



NURSES' LEVEL OF KNOWLEDGE IN CHRONIC WOUND MANAGEMENT

Faisal Mutlaq Mashi Alotaibi^{1*}, Mohammed Ghazi Ayedh Alotaibi², Awadh Faihan Zuhian Almughyiri³, Salman Ghazai Ayed Al Otaibi⁴, Ahmed Ghazi Ayedh Alotaibi⁵, Eqab Abdullh Ali Almarshdi⁶, Walid Setan Hamdan Alotaibi⁷, Adel Faraj Dawi Alotaibi⁸, Mohsen Al Howaimel Saied Al Shebany⁹, Sultam Dekhellah Almutairi¹⁰

ABSTRACT

Background: Chronic wounds are a challenge and a major cause of morbidity. A wound is considered chronic if healing does not occur within the expected time frame depending on the etiology and location of the wound. **Objective:** To assess the level of knowledge about chronic wound management of postgraduate nurses in different areas of the health system and their previous satisfaction with the training received during their undergraduate studies. **Design:** Cross-sectional study of a health system of 95,000 inhabitants and 557 nursing professionals working in it. **Participants:** Nurses working in the study health system and in areas with care for patients with chronic wounds in social, primary and hospital care.

Results: Survey results described a low knowledge of chronic wound management in general. Data on knowledge according to area of work showed that nurses in primary care had the highest knowledge of wound etiology. Nurses working in health and social care were most knowledgeable in diagnostic knowledge. Hospital nurses showed the lowest knowledge overall. A relationship was observed when nurses had a master's degree followed by an expert with better knowledge in the test. In addition, nurses reported little training in chronic wounds during their university studies (69.73 %, n = 106). **Conclusions:** Therefore, a review of this point should be considered to improve the management of chronic wounds and their correct approach among nursing students. A review of continuing and even specialised training needs in the clinical care setting should also be considered.

¹Nursing Specialist Afif Hospital, Saudi Arabia

²Nursing Technician Afif Hospital, Saudi Arabia

³Nursing Assistant Afif Hospital, Saudi Arabia

⁴Nursing Technician Afif Hospital, Saudi Arabia

⁵Nursing Technician Afif Hospital, Saudi Arabia

⁶Nursing Assistant Afif Hospital, Saudi Arabia

⁷Nursing Technician Afif Hospital, Saudi Arabia

⁸Nursing Specialist Albejadiah Hospital, Saudi Arabia

⁹Nursing Technician AlbeJadiah Hospital, Saudi Arabia

¹⁰Nursing Technician Thurb PHC Hospital, Saudi Arabia

***Corresponding Author:** - Faisal Mutlaq Mashi Alotaibi

*Nursing Specialist Afif Hospital, Saudi Arabia

DOI: 10.53555/ecb/2023.12.2.039

1. Introduction

Despite advances in medicine, chronic wounds remain a challenge and a major cause of disability, mortality and morbidity. Chronic wounds are those that do not progress through a normal, orderly, and timely sequence of repair. Various alternative terms have been proposed, such as “refractory wound,” “refractory wound,” “nonhealing wound. “Chronic wounds” are generally defined as “wounds that are not properly repaired in a timely manner to establish anatomical and functional integrity after 3 months” (Dubhashi and Sindwani, 2015). However, the term has met criticism for its uncertainty regarding the duration of chronicity (Pai and Simerjit, 2013). They are often incorrectly treated. The morbidity and associated costs of chronic wounds highlight the need to implement prevention and appropriate treatment for each as well as prevalence studies to determine healthcare expenditure and associated quality of life. A German study found a 2 % to 3 % prevalence of chronic non-healing wounds in the general population (Bowers and Franco, 2020).

2. Background

The progressive ageing of the population increases the risk of suffering from chronic diseases. This, in turn, favours the development of wounds of different aetiologies, especially in the lower extremities, such as venous and arterial ulcers, diabetic foot and arteriopathies (Gethin et al., 2020; Gupta et al., 2017). Chronic wounds do not follow a linear healing process and tend to stagnate in the inflammatory phase because the chronic pathology was not addressed. These wounds do not heal with dressings, but epithelialise when the chronic process is resolved. Their management must be unequivocally based on a correct aetiological diagnosis (González de la Torre et al., 2017). Patient-centred multidisciplinary teams should carry out the management of difficult-to-heal wounds. The international perspective on chronic wounds has seen significant advances in recent decades, not only in the advancement of new therapies, but also in the multidisciplinary approach and in wound technology and monitoring (Patricios et al., 2023). As part of these teams, there should be a wound nurse specialist. However, the National Group for the Study and Advice on Pressure Ulcers and Chronic Wounds in Spain (GNEAUPP) one of the main national wound associations indicates that most Health Areas in Spain do not have a specific unit (García-Fernández et al., 2018). In other words, there is no specialised chronic wound unit within the public health system (Romero-Collado et al., 2015; Laná-Pérez et al., 2018). Currently in Spain, the care levels where patients with chronic wounds are

cared for are Primary Care (PC), Hospital Care (HC) and Social and Health Care (SHC), the latter for people requiring long stays and specialised geriatric care. Postgraduate training, both in the form of University Expert and Master’s degrees, has experienced a significant increase, due to the fact that professionals seek the necessary specialization to carry out their work with quality. Although some forms of specialization have been developed in some healthcare areas, such as Advanced Practice Nursing (APN) for wounds (Welsh and Lusher, 2022), it is not enough. Wound training in Spain is mainly at postgraduate level, in contrast to the scarcity of knowledge imparted in this area during undergraduate university education (Romero-Collado et al., 2015). Only 5.45 % of undergraduate nursing degrees have an elective course on chronic wound management (Welsh, 2018; Weller et al., 2020; Kielo-Viljamaa et al., 2021). It is a potentially viable avenue for improving current nursing processes and procedures in wound care. Because improving and updating undergraduate education based on etiological, diagnostic and best treatment evidence will not only strengthen the knowledge base of nurses in undergraduate education but could also lead professionals towards a responsibility in their postgraduate continuing education to improve the quality of care in this area in the long term. Therefore, there is a need for evidence on the current level of wound knowledge in practising professionals and their satisfaction with their undergraduate training (Kuhnke et al., 2019; Sandoz, 2022). In this study, the aim was to assess the level of knowledge about chronic wound management of postgraduate nurses in different areas of the health system of Castilla y León and their previous satisfaction with the wound training received during their undergraduate studies.

3. Methods

3.1. Design

A cross-sectional study was carried out of the Castilla y León health system, Spain with 95,000 inhabitants and 557 nursing professionals working there. This area is comprised of two Hospitals, 14 Primary Care centers and one Social and Health Care. Non-probabilistic convenience sampling was used. The hospital services considered to have the highest prevalence of patients with chronic wounds (Internal Medicine, General Surgery, Traumatology, Neurology, Otorhinolaryngology, Urology), an urban Primary Care area and a socio-health centre with the highest number of residents where patients with wounds are frequent were selected. The sample size was calculated on a sample of 557 nurses with a confidence level of 95 %, an accuracy of 3 %, requiring a sample of 155 nurses for the study.

3.2. Data collection

Data collection on

wound knowledge was conducted using the Delphi method and feedback from a panel of wound experts on a questionnaire that could assess wound knowledge. The process consisted first of selecting four experts whose expertise was based on having a master's degree in chronic wounds, at least two scientific publications on the topic and working in the field of care. In the second phase, questions were designed that were considered relevant to the topic of the study and a first round was conducted where feedback on the questions and their interpretation was solicited to avoid doubts that future study subjects might have. A second round that included suggestions for modifying or adding new questions followed this. Subsequently, an analysis of the responses from the second round was carried out and a consensus was reached between the experts and the questions where there were discrepancies or a need for clarification, of which there were four. The last stage of the process was based on consensus and validation of the process with a final thorough reading by the experts, which showed the finalization of the process. This was then passed to 15 non-expert chronic wound nurses as a pilot test to ensure that the questions were correct in syntax and structure. The questionnaire was administered in the last quarter of 2021 through the official dissemination channels of the different care areas from which permission was requested. Once permission was obtained, an informative note was prepared to inform the supervisor or head of each unit of the purpose of the study, who was responsible for the dissemination, delivery and collection within an established period of approximately 15 days from the delivery of the study. Subsequently, the principal investigator was responsible for collecting the questionnaires. We have called this tool the Chronic Wound Knowledge Test (CWKT). It was subjected to a statistical reliability analysis. Once the statistical analysis had been carried out, a Cronbach's alpha of 0.77 was obtained, which determines the acceptance of the consistency of the questionnaire. It is an instrument consisting of three blocks (Annex I). The first covers three aspects: area of work (HC, PC and SHC), seniority, stratified into low (0–10 years), medium (11–20) and high (>21). In addition, the degree of previous training in wound care, ranging from no training (0), courses of up to 20 h (1), university expert (2) and university Master's degree (3). The second block constitutes the body of the tool and consists of three areas with 30 questions on wound knowledge that fall under the different areas of knowledge. Each question has five answer options and only one is correct. These areas are etiology (E), diagnostic methods (D) and treatment (T). The

first area includes items E1, E9, E13, E19, E26, E27 that are questions aimed at assessing the respondents' knowledge of wound etiology and a maximum score of 6 can be obtained. The second one on diagnostic methods includes items D2, D5, D6, D8, D10, D14, D15, D16, D17, D18, D20, D23, D25, D28, D29, D30, which assess the respondents' knowledge of diagnostic methods, and a maximum score of 16 can be obtained. The third area is about knowledge of treatment and includes items T3, T4, T7, T11, T12, T21, T22, T24, a maximum score of 8 can be obtained. The maximum score that can be obtained in knowledge block 2 is 30 points. Finally, the third block consists of three questions that aim to determine the degree of satisfaction with the training received in the subject, both at university level and in the workplaces where the professional works, as well as the perceived need for training by the professional (Annex I).

3.3. Ethical and legal considerations Participation in the study was voluntary. The participants were informed about the study and data processing and protection according to the EU general data privacy regulation (EU, 2016/679). The anonymity of the participants was maintained and the confidentiality of the data was maintained according to the Organic Law 3/2018, of 5 December, on the Protection of Personal Data and Guarantee of Digital Rights (LOPD-GDD) and the Helsinki declaration. Ethical approval was obtained from the University Ethics Committee Ref. CIEC 002104, including approval for the creation of an expert panel group for the Delphi process.

3.4. Statistic Collected data were analyzed using IBM SPSS v. 26.0 software. A descriptive statistical analysis was carried out using absolute and relative frequencies of the variables, as well as measures of central tendency such as mean, median and mode. The quantitative variables were described as mean \pm standard deviation (SD), while the qualitative variables were described with absolute and relative frequencies. Changes in clinical variables were compared before and after performing the educational intervention, using Student's t-test for continuous variables and the Chi-square test for qualitative variables. A p-value 20 years) in 40.78 % (n =62) indicating that 59.85 % (n =91) of the respondents had >10 years of experience. When analyzing professional experience by level of care, we found a mean of 15.56 \pm 12.653 years of experience in HC, 20.73 \pm 13.380 years in PC and 14.87 \pm 12.380 years in SHC. Regarding wound training, 29.60 % (n =45) acknowledged no specific training in chronic wounds, 65.13 % (n =99) had courses of up to 20 h, 4.60 % (n =7) had university expert training and only 0.65 % (n =1) had a university master's degree

in wounds. 4.2. Analysis of the chronic wounds knowledge test The results of the mean scores obtained in the overall test in each area of work and for each variable analyzed are shown in Table 1. The data analyzed on wound knowledge by area of work showed that nurses working in primary care had the best results, with the highest scores for

knowledge of wound etiology as shown in Table 1. Nurses working in social health centers stood out in their knowledge of diagnosis. Although we can say that, there was no significant association between the area of work and the test result, except in the questions of the treatment section

Table 1
Results of the Chronic Wound Knowledge Test (CWKT) in each of the areas with the variables analyzed.

	Etiology		Diagnosis		Treatment		Total	
	Mean/SD	p value	Mean/SD	p value	Mean/SD	p value	Mean/SD	p value
Level of care where you work								
Hospital care	2.62 ± 1.15	0.289	8.00 ± 3.17	0.076	4.48 ± 1.42	<0.010	15.30 ± 4.96	0.544
Primary care	3.29 ± 1.39		9.45 ± 2.76		6.00 ± 1.46		18.92 ± 4.30	
Socio-health centre	2.80 ± 1.01		10.20 ± 2.24		6.00 ± 1.66		17.40 ± 2.97	
Work experience								
Low	2.67 ± 1.16	0.050	8.41 ± 2.94	0.543	5.05 ± 1.45	0.710	16.72 ± 4.86	0.226
Medium	2.48 ± 1.40		8.86 ± 2.73		5.24 ± 1.70		16.13 ± 4.59	
High	3.23 ± 1.19		8.92 ± 3.32		5.05 ± 1.79		17.32 ± 4.84	
Wound training level								
Untrained	2.91 ± 1.27	< 0,010	9.02 ± 3.04	0.173	5.31 ± 1.69	0.316	17.32 ± 4.87	0.002
Course up to 20 h	2.91 ± 1.27		9.02 ± 3.04		5.31 ± 1.69		17.32 ± 4.87	
University expert	3.86 ± 1.57		7.71 ± 4.23		5.43 ± 1.27		17.29 ± 6.31	
University master	5.00		13.00		6.00		24.00	
Total test	2.86 ± 1.250		8.70 ± 3.580		5.09 ± 1.64		16.72 ± 4.86	

Note: maximum test score 30; maximum score in the area on etiology (E) 6 points, in diagnostic methods (D) 16 points and in the area on treatment knowledge (T) 8 points. This table shows the mean and the standard deviation (std) for all variables. The results were analyzed by scoring each correct item with 1 point and each incorrect item with 0 points.

2. Discussion

Currently, concerns are raised about nursing preparation for wound care clinical skills due to their fragmentation and lack of objectives in the undergraduate curriculum (Redmond et al., 2018). However, concerns are also evident in postgraduate education. The learning objectives and content of wound care training are not always clearly defined (Redmond et al., 2018) and there has even been a consensus among experts as to what the learning objectives should be for the best training (Kielo-Viljamaa et al., 2022a, 2022b). The foundation of wound care competence of registered nurses is built during their undergraduate nursing studies. However, we cannot forget the continuity of this learning during postgraduate studies. 5.1. Discussion of the results From the findings of this study, there is a need for more specialised training in undergraduate and postgraduate nursing practice. It is important to gain greater control in the management of chronic wounds through knowledge of the etiology, diagnosis and treatment of chronic wounds. Our study assessed nurses' general knowledge on the management of chronic hard-to-heal wounds with a slightly higher percentage of correct answers than other studies (Gonçalves et al., 2015; Schmidt et al., 2020). Considering the workplace, hospital-based professionals scored the lowest, with those working in PC having the best efficacy, with an average level of correct answers. A statistically significant association was found between work centre and total test score (\$10 billion of annual healthcare Eur. Chem. Bull. 2023, 12(Regular Issue 02), 402 - 406

expenditure in the United States (Rosenbaum et al., 2018). In Spain, treatment of pressure ulcers alone exceeds € 600 million each year (Soldevilla-Agreda et al., 2022). Work experience could also be an added factor to the lower knowledge shown by the hospital-based professionals in this study. This may lead us to think that the problem may lie in the lack of specialised continuing education. This is in line with similar studies (Dugdall and Watson, 2009; Kielo-Viljamaa et al., 2022a, 2022b) which show that nurses prefer experience, clinical practice and learning from colleagues, i.e. they rely on low-level evidence rather than using evidence-based guidelines. Hospital professionals had the lowest level of training, in contrast to PC professionals who had the highest number of university experts and masters. We affirm that among the participants in this study, having a higher level of specialised wound training, namely a master's degree and an expert, is associated with better knowledge outcomes (nurses base their actions on the experiences of others or on non-formal training from the pharmaceutical industry. Regarding the satisfaction and opinion of respondents with the training received throughout their professional career in chronic wounds evaluated in the third block of the CWKT we highlight that of professionals believe that the implementation of a specific subject in wounds in undergraduate training is necessary. Coinciding with the low dedication of ETCS credits that Spanish universities dedicate to wound training at both academic and postgraduate level (Tobajas-Se

nor et al., 2017). In our study, we observed that the least educated considered the training received for healthcare personnel in general by healthcare institutions to be sufficient. This contrasted with the opposite opinion of the expert nurses with a master's degree in chronic wounds, who considered it insufficient. This suggests that the lower the level of knowledge, the lower the awareness of its deficiency. The generation of knowledge and development of new technologies and treatments for the care of people with hard-to-heal chronic wounds has made significant advances. Hence the need for constant updating of knowledge based on scientific evidence (Dhar et al., 2020). While time of experience may be one aspect that contributes to improved practice and knowledge, it is not sufficient. There may also be motivational and individual factors, related to the desire to continuously learn and train, which have a direct impact on the healing and resolution outcomes of chronic wounds in patients (Bergersen et al., 2016; Frykberg and Banks, 2015). As well as the need for greater institutional involvement.

5.2. Strengths and limitations We have not differentiated statistically by gender to avoid biased extrapolation of the results. Due to the high participation of women versus men in this study. It is more difficult to generalize to the whole population in a non-probability sample as we have done with the study participants. However, it is quicker to do and more economical if the researcher has a good knowledge of the field of study, as in our case. In addition, the nurses participating in the test came from different levels of health care, reducing this possible limitation. It is important to note that all participating nurses had or had cared for patients with complex chronic wounds. This is considered a strength when assessing wound knowledge based on evidence of being part of nursing work at different levels of care, and not to take samples from other fields of work where this need is not evident. Another limitation may be that in each country, there are differences in the training and competencies of undergraduate and postgraduate wound care nurse educators, although we consider that these findings can be extended to all those countries subject to the European Union Directives because they have similar competency criteria and professional qualifications (Satu et al., 2013). In addition, to other countries developing their own training and competence programmes in this field (National Pressure Ulcer Advisory Panel, 2014). International organizations, such as the World Health Organization and international medical associations, often provide guidelines and recommendations on chronic wound management, as chronic wound care is an area of health care that

transcends borders and has global relevance.

6. Conclusions The level of knowledge about chronic wound management of post graduate nurses in different care areas is low. Our results show dissatisfaction with the wound training received during undergraduate studies. The nurses in the study consider it important to promote and improve specific training in chronic wound management from undergraduate studies. This specific knowledge is integrated in a transversal way in different subjects of the studies; however, it should be further enhanced as a specific area. PC nurses are more knowledgeable about chronic wound

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