and involvement in research (Ghorbani et al, 2023).

The present study demonstrates the significant benefits of the WCP guide and highlights its role in translating a complex area into easily accessible, simple and practical treatment guidance. Participants' knowledge and motivation to provide best practice and evidence-based wound management support the aim of this WCP, which is to facilitate a reduced healing time and encourage general nurses and healthcare providers to become wound healers rather than wound dressers (Swanson et al, 2020). Wound type-specific pathways for diabetic foot ulcers, venous leg ulcers, skin tears, pressure injuries/ulcers and surgical wound dehiscence are also being developed.

Conclusions

Providing HCPs with a concise, evidence-based and systematic guide, the WCP encourages a more critical approach to wound care. It promotes a holistic framework that emphasises patient involvement and active wound healing. The WCP is easily adopted by HCPs and ensures that wound care is effective, patient-centred and evidence-driven. **CWC**

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Participants did not receive financial compensation for their participation in the study.

Ethical approval: This research did not require ethical approval. It did not include patients, or patient data. Only the opinions of health care providers were gathered, and that information was only gathered directly from the providers, who consented to the process and the information collected.

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