



## The Effect of an Educational Intervention on Nurse's Knowledge and Skill Regarding Wound Management

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### ABSTRACT

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**Background:** Wound management is still a major worldwide healthcare issue that requires advanced nursing competencies for effective healing. Nurses often face limitations due to knowledge gaps and insufficient training.

**Objectives:** This study intends to increase the knowledge and abilities of staff nurses in wound assessment and management by means of focused educational interventions.

**Methodology:** An intervention study of a single-group was used by quasi-experimental technique on 80 nurses in the Raparin administration hospitals from 5th January 2025 to 31st March 2025. The intervention was a lecture and hands-on seminars via using wound medical simulators and a bilingual pamphlet (Kurdish and English). Participants' knowledge and wound-dressing skills were evaluated before and after the intervention using a questionnaire and checklist.

**Results:** The results showed a significant improvement in nurses' wound care knowledge and skills following the educational intervention. The mean knowledge score increased from 10.84 (SD = 2.13) to 13.61 (SD = 2.53), and the mean skill score rose from 42.93 (SD = 5.26) to 56.95 (SD = 5.91). Both improvements were statistically significant ( $p < 0.001$ ), according to Wilcoxon signed-rank tests.

**Conclusion:** The study revealed that targeted educational interventions can significantly enhance nurses' knowledge and skills in wound care. Integrating regular training and evidence-based guidelines into clinical practice is essential to maintain high standards of care and promote ongoing professional development.

**Keywords:** Health Education, Nurses, Wound Care, Clinical Competence, Knowledge.

### INTRODUCTION

Wound represents an interruption in the normal integrity and functioning of the skin and the associated soft tissues, attributable to diverse factors including trauma, surgical interventions, prolonged pressure, vascular disorders, infection, and others (McNichol et al., 2022). Wounds are typically categorized as either acute, such as surgical or

traumatic wounds that progress through normal healing, or chronic, which fail to heal in an orderly or timely manner. Chronic wounds including diabetic foot ulcers, pressure injuries and venous leg ulcers pose particular clinical challenges due to delayed healing, frequent recurrence, and a higher risk of infection (David G Armstrong et al., 2025; Falanga et al., 2022).

Wound healing is a dynamic and continuous biological process that involves four overlapping and highly coordinated phases: hemostasis, inflammation, proliferation, and tissue remodeling (Lu et al., 2022). This process is influenced by both intrinsic and extrinsic factors. Intrinsic factors include age, immune status, psychological stress, hereditary skin disorders, and comorbidities. Extrinsic factors encompass infection, malnutrition, poor oxygenation, smoking, chemotherapy, radiation, and certain medications (Kimberly Ernstmeier & Dr. Elizabeth Christman, 2023).

Effective wound management is a critical component of healthcare, requiring a thorough understanding of the wound healing process and accurate assessment of wound parameters. These assessments enable clinicians to make informed decisions, guiding the wound care team toward appropriate treatments (Lu et al., 2022). Inadequate wound care is associated with multiple complications including infection, delayed wound healing, wound dehiscence, peri-wound maceration, necrosis, pain related to inappropriate dressing, and suboptimal scar formation. These complications contribute to prolonged treatment duration, increased healthcare expenditure, and diminished patient quality of life (Sharon Baranoski & Elizabeth A. Ayello, 2021).

Nurses are central to wound care, as their knowledge of wound healing physiology and their ability to perform appropriate nursing interventions are essential to improving patient outcomes (Tegegne et al., 2022). However, the field of wound management is always changing, with new technologies, and medical treatments on regular basis. This dynamic environment requires nurses to remain updated on the latest best practices. Unfortunately, knowledge gaps, limited resources, and the fast-paced nature of healthcare often prevent nurses from keeping abreast of these advancements (Halász et al., 2021).

To address these challenges, educational interventions are crucial. Educational programs that

integrate theoretical knowledge with practical skills such as hands-on workshops and case study discussions have been shown to increase nurses' understanding of wound healing processes and their clinical skills in managing various wound types (Kielo-Viljamaa et al., 2022). Several studies have demonstrated improvements in nurses' knowledge and skills after educational interventions targeting wound care (Abd & Sheta, 2020; Shower et al., 2024).

A meta-analysis by Yuan et al. (2022) confirmed that educational training is effective in enhancing both knowledge and practical skills in wound care (Yuan et al., 2022). For example, an interventional study in Turkey involving 194 nurses demonstrated a significant rise in pressure injury knowledge, from 55.4% pre-training to 69.9% post-training ( $p < 0.05$ ) (Gocmen Baykara et al., 2021). This study is grounded by Knowles' Adult Learning Theory, which highlights the importance of self-directed, experience-based, and relevant learning for adults. This framework guided the development of an interactive, practice-oriented educational intervention tailored to nurses' clinical needs, aimed at enhancing their knowledge and skills in wound management (Knowles et al., 2014).

## **AIMS OF THE STUDY**

The study was implemented to evaluate the effectiveness of an educational intervention in enhancing the wound management knowledge and clinical proficiency of staff nurses, using pre-intervention performance as a baseline for comparison.

## **METHODOLOGY**

### **Study design and participants:**

The study utilized a pre-post intervention quasi-experimental design without a control group to evaluate the impact of an educational program on wound care knowledge and practice among nurses at the (three governmental healthcare facilities) in the

Raparin administration. Raparin is an administration located within the Sulaymaniyah Governorate in the Kurdistan Region of Iraq from 5th January 2025 to 31st March 2025.

The study population consisted of 80 nursing staff members responsible for wound dressing. Eighty of the 89 recruited nurses completed both assessments and were included in the final analysis. Participants were selected from the surgical ward and emergency department of the hospitals and were present during the data collection period. Nursing staff who refused to participate or worked in wards that did not involve wound dressing procedures were excluded from the study. A convenience non-probability sampling method was used due to practical considerations such as accessibility, time constraints, and the availability of participants within the target healthcare facilities.

### **Ethical Considerations**

Ethical approval was obtained from both the Scientific and Ethical Committees of the College of Nursing at the University of Raparin. As well, official approval (Ref.No: 834 on December 11, 2024) from the General Directorate Health of Raparin was also granted. In addition, all study participants from the study obtained oral consent and all nurses who have been selected for the study have the right to involve or refuse to participate in the study. In order to preserve the data's confidentiality, participants were assured that the information would be kept anonymous and used only for research purposes.

### **Data Collection Tools**

Data were collected using a self-administered questionnaire, an observation checklist, and an educational program all of which were developed based on previous studies with similar objectives and validated by experts in the field. A panel of twelve experts including seven medical-surgical nursing specialists, four general surgeons, and one statistician assessed the tools for content validity. They evaluated the items for appropriateness, relevance, and clarity in relation to the study's

objectives. Based on their feedback, several adjustments were made, and a final draft of the instruments was established and deemed valid for data collection.

### **1. Self-Administered Questionnaire:**

A pilot test was conducted with a sample of 10 nurses to assess the clarity and relevance of the structured knowledge questionnaire prior to full implementation. Based on the feedback, minor modifications were made to improve clarity. The questionnaire was divided into three parts:

- **Part One:** Sociodemographic Characteristics – This section collected data on nurses' age, gender, education level, monthly income, and region of residence.
  - **Part Two:** Work-Related Characteristics – This section included information about years of employment, experience in the current ward, hospital affiliation, previous wound care training, participation in workshops or webinars, source of wound care knowledge, and the availability of wound care guidelines.
  - **Part Three:** Knowledge Assessment – This section consisted of 20 multiple-choice questions (MCQs) developed by the researcher following an extensive literature review. The questions covered areas such as wound types, wound healing, wound assessment, and principles of wound care and dressing.
- Knowledge scoring system:** Each knowledge item consisted of a multiple-choice question with four possible answers. Each correct answer received a score value of "1" whereas the untrue response received a score value of "0".

### **2. Nurses' Practices Observation Checklist:**

A modified observation checklist was used to assess nurses' practical competencies in wound care. It was validated through inter-rater reliability (equivalence reliability) and had a Cronbach's alpha of 0.90. The checklist included 25 steps grouped into three phases:

- **Preparation Phase (8 steps)** preparing the equipment and the patient.

- **Wound Dressing Technique (13 steps)** performing the wound dressing procedure.
- **Post-Dressing Phase (2 steps)** post-procedure care and documentation.

**Practice scoring system:** each practice item that was seen to be correctly performed was given a "1" while incorrectly performed or not performed was given a "0".

### 3. Educational Program:

An educational program was designed based on the needs identified during the initial assessment. It aimed to enhance nurses' knowledge and practical skills in wound management. The instructional program was delivered in a single, structured session with a total duration of approximately three hours. Each session consisted of:

- A lecture delivered in a seminar format.
- Hands-on training using a wound model simulator and dressing equipment.
- A bilingual pamphlet (Kurdish and English) summarizing key wound care concepts, informed by expert input and current literature.

#### Field work:

The study was conducted in three stages over a three-month period. During the preparatory stage, pre-intervention data were collected through a self-administered questionnaire and observational checklist, with nurses performing wound care on a simulated model. To reduce the risk of measurement bias, the observer scoring the skills checklist was blinded to the timing of the intervention. The implementation stage involved delivering an educational program designed based on assessed needs, which included lectures, hands-on training, and educational materials in Kurdish and English. All training sessions were delivered by the same instructor to ensure consistency. Each of the eight groups received identical training content and session duration. Participants were divided into eight groups to enhance engagement, ensure effective hands-on practice, and maintain instructional quality through smaller group sizes. Each group attended one

comprehensive session covering both theoretical and practical components of wound care. In the evaluation stage, a post-test was administered two weeks after the intervention using the same tools to measure changes in knowledge and practice.

#### Data Analysis

The data were analyzed utilizing IBM SPSS Statistics (version 27) to generate descriptive statistics (mean, standard deviation, median, and interquartile range) measures. Normality of knowledge and skill difference scores was assessed using the Shapiro–Wilk test, suitable for small to moderate samples. Therefore, the Wilcoxon signed-rank test was employed to compare pre- and post-intervention knowledge and practice scores, due to non-normal data distribution. Parametric tests (Independent t-test, One-Way ANOVA) were used for normally distributed data. A p-value of less than 0.05 was considered statistically significant.

## RESULTS

This study included 80 nursing staff members and the mean age of the participants was 36.33 years ( $\pm 8.14$ ), 36 (45%) were between 30–39 years. The majority of participants were female representing 48 (60%). Regarding educational level, more than half of the participants held a diploma in nursing 47 (58.8%), and 26 (32.5%) had a bachelor's degree in nursing; no participants held a master's degree. Concerning monthly income, 48 (60%) most of the participants reported it as barely sufficient. In addition, nearly even of the participants 72 (90%) resided in urban areas, while only 8 (10%) were from rural areas (Table 1).

Table 2 reveals the working characteristics of the study participants. The mean years of employment was 13.48 ( $\pm 8.84$ ), the majority of the participants 27 (33.8%) had been employed for 11–20 years. Regarding experience, the mean years of experience in the ward were 9.65 ( $\pm 7.43$ ), most participants 33 (41.3%) had 5 years or less. In terms of their working place, the highest number of

participants 36 (45%) were from Qaladize Teaching Hospital.

When study participants asked about wound care training, the majority of the staff members 64 (80%) had not attended any training. Regarding participation in wound care-related workshops, webinars, or seminars, only 11 (13.8%) had attended such events. Furthermore, when asked about their main sources of information, most participants 59 (73.8%) reported using the internet. Importantly, none of the participants reported the availability of wound management guidelines in their working unit.

The comparison between participants' knowledge scores before and after the intervention (Table 3). The findings discover a significant improvement in participants' knowledge following the intervention, with a P-value of 0.0001 based on the Wilcoxon signed-rank test. The mean pre-intervention knowledge score was 10.84 (54.19%), which increased to 13.61 (68.06%) post-intervention, reflecting a mean difference of 2.77 (13.87%) points. The median score also improved from 11 (55%) before the intervention to 14 (70%) after, with a difference of 3 points and 15 percentage points. The standard deviation showed a slight decrease from 2.325 to 2.27, indicating slightly less variability in post-intervention scores. The minimum score increased from 5 (25%) to 9 (45%), while the maximum score remained consistent at 17 (85%) for both assessments, though the difference in minimum scores highlights a substantial improvement among the lower-performing participants.

The intervention for nurse's skills regarding wound management indicates a statistically significant (P-value 0.0001) improvement. The mean pre-intervention skill score was 42.93 (35.85%), which increased notably to 56.95 (63.90%) post-intervention, resulting in an important rise in a mean difference of 14.02 (28.05%) points. The median score improved from 43 (36%) before to 57 (64%) after the intervention, with an increase of 14 points and 28 percentage points. The standard deviation

increased slightly from 6.378 to 7.601, suggesting a wider spread in post-intervention scores. The range of scores narrowed from 39 to 30, while the minimum score increased from 26 (2%) to 41 (32%), showing significant progress among the lower scorers. The maximum score improved from 65 (80%) to 71 (92%), with a 6-point increase and a 12-percentage point gain at the upper end of performance (Table 4).

For comparison between various demographic groups and the difference in participants' knowledge scores the data reveal variations in knowledge improvement across age groups, with the highest mean score difference observed among participants aged 50 years and above ( $4.40 \pm 1.67$ ). In terms of gender, male participants demonstrated a significantly higher knowledge gain ( $3.75 \pm 2.58$ ) compared to female participants ( $2.13 \pm 2.34$ ), with a p-value of 0.007, pointing to statistically significant difference.

Regarding educational attainment, participants with a secondary school of nursing background showed a mean score difference of  $3.00 \pm 2.31$ . However, the difference was not statistically significant ( $p = 0.638$ ). For monthly income, participants reporting barely sufficient income demonstrated a higher knowledge score improvement ( $3.02 \pm 2.41$ ) ( $p = 0.477$ ).

Considering residential location, participants from urban areas had a slightly higher mean difference ( $2.81 \pm 2.64$ ) compared to those in rural areas ( $2.50 \pm 1.60$ ), though the variation was not significant. With respect to employment duration, the highest knowledge improvement was seen in those with 11–20 years of employment ( $3.41 \pm 2.69$ ), this variation was not statistically significant ( $p = 0.159$ ).

A similar trend was noted for total years of experience, where those with 11–15 years of experience achieved the highest knowledge score difference ( $4.00 \pm 2.68$ ). Among the three hospitals, participants from Ranya General Teaching Hospital had the highest mean improvement ( $2.94 \pm 2.78$ ), ( $p = 0.993$ ).

Importantly, participants who attended wound care training showed a significantly greater knowledge score difference ( $4.81 \pm 2.29$ ) than those who had not ( $2.27 \pm 2.37$ ), with a highly significant *p*-value of 0.001. Attendance at workshops, webinars, or seminars showed minimal variation between groups, with participants who attended scoring  $3.00 \pm 2.24$  compared to  $2.74 \pm 2.61$  among non-attendees (*p* = 0.627). Regarding sources of information, participants who relied on other sources showed the greatest improvement ( $3.31 \pm 2.66$ ). Nevertheless, these differences were not statistically significant (*p* = 0.740) (Table 5).

For comparison between various demographic groups and the difference in participants' skill scores the data (Table 6) showed variations in skill improvement across different age groups, with participants aged 30–39 years demonstrating the maximum mean skill score difference ( $15.14 \pm 7.86$ ). The lowest mean difference was observed among participants aged 50 and above ( $11.20 \pm 8.90$ ) (*p* = 0.633). In terms of gender, female participants recorded a higher mean skill score difference ( $15.29 \pm 7.96$ ), although the difference approached but did not reach statistical significance (*p* = 0.072).

Regarding educational background, participants with a secondary school nursing education demonstrated the greatest skill score improvement ( $18.57 \pm 9.50$ ). This difference was marginally non-significant (*p* = 0.080). When comparing monthly income, participants with insufficient income showed the highest mean difference ( $15.16 \pm 5.89$ ) (*p* = 0.631).

In terms of residence, urban participants reported a mean skill score difference of  $14.11 \pm 7.89$ , slightly higher than rural participants, (*p* = 0.767). Regarding years of employment, participants with 6–10 years had the top mean difference ( $17.27 \pm 7.99$ ). The variation in skill score by employment duration was not statistically significant (*p* = 0.300).

Similarly, analysis by total years of experience showed that those with 6–10 years had the greatest improvement ( $16.24 \pm 7.41$ ), (*p* = 0.533). Across hospital sites, the maximum mean skill score difference was found among participants from Qaladize Teaching Hospital ( $14.78 \pm 7.57$ ), (*p* = 0.698).

Interestingly, participants who did not attend wound care training had a higher mean skill score difference ( $14.69 \pm 7.64$ ) compared to those who did attend ( $11.38 \pm 7.75$ ), though this inverse relationship was not statistically significant (*p* = 0.126). A similar trend was observed among those who attended wound care workshops, webinars, or seminars ( $10.36 \pm 7.20$ ), who had lower mean improvements compared to those who did not ( $14.61 \pm 7.70$ ), with *p* = 0.091. Regarding the source of wound care knowledge, participants who used other sources showed the highest skill score difference ( $15.08 \pm 10.00$ ).

## DISCUSSION:

This study evaluated the impact of a structured wound care management training program on the knowledge and skill levels of 80 nurses from three teaching hospitals. The results revealed significant improvements in both domains, highlighting the effectiveness of structured educational interventions in enhancing nursing competencies in wound care.

Post-intervention, knowledge scores rose markedly from 54.19% to 68.06%, indicating that the program effectively addressed existing gaps in theoretical understanding. This finding is consistent with previous studies, such as (Abd & Sheta, 2020), who reported an increase in nurses' knowledge from 55% to 80% following educational training. Similarly, (Kielo-Viljamaa et al., 2022) emphasized that structured educational support improved nurses' confidence and perceived competence in providing appropriate care.

Further analysis showed that nurses with previous wound care training exhibited significantly

greater knowledge gains (mean difference = 13.87%,  $p = 0.0001$ ), underscoring the cumulative benefit of ongoing education. This aligns with findings from (Gocmen Baykara et al., 2021), who reported a comparable increase in knowledge levels after the implementation of a tailored training program (mean difference = 14.5%,  $p < 0.05$ ). Interestingly, male nurses in our study achieved significantly higher knowledge improvements than their female counterparts (mean difference = 3.75 vs. 2.13;  $p = 0.007$ ). While gender-based differences in wound care education outcomes are not well documented, similar disparities have been noted in broader nursing education contexts and may be influenced by factors such as role expectations, access to clinical opportunities, or differing learning preferences (State of the World's Nursing 2020: Investing in Education, Jobs and Leadership, 2020).

Skill scores also improved substantially from 35.85% to 63.90% demonstrating the program's effectiveness in enhancing clinical performance. Unlike knowledge outcomes, however, no significant differences in skill improvements were found across most demographic and work-related subgroups. This suggests that the practical component of the training was broadly effective, regardless of participants' background, and supports the use of hands-on, competency-based learning models. This is in line with evidence from (Shawer et al., 2024) and (Kielo-Viljamaa et al., 2022) who documented the benefits of experiential learning across diverse nursing populations. Recent findings also endorse simulation-based approaches using moulage scenarios and high-fidelity manikins as effective methods for improving skill acquisition and clinical confidence (Shahzeydi et al., 2024). Therefore, educational interventions have a profound role in enhancing nurses' knowledge, clinical skills, and professional confidence. Structured programs, such as workshops and simulation-based training, have been shown to significantly increase nurses' competencies in evidence-based practice (EBP) and clinical decision-

making. For instance, a systematic review found that educational interventions improved nurses' EBP knowledge, skills, attitudes, confidence, and behavior, suggesting that such programs should be integral to nurses' professional development (Sapri et al., 2022). Similarly, Lee et al. (2023) demonstrated that simulation-based learning effectively boosted nursing students' self-confidence in performing clinical tasks, making clinical judgments, and improving teamwork skills essential for safe and effective nursing practice (Alrashidi et al., 2023).

Notably, nurses with lower formal qualifications (i.e., those trained at the secondary school level) showed the most substantial, though not statistically significant, skill improvements. Similarly, nurses with limited ward experience or those reporting insufficient income tended to show greater gains. These trends may reflect a steeper learning curve and a higher responsiveness to structured training among underprepared or resource-constrained groups. This finding reinforces global calls from organizations such as the (State of the World's Nursing 2020: Investing in Education, Jobs and Leadership, 2020) and (NHS Workforce Statistics - March 2023 (Including Selected Provisional Statistics for April 2023) - NHS England Digital, 2023) for targeted capacity-building efforts to strengthen competencies among underserved segments of the nursing workforce.

A critical finding of this study was the widespread reliance on non-evidence-based information sources, such as the Internet, in the absence of formal wound management guidelines across all participating hospitals. This points to systemic gaps in institutional support and the lack of standardized protocols, which may lead to inconsistencies in clinical practice. Similar concerns were highlighted in the (Definition and Principles of Nursing, 2024) Employment Survey, which reported significant variability in nurses' access to clinical education and ongoing training. These deficiencies in current wound care practices underscore an urgent need for institutional policies that support evidence-

based practice and ensure consistent implementation of best practices in wound care (Sen, 2024).

### LIMITATIONS OF THE STUDY:

Despite the demonstrated effectiveness of the intervention, the study had its own limitations include the lack of a control group, convenience sampling, the short follow-up period and patient outcomes were not measured.

### CONCLUSIONS:

The study findings demonstrated that structured educational intervention significantly improved nurses' knowledge and skills in wound care management. While all participants benefited, knowledge gains were greater among those with prior training, whereas skill improvements were more pronounced among those without. These findings highlight the importance of competency-based education and the need for regular training and standardized guidelines to ensure consistent, high-quality wound care.

### RECOMMENDATIONS:

- Healthcare institutions should provide ongoing wound care education, especially for nurses with less prior experience.
- Develop and implement standardized wound care guidelines to ensure consistent, high-quality care.
- Explore the long-term impact of wound care training on skill retention and patient outcomes.

### Funding:

There was no funding provided for this study.

### Declaration of Competing interest

The authors report no conflict of interest.

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## TABLES:

Table (1): The distribution of the nurse's demographic characteristics

Variables and groups	F.	%	
Age groups (36.33±8.14)	20-29	16	20
	30-39	36	45
	40-49	23	28.7
	50≥	5	6.3
Gender	Male	32	40
	Female	48	60
Level of education	Secondary school of nursing	7	8.8
	Diploma in nursing	47	58.8
	Bachelor's degree in nursing	26	32.5
	Master's degree in nursing	0	0
Monthly income	Sufficient	13	16.3
	Barley sufficient	48	60
	Insufficient	19	23.8
Residential	Urban	72	90
	Rural	8	10

Table (2): The working characteristics of the study participants

Variables and groups	F.	%	
Employment (year) 13.48±8.84	5≤	17	21.3
	6-10	15	18.8
	11-20	27	33.8
	more than 20	21	26.3
Experience (year) 9.65±7.43	5≤	33	41.3
	6-10	17	21.3
	11-15	13	16.3
	more than 15	17	21.3
Hospital name	Ranya general teaching-hospital	33	41.3
	Qaladize teaching-hospital	36	45
	Maternity and Pediatric Teaching Hospital	11	13.8
Have you attended any wound care training?	Yes	16	20
	No	64	80
Did you attend any workshops, webinars or seminars on wound care?	Yes	11	13.8
	No	69	86.3
Which source did you use to get your information from?	Books	8	10
	Internet	59	73.8
	Others	13	16.3
Are the wound management guidelines available in your working unit?	Yes	0	0
	No	80	100

Table (3): The comparison between participants' knowledge score before and after intervention

Measurements	Pre-Knowledge Score	Post-Knowledge Score	Differences	Pre-Knowledge Percentage	Post-Knowledge Percentage	Differences
Mean	10.84	13.61	2.77	54.19	68.06	13.87
Median	11	14	3	55	70	15
Std. Deviation	2.325	2.27	-0.055	11.623	11.349	-0.274
Minimum	5	9	4	25	45	20
Maximum	17	17	4	85	85	20

Table (4): The comparison between participants' skill scores before and after intervention

Measurements	Pre-Skill score	Post-Skill score	Differences	Pre-Skill Percentage	Post-Skill Percentage	Differences
Mean	42.93	56.95	14.02	35.85	63.90	28.05
Median	43	57	14	36	64	28
Std. Deviation	6.378	7.601	1.223	12.756	15.201	2.445
Range	39	30	9	78	60	18
Minimum	26	41	15	2	32	30
Maximum	65	71	6	80	92	12

Table (5): Comparison between demographic groups and the knowledge score difference

Variables and groups	Knowledge Score difference		P-value	
	Mean	Standard Deviation		
Age groups	20-29	2.75	1.88	0.265
	30-39	2.33	2.67	
	40-49	3.13	2.83	
	50 $\geq$	4.40	1.67	
Gender	Male	3.75	2.58	0.007
	Female	2.13	2.34	
Level of education	Secondary school of nursing	3.00	2.31	0.638
	Diploma in nursing	2.98	2.52	
	Bachelor's degree in nursing	2.35	2.71	
Monthly income	Sufficient	2.69	3.22	0.477
	Barley sufficient	3.02	2.41	
	Insufficient	2.21	2.44	
Residential	Urban	2.81	2.64	0.872
	Rural	2.50	1.60	
Employment (year)	5 $\leq$	2.18	1.91	0.159
	6-10	1.60	2.41	
	11-20	3.41	2.69	
	more than 20	3.29	2.67	
Experience (year)	5 $\leq$	2.27	2.25	0.260
	6-10	2.76	2.61	
	11-15	4.00	2.68	
	more than 15	2.82	2.83	

<b>Hospital name</b>	Ranya general teaching-hospital	2.94	2.78	0.993
	Qaladize teaching-hospital	2.72	2.46	
	Maternity and Pediatric Teaching Hospital	2.45	2.30	
<b>Have you attended any wound care training?</b>	Yes	4.81	2.29	0.001
	No	2.27	2.37	
<b>Did you attend any workshops, webinars or seminars on wound care?</b>	Yes	3.00	2.24	0.627
	No	2.74	2.61	
<b>Which source did you use to get your information from?</b>	Books	2.75	2.76	0.74
	Internet	2.66	2.53	
	Others	3.31	2.66	

Table (6): Comparison between demographic groups and the skill score difference regarding wound management.

Variables and groups	Skill Score difference		P-value	
	Mean	Standard Deviation		
<b>Age groups</b>	20-29	13.31	5.49	0.633
	30-39	15.14	7.86	
	40-49	13.39	8.76	
	50 $\geq$	11.20	8.90	
<b>Gender</b>	Male	12.13	7.07	0.072
	Female	15.29	7.96	
<b>Level of education</b>	Secondary school of nursing	18.57	9.50	0.08
	Diploma in nursing	12.55	7.06	
	Bachelor's degree in nursing	15.46	7.96	
<b>Monthly income</b>	Sufficient	12.46	11.78	0.631
	Barley sufficient	14.00	7.11	
	Insufficient	15.16	5.89	
<b>Residential</b>	Urban	14.11	7.89	0.767
	Rural	13.25	6.54	
<b>Employment (year)</b>	5 $\leq$	13.06	6.12	0.300
	6-10	17.27	7.99	
	11-20	14.00	7.86	
	more than 20	12.52	8.37	
<b>Experience (year)</b>	5 $\leq$	13.73	7.31	0.533
	6-10	16.24	7.41	
	11-15	14.08	7.91	
	more than 15	12.35	8.83	
<b>Hospital name</b>	Ranya general teaching-hospital	13.18	6.98	0.698
	Qaladize teaching-hospital	14.78	7.57	
	Maternity and Pediatric Teaching Hospital	14.09	10.53	
<b>Have you attended any</b>	Yes	11.38	7.75	0.126

<b>wound care training?</b>	No	14.69	7.64	
<b>Did you attend any workshops, webinars or seminars on wound care?</b>	Yes	10.36	7.20	0.091
	No	14.61	7.70	
<b>Which source did you use to get your information from?</b>	Books	14.00	6.82	0.867
	Internet	13.80	7.40	
	Others	15.08	10.00	