






Knowledge and Practice of Wound Care and Associated Factors among Nurses Working in South Wollo Zone Government Hospitals, Ethiopia

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Background: Wound infection is caused by pathogenic organisms invading viable tissue surrounding a localized defect or excavation in the skin or underlying soft tissue. Nurses have a critical role in wound care and dressing selection, and they should strive to stay current in this ever-changing field. To prevent wound infection, it is essential to improve wound-care knowledge and practice.

Objective: To assess knowledge and practice of wound care and associated factors among nurses working in government hospitals of South Wollo Zone, Ethiopia.

Methods: A hospital-based cross-sectional study design was used among 422 randomly selected nurses in government hospitals in South Wollo. A pretested structured self-administered questionnaire was used to collect data. Data were entered in EpiData 4.4.2 and exported to SPSS 25.0 for analysis. Descriptive statistics and bivariate and multivariate logistic regression were applied. Variables with *P* value <0.05 were considered statistically significant for knowledge and good practice of wound care.

Results: According to the findings, 40.3% and 51.0% had good knowledge and practice of wound care, respectively. Holding a bachelor's degree or above (AOR 3.27, 95% CI 1.97–5.43) and training (AOR 3.71, 95% CI 2.37–5.81) were significantly associated with knowledge of wound care. More than 10 years of experience (AOR 3.15, 95% CI 1.96–5.04), training (AOR 3.75, 95% CI, 2.38–5.85), and not having a patient load (AOR 3.15, 95% CI 1.96–5.04) were significantly associated with wound-care practices.

Conclusion: Nurses' wound-care knowledge and practice were low. Knowledge and practice on wound care were determined by education, training, patient load, and experience. Nurses should get training and share experience.

Keywords: wound care, knowledge, practice, Ethiopia

Introduction

Wound infection is caused by pathogenic organisms invading viable tissue surrounding a localized defect or excavation in the skin or underlying soft tissue.^{1,2} Antimicrobial-resistant bacteria cause bacterial wound infections, which are linked to higher morbidity and health-care costs. In underdeveloped countries, they are a leading cause of morbidity and mortality.^{3,4}

If proper wound care is not provided, the wound-healing process may be delayed,^{5,6} and can cause extended duration of hospitalization, bad scar formation, and hernia induced by wound dehiscence, also resulting in increased costs.^{7,8} A number of factors may contribute to a delayed wound-healing process, thus causing improper or impaired tissue

repair.⁹ Some of these factors are cancer therapies (radiation, chemotherapy), comorbidities (diabetes, obesity, protein-energy deficiency), and lifestyle choices (smoking, alcohol abuse).¹⁰

For rapid wound healing, special nursing care is required at both the hospital and after discharge, within the scope of the discharge care, and also the patient and family or caregiver should be educated concerning wound care, prevention of infection development, regulation and maintenance of nutrition, medication, and under which conditions they need to be seen by a health-care provider,^{11,12} because quality wound care is very important for rapid and uncomplicated healing through decreasing complications, repeated admissions, length of hospital stay, and costs, and enhancing patient quality of life.^{13–16}

Although wound care is performed by a multidisciplinary team, it is primarily a nurse-led activity.¹⁷ Indeed, wound healing depends on nurses' knowledge of the physiology and process of wound healing and consequently the nursing interventions.¹⁸ With sufficient knowledge concerning wound healing, a nurse can perform a systematic and holistic patient assessment and identify possible wound complications at an early stage.^{13,14,19} Improving knowledge and practice of wound care is paramount to reducing wound infection. Better knowledge and practice of wound care decreases wound-related complications and repeated admissions and enhances one's quality of life.²⁰ Therefore, this study aimed to assess nurses' knowledge and practice of wound care.

Methods

Study Area and Period

The study was conducted in governmental hospitals of South Wollo Zone, Amhara, Ethiopia from April 25 to May 25, 2021. South Wollo is in Amhara National Regional State, which has a total population, of 2,816,299 (1,409,131 male and 1,407,168 female). The zone has 13 hospitals, one a comprehensive specialized hospital. A total of 6,454 health-care providers are found in this zone (those working in health centers and hospitals), and among these, around 778 of nurses are from hospitals.

Study Design

An institution-based cross-sectional study design was used.

Source Population

All nurses working in governmental hospitals of South Wollo were the source population.

Study Population

All nurses who had worked for at least 6 months in government hospitals of South Wollo were the study population.

Exclusion Criteria

Volunteer nurses and those on annual or maternity leave were excluded from the study.

Sample-Size Determination

The sample size was calculated using a single population–proportion formula considering $P=48.7\%$ ²¹ with a 95% CI and 5% marginal error:

$$n = (Z \alpha/2)^2 \times p(1 - p)/W^2$$

where:

n = sample size

α = confidence interval

p = prevalence of good behavioral responses

W = margin of error

$$n = (1.96)^2 \times 0.487 (0.513)/(0.025) = 384$$

By considering a 10% nonresponse rate, the sample size was 422.

Sampling Procedure/Technique

There are 13 governmental hospitals in this zone. Among these, six were randomly selected, (through lottery method), and then to select participants, the first proportional allocation of nurses from each hospital was done based on the total number of nurses found in each hospital. Then, simple random sampling was used to select participants (Figure 1).

Data-Collection Tool and Procedures

The data were collected using a pretested structured self-administered questionnaire. The data-collection tool was developed by reviewing the literature.^{21,22} It had five parts: sociodemographic characteristics (age, sex, ethnicity, religion, education, marital status, and working experience), health-care provider-related factors (lack of assertiveness, position, lack of familiarity with antiseptics, and lack of opportunity to express opinion), institution-related factors (workload, training, lack of variety in wound-cleaning and dressing material, presence of protocols and guidelines, hierarchy pressure, and clinical working unit), knowledge-related items (14 questions with yes/no responses), and practice-related items (15 items using a Likert scale ranging from “never” to “always”). The data were collected by four BSc nurses and one MSc nurse supervisor.

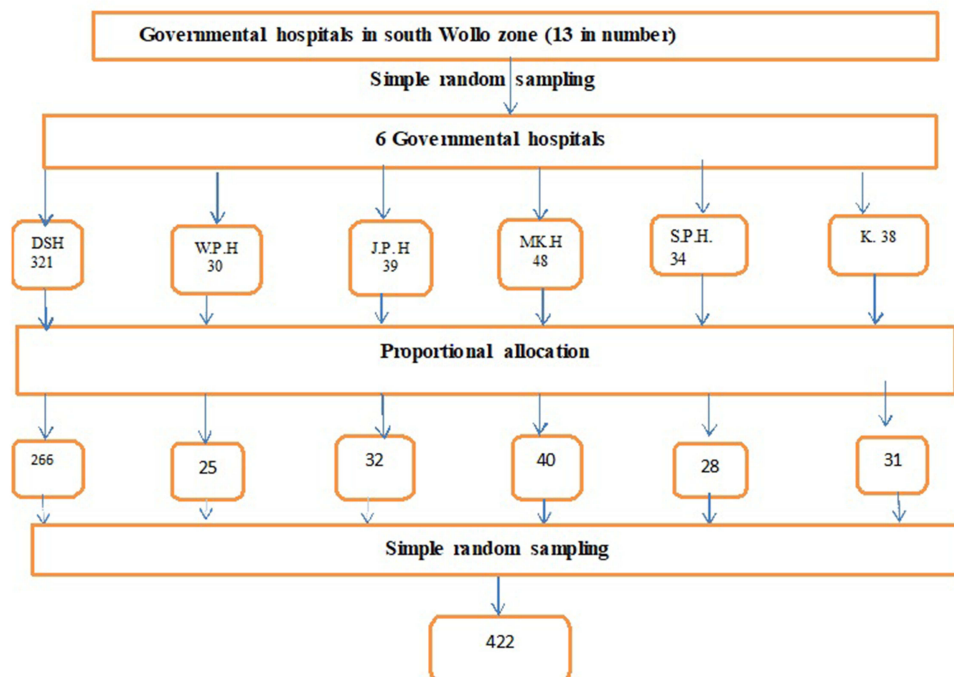
Variables

Dependent Variable

Knowledge and practice of wound care.

Independent Variables

Sociodemographic characteristics: age, sex, ethnicity, religion, education, marital status



N.B: DSH: Dessie comprehensive specialized hospital; W.P.H: wuchalie Primary hospital; J.P.H: Jamma primary hospital; M.K.H: Mekane selam general hospital; S.P.H: Saint primary hospital; K.: Kelela Primary Hospital.

Figure 1 Sample selection.

Health-care provider–related factors: lack of assertiveness, position, hierarchy pressure, lack of familiarity with antiseptics, lack of opportunity to express opinion

Institution-related factors: workload, training, lack of wound-cleaning and dressing materials, absence of protocols and guidelines, clinical working unit

Operational Definitions

Good knowledge: those who scored equal to and above the mean on knowledge items

Poor knowledge: those who scored below the mean on knowledge items

Good practice: those who scored equal to and above the mean on practice items

Poor practice: those who scored below the mean on practice items

Data Quality Control

Data quality was assured through conducting training for data collectors on the overall process of data collection. The questionnaire was written in English, then translated into Amharic, which was the study subjects' native language, and finally back to English by language experts to ensure consistency and conceptual equivalence. At the same time, each completed questionnaire was checked for coherence, completeness, and consistency. Daily evaluation was carried out to address any issues that arose during the data-collection process.

Data Processing and Analysis

Data were cleaned before being coded and entered in EpiData 4.4.2, then exported to SPSS 23 for analysis. To summarize descriptive statistics, frequency tables and figure were used. All variables with $p < 0.25$ one bivariate binary logistic regression analysis were kept for multivariate analyses. $P < 0.05$ was used to define statistical significance.

Results

Sociodemographic Characteristics of Respondents

A total of 400 nurses were involved in the study, yielding a response rate of 94.8%. Their mean age was 31.96 ± 6.10 years. The religious distribution showed that a majority (211, 52.8%) were orthodox Christian. Regarding education, 273 (68.3%) held degrees and above. More than half (223, 55.8%) were male (Table 1).

Health Service–Related Characteristics

A quarter of the study participants were working in medical wards. More than half (213, 53.3%) responded that there were no guidelines. Only 180 (45.0%) had enough dressing material in their units. Regarding training, 210 (52.5%) had formal training about wound care (Table 2).

Knowledge of Wound Care

The mean knowledge score was 20.02 ± 2.24 . Using the mean value as a cutoff point, 40.3% of respondents had good knowledge of wound care. A majority (268, 67.0%) responded that irrigation removed debris from wounds better than swabbing (Table 3).

Factors Associated with Knowledge of Wound Care

Bivariate analysis results showed that education, guideline availability, training, and age were significantly associated with knowledge of wound care, so were candidates for multivariate analysis. On multivariate analysis, only education and training were identified to be significantly associated with knowledge of wound care. The odds of having knowledge were 3.27 times (95% CI 1.97–5.43) higher among nurses who held degrees and above than diploma holders. Nurses who had had training on wound care were 3.71 times (95% CI 2.37–5.81) more likely to have good knowledge than their counterparts (Table 4).

Table 1 Sociodemographic characteristics of participants (n=400)

		n	%
Age, years	<25	56	14.0
	25–35	211	52.8
	35–45	109	27.3
	>45	24	6.0
Marital status	Single	139	34.8
	Married	213	53.3
	Separated	27	6.8
	Widowed	21	5.3
Religion	Orthodox	211	52.8
	Muslim	176	44.0
	Protestant	10	2.5
	Other (1)*	3	0.8
Sex	Male	223	55.8
	Female	177	44.3
Education	Diploma	127	31.8
	Degree and above	273	68.3
Ethnicity	Amhara	364	91.0
	Oromo	24	6.0
	Tigre	9	2.3
	Other (2)**	3	0.8
Experience	<10	224	56.0
	>10	176	44.0

Notes: *Catholic; **Afar.

Wound-Care Practices

Mean practice score was 31.27 ± 4.57 . Using the mean value as a cutoff point, 51.0% of respondents had good practice of wound care. Two-thirds (150, 37.5%) of the nurses “sometimes” washed their hands before and after wound dressing. Using sterilized and dressing materials for cleaning and dressing wounds had the most positive (always) responses (251, 62.8%; Table 5).

Factors Associated with Wound-Care Practices

Bivariate analysis results showed that guidelines, patient load, training, familiarity with antiseptics, hierarchy pressure, age, and experience were significantly associated with wound-care practices. On multivariate analysis, only patient load, training, and work experience were significantly associated with wound-care practices (Table 6). The odds of having good practices were 3.15 times (95% CI 1.96–5.04) higher among nurses who had no patient load than their counterparts. Nurses who had had training were 3.73 times (95% CI 2.38–5.85) more likely to practice wound care than those who had not. The findings also showed that nurses who had >10 years of work experience were 1.82 times (95% CI 1.16–2.85) more likely to have good practice than those who had <10 years of working experience.

Table 2 Health service–related characteristics (n=400)

	Category	n	%
Working unit	Medical	100	25.0
	Surgical	99	24.8
	Emergency	77	19.3
	Orthopedic	37	9.3
	Obstetric	32	8.0
	ICU	36	9.0
	Other*	19	4.8
Guidelines available in working unit	Yes	187	46.8
	No	213	53.3
Dressing material available in working unit	Yes	180	45.0
	No	220	55.0
Patient load	Yes	144	36.0
	No	256	64.0
Formal training	Yes	210	52.5
	No	190	47.5
Lack of assertiveness	Yes	73	18.3
	No	327	81.8
Lack of familiarity with antiseptics	Yes	175	43.8
	No	225	56.3
Lack of opportunity to express opinion	Yes	35	8.8
	No	365	91.3
Hierarchy pressure	Yes	64	16.0
	No	336	84.0
Facility type (hospital)	Comprehensive	148	37.0
	Referral	77	19.3
	General	69	17.3
	Primary	106	26.5

Note: *Outpatient department.

Abbreviation: ICU, intensive care unit.

Discussion

This study aimed to assess nurses' knowledge and practice of wound care. Education and training were significant factors in knowledge. Similarly, training, patient load, and experience were predictors of wound-care practices. We found that 40.3% (95% CI 36.0%–45.3%) of nurses had good knowledge regarding wound care. This was lower than studies conducted in Bahir Dar, Ethiopia, Turkey, the UK, and Malaysia.^{22–29} This difference may be due to the inclusion of all

Table 3 Knowledge of wound care (n=400)

	Correct		Incorrect	
	n	%	n	%
Immobility, impaired nutrition, and location of the wound are risk factors of wound infection	266	66.5	134	33.5
Wet therapy is the “gold standard” for treating chronic wounds	268	67.0	132	33.0
The selection of the coverage of the wound should be based on characteristics of his deathbed (moisture, drainage, or presence of devitalized tissue)	261	65.3	139	34.8
Lift up the patient without dragging	265	66.3	135	33.8
The pain in the wound must be evaluated by the health-care professional, not by the patient	268	67.0	132	33.0
The first stage of pressure ulcers is easily identified in people of dark skin	262	65.5	138	34.5
Assessment of a wound is a cumulative process that comprises observation, data collection, and evolution	268	67.0	132	33.0
The classic signs of infection (pain, heat, redness, swelling, pus) may not be present in patients with chronic wounds or those who are immunosuppressed	267	66.8	133	33.3
Enzymes (pepsin, collagens, etc) are effective in the removal of devitalized tissue of chronic wounds	262	65.5	138	34.5
PVPI is indicated to clean chronic wounds	267	66.8	133	33.3
The Braden scale is an instrument used to assess the risk of a patient developing a vascular ulcer	265	66.3	135	33.8
When taking a wound culture, the swab is dipped in wound drainage to assess infection	267	66.8	133	33.3
The nurses are authorized to use conservative debridement (superficial)	270	67.5	130	32.5
Wet gauze are more indicated for treating chronic wounds	267	66.8	133	33.3
Irrigation removes debris from wounds better than swabbing	268	67.0	132	33.0

Table 4 Binary and multivariate logistic regression on predictors of knowledge of wound care

		Knowledge		95% CI	
		Good	Poor	COR	AOR
Age, years	<25	18	38	0.33 (0.12–0.91)	0.36 (0.12, 1.04)
	25–35	92	119	0.55 (0.23,1.31)	0.61 (0.24, 1.54)
	35–45	37	72	0.36 (0.14, 0.90)	0.44 (0.16, 1.18)
	>45	14	10		
Education	Diploma	29	98		
	Degree and above	132	141	3.16 (1.96,5.10)	3.27 (1.97, 5.43)*
Guideline availability	Yes	84	103	1.44 (0.96, 2.11)	1.44 (0.93, 2.24)
	No	77	136		
Training	Yes	113	97	3.44 (2.25,5.20)	3.71 (2.37, 5.81)**
	No	48	142		

Notes: *P=0.00004, **P=0.

Table 5 Wound-care practices

Items	No		Rarely		Sometimes		Always	
	n	%	n	%	n	%	n	%
Hand washing before and after wound dressing	28	7.0	77	19.3	150	37.5	145	36.3
Hand washing before wearing sterile gloves	18	4.5	61	15.3	121	30.3	200	50.0
I perform glucose tests regularly in a diabetic patient	34	8.5	81	20.3	156	39.0	129	32.3
I assess my patients body-mass index	38	9.5	159	39.8	104	26.0	99	24.8
Advise my patient to eat vegetables and fruit	11	2.8	57	14.3	162	40.5	170	42.5
Advise malnourished patient to eat nutritious protein diet	8	2.0	54	13.5	119	29.8	219	54.8
I inspect first for whiteness of gauze and color of discharge	16	4.0	129	32.3	155	38.8	100	25.0
I clean surgical sites from clean to less clean areas	10	2.5	83	20.8	129	32.3	178	44.5
Use sterilized dressing materials for cleaning and dressing wound	7	1.8	54	13.5	88	22.0	251	62.8
I use iodine or normal saline for cleaning surgical wounds	12	3.0	124	31.0	170	42.5	94	23.5
Used aseptic technique for surgical wound dressing	8	2.0	81	20.3	124	31.0	187	46.8
Used aseptic technique to obtain specimen for swab culture	4	1.0	133	33.3	145	36.3	118	29.5
Advise immunodeficient patients to maintain personal hygiene	12	3.0	88	22.0	120	30.0	180	45.0
I assess and monitor surgical site condition	13	3.3	124	31.0	171	42.8	92	23.0
Used facemask during cleaning and dressing surgical wound	8	2.0	80	20.0	124	31.0	188	47.0

Table 6 Binary and multivariate logistic regression on predictors of wound-care practices

		Practice		95% CI	
		Good	Poor	COR	AOR
Age, years	<25	30	26		
	25–35	103	108	0.82(0.45, 1.49)	0.96(0.50, 1.83)
	35–45	51	58	0.76(0.39, 1.45)	0.86(0.42, 1.76)
	>45	20	4	4.33(1.31, 14.31)	3.14(0.88, 11.10)
Patient load	No	180	76	3.31(3.21, 3.41)	3.15(1.96, 5.04)**
	Yes	60	84		
Training	Yes	135	75	3.15(2.09, 4.75)	3.73(2.38, 5.85)***
	No	69	121		
Familiarity with antiseptics	Yes	99	76	1.48(1.00, 2.21)	1.48(0.94, 2.34)
	No	105	120		
Hierarchy pressure	Yes	23	41	0.48(0.27, 0.83)	0.64(0.34, 1.20)
	No	181	155		
Experience	<10	101	123		
	>10	103	73	1.71(1.15, 2.56)	1.82(1.16, 2.85)*

Notes: *P=0.009, **P=0.00002, ***P=0.

nurses (this study included nurses working in all units), differences in organizational behavior among countries, where some might have good training and educational institutions, and study-method difference (The UK study used qualitative methods). However, our result is higher than studies conducted in Australia and Uganda.^{30–32} The difference might be the previous studies focused only on nurses' knowledge of pressure-ulcer prevention.

Having a degree and above was a contributing factor to knowledge of wound care. The odds of having knowledge of wound care were 3.27 times higher among nurses who had degree and above educational qualification than diploma holders. This might be due to bachelor's degree and above holders having a deeper knowledge base on which to draw in such areas as clinical practice and critical thinking. The other factor that contributed to nurses' knowledge was training related to wound care. Nurses who had had training on wound care were 3.71 times as likely to have good knowledge than their counterparts. This finding is congruent with the study conducted in Bahir Dar.²² This may be because updating health workers' knowledge about infection prevention improves their older understanding, resulting in a high score on knowledge questions. Furthermore, because Ethiopia's current infection-prevention and patient-safety national guidelines include thorough information and evidence-based recommendations for infection prevention, nurses who have completed this training may have a better understanding of infection prevention. The conceptual map and assumption that the training was enhancing knowledge and skills in health-care practices of health workers and primary health-care entities would significantly improve the performance of individuals, teams, organizations, and health systems for better health outcomes. The other outcome variable addressed in this study was the practices of wound care, and 51.0% (95% CI 46.3%–56.0%) of the nurses had good practices. This finding was lower than the study conducted in Malaysia.²⁶ However, it was higher than the studies conducted in Bahir Dar and Australia.^{22,30,33} Reasons for the disparity might be a difference in health-staff awareness of how to prevent surgical site infection and the presence of specific case assessment of surgical site–infection prevention.

The first contributing factor to wound-care practices addressed in this study was having no patient load in the working unit. The odds of having good practices were 3.15 times higher among nurses who had no patient load in the working unit than their counterparts. It is clear that substantial nursing workload can influence the care provider's decision to perform various procedures, mainly in infection prevention.³⁴ This might be due to the fact that less patient load will also help keep employees from burnout and loss of function, and also under extensive workloads, nurses may not have adequate time to perform tasks that can have a direct effect on wound-care practices.^{35,36} The other contributing factor to wound-care practices was training. Nurses who had had training were 3.73 times more likely to practice wound care than those who had not. This finding is in line with the studies conducted in Bahir Dar and the UK.^{20,22} This might be also due to training making nurses aware of procedures and wound-care practices. Facilities can minimize on-the-job injuries and accidents with a robust safety-training program. Training workers that they are motivated to follow the procedures.

Lastly, work experience was a contributing factor to wound-care practices. Nurses who have >10 years' work experience were 1.82 times as likely to have good practice as those with <10 years' experience. This could be explained by the fact that when experience increases, social interaction increases, they take on more responsibility, skill development and interest in practices develops as well,³⁷ and also due to the fact that as health workers' years of experience increase, they are more likely to be exposed to surgical departments on a regular basis and gain experience through working with senior staff.

Limitations

Social desirability bias and recall bias could be limitations of this study. As a result, respondents were assured of complete confidentiality and anonymity throughout the study to reduce the former.

Conclusion

This study revealed that nurses' knowledge and practice of wound care were poor. Education and training were factors for knowledge. Similarly, patient load, training, and work experience were predictors of practices. Therefore, nurses should improve their education and take basic training related to knowledge and practice of wound care.

Data Sharing

Data will be available upon request from the corresponding author.

Ethics Approval and Consent to Participate

The study protocol was approved by the Research Ethics and Approval Committee of Wollo University, College of Medicine and Health Science (RF: CMHS 187/02/12). Official letters of cooperation were written to each hospital for facilitating the study. Informed written consent was obtained from each study participant, and respondents had the right not to participate or withdraw from the study at any stage. Anonymity and confidentiality of the data were ensured, and all study methods were performed in accordance with the Declaration of Helsinki.

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The authors declare no conflicts of interest in relation to this work.

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