


Multicentre Cross-Sectional Study Describing Postoperative Wound Care Practice in Northeast Ethiopia

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Abstract

Background: Postoperative care is the management of a patient after surgery that includes care given during the immediate postoperative period. Postoperative complications are continuing to be a major source of morbidity following operative procedures. Postoperative wound infection delays the patient's recovery, increases discomfort, and prolongs the hospital stay.

Objective: The study aimed to assess among nurses working in governmental hospitals in the south Wollo zone and Oromia special zone, northeast Ethiopia, 2020.

Methods: Institution-based cross-sectional study design was conducted on governmental hospitals in the south Wollo zone and Oromia special zone. Variables in multivariable logistic regression, p -value < 0.05 was used to declare statistical significance.

Result: From a total of 411 samples, 402 nurses responded to the questionnaire, with a response rate of 97.81%. This study showed that 49.8% of participants had good practice. The availability of a wound management tool was 1.6 times more likely to promote good practice than the lack of a wound assessment tool. Nurses who had documented their wound assessment and management activities were 2.1 times more likely to have good practice than those who hadn't documented.

Conclusion: This study showed that half of the participants had poor wound care practices. Regarding associated factors, the availability of wound management tools and documentation of wound assessment and management had a significant association with the nurse's poor wound care practice. On the basis of these results, health policymakers and hospital administrators should develop a program to train nurses in wound care practice, and it helps as a reference for the researchers to further study.

Keywords

Ethiopia, postoperative, practice, wound care

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Background

Every year estimated, 187–281 million surgical procedures are carried out worldwide, or one surgical procedure every 25 individuals (WHO, 2009). Surgical site infection (SSI) is an infection that occurs within the first 30 days after a surgical operation if no implant is placed or within 1 year after a surgical operation if an implant is placed and the infection appears to be related to a surgical operation (Famakinwa et al., 2014). Postoperative care is the management of a patient after surgery that includes care given during the immediate postoperative period, both in the operating room and days following the

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surgery, and it is important to prevent complications such as infection and promote healing of the surgical incision (Hendy Gouda et al., 2019; Pukki et al., 2010).

Nursing care is one of the major components of healthcare delivery that helps the patients in monitoring personal hygiene, help in nutrition, environmental sanitation, examination, maintaining body temperature, providing safety and comfort, helping in adaptability, and providing health education (Getachew & Bewket, 2016). The new healthcare technologies have increased the costs of the health sector and the population's expectations with regard to the services offered, nevertheless, studies indicate flaws in the quality and safety of care, involving unwanted events that negatively affect the health organizations' image (De Feitas et al., 2014).

The World Health Organization estimates a global deficit of about 12.9 million skilled health professionals (midwives, nurses, and physicians) by 2035, and these shortages limit the ability of countries, particularly resource-constrained countries, to deliver basic healthcare, respond to emerging and more complex needs, and teach, graduate, and retain their future health professionals (Stuart-Shor et al., 2017). Postoperative complications continue to be a major source of morbidity following operative procedures (Boettge et al., 2021; Raykha et al., 2018; Sandy-Hodgetts et al., 2022). It is considered that the dressing protects the wound against bacterial contamination, foreign material, and trauma, absorbs exudates, and provides compression, so dressing the primarily sutured surgical wound with a sterile dressing until the stitches are removed represents the current practice among nurses (Brindle & Farmer, 2019; Brown, 2022; Dowell et al., 2016; Moss et al., 2017; Pukki et al., 2010; Sandy-Hodgetts et al., 2022; Sway et al., 2018).

In the United Kingdom (UK), the National Institute for Health and Care Excellence (NICE) estimated that SSIs have been shown to compose up to 20% of all healthcare-associated infections, and of those, at least 5% of patients undergoing a surgical procedure develop a SSI (Ding et al., 2016). In the United States, approximately 2% to 5% of the 16 million patients who undergo surgery each year have postoperative SSIs (Willis-Owen et al., 2010). The study showed that in the UK, economic estimations demonstrate that wound-related costs comprise approximately 4% of all health costs, and this ratio is rising (Gillespie et al., 2014). Maintaining quality care is a fundamental responsibility of any healthcare organization. Exploring the quality of nursing care from the patient's perspective is an essential part of the quality evaluation (Ayyub et al., 2015). In Africa, the probability of being harmed in a hospital is higher, the risk of acquiring a healthcare-associated infection is as much as 20 times higher, and the problems associated with surgical safety account for half of the avoidable adverse events that result in death or disability (WHO, 2020). For the sake of patient safety, safe care directly and closely influences the quality of care delivery to the population; patients, in turn, have gained awareness of their rights,

establishing criteria that reflect their choices and attitudes towards the health services (Ayyub et al., 2015; Henriques & Lacerda, 2016).

Wound care is a nursing duty that requires excellent skills and knowledge to prevent massive complications whereas the studies revealed that, more than half of the participants (57.7%) had poor practice in postoperative wound care in Tanzania (Mwakanyamale et al., 2019), 45% of nurses did not wash their hands before doing the dressing in Nigeria (Maureen et al., 2013), and 30% used single-sterile gauze in Tanzania (Mwakanyamale, 2013). A recent environmental scan revealed that the availability of a wide range of dressing products was considered advantageous in wound management (Gillespie et al., 2012).

According to a study conducted in Ethiopia, the public need both essential and emergency surgical treatments, but the majority of hospitals did not effectively provide them, and there was insufficient effective use of the resources that were available (Alemayehu et al., 2020; Lemma et al., 2013), and Amref Health Africa's health post assessment, findings reflected that more than half of health posts lacked a clean examination room, waiting area, latrine, and other basic sanitation facilities, and had disorganized management of patients' registration books (Makonnen, 2017). Another study done in Jimma University specialized hospitals, in Ethiopia, revealed that around one-third of nurses were not performing at their best level, which might contribute to long hospital stays, increased risk of nosocomial infection, increased health care costs, and poor patient care outcomes (Tefaye & Abera, 2015).

Appropriate postoperative wound management can significantly decrease patients' morbidity and mortality, including early and late complications, and the management of postoperative wounds has perhaps received less attention than is merited, with the greatest focus being upon the management of chronic wounds (Charalambous, 2013). In an epidemiological review of health maintenance organizations in patients, an ambulatory care electronic medical record found that SSI accounts for 3.4% of all post-cesarean sections (Tharpe, 2008).

To the best of knowledge, there were no many studies done related to postoperative wound care practices in Ethiopia. Thus, this study aims to determine the magnitude of nursing practice on postoperative wound care and its associated factors among nurses working in governmental hospitals in south Wollo zone and Oromia special zone, Ethiopia. And to fill the existing gap in the literature and serve as baseline evidence for health policy makers/program planners and strategic developers for wound care practice.

Review of Literature

Prevalence of Nurses' Practice Regarding Postoperative Wound Care

Findings from a study in Baghdad, Iraq, on nurses' practices towards postoperative wound dressing in surgical wards

showed that all nurses, regardless of their gender, performed almost at the same level of practice relative to postoperative wound dressing (Atiyah et al., 2012). A study conducted in Bangladesh on nurse's knowledge and practice on the prevention of postoperative SSI showed that the knowledge of the nurses was at a moderate level with a mean score of 74.16%, and the postoperative practice of SSI prevention was at a very high level with a mean score of 96%. Of the participants (51.7%), nurses had good practice. From the participants, 93.3% used sterile dressing materials for cleansing surgical wound dressing (Sickder, 2010). The study conducted in Australia showed that 76 (65.5%) respondents indicated that the most important characteristic was the ability of the dressing to remove excess exudates and toxins (Gillespie et al., 2013).

The study conducted in Brazil shows that 66 percent of the professionals had specializations other than nursing, such as Intensive care, Surgery centers, first aid, and Emergency Care, showing some education and professional preparation to provide high-complexity care (Santos et al., 2016). The study conducted at Olabisi University showed that 45% of respondents did not wash their hands before doing the dressing, and 88.3% of respondents cleared the trolley after wound dressing (Maureen et al., 2013). The study conducted at Muhimbili National Hospital reported that 30% of respondents used single-sterile gauze in one direction only (Mwakanyamale, 2013). A study conducted in Tanzania showed that of 71 nurses, 30 participants (42.3%) had good practice on postoperative wound care, and more than half of participants (57.7%) had poor practice on postoperative wound care (Mwakanyamale, 2013). A study conducted in Egypt showed that out of 75 participants, 40% had good practice (Hendy Gouda et al., 2019). A cross-sectional study done in Mekelle public hospitals showed that 58.2% of nurses reported that they had good postoperative practice (Dr. Haftu et al., 2015).

Factors Associated with Nurses' Practice Regarding Postoperative Wound Care

Findings from a study in Baghdad, Iraq, on nurses' practices towards postoperative wound dressing in surgical wards showed that nurses who were older than 50 years demonstrated inadequate practices concerning postoperative wound infection precautions. Besides that, the study results indicated that all the segments of nurses with bachelor's degrees (100.0%) showed a high practice level compared with other nurses' educational backgrounds. In addition, the findings highlight that those nurses with ≤ 26 years of employment showed the highest percentage (93.0%) of moderate practice levels. Once again, findings lead us to conclude that moderate practice levels are prominent in terms of nurses' experience in surgical wards within 6–10 years of nurses' experience in surgical wards (Atiyah et al., 2012).

The study conducted at Al-Sadder Teaching Hospital showed that 44% of respondents had less than or equal to 5 years of work experience (Khudhair, 2018). The study

conducted among nurses working at King Abdulaziz University Hospital showed that only 13 (33.3%) of participants educated the patients and their families on how to deal with wounds correctly (BaMohammed et al., 2018). In the study conducted in Haiti, an aseptic wound-cleaning technique was observed in only three observations. In about half of the observations, gloves were not changed after the removal of the soiled dressing and were used to clean and install the new dressing. Regarding patient education, only two instances were observed: one nurse provided feedback on the condition of the wound, while another recommended hygiene practices to promote wound healing (Timmins et al., 2018). The study conducted in Australia showed that two-thirds (64.4%) of respondents' highest qualification was at the degree level, and a modest 3.4% held a master's qualification (Gillespie et al., 2013). In the study conducted in Brazil, 18 nurses participated, of whom 72% were women. The prevailing age group ranged from 24 to 40 years old.

Regarding professional education, two (11%) nurses attended professional training in postoperative care and attended an academic master's degree course; 50% of the professionals had been working for more than 4 years in the institution, and 61.12% had up to 4 years of experience in the units of study (Santos et al., 2016). The study conducted in Al-Jamhuree and Al-Salam Teaching Hospitals in Mosul City, Iraq, showed that most of the nurses (56.7%) were male and the remaining (43.3%) were female in the study groups. The percentage distribution of samples with reference to age reveals that the highest percentage (43.4%) of the nurses in the study group belonged to the age group of 20–29 years. Concerning the years of experience in nursing service, the findings indicated that 40% of the study group had less than 5 years of experience in nursing (Jaddoue, 2015).

The study conducted in a tertiary university hospital in São Paulo State with a sample of 35 nurses shows that the predominant age range was 21–30 years old, with 57.1%, followed by those older than 30 years old, who accounted for 42.9%. Regarding time of nursing experience, 31.4% had less than a year, with the remainder ranging from one to more than 20 years of experience (Ferreira et al., 2014). The study conducted in hospitals in Erbil city shows that the highest percentage of nurses (48.4%) were less than 30 years old; 60.9% of them were males, most of them (82.8%) had a diploma in nursing; 62.5% of the nurses had less than 5 years of experience; and about 68.8% of them did not participate in training regarding wound dressing practice (Najm & Hussein, 2018). A cross-sectional study done in Tanzania showed there was a significant improvement in practice among undergraduate nurses compared to diploma-trained nurses ($p=0.003$). Moreover, good postoperative wound practice was observed among undergraduate nurses compared to certificate-holding nurses ($p=0.006$) (Mwakanyamale, 2013). A cross-sectional study done in Mekelle public hospitals showed that Poor documentation was associated with poor practice [Adjusted Odd Ratio (AOR)=0.28; 95% CI (0.1, 0.74)] (Dr. Haftu et al., 2015).

Objectives of the Study

General Objective. To assess nursing practice and associated factors regarding postoperative wound care among nurses working in government hospitals of south Wollo zone and Oromia special zone, northeast Ethiopia, 2020.

Specific Objectives. To determine nursing practice regarding postoperative wound care among nurses working in governmental hospitals of south Wollo zone and Oromia special zone northeast Ethiopia, 2020.

To identify factors associated with nursing practice on postoperative wound care among nurses working in governmental hospitals of south Wollo zone and Oromia special zone, northeast Ethiopia, 2020.

Methods and Materials

This study used the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) cross-sectional reporting guidelines (Von Elm et al., 2007).

Study Design and Areas

An institution-based cross-sectional study design was conducted in the south Wollo zone and Oromia special zone, Amhara, northeast Ethiopia, from February to March 2020. The study was conducted among nurses working in governmental hospitals in the south Wollo zone and Oromia special zone including Dessie Referral Hospital, BoruMeda General Hospital, Akesta Hospital, Mekaneselam Hospital, and Kemissie Hospital. Seven hundred forty Nurses were working in south Wollo zone hospitals and Oromia special zone.

Populations

All staff nurses working in south Wollo zone and Oromia special zone hospitals were a source of population, while nurses working in selected governmental hospitals in the south Wollo zone and Oromia special zone (Dessie Referral Hospital, Borumeda, Kemissie, Akesta, and Mekaneselam hospitals) during the study period were the study population.

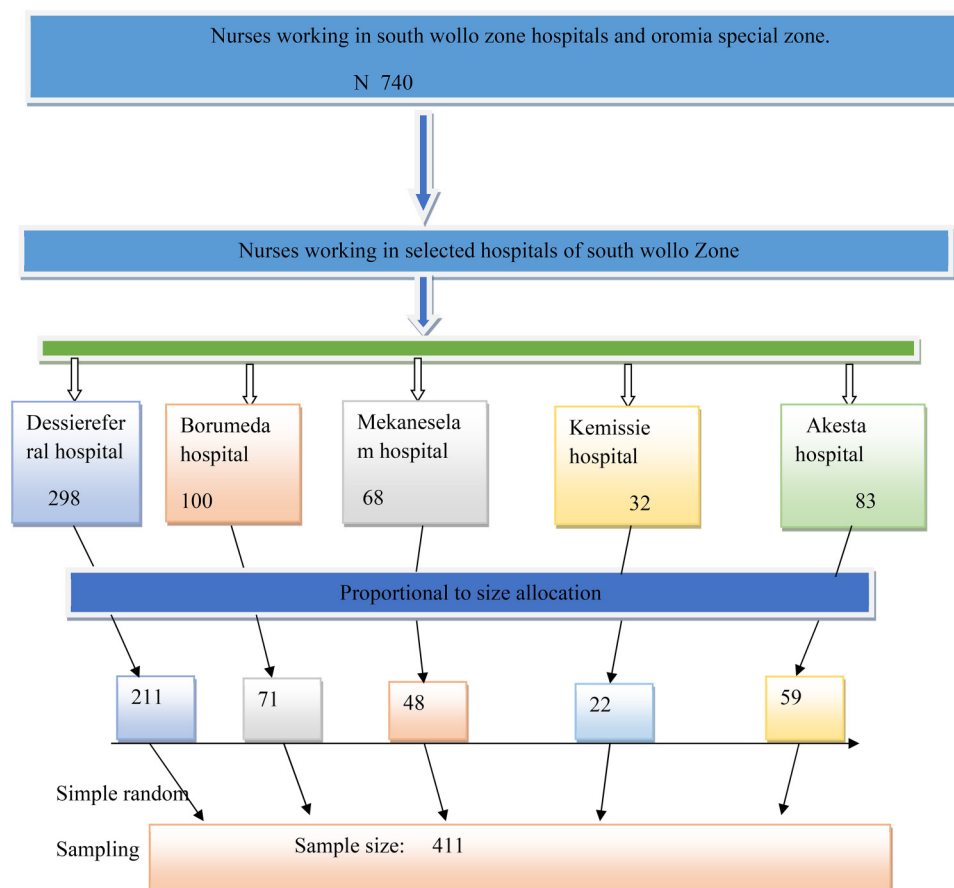


Figure 1. Schematic presentation of the sampling procedure to select study participants, South Wollo Zone and Oromia Special Zone, Northeast, Ethiopia, 2020.

Inclusion Criteria

All nurses, who are working surgical ward, operation room (OR), recovery, gynecology, and medical ward were included in this study, whereas nurses who were severely sick and on annual leave during data collection were excluded.

Bias

Response biases might have occurred when completing the questionnaire due to English-only survey and English as a second language for participants. The selection process could be a random sampling technique rather than a survey.

Sample Size Determination and Procedure

The sample size was calculated using the single population proportion formula with the following assumptions: considering a study conducted at Mekelle public hospitals, the nursing practice towards postoperative wound care was 58.2% (Dr. Haftu et al., 2015). Using a 5% margin of error at a 95% confidence level, then the sample size was determined using the following formula: $n = ((Z\alpha/2)^2 P(1-p))/d^2$. Thus, with 10% non-response rate the final sample size was 411.

Sampling Technique

From governmental hospitals working in the south Wollo zone and Oromia special zone, Dessie Referral Hospital, Boru Meda General Hospital, Akesta Hospital, Mekaneselam Hospital, and Kemissie Hospital were selected. Those hospitals were purposely selected, which meant postoperative wound care was done. Seven hundred and forty nurses are working in the south Wollo zone. Of those, 581 nurses are working in Dessie Referral Hospital, Boru Meda General Hospital, Akesta Hospital, Mekaneselam Hospital, and Kemissie Hospital. A proportional sample size allocation was implemented, and the simple random sampling (computer-generated randomization) method was done by using their workplace identification number (Figure 1).

Study Variables:

Operational Definition

Good postoperative wound care practice: is the practice status of nurses when they score greater than the calculated mean (Sickder et al., 2017).

Poor postoperative wound care practice: is the practice status of nurses when they score less than or equal the calculated mean (Sickder et al., 2017).

Data Collection Instruments

The outcome variable was, postoperative wound care practice, assessed using the adapted and modified tool of 18

Dependent variable		Independent variables
Practice related to postoperative wound care		<ul style="list-style-type: none"> > Age > Sex > Postoperative area of experience > Year of working experience
Good postoperative wound care practice	Poor postoperative wound care practice	<ul style="list-style-type: none"> > Educational level > Training > Marital status > Workload > Availability of materials > Current area of practice > Availability of an assessment tool > Documentation > Availability of equipment to perform nursing procedures

items with a 4-point Likert scale (never practice, seldom practice, sometimes practice, and always practice) and receives a score of “0” for never practice, rarely practice “1,” sometimes practice “2,” and always practice “3.” The scores ranged from 0 to 90 and were transformed into a percentage for interpretation after checking for normality. Accordingly, nurses’ practice towards postoperative wound care was classified into two categories: good practice (if above the mean) and poor practice (equal to or below the mean) (Mwakanyamale et al., 2019; Sickder et al., 2017). And also, the questionnaires contain information on nurses’ socio-demographic status and other associated factors.

Data Collection Procedures and Quality Control

A structured self-administered English version questionnaire (as nurses use the English language as a medium of communication as well as learning proficiency in the Ethiopian context) that was adapted from related studies was used to collect the necessary data from the study participants. The data collection tool was adapted and modified from previous comparable studies in Ethiopia (Mengesha et al., 2020). The questionnaire was pretested by 5% of the total sample size at Woreilu Hospital. A reliability test was done, which showed a Cronbach’s alpha of 0.78. The collected data were checked for completeness. Data were collected by five BSc nurses, who were trained about the study objects, instruments, and data collection methods. Supervision by the principal investigator was carried out, and during data collection, a filled questionnaire was checked for completeness and consistency.

Data Processing and Analysis

The data was entered to Epi-data version 3.1 for Windows and exported to statistics packages for Social Science version 26 for statistical analysis. Descriptive statistics were computed through percentage, frequency, and mean. Binary logistic regression was used to determine the statistical association between a set of independent variables and a dependent variable. Variables with p -value <0.25 in the bivariate analysis were included in the multivariate analysis. Adjusted odds ratio with a 95% confidence interval was computed and Hosmer-Lemeshow Test was used to check model fit (p -value >0.05).

Ethical Consideration

Ethical approval was obtained from the ethical review board of College of Medicine and Health Science, Wollo University. After ethical clearance was received, permission letters were obtained from Dessie Referral Hospital, Borumeda General Hospital, Akesta Hospital, Mekaneselem Hospital, and Kemissie Hospital. A written consent was taken from all study participants. In addition to this, all participants were informed of the purpose of the study and that their participation was voluntary, and the name of the participant was omitted from the checklist instead of an ID number being used to ensure the confidentiality of the study participants. Generally, the data collectors were told the study participants there was no risk regarding this research project other than the benefit to the nurse and also explained the reality that no one was involved with an obligation if they weren't interested in the research project.

Results

Socio-Demographic Characteristics of Participants

From a total of 411 samples, 402 nurses responded to the questionnaire, resulting in a response rate of 97.81%. From the total participants, 208 (51.75%) were females. Among the participants, 160 (39.8%) of the respondents were in the age range of 30–39 years. Regarding marital status, more than half (56.4%) of respondents were married. In the level of qualification (educational level), the majority of respondents hold a BSc degree, which accounts for 277 (56.46%). Among the participants, 173 (43.03%) had work experience less than or equal to 5 years (Table 1).

Nurses' Practice on Postoperative Wound Care

This study showed that 200 nurses (49.8%) have good postoperative wound care practices. Nurses who had always practiced hand washing before and after wound dressings were 301 (74.9%). Nurses who had always practiced hand washing before wearing sterile gloves were 248 (61.7%). Nurses who had the practice of placing bags for soiled items within patient reach were 131 (32.6%) (Table 2).

Table 1. Socio-demographic Characteristics of Nurses Working in Governmental Hospitals of South Wollo Zone, Northeast Ethiopia, 2020 (n = 402).

Variable	Category	Frequency	Percent %
Sex	Male	194	48.25
	Female	208	51.75
	Total	402	100
Age	20–29	131	32.58
	30–39	160	39.8
	40–49	80	19.9
	50–59	31	7.72
	Total	402	100
Marital status	Married	227	56.46
	Single	119	29.60
	Divorced	39	9.7
	Widowed	12	2.98
	Separated	5	1.24
	Total	402	100
Level of qualification	Diploma	111	27.6
	Bachelor degree	277	56.46
	Master's degree and above	14	3.48
	Total	402	100
Work experience	Less than or equal 5 years	173	43.03
	6–10 years	140	34.83
	11–15 years	56	13.93
	16–20 years	25	6.21
	Greater than 20 years	7	1.74
	Total	402	100
Experience in postoperative area	Less than 5 years	313	77.86
	Greater than or equal to 5 years	89	22.14
	Total	402	100
Current area of practice	Surgical ward	111	27.61
	Medical ward	76	18.90
	OR	68	16.91
	Gynecology	22	5.47
	Pediatrics	43	10.69
	Other ^a	78	19.40
	Total	402	100

^aOPD, Emergency

Factors Associated with Level of Nurses' Practice

The level of nurses' practice was assessed for its association with socio-demographic and institutionally related variables. In bivariable logistic regression analysis, nine variables such as age, postoperative area of experience, training, marital status, current area of practice, workload, documentation, availability of the wound assessment tool, and availability of equipment to perform nursing procedures were imported to multivariable with a p -value less than 0.25. From the total respondents who were in the age range of 50–59 years, 22 (71%) had good postoperative wound care practice; there was

Table 2. Percentage Distribution of Nurses According to Level of Their Practice on Postoperative Wound Care Practice, South Wollo Zone Northeast, Ethiopia 2020 (n = 402).

No	Item	Either of sometime or never practice n(%)	Always practice n(%)
1	I wash my hand before and after changing wound dressing	101 (25.1%)	301 (74.9%)
2	I wash my hand before wearing sterile gloves	154 (38.3%)	248 (61.7%)
3	I assess patients body mass index after surgery	171 (42.5%)	231 (57.5%)
4	I advise my patient to take vegetable and fruits after surgery as needed	188 (46.8%)	214 (53.2%)
5	I advise malnourished patient to take nutritious protein diet	149 (37.1%)	253 (62.9%)
6	Place bag for soiled item within patient reach	131 (32.6%)	271 (67.4%)
7	I inspect the gauze for wet and color of discharge	112 (27.9%)	290 (72.1%)
8	Put on disposable (clean) gloves when opening wound	133 (33.1%)	269 (66.9%)
9	I clean surgical wound from clean to dirty area	131 (32.6%)	271 (67.4%)
10	I used sterile dressing materials for cleansing surgical wound dressing	108 (26.9%)	294 (73.1%)
11	Use single-sterile gauze in one direction only	166 (41.3%)	236 (58.7%)
12	Clean the wound by using forceps (non-toothed dissecting forceps)	163 (40.3%)	240 (59.7%)
13	I use povidine-iodine or normal saline for cleaning surgical wound as needed	114 (28.4%)	288 (71.6%)
14	I used aseptic technique during obtaining swab culture	138 (34.3%)	264 (65.7%)
15	I assess and monitor surgical site condition	113 (28.1%)	289 (71.9%)
16	I separate infected from non-infected cases during dressing	113 (28.1%)	289 (71.9%)
17	I used face mask during wound dressing	171 (42.5%)	231 (57.5%)
18	I clean and disinfect the surface of the dressing trolley with antiseptic solution	122 (30.3%)	280 (69.7%)

no significant difference in practice scores between participants of different age groups ($p = 0.069$). Nurses with 5 years or more of postoperative experience had good practices, accounting for 50 (56%). Nurses who were working in OR 42 (61.8%) had good postoperative wound care practices. Nurses who had no workload (114, or 53.8%) had good postoperative wound care practice. Good postoperative wound care practice was reported by 117 (52.5%) of the nurses who attended the training. This study showed that 49.8% of nurses had good postoperative wound care practice and 50.2% had poor postoperative wound care practice (Table 3).

In multivariable regression analysis, two variables: availability of wound management tools and documentation of wound assessment and management had significant associations with the dependent variable. The availability of a wound management tool was 1.6 times more likely to promote good postoperative wound care practice than the lack of availability of a wound assessment tool [AOR = 1.6; 95% CI (1.11, 2.50)]. Nurses who had documented their wound assessment and management activities were 2.19 times more likely to have good postoperative wound care practice than those who hadn't documented [AOR = 2.19; 95% CI (1.44, 3.34)] (Table 4).

Discussion

The aim of the study was to assess nursing practice and associated factors regarding postoperative wound care among nurses working in governmental hospitals in the south Wollo zone and Oromia special zone, northeast Ethiopia, in 2020. This study showed that 49.8%, with a 95% CI of

44.84–54.66, of the participants had good postoperative wound care practice. This finding is in line with the finding in Bangladesh, where 51.7% of nurses had good wound care practices (Sickder, 2010). This finding is greater than the study conducted in Tanzania, which reported that 42% had good practice (Mwakanyamale, 2013) and the study conducted in Egypt, which reported that 40% had good wound care practice (Hendy Gouda et al., 2019). This difference might be due to population differences among the studies. This finding is lower than the study conducted in Mekelle, which showed that 58% of respondents had good wound care practices (Dr. Haftu et al., 2015). This difference might be due to the time difference during the study. In this study, 73% of respondents used sterile dressing materials for cleansing surgical wound dressing, and this finding is less than the study conducted in Bangladesh, which reported that 93.3% of respondents used sterile dressing materials for cleansing surgical wound dressing (Sickder, 2010). This difference might be due to socioeconomic differences between the samples in the study.

In this study, 38% of participants did not wash their hands before dressing. This result is similar to that of Olabisi University, which showed that 45% of respondents did not wash their hands before dressing (Maureen et al., 2013). In this study, 69.7% of the respondents cleared the trolley after wound dressing. But it is less than the study conducted at Olabisi University, which showed that 88.3% of respondents cleared the trolley after wound dressing (Maureen et al., 2013). This difference might be due to a lack of access to necessary equipment and materials. In this study,

Table 3. Bivariable Logistic Regression Analysis Result of Independent Variables with the Level of nurses' Practice Working in Governmental Hospital of South Wollo Zone 2020 (n = 402).

Variable	Nurse's practice N = 402			p-value	
	Good (n%)	Poor (n%)	COR		
Age	20–29	58 (44.9%)	73 (55.1%)	1	
	30–39	78 (48.8%)	82 (51.2%)	1.20 (0.76, 1.9)	0.447
	40–49	42 (52.5%)	38 (47.5%)	1.39 (0.80, 2.43)	0.246
	50–59	22 (71%)	9 (29%)	3.10 (1.32, 7.18)	0.009
	Total	200	202		
Marital status	Married	112 (48.3%)	115 (50.7%)	1	
	Single	54 (45.4%)	65 (54.6%)	0.85 (0.55, 1.33)	0.484
	Divorced	21 (53.5%)	18 (46.2%)	1.20 (0.61, 2.36)	0.603
	Widowed	10 (83.3%)	2 (16.7%)	5.13 (1.10, 4.00)	0.037
	Separated	3 (60%)	2 (40%)	1.54 (0.25, 9.39)	0.64
	Total	200	202		
Experience in post- operative area	Less than 5 years	150 (42.9%)	163 (52%)	0.72 (0.45, 1.20)	0.17
	Greater than or equal to 5 years	50 (56.2%)	39 (43.8%)	1	
	Total	200	202		
Current area of practice	Surgical ward	61 (55%)	50 (45%)	1	
	Medical ward	43 (44.7%)	42 (55%)	0.66 (0.37, 1.19)	0.171
	OR	42 (61.8%)	26 (38.2%)	1.32 (0.715, 2.45)	0.371
	Gynecology	6 (27.3%)	16 (72%)	0.31 (0.11, 0.84)	0.022
	Pediatrics	17 (39.5%)	26 (65.5%)	0.54 (0.20, 1.09)	0.088
	Other*	39 (50%)	39 (50%)	0.82 (0.43, 1.46)	0.502
	Total	200	202		
Workload	NO	114 (53.8%)	98 (46.2%)	1.41 (0.95, 1.21)	0.089
	Yes	86 (45.3%)	104 (54.7%)	1	
	Total	200	202		
Training	No	83 (46.6%)	95 (53.4%)	1	
	Yes	117 (52.5%)	106 (47.5%)	1.26 (0.85, 1.87)	0.246
	Total	200	202		
Availability of wound management tool	No	75 (43.6%)	97 (56.6%)	1	
	Yes	125 (54.3%)	105 (45.7%)	1.53 (1.03, 2.29)	0.033
	Total	200	202		
Documentation of wound assessment and management	No	55 (38.2%)	89 (61.8%)	1	
	Yes	145 (56.2%)	113 (43.8%)	2.08 (1.37, 3.14)	0.001
	Total	200	202		
Availability of dressing equipment	No	50 (42.4%)	68 (57.6%)	1	
	Yes	150 (52.8%)	134 (47.2%)	1.52 (0.99, 2.34)	0.057
	Total	200	202		

COR=Crude Odd Ratio; OR=Operation Room.

43.5% of respondents did not have training, similar to the study in Al-Shahid Ghazi Hospital, where 46.3% of respondents did not take training (Atiyah et al., 2012). However, it is higher than a study conducted in Brazil, which reported that only 11% took training (Santos et al., 2016), and 68.8% had no training in Erbil city. This difference might be due to the population difference under study.

In this study, 68.7% of the participants with a degree educational level had good wound care practice, and this is similar to the study conducted in Australia, which reported that 64.4% of respondents with a BSc degree had good

practice (Gillespie et al., 2013). In this study, 58.7% of the respondents used single-sterile gauze in one direction only. In this study, 58.7% of the respondents used single-use sterile gauze in one direction only. This finding is higher than that of a study conducted in Muhimbili National Hospital, which reported that 30% of respondents used single-use sterile gauze in one direction only (Mwakanyamale, 2013). This might be due to time differences. In this study, the availability of a wound management tool was 1.6 times more likely to promote good wound care practice than the lack of an available wound assessment tool

Table 4. Multivariable Regression Analysis Result of Variables with the Level of Nurses' Practice Working in Governmental Hospitals of South Wollo Zone, 2020 (n = 402).

Variable	Nurse's practice N = 402		COR	AOR	p-value	
	Good n(%)	Poor n(%)				
Availability of wound management tool	Yes	125 (54.3%)	105 (45.7%)	1.53 (1.03, 2.29)	1.60 (1.11, 2.50)	0.015
	No	75 (43.6%)	97 (56.4%)			
	Total	200	202			
Documentation of wound assessment and management	Yes	145 (56.2%)	113 (43.8%)	2.08 (1.37, 3.15)	2.19 (1.44, 3.34)	<0.001
	no	55 (38.2%)	89 (61.8%)			
	Total	200	202			

AOR=Adjusted Odd Ratio; COR=Crude Odd Ratio.

[AOR = 1.6; 95% CI (1.106, 2.498)]. Nurses who had documented their wound assessment and management activities were 2.1 times more likely to have good wound care practice than those who hadn't documented their activities [AOR = 2.1; 95% CI (1.435, 3.343)]. This is similar to the finding in Mekelle Hospital: poor documentation [AOR = 0.28; 95% CI (0.1, 0.74)] (Dr. Haftu et al., 2015).

Strengths and Limitations of the Study

This study was the first study of in the region that could provide a basis for further research. Whereas, the response biases might have occurred when completing the questionnaire due to English-only survey and English as a second language for participants. The selection process could be a random sampling technique rather than a survey. In addition, there might be a limitation to establishing a causal relationship between risk factors and nurses' practice on postoperative wound care because these findings were from a cross-sectional study design.

Implications for Practice

Hospital administrators and professionals need to conduct continuous nursing education programs to enhance nurses' practice in postoperative wound care. It is also important if hospital administrators to strengthen evidence-based practices which would help improve the practice. Hospitals also needed to offer more resources to manage postoperative wound care. Further study using the observational method and additional factors associated with practice in postoperative wound care is needed in the future. The current policy and guidelines on wound care in the hospital need to be expanded and reviewed based on evidence. Rather, the minister of health should better train nurses on postoperative wound care.

Conclusion

This study showed that half of the participants had poor postoperative wound care practices. Regarding associated factors, the availability of wound management tools and

documentation of wound assessment and management had a significant association with the nurse's poor postoperative wound care practice. On the basis of these results, health policymakers and hospital administrators should develop a program to train nurses in wound care practice, and it helps as a reference for the researchers to further study.

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Availability of Data

The raw data supporting the conclusions of this article will be made available by the author (Fantahun Andualem, email: fantaandu27@gmail.com), without undue reservation.

Authors' Contributions

LT designed the study, developed the proposal, conducted data collection, and performed data analysis. FA drafted the paper. LF, FA, TB, JS, and KT revised the draft and made critical intellectual contributions; they agreed to the submission. All authors read and approved the final manuscript.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical Approval and Consent to Participate

The study was conducted as per the Declaration of Helsinki and approved by the institutional review committee of the College of Medicine and Health Science research committee at Wollo University with the reference number of CMHS160/13/12. After ethical clearance was received, permission letters were obtained from Dessie Referral Hospital, Borumeda General Hospital, Akesta Hospital, Mekaneselam Hospital, and Kemissie Hospital. The information sheet was prepared and read to all participants in the study. A verbal consent was taken from all study participants. In addition to this, all participants were informed of the purpose of the study and that their participation was voluntary, and the

name of the participant was omitted from the check list instead of an ID number being used to ensure the confidentiality of the study participants. Generally, the data collectors were told the study participants there was no risk regarding this research project other than the benefit to the nurse and also explained the reality that no one was involved with an obligation if they weren't interested in the research project.

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References

- Alemayehu, T. Y., Boled, A. T., Taye, M. G., Kibret, S., & Habtie, M. (2020). Assessment of emergency and essential surgical service in primary hospitals of South Gondar zone, Amhara region, Ethiopia, 2019. *International Journal of Surgery Open*, 23, 35–38. <https://doi.org/10.1016/j.ijso.2020.02.003>
- Atiyah, H., Khudhur, K., & Hasan, S. (2012). Evaluation of nurses' practices toward postoperative wound dressing in surgical wards. *Iraqi National Journal of Nursing Specialties*, 25(1), 29–38. <https://doi.org/10.58897/injns.v25i1.115>
- Ayyub, R., Kanji, Z., Dias, J., & Roshan, R. (2015). Perceptions of patients regarding quality nursing care at a Tertiary Care Hospital in Karachi, Pakistan. *Journal of Clinical Research & Bioethics*, 6(6). <https://doi.org/10.4172/2155-9627.1000254>
- BaMohammed, A., Mohidin, S., George, B., & Al-Aidarous, S. (2018). An observational study on wound dressing performance among nurses in adult units. *Journal of Nursing and Health Science*, 7(3). <https://doi.org/10.9790/1959-0703020106>
- Boettge, K., Azarhoush, S., Fiebelkorn, J., De Santo, G., Aljedani, N., Ortiz, P., Anders, S., Hünerbein, M., & Paasch, C. (2021). The negative pressure wound therapy may salvage the infected mesh following open incisional hernia repair. *Annals of Medicine and Surgery*, 61, 64–68. <https://doi.org/10.1016/j.amsu.2020.12.013>
- Brindle, T., & Farmer, P. (2019). Undisturbed wound healing: A narrative review of literature and clinical considerations. *Wounds International*, 10(2), 40–48.
- Brown, A. (2022). Managing dehisced wounds. *Journal of Community Nursing (JCN)*, 36(5).
- Charalambous, M. (2013). A critical exploration of surgical-oncology nurse's perceptions of factors involved in decision making on postoperative wound management: A descriptive survey. *Hellenic Journal of Nursing Science*, 03(01).
- De Feitas, S. C., Silva, A. E. B. C., Minamisava, R., Bezerra, A. L. Q., & Sousa, M. R. G. (2014). Quality of nursing care and satisfaction of patients attended at a teaching hospital. *Revista Latino-Americana de Enfermagem*, 22(3), 454–460. <https://doi.org/10.1590/0104-1169.3241.2437>
- Ding, S., Lin, F., & Gillespie, B. (2016). Surgical wound assessment and documentation of nurses: An integrative review. *Journal of Wound Care*, 25(5), 232–240. <https://doi.org/10.12968/jowc.2016.25.5.232>
- Dowell, D., Haegerich, T. M., & Chou, R. (2016). CDC Guideline for prescribing opioids for chronic pain—United States. *JAMA*, 315(15), 1624–1645. <https://doi.org/10.1001/jama.2016.1464>
- Dr. Haftu, B. H. T., Seada, E., et al. (2015). Nurses' knowledge, practice and associated factors regarding postoperative wound care of hospitalized pediatric patients in public hospitals of Mekelle City, North Ethiopia. *International Journal of Development Research*, 08(10), 23592–23603.
- Famakinwa, T. T., Bello, B. G., Oyeniran, Y. A., Okhiah, O., & Nwadike, R. N. (2014). Knowledge and practice of post-operative wound infection prevention among nurses in the surgical unit of a teaching hospital in Nigeria. *International Journal of Basic, Applied and Innovative Research*, 3(1), 23–28.
- Ferreira, A. M., Rigotti, M., Barcelos, R. M., Simão, C., Ferreira, D., & Gonçalves, R. (2014). Knowledge and practice of nurses about care for patients with wounds. *Journal of Research Foundation Care Online*, 6(3), 1178–1190. <https://doi.org/10.9789/2175-5361.2014v6n3p1178>
- Getachew, G. B. D., & Bewket, M. (2016). Why patients are dissatisfied on nursing care services at Menelik Hospital, Addis Ababa. *J.Bio.Innovation Association*, 850–860.
- Gillespie, B., Chaboyer, W., Nieuwenhoven, P., & Rickard, C. J. W. P. (2012). Drivers and barriers of surgical wound management in a large health care organisation. *Wound Practice and Research*, 20, 90–102.
- Gillespie, B. M., Chaboyer, W., Allen, P., Morely, N., & Nieuwenhoven, P. (2013). Wound care practices: A survey of acute care nurses. *Journal of Clinical Nursing*, 2618–2627. <https://doi.org/10.1111/jocn.12479>
- Gillespie, B. M., Chaboyer, W., Kang, E., Hewitt, J., Nieuwenhoven, P., & Morley, N. (2014). Postsurgery wound assessment and management practices: A chart audit. *Journal of Clinical Nursing*, 23, 3250–3261. <https://doi.org/10.1111/jocn.12574>
- Hendy Gouda, A., Talaat Mohammed, E., & Ali Ameen, D. (2019). Factors affecting postoperative nursing performance in the surgical units. *Egyptian Journal of Health Care*, 10(1), 50–64. <https://doi.org/10.21608/ejhc.2019.26750>
- Henriques, B. D. C. S., & Lacerda, S. (2016). Nursing care in surgical patient safety: An integrative review. *Cogitare Enferm.*
- Jaddoue, T. (2015). Impact of health educational program upon nurses' knowledge towards postoperative wounds care in Mosul teaching hospitals. *Iraqi National Journal of Nursing Specialties*, 28(2).
- Khudhair, A. S. (2018). Nurses practice concerning postoperative clean wound dressing. *Indian Journal of Public Health Research & Development*, 9, 251–256. <https://doi.org/10.5958/0976-5506.2018.00559.4>
- Lemma, B-e., Andualem, D., Kassahun, N., Asrat, M., Abeba, M., Medhanit, M., Awoke, T., Tigist, T., Baye, D., & Achamelysh, A. (2013). Situational analysis of emergency and essential surgical care in public hospitals in Ethiopia. *2013*, 1–22.
- Makonnen, M. (2017). Amref health Africa leads transform: Health in developing regions. *Ethiopia Highlights*, 4(1).
- Maureen, B. N., Nnodimele Atulomah, O., & Otu, E. (2013). An assessment of wound dressing by nursing personnel at Olabisi university teaching hospital. *Wilolud Journals*, 1(5). <https://doi.org/10.5707/cjns>
- Mengesha, A., Tewfik, N., Argaw, Z., Beletew, B., & Wudu, M. (2020). Practice of and associated factors regarding prevention

- of surgical site infection among nurses working in the surgical units of public hospitals in Addis Ababa city, Ethiopia: A cross-sectional study. *PloS One*, *15*(4), e0231270. <https://doi.org/10.1371/journal.pone.0231270>
- Moss, A. J., Williams, M. C., Newby, D. E., & Nicol, E. (2017). The updated NICE guidelines: Cardiac CT as the first-line test for coronary artery disease. *Current Cardiovascular Imaging Reports*, *10*, 1–7. <https://doi.org/10.1007/s12410-017-9399-z>
- Mwakanyamale, A. A. (2013). Nursing practice on post operative wound care in surgical wards at Muhimbili National Hospital, Dar-Es-Salaam, Tanzania.
- Mwakanyamale, A. A., Mukaja, A. M. A., Ndomondo, M. D., Zenas, J. P., Stephen, A. M., & Mika, E. (2019). Nursing practice on post-operative wound care in surgical wards at Muhimbili National Hospital, Dar-es-Salaam, Tanzania. *Open Journal of Nursing*, *9*(8), 870–890. <https://doi.org/10.4236/ojn.2019.98065>
- Najm, H., & Hussein, H. (2018). Assessment of wound dressing practices among nurses at the emergency hospitals in Erbil city. *Zanco Journal of Medical Sciences*, *22*(1), 96–103. <https://doi.org/10.15218/zjms.2018.013>
- Pukki, T., Tikkanen, M., & Halonen, S. (2010). Assessing Mepilex Border in post-operative wound care. *Clinical Research/Audit*, *6*, 30–40.
- Raykha, C., Botros, A. S. R., Roden, Y., & Murchan, P. (2018). Negative pressure wound therapy with instillation as conservative management for a large abdominal wound following incarcerated parastomal hernia repair. *Cureus*. <https://doi.org/10.7759/cureus.3728>
- Sandy-Hodgetts, K., Thomas, S., Idensohn, P., Harikrishna, K. R., Assadian, O., McIsaac, C., Gulnaz, T., Morgan-Jones, R., Rochon, M., Wainwright, T., & Risal, D. (2022). Barriers and enablers for clinical management of surgical wound complications: Results of an international survey prior and during the COVID-19 pandemic. *Wounds International*, *13*, 9–15.
- Santos, A. P. A., Camelo, S. H. H., Santos, F. C., Leal, L. A., & Silva, B. R. (2016). Nurses in post-operative heart surgery: Professional competencies and organization strategies. *Journal of School of Nursing Nursing*, *50*(3), 474–481. <https://doi.org/10.1590/S0080-623420160000400014>
- Sickder, H. K. (2010). Nurses' knowledge and practice regarding prevention of surgical site infection in Bangladesh.
- Sickder, H. K., Lertwathanawilat, W., Sethabouppha, H., & Viseskul, N. (2017). Nurses' surgical site infection prevention practices in Bangladesh. *Pacific Rim International Journal of Nursing Research*, *21*(3), 244–257.
- Stuart-Shor, E. M., Cunningham, E., Foradori, L., Hutchinson, E., Makwero, M., Smith, J., Kasozi, J., Johnston, E. M., Khaki, A., Vandervort, E., Moshi, F., & Kerry, V. B. (2017). The global health service partnership: An academic–clinical partnership to build nursing and medical capacity in Africa. *Frontiers in Public Health*, *5*, <https://doi.org/10.3389/fpubh.2017.00174>
- Sway, A., Solomkin, J. S., Pittet, D., & Kilpatrick, C. (2018). Methodology and background for the World Health Organization global guidelines on the prevention of surgical site infection. *Surgical Infections*, *19*(1), 33–39. <https://doi.org/10.1089/sur.2017.076>
- Tesfaye, T., & Abera, A. (2015). Assessment of factors affecting performance of nurses working at Jimma university specialized hospitals in Jimma Town, Oromia, Region, southwest Ethiopia. *Journal of Nursing and care*, *4*(6). <https://doi.org/10.4172/2167-1168.1000312>
- Tharpe, N. (2008). Postpregnancy genital tract and wound infections. *Journal of Midwifery & Women's Health*, *53*(3), 236–246. <https://doi.org/10.1016/j.jmwh.2008.01.007>
- Timmins, B. A., Thomas Riché, C., Saint-Jean, M. W., Tuck, J., & Merry, L. (2018). Nursing wound care practices in Haiti: Facilitators and barriers to quality care. *International Nursing Review*, *65*, 542–549. <https://doi.org/10.1111/inr.12438>
- Von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: Guidelines for reporting observational studies. *Lancet*, *370*(9596), 1453–1457. [https://doi.org/10.1016/S0140-6736\(07\)61602-X](https://doi.org/10.1016/S0140-6736(07)61602-X)
- WHO. (2009). WHO guidelines for safe surgery. *A world alliance for safer health care*.
- WHO. (2020). Patient safety. *Reginal Office for Africa*.
- Willis-Owen, C. A., Konyves, A., & Martin, D. K. (2010). Factors affecting the incidence of infection in hip and knee replacement. *The Journal of Bone and Joint Surgery*, *92*, 1128–1133. <https://doi.org/10.1302/0301-620X.92B8>