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Development and validation of a novel clinical instrument for wound management at a tertiary hospital in Ghana

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Abstract

Background: Wound management remains a challenge globally. Patients' outcomes after wound care have not been satisfactory due to the lack of an appropriate clinical guideline instrument for wound management among nurses in health institutions in Ghana. Some of the desired outcomes include infection prevention, faster wound healing, fewer complications, fewer hospitalisations, and decreased mortality. However, the currently available instrument in Ghana has not yielded the desired results, highlighting the need for a more appropriate, standardised instrument to improve wound care outcomes.

Objective: This study aimed to develop and evaluate the instrument for managing wounds.

Methods: This cross-sectional study involved 200 consenting nurses of various ranks recruited from four departments at Korle-Bu Teaching Hospital. The instrument used was self-administered. It involved 23 items on a 4-point Likert scale from three domains: before, during and after and two subdomains: assessment and technique. Mean scores were computed for each item. Values greater than or equal to 2 were classified as good knowledge and practice. Cronbach's α was used to test reliability, and the content validity index (CVI) for validity of the tool.

Results: Cronbach's α was 0.7, the CVI was 0.87, and the interclass correlation coefficient was 0.801. The mean scores of the domains were: before (3.3 ± 0.4); during (3.2 ± 0.4); after (3.8 ± 0.2), technique of wound care (3.5 ± 0.5); and wound assessment (3.2 ± 0.4). The maximum score was 4. These mean scores were all above 3, indicating positive responses to most items in the instrument.

Conclusion*:* The instrument had high reliability and a good CVI, with high positive mean scores on the items. The instrument is therefore reliable for use in wound care to improve quality, patient outcomes, and patient satisfaction.

Keywords: Nurses, questionnaire instrument, wound management, knowledge, practice, reliability, content validity

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INTRODUCTION

Effective wound management must be based on evidence-based knowledge and practice, supported by a standard tool, strict adherence to the instrument, and good clinical settings and availability of standard logistics. This instrument must be validated under different population groups to establish its reliability and effectiveness for successful wound care. The current wound management guideline used in Ghana is based on the Caucasian population and has been revised a few times. The use of the existing guideline did not improve wound care in Ghanaian patients [1]. This may be due to contextual differences, including environmental factors, cultural practices, variations in behaviour and attitudes towards wound care, and disparities in access to wound care services. Therefore, there is a need to develop a Ghanaian-specific instrument to guide the management of wounds in our health facilities. The knowledge and practice of wound management among nurses are critical and must therefore be supported by effective guidelines [2]. A review of the literature revealed

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limited access to evidence-based guidelines and poor knowledge and practice of chronic wound management, along with its associated factors, among healthcare workers [3]. Wound management is a challenge in health care institutions in Ghana due to the lack of evidence-based guidelines, appropriate care instruments, shortage of speciality staff/experts, limited clinical settings, and inadequate standard logistics [1,4]. Furthermore, poor training and inadequate understanding of chronic wound management, as well as the inappropriate use of wound care tools, contribute to poor wound management [5].

Nurses with sufficient knowledge of wound management guidelines are more likely to deliver evidence-based practice that satisfies patients than those with limited knowledge, but a demonstrated optimistic attitude [2,3,6]. A study in New Jersey reported that the use of the clinical guideline tool for standard dressing enhances wound care and facilitates healing [7]. However, the lack of adequate guidelines for complete wound assessment before intervention may lead to poor care outcomes. Therefore, the guideline instruments must include a thorough wound assessment before intervention. Assessment of the wound enables the health worker to identify the underlying conditions contributing to delayed wound healing and potential complications, and to decide on the most appropriate treatment regimen (topical agents and techniques) to facilitate wound healing and prevent further infection that may lead to complications [8,9,10,11]. The existing international instrument involves 'Seven-Key-Steps' for wound assessment, namely, health history taking, location or site of the wound, wound dimensions, type of tissue involved, odour of the wound, drainage amount, and peri-wound skin [9,11,12,13].

Another assessment guideline employs the "T.I.M.E" acronym for the preparation of the wound bed. This involves nonviable tissue (T), which must be debrided, and viable tissue must be sustained; inflammation and infection (I), which must be controlled or prevented; moisture (M) imbalance, which must be corrected and balanced moisture must be maintained; the edge and epithelialisation (E), which must be corrected or restored [4,9,14].

Previous wound management tools may not be suitable for Ghanaian nurses and patients due to inadequate wound care tools, limited health care resources, and other healthcare system challenges [1]. Hence, it is necessary to develop a wound management tool for Ghanaian nurses caring for patients. The wound care instruments in use do not include pain rating and management, and also do not include monitoring vital signs before and after the intervention. Furthermore, the topical agents' solutions are poured before wound assessment. It is thought that, in the new instrument, pain assessment would be necessary, as pain management in our facilities is not optimal. In addition, monitoring vital signs before and after the intervention will be needed to assess the patient's stability. The newly developed instrument must be validated among nurses to ensure it is reliable and appropriate for the intended patient population, and hence ensure effective wound care and desirable outcomes.

MATERIALS AND METHODS

Study design and sites

This was a cross-sectional study conducted among 200 nurses recruited from four departments of the Korle Bu Teaching Hospital (KBTH), including Surgery, Medicine, Obstetrics and Gynaecology, and Paediatrics. KBTH is the largest referral hospital with about 2000 bed capacity, located in Accra, the capital city of Ghana. KBTH manages the high volume of patients with wounds. A total of 50 eligible and consenting nurses in each department were consecutively selected from October 1st to December 31st, 2020. Respondent nurses were all 18 years and above.

Development of the clinical guideline instrument

The instrument was based on three domains: before, during, and after wound dressing. Specific questions were developed under the different domains of the tool.

Before the wound dressing domain

This included six questions that addressed the following issues: self-introduction, establishing rapport, explaining the procedure, setting up the dressing room and trolley, monitoring vital signs before and after, and finally administering the prescribed analgesics.

During the wound dressing domain

This considered the following issues: dressings performed under aseptic technique and receptacles for used consumables. There were also two subdomains covering wound assessment and wound technique.

Wound assessment subdomain

Under the wound assessment subdomain, the following were addressed: classification of wounds, identification of baseline abnormalities, probing to assess wound depth and length, taking wound swabs for culture and sensitivity testing, and taking photographs for wound monitoring.

Wound technique subdomain

This subdomain involved selecting the appropriate wound-cleansing solution, the appropriate technique, the appropriate topical agent, and sterile gauze for packing.

After the wound dressing domain

This involved questions about hand washing after every procedure, ensuring patient comfort and expressing gratitude, discarding used items and disinfecting reusable items, cleaning the dressing room in preparation for the next patient, documenting and signing findings during assessment, and finally informing the superiors in charge of the findings. Each domain was measured on a four-point Likert Scale, with options of never, sometimes, most of the time, and always. The instrument summary score is presented in Table 1. The questions on the various domains for the development of the tool were formulated with

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consultation and support from experts in the field of wound management, following a thorough review of the literature.

Pre-testing of the instrument

This was done with 15 nurses at KBTH due to COVID-19 restrictions and was followed by a consultation with an expert to review the final instrument, which had 33 questions. Invitations to participate in a content validity assessment of self-generated questions, supported by the literature, were sent to 4 wound care experts to score, provide comments, and offer suggestions. The original questions were reduced from 33 to 28 and later sent to seven other wound experts in China, who further advised the reduction of items to 23. These seven experts estimated the content validity index (CVI), which yielded a value of 0.87 (Table 2). The formula for estimating the CVI for ordinal scales is CVI = n/N. Where: n = number of raters that agreed and N = sum of evaluators. For item 1, 5 raters agreed, while 2 did not. Therefore, CVI for that question = 5/7 = 0.71. The overall CVI is estimated as the mean CVI for all the questions in the tool. The overall CVI for the instrument was estimated as 0.87.

Administration of the final instrument

The developed instrument was implemented among 200 nurses across the four departments (Surgery, Medicine, OBGYN, and Paediatrics) of KBTH. Data collection started after consent was obtained from the respondents. The survey was conducted separately in undisturbed rooms for each department to protect participants' privacy. Participants were asked to rate how often they practised wound management using 23 items. A four-point Likert Scale ranging from "never" to "always" was used. It took approximately 10 minutes to complete the self-administered questionnaire. Each right answer (response) to the question was coded as '1', and each incorrect answer was coded as '0'. The summary of each domain or subdomain was calculated as a total score across all items in that domain to estimate knowledge and practice scores. The higher the score, the better the knowledge level and the practice of wound management.

Data processing and statistical analysis

Each questionnaire was checked for errors immediately after collection, and any missing items were verified with participants. The data were entered and analysed using SPSS 25.0. A descriptive summary of the composite scores was conducted for all items within each domain and subdomain of the instrument. The scale ranged from 1 = Never to 4 = Always. The mean score value of 2 was used as the cut-off for the scale [15]. The mean of all item scores was used as the aggregate score for each scale. Participants with mean scores above 2.0 were considered to have good knowledge and practice in wound management. Those having mean scores less than or equal to 2 responded as never or sometimes, and those with mean scores greater than 2 responded as most of the time to always, indicating good knowledge and practice. This study was approved by the ethics committee of Xiangya School of Nursing at Central South University with approval ID 12020001 and the Korle Bu Teaching Hospital Institutional Review Board with clearance approval ID KBTH-IRB/000139/2020

RESULTS

The mean scores for the knowledge and practices estimates are reported in Table 1, while the CVI estimation is reported in Table 2. The practice mean score is reported in Figure 1. Reliability of this instrument's internal consistency was estimated using Cronbach's alpha ($\alpha = 0.7$). The interclass correlation coefficient for the average measures was also 0.801 (95% CI, 0.58 – 0.839), $p < 0.001$. The means scores of the domains are reported in Table 1. The result was reported on the three major domains of the instrument: before, during, and after the wound dressing. The mean scores for before wound dressing, during wound dressing and after wound dressing domains are as follows: 19.86 ± 0.18, 33.09 ± 0.29, and 26.61 ± 0.12, respectively.

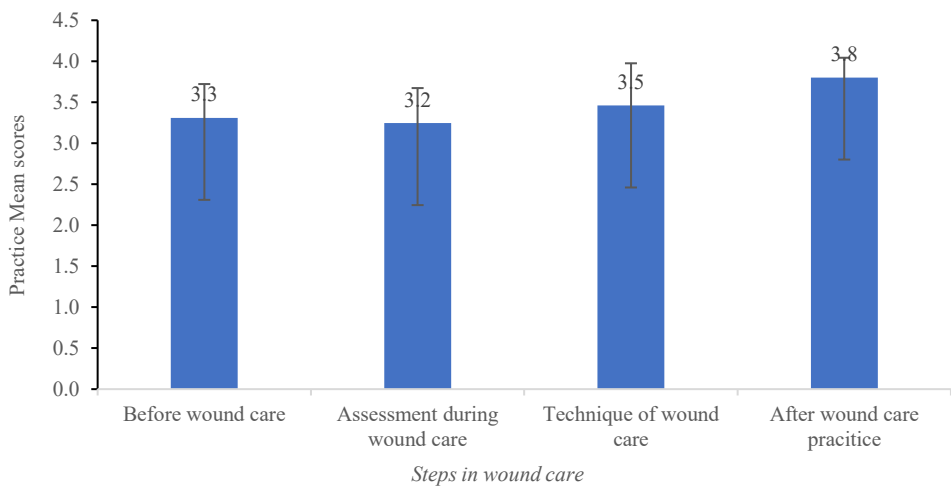

Figure 1. Wound care practice mean scores among the participants.

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The two items with the highest mean scores, 3.89 ± 0.03, all appeared in the after-wound dressing domain, with the following questions: "Do you discard used items and disinfect instruments if they are not disposable?" and "Do you make sure the wound dressing room is clean for the next wound dressing?" However, the participants performed poorly in monitoring vital signs before and after wound dressing, for which item they had the lowest mean score of 2.35 ± 0.07 (Table 1).

Wound care assessment and practice among participants

The mean scores are as follows: before wound care (3.3 ± 0.4), during wound care (3.2 ± 0.4), technique of wound care (3.5 ± 0.5) and after wound care practice (3.8 ± 0.2). On a scale of 1 - 4, all the mean scores were above 3.0. This indicated adequate wound care assessment and practice (Figure 1).

Estimation of content validity index (CVI) by seven raters on the instrument

To validate the instrument, experts were asked to assess its reliability using the content validity index (CVI). There were seven raters; when they agreed, it was rated X; when they disagreed, it was rated 0. The composite score was estimated as the mean of each rater's score. In item 1, five of the seven raters agreed (5/7 = 0.71). On item 8, all 7 raters agreed, giving a CVI of 1.0.

Reliability and validity test of the instruments

Confirmatory factor analysis (CFA) was conducted, and the following parameters were estimated: KMO to assess the adequacy of the data gave a value of 0.748; Bartlett's test: chi-square = 1172.7, df = 253, $p < 0.001$. Oblimin rotation was used for factor loading. The Interclass Correlation Coefficient (ICC) was 0.810 using a two-way mixed model with type as the consistency factor for the average values.

Table 1. Mean scores for practice on chronic wound management (n = 200).

Item	Mean± SD
Before wound dressing:	
1) I introduce myself to the patient, at the same time checking the wrist band for the correct patient.	3.50 ± 0.05
2) I establish a rapport with the patient or the patient's guardian.	3.73 ± 0.04
3) I do explain the procedure and do allow the patient to give consent without persuasion. If the patient refuses, I inform the unit head, then the resident doctor, and document.	3.58 ± 0.0 4
4) I set up the dressing room and prepare a wound dressing trolley aseptically before wound dressing is done.	3.85 ± 0.03
5) Do you monitor vital signs before and after wound dressing?	2.35 ± 0.07
6) I make sure that the right prescribed analgesics is administered and wait for its effect before touching the wound.	2.86 ± 0.06
During wound dressing:	
7) I make sure that wound dressing is done under aseptic technique.	3.87 ± 0.03
8) Do you use a receptacle for the used consumables or waste?	3.81 ± 0.03
(*A*) *wound assessment after opening*:	
9) Do you assess by using 7-Key-Steps of wound assessment and classification of wound, before dressing with the right topical agent?	3.50 ± 0.05
10) I observe for any base line of abnormalities like high temperature, peri- wound, pussy/abscess, necrotic, slough, gangrene etc.	3.38 ± 0.05
11) Do you probe for the depth and measure the wound, if the is a cavity?	2.69 ± 0.06
12) I take wound swab for culture and sensitivity, if the wound is infected.	2.95 ± 0.06
13) Do you take a wound photographs for monitoring the progress of the wound? (By seeking the consent from patient before taking photograph)	2.54 ± 0.07
(B) wound dressing techniques:	
14) I decide which cleansing solution to be used for each type of wound, whether antiseptic or isotonic solution as well as topical solution or paste needed.	3.37 ± 0.05
15) Do you decide the technique you will use, whether dabbing for a sutured wound, irrigating for a clean wound and debriding or toileting if the wound is infected/slough/necrotic.	3.45 ± 0.05
16) After the cleaning, I use prescribed topical agents for application and decide on the sterile dressing's gauze according to the assessment of the wound.	3.57 ± 0.05
After wound dressing:	
17) Do you wash hands after every procedure?	3.95 ± 0.02
18) I thank the patient and make the patient comfortable before I leave.	3.80 ± 0.03
19) Do you discard used items and disinfect instruments, if it's not disposable?	3.89 ± 0.02
20) Do you make sure the wound dressing room is clean for the next wound dressing?	3.89 ± 0.02
21) I document my findings during assessment of wound dressing.	3.85 ± 0.03
22) Do you sign your name after documentation?	3.77 ± 0.04
23) Do you inform the nurse in charge about your findings?	3.47 ± 0.06

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The five domains of the instrument had factor loadings with eigenvalues all greater than 1, and the variances explained under the extraction and oblimin rotations are presented in Table 3. The table shows that at least 50% of the variance has been explained.

DISCUSSION

Effective wound management depends on standard instruments and the competencies of the wound caregiver. Adequate knowledge and practice improve the outcome of the wound management of the patient. In addition, appropriate tools and settings are essential to achieving the best possible outcome in wound management. Standardised procedures defined in the appropriate instrument facilitate effective wound management and ensure satisfactory outcomes. This study evaluated the content validity and reliability of the instrument developed for effective wound management at the Korle Bu Teaching Hospital. The tool developed was based on three main domains of wound management: before, during and after wound care. The instrument included items on knowledge and practice in wound management. The instrument consisted of 23 items on a 4-point scale. This was tested on 200 nurse respondents. The mean score of each domain was then estimated. The content validity index (CVI) for the tool was

Table 2. Content validity Index (CVI) of survey items (Tool)

Item No.	Rater 1	Rater 2	Rater 3	Rater 4	Rater 5	Rater 6	Rater 7	CVI
Contemporary skills								
1	X	X	X	0	0	X	X	0.71
2	X	X	X	X	X	0	X	0.86
3	X	X	X	X	X	X	X	1
4	X	X	X	0	X	X	X	0.86
5	X	X	X	0	0	0	X	0.57
6	X	X	X	0	X	X	X	0.86
7	X	X	X	0	0	X	X	0.71
8	X	X	X	X	X	X	X	1
Functional Concept								
9	X	X	X	X	X	0	X	0.86
10	X	X	X	0	X	X	X	0.86
11	X	X	X	0	X	X	X	0.86
12	X	X	X	0	0	X	X	0.86
13	X	X	X	0	0	X	0	0.57
14	X	X	X	0	0	X	X	0.71
Intellectual Capability								
15	X	X	X	X	X	X	X	1
16	X	X	X	X	X	X	X	1
17	X	X	X	X	X	X	X	1
18	X	X	X	X	X	X	X	1
19	X	X	X	X	X	X	X	1
20	X	X	X	X	X	X	X	1
21	X	X	X	0	0	0	0	0.43
22	X	X	X	X	X	X	X	1
23	X	X	X	0	X	X	X	0.86
24	X	X	X	X	X	X	X	1
25	X	X	X	X	X	X	X	1
26	X	X	X	X	X	X	X	1
27	X	X	X	0	X	X	X	0.86
28	X	X	X	X	X	X	X	1
29	X	X	X	0	X	X	X	0.86
Overall CVI								0.87

Table 3. Factor loading for the five domains and their variances explained

Total variance explained									
Component / Domains	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.848	21.076	21.076	4.848	21.076	21.076	3.017	13.120	13.120
2	2.164	9.410	30.486	2.164	9.410	30.486	2.271	9.873	22.993
3	1.617	7.029	37.515	1.617	7.029	37.515	2.159	9.389	32.382
4	1.511	6.569	44.084	1.511	6.569	44.084	2.117	9.206	41.587
5	1.368	5.950	50.034	1.368	5.950	50.034	1.943	8.447	50.034

0.87, and the Cronbach's α was 0.7. The interclass correlation coefficient for the average measures was also 0.801 (95% CI: 0.58 – 0.839), $p < 0.001$. These measures are high and provide a reliable basis for using the instrument for wound assessment and management to achieve good wound care outcomes and patient satisfaction.

The two items with the highest mean scores (3.89 ± 0.03), indicative of good performance, occurred under the after-wound dressing domain. The items assessed were the practice of discarding used items, disinfecting non-disposable instruments, and ensuring the wound dressing room is clean for the next wound dressing. The item on which participants performed poorly involved assessing vital sign monitoring before and after wound dressing, and the lowest mean score was 2.35 ± 0.07. The total mean scores for the before, during, and after wound-dressing domains are 19.86 ± 0.18, 33.09 ± 0.29, and 26.61 ± 0.12, respectively. The total mean score for the Before-Wound Management domain (19.86) was out of a maximum of 24, equivalent to 83% of the maximum. The During-Wound Management domain mean score was 33.09 out of a maximum of 36, representing 91.7% of the total possible score. The After-Wound Management domain also yielded a mean total score of 26.6 out of 28, representing approximately 95% of the maximum score. These domain total mean scores indicate the high performance of the items used to assess the knowledge and practice of wound management among the respondent nurses.

Regarding the assessment of the nurses' wound management practice before wound dressing, the majority of nurses assessed the wound before dressing, but did not probe or take wound swabs for further investigation. With reference to wound assessment after opening, it was revealed in this study that participants who classified the wounds and those who assessed for any baseline abnormalities had their mean and standard deviation scores as (3.50 ± 0.05) and (3.38 ± 0.05), respectively. This indicated good practice. However, several researchers have reported that the Seven-Step Key for wound assessment helps health care clinicians identify the underlying condition and determine the appropriate treatment regimen for wound management, thereby facilitating wound healing [11,12,16]. The study demonstrated that nurses who assessed and classified wounds during wound management possessed good knowledge. A report on Buruli ulcer cases in Ghana and Benin found that overall understanding and practice of wound assessment remained persistent [17]. Karen et al. noted that it is important for each healthcare specialist to understand and improve their knowledge and skills to enable accurate and timely wound assessment, thereby ensuring continuity of care [14].

However, the instrument for wound assessment after wound opening is not consistently used by the majority of nurses, indicating a need for greater awareness in this regard. Wound dressing depends on the outcome of the wound assessment provided with the standard dressing tool, as well as on topical agents [16]. However, respondents who probed for the depth of the wound and those who took wound swabs for culture and sensitivity to rule out particular infection had their mean scores as (2.69 ± 0.06) and (2.95 ± 0.06), respectively. This was considered to be a low score, indicative of poor assessment. However, this study shows that the majority of nurses do assess the wound before applying the standard topical agent for a specific wound. A study in Ghana indicated that limited access to evidence-based instruments and inadequate understanding of wound management techniques affect wound-healing outcomes [3]. Furthermore, it has been shown that observation and assessment enable healthcare professionals to determine the most appropriate topical agent and standard dressing required to promote healing, prevent infection, and minimise complications [3,9,18].

Studies conducted in the United States of America and India reported that advanced wound dressings can be selected based on proper assessment of wound characteristics and the decision of which available dressing products are most suitable for that wound [4,19]. A related study showed that properly assessing wound features helps determine the appropriate wound dressing products to use [7]. This study showed that after assessment, the majority of nurses cleaned the wound, used the prescribed or appropriate topical agent, and then applied sterile gauze. This is indicated by the mean score of (3.57 ± 0.05). Similarly, studies reported that wound assessment assists health workers in evaluating the most appropriate skills to apply [3,9,20,21].

The mean vital signs monitoring score before and after wound dressing (2.35 ± 0.07) indicates poor performance by the nurses. A study conducted in China has shown that assessing the patient's physiological vital signs, such as temperature, fasting blood sugar, and random blood sugar, may provide diagnostic indicators and indicators of healing status, in addition to information on adverse healing events [22,23]. Moreover, the mean score for suitable prescribed analgesics (2.86 ± 0.06) was low, indicating poor performance by the nurses in pain management. This poor pain management may increase anxiety or discomfort, thus reducing patient satisfaction with care. This requires the inclusion of pain assessment in the instrument under study. A study done in Australia emphasised the extent to which wound pain assessment and treatment should be part of everyday wound care practice [23,24]. In addition, it was recommended that the pain assessment scale should be used to assess related and incident pains, as well as pain assessment before, during, and after a dressing change. This should continue to ensure a consistent pain management strategy and a desirable outcome [22,23].

The confirmatory factor analysis, which considered the factor loadings with respect to the instrument's items, yielded Eigenvalues greater than 1 and explained at least 50% of the variance in the data. This affirms the instrument's reliability and validity. The instrument was

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not intended as a psychometric tool but rather to assess actual knowledge and practice in wound management.

According to the study's results, there was inadequate knowledge of wound management. Using an evidence-based wound care tool facilitates healing, prevents complications, reduces workload, and reduces long hospitalisation and financial burden. In addition, the majority of nurses did not consistently follow all the required steps when using the wound assessment instrument after the wound was opened. This suggests that greater awareness and training are needed to emphasise the importance of adhering to every step of the assessment tool during wound assessment. There must be a tool for proper assessment of wound characteristics and for decision-making on the use of available dressing products suitable for that particular wound. In addition, appropriate standard wound care techniques for the specific wound must be provided, as every wound is unique and must be treated accordingly. Moreover, the wound management in our study indicates the need for nurses to provide proper wound care. It is important for nurses to deepen their knowledge, refine their techniques, and improve their practice to enhance the quality of wound care. This can be enhanced by the use of this new wound care instrument. We consider the tertiary health facility where the study was conducted as ideal and the highest standard expected for wound management; hence, this should apply even at lower-care facilities. This has positive implications for practice at every level of care facility. Although this study had a significant impact on nurses, it had several limitations. Responses were primarily self-reported; therefore, recall bias and social desirability bias may have occurred. Nurses might have rated their performance on various items higher than their actual practice.

Before using this instrument, the wound management practitioners should first be trained on it and their practice evaluated to ensure effective outcomes of the interventions. For specific items in the tool where nurses are found deficient, special attention should be given to improve their practice. The instrument must be tested in other lower-level healthcare facilities to assess its effectiveness in achieving good wound management outcomes, since this study was conducted in a tertiary healthcare facility. This instrument should be included in health training institutions to train new nurses to become more efficient in wound management, thereby achieving greater patient satisfaction.

Conclusion

Compared to other tools, which rarely assess pain or monitor vital signs, this instrument included items to assess pain and its management, as well as to monitor vital signs before and after wound dressing. This was intended to improve the outcome of the wound management. The result showed that there was adequate reliability (Cronbach's α = 0.7) of the instrument to assess both knowledge and practice of wound management. The three main domains assessed adequately showed good and poor performance on the specific items in each domain. The domains included Before, During and After wound dressing. The content validity index value of 0.87 is indicative of adequate content validity. This implies that the tool consistently yields reproducible results across various settings in wound management. This is supported by further detailed psychometric analysis, including the KMO, Bartlett's test, interclass correlation coefficient, and confirmatory factor analysis.

DECLARATIONS

Ethical consideration

The study was approved by the ethics committee of Xiangya School of Nursing at Central South University with approval ID 12020001, and the Korle Bu Teaching Hospital Institutional Review Board with clearance approval ID KBTH-IRB/000139/2020

Consent to publish

All authors agreed on the content of the final paper.

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None

Competing interest

The authors declare no conflict of interest

Author contribution

DOB developed the initial concept, collected and analysed the data, and drafted the manuscript. TAN contributed to data analysis and manuscript writing. EA and AP revised the study instrument and contributed to manuscript writing. HW revised the instrument, supervised the student work, and contributed to manuscript writing. All authors read and approved the final manuscript.

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Availability of data

Data is available upon request to the corresponding author

REFERENCES

1. Ghana Nursing and Midwifery Council (n.d.) Ghana Nursing Procedures Manual. Accra, Ghana
2. Chen YT, Chang CC, Shen JH, Lin WN, Chen MY (2015) Demonstrating a conceptual framework to provide efficient wound management service for a wound care center in a tertiary hospital. Medicine (United States) 94:e1962

3. Owusu-Boakye D, Ndanu TA, Paintsil A, Angyigba E, Wang H (2024) Knowledge and practice of chronic wound management and associated factors among nurses at the Korle-Bu Teaching Hospital, Ghana. Health Sci Investig J 5:660–669
4. Frykberg RG, Banks J (2015) Challenges in the treatment of chronic wounds. Adv Wound Care 4:560–582
5. Kaya Z, Karaca A (2018) Evaluation of nurses' knowledge levels of diabetic foot care management. Int J Diabetes Clin Res 2018:1–5
6. Gould LJ (2020) Opportunities and challenges of the management of chronic wounds: a multidisciplinary viewpoint. Wound Repair Regen 28:123–135
7. Granick MS, Sood A, Tomaselli NL (2014) Wound dressings and comparative effectiveness data. Adv Wound Care 3:511–529
8. Ousey K, Cook L (2011) Understanding the importance of holistic wound assessment. Practice Nursing 22:308–314
9. Nichols E (2016) Wound assessment style: headline 11:1
10. Benbow M (2016) Best practice in wound assessment. Nurs Stand 30:40–47
11. Brennan MR (2019) Wound assessment: a step-by-step process. Nursing 49:62–64.
12. Orsted HL, Keast DH, Forest-Lalande L, Kuhnke JL, O'Sullivan-Drombolis D, Jin S, Haley J, Evans R (2017) Best practice recommendations for the prevention and management of wounds. In: Foundations of Best Practice for Skin and Wound Management. Wounds Canada, Canada
13. Grey JE, Enoch S, Harding KG (2006) Wound assessment. Br Med J 332:285–288
14. Ousey K, Cook L (2012) Wound assessment: made easy. Wounds UK 8:2
15. Priyadarshani RAC, Samarawickrama MB (2017) Knowledge, attitudes and practices of patients regarding chronic wound care and point prevalence of chronic wounds at surgical and medical units in Teaching Hospital Karapitiya, Sri Lanka. IOSR J Pharm Biol Sci 12:38–46.
16. Sarabahi S (2012) Recent advances in topical wound care. Indian J Plast Surg 45:379–387
17. Phillips R, Sarfo F, Sarpong Duah M, Wansbrough-Jones M, Frimpong M (2016) Buruli ulcer: wound care and rehabilitation. Chronic Wound Care Management and Research 3:73–84
18. Ousey K, Cook L (2012) Wound Assessment: Made Easy. Wounds UK, 8(2). University of Huddersfield Repository. Available at: http://eprints.hud.ac.uk/16486/
19. Kundu A, Phuljhele S, Wale N, Gurudatta HS, Agrawal V (2018) Study of effects of negative pressure wound therapy in contaminated wounds. Int J Res Orthop 4:803
20. Keim A, Marinucci J (2019) Making better wound management decisions. J Am Acad Physician Assist 32:15–22
21. Brown A (2015) The principles of holistic wound assessment. Nursing Times 111(46):14–16
22. Pang Q, Yang F, Jiang Z, Wu K, Hou R, Zhu Y (2023) Smart wound dressing for advanced wound management: real-time monitoring and on-demand treatment. Mater Des 229:111917
23. Frescos N (2018) Assessment of pain in chronic wounds: a survey of Australian health care practitioners. Int Wound J 15:943–949
24. Medicins Sans Frontieres (MSF) (2018) Wound care protocol. MSF. Available at: https://bibop.ocg.msf.org/docs/29/L029NURM02E-P_Wound-Care-protocol_OCB_EN_2018.pdf