Nurses Practice Regarding Post-operative Wound Care And Its Associated Factors Of Hospitalised Patients In Public Hospitals Of Mekelle City, Tigray, Ethiopia, 2018/19.

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Abstract

Background: Post-operative wound care is a care that applied sterile gauze or bandage to wound to promote healing and protect the wound from further harm after surgical operation is done internally or externally to the involved organs. Post-operative Wound care is a nursing duty that requires excellent skills and knowledge to prevent massive complications such as infection, gangrene and amputation or, in severe cases, even death.

Methods: Hospital based cross sectional study design was implemented and the total sample size was 375 nurses working in Ayder Comprehensive Specialized Hospital, Mekelle Hospital and Quiha hospital. Pre-test was done on 10 % of the sample size. Data was collected by observation and face to face interviewing using pre tested checklist and structured questionnaire respectively from March 20, 2019 to May 20, 2019. Simple random sampling was used. Data was coded, entered and analyzed using SPSS version 22.0 for statistical analysis. Binary logistic regression analysis was used to determine the predictor variables to the outcome variables with 95% confidence level at p-value of < 0.25 and finally p-value < 0.05 was described as statically significant.

Result: A total of 375 respondents were participated in the study. Among them, 234(62.4%) were women. The overall nursing post-operative wound care practices were poor 258(68.8%). Work experience (AOR=0.47, 95%CI; 0.26-0.86), level of education (AOR=0.03, 95%CI; 0.004-0.25) and lack of materials (AOR=0.29, 95%CI; 0.09-0.89) was found to be associated with nurses post-operative wound care practice.

Conclusion and recommendation: Factors such as work experience, educational level and lack of materials were statically significant association with nurses post-operative wound care practice. Highly qualified nurses should be engaged in training of other staff nurses in the tenderized dressing techniques of postoperative wounds.

Background

Wound care is defined as the application of fluid to a wound to remove exudates, slough, necrotic debris, bacterial contaminants and dressing residue without adversely impacting cellular activity vital to the wound healing process(1). The custom of post-operative wound care practice is as old as the history of surgery(2). It was started by washing the wounds by beer, making the plasters and bandaging the wound(3).

Approximately 10% of the hospitalized surgical patients suffers from surgical site infection in the world due to insufficient nursing postoperative wound care practice. Adequate level of skill and positive attitude are essential components in the delivery of post-operative wound care(4).

Effective wound care promotes wound healing and leads to early discharge and saving costs. The dressing protects the wound from injury, prevents introduction of bacteria, reduces discomfort, and

speeds healing(5).Even to prevent such post-operative complications, it is necessary to study existing wound care practices and measure the difference between these and, ideally, to lean more towards evidence-based practices for wound care(6).

A surgical site infection is one of the most common causes of health care associated infection. It is also one of the most important complications of a surgical intervention. Certain factors are known to be responsible for surgical site infections. including application of skin antiseptics, inadequate sterilization of instruments, surgical hand's scrubs, and post-operative dressing techniques(7).

Postoperative wound infection is the leading infection in the general patient population in countries with limited resources, affecting up to two third of operated patients and with a frequency up to nine times higher than in developed countries. Postoperative wound infection accounts for about 15% of all health-care-associated infections and about 37% of the hospital-acquired infections of surgical patients. In western countries, the frequency of such infections is 15– 20% of all cases, with an incidence of 2–15% in general surgery. In Africa an incidence of surgical site infection ranging from 2.5–30.9% following various types of surgical procedures and up to 21% of operated patients develop wound infection in Ethiopia (9, 10).

Methods

Study area and period

The study was conducted in public Hospitals of Mekelle city, Tigray, Ethiopia

The study was conducted March 20, 2019 to April 20, 2019.

Study design

Institutional based cross -sectional study was employed.

Source population

All nurses working in post-operative Hospitalized Patients at the public hospitals of Mekelle city.

Study population

All selected nurses who are working in post-operative hospitalized Patients of the public hospitals of Mekelle city in the study period.

Inclusion and exclusion criteria

Inclusion criteria

All nurses working in post-operative hospitalized Patients at the public hospitals.

Exclusion criteria

Nurses who were not directly involved in the bedside patient care such as head nurse and facilitator.

Sample size determination and sampling technique

The actual sample size for the study was determined by using the formula for single population proportion by assuming 5% marginal error (d), 95% confidence interval and the proportion of poor nurses practice on post-operative wound care was taken 57.7% from previous study in Tanzania among nurses working in surgical wards. Based on the above information, the total initial sample size was calculated by using the formula.

$$n = \frac{Z^2 P (1-P)}{d^2}$$

Where; n = require initial sample size,

Z = critical value for normal distribution at 95% confidence interval which equals to 1.96

P = 57.7%, estimated proportion of nurses who had poor Practice on postoperative wound care.

q = proportion of population practice of nurses on post-operative wound care (1-0.577 = 0.423).

d = the margin error between the sample and the population (0.05).

$$n_i = \frac{(1.96)^2 \times 0.577(1-0.577)}{(0.05)^2} = 375$$

Since the source of population is few and to increase the representativeness, correction formula was not used and the study participants final sample size was 375 nurses.

Sampling technique and Sampling procedure

Simple random sampling method was employed to allocate the 375 study participants who are working in the wards during data collection period. Sampling process was based on lottery method

Dependent variable

- Nurses Post-operative wound care practice

Independent variables

- **Socio demographic characteristics of nurses** (Sex, Age, Level of education, Work experience)
- **Institutional factors** (Training, Work load, shortage of materials, Presence of protocol and standard)

- **Health care provider related factors** (opportunity to opinion, assertiveness and familiarity with antiseptic)

Operational Definitions

Practice - The application of standards and knowledge in to action (12).

Good practice – those who scored above the mean on practice items (9 and 14).

Poor practice – those who scored below the mean on practice items (9 and 14).

Post-operative –a period from patient is admitted to ward after having surgery till discharge home (28)

Wound care - dressing of wound using standard way (8).

Data collection tool and technique

Standard checklist and set of structured questionnaires by reviewing different literatures and modified by the researcher was used to collect the data after getting ethical clearance from IRB of Mekelle University. It was prepared in English then, the data were collected using observation and face to face interview from the study subjects. In this study BSc Nurses was collected data using a pretested checklist and questionnaire from the sample population according to the inclusion criteria. Four data collectors (BSc Nurses) from Mekelle Health Center and two supervisors (MScN) from Ayder comprehensive specialized Hospital was selected and they were participated throughout the data collection period.

Data quality control

Prior to data collection a two days training was given by the principal investigator. The training was supported by clearly prepared training manual and incorporated that; objectives of the study, introduction of checklist and questionnaire format, Procedure of observing and interviewing. To ensure quality of data, properly designed standardized data collection tool was used. Pre-test was conducted using 10% of the sample on nurse working in surgical ward in Wukro hospital before 2 weeks of the actual data collection period to assess instrument validity, simplicity, flow and consistency and questionnaire modification was made after the pretest accordingly

Data processing and analysis

The collected data was edit, check visually for its completeness and the response was coded, enter and analyzed using SPSS version 22.0.Descriptive statistics such as frequency, percentage mean and

standard deviation was computed and the results was summarized and present by tables, charts and texts.

Results

Socio- demographic characteristics of respondents

A total of 375 nurses were involved in the study with the response rate of 100%. Among the participants 234(62.4%) of them were females, the mean age and standard deviation of the participants was 33.98 ± 6.12 with majority of 207(55.2%) of the nurses age was 25–34 years, educational level of the study participants 282 (75.2%) of them had BSc degree in nursing. Regarding, work experience in the wards of the study participants majority 182(48.5%) of them had from 2–5 years (**As shown in Table 1**).

Table 1
Socio - demographic characteristics of nurses working in
Postoperative wound care at Mekelle Public Hospitals, Tigray,
Ethiopia, 2019 (n = 375).

Variable	Category	Frequency	Percent (%)
Sex	Male	141	37.6
	Female	234	62.4
Age	Less than 25	8	2.1
	25–34	207	55.2
	35–44	135	36.0
	More than 44	25	6.7
Educational level	Diploma	81	21.6
	BSc Degree	282	75.2
	MSc	12	3.2
Work experience	less than 2 years	126	33.6
	2-5yrs	182	48.5
	> 5yrs	67	17.9

Nurse's practice on postoperative wound care

More than half 201(53.6%) of nurses were able to review physician order for dressing change procedures. Regards to documentation and teaching phase, documenting after dressing any signs of inflammation, infection or wound progress were done only by 3.7% of the participants followed by record of date and time 8.5% after the procedure (**As shown in Table 2**).

Table 2

Nurses practice of post-operative wound care in Mekelle Public Hospitals, Tigray, Ethiopia, 2019(n = 375).

Variable	Category	Frequency	Percent (%)
Review physician order for dressing change procedures	Yes	201	53.6
	No	174	46.4
Prepare necessary equipment	Yes	261	69.6
	No	114	30.4
Identify the patient	Yes	295	78.7
	No	80	21.3
Explain procedure to the patient	Yes	173	46.1
	No	202	53.9
Provide privacy	Yes	34	9.1
	No	341	90.9
Patient's position comfortably	Yes	173	46.1
	No	202	53.9
Wash hands and use face mask	Yes	104	27.7
	No	271	72.3
Open sterile dressing sets on trolley (patient bedside)	Yes	211	56.3
	No	164	43.7
Open bottle of antiseptic solution or saline and pour into sterile basin	Yes	198	52.8
	No	177	47.2
Wear disposable gloves	Yes	256	68.3
	No	119	31.7
Remove and Dispose soiled dressing in disposable bag and apply mackintosh	Yes	290	77.3
	No	85	22.7
Remove gloves by pulling out the inside of them	Yes	201	53.6
	No	174	46.4
Put on sterile gloves	Yes	307	81.9
	No	68	18.1

Variable	Category	Frequency	Percent (%)
Clean wound with antiseptic solution use gauze swab from least contaminated area to most contaminated	Yes	194	51.7
	No	181	48.3
use a separate gauze swab for each stroke, applying antiseptic ointment if ordered	Yes	160	42.7
	No	215	57.3
Use dry gauze to swab in same manner as in (14,15) to dry the wound	Yes	232	61.9
	No	143	38.1
Cover the wound with sterile gauze	Yes	362	96.5
	No	13	3.5
Remove gloves and dispose in bag(change disposable glove optional)	Yes	50	13.3
	No	325	86.7
Apply tape over dressing (separate from drain)	Yes	320	85.3
	No	55	14.7
Assist patient to return to his/her comfortable position	Yes	48	12.8
	No	327	87.2
Dispose or return of supplies to their proper place	Yes	84	22.4
	No	291	77.6
Wash hands after procedure	Yes	47	12.5
	No	328	87.5
Record Any sign of Inflammation or infection such as (hotness, redness, swelling, tenderness, bad odor or pus)	Yes	14	3.7
	No	361	96.3
Record date and time	Yes	32	8.5
	No	343	91.5

Table 3

Bivariate logistic regression analysis for socio demographic, professional and institutional associated factors of nurses practice post-operative wound care Mekelle public hospitals, 2019.(n = 375)

Variables	Category	OR	
		COR	P ≤ 0.25
Age	less than 25	1	1
	25-34yrs	2.96(0.57–15.39)	0.19
	35-44yrs	0.88(0.37–2.11)	0.79
	> 44 yrs	0.56(0.24–1.47)	0.26
Sex	Male	1	1
	Female	1.05(0.67–1.65)	0.81
Work experience	Less than 2 yrs	1	1
	2–5 yrs	0.49(0.26–0.91)	0.025
	> 5yrs	0.48(0.26–0.85)	0.013
Educational level	Diploma	1	1
	Degree	0.04(0.005 – 0.35)	0.003
	MSc	0.03(0.005–0.28)	0.002
Opportunities to demonstrate new practice	Yes	1	1
	No	0.96(0.62–1.50)	0.87
Is there lack of assertiveness in the health care provider	Yes	1	1
	No	0.81(0.51–1.28)	0.37
Is there lack of Familiarity to antiseptic	Yes	1	1
	No	1.35(0.74–2.48)	0.31
Training	Yes	1	1
	No	0.71(0.41–1.23)	0.23
Work load effect in practice	Yes	1	1
	No	1.99(0.89–4.47)	0.09

Variables	Category	OR	
		COR	$P \leq 0.25$
Lack of materials effect in practice	Yes	1	1
	No	0.32(0.11–0.95)	0.04
Protocol presence in the ward	Yes	1	1
	No	2.11(0.7–6.40)	0.18
Effect of protocols in practice	Yes	1	1
	No	1.45 (0.79–2.63)	0.22

Health care provider related associated factors

Among the participants, majority of them 217 (57.9%) responds that they have the opportunities to perform the new technique of post-operative wound care practice. Regards to lack of assertiveness 65.6% of the participant believes that there is lack of assertiveness and 14.4% of the participant said that there is lack of familiarity with antiseptics.

Institutional related associated factors

From a total of 375 participants, only 22.7% are taken a training related to post-operative wound care practice. Regards to work load 89.1% of the participants, said it affects the nursing practice, 96.3% of the participant respond that lack material affects wound care practice.

Bi-variate logistic regression analysis

The association of dependent variables with the independent variable was investigated using both bivariate and multivariable logistic regression technique. Bivariate logistic regression was done to assess the relationship between each independent variable with the outcome variable. The result reveals that age, work experience, Educational level, training, Work load effect, Lack of materials, Protocol presence and Effect of protocols found be significant predictors of nursing post-operative wound care practice at P-value of ≤ 0.25 . However; in this study there were no statistically significant relationships between nurses' sex, opportunities to demonstrate new practice, lack of assertiveness and lack of Familiarity to antiseptic towards post-operative wound care practice. Variables at p-value ≤ 0.25 were transferred in to multivariate logistic analysis.

Multi-variable analysis

Multivariable logistic regression was done for post-operative wound care practice adjusted for all possible candidate predictors pooled from bivariate logistic regression at p value ≤ 0.25 analysis. In multivariate those at p value < 0.05 like work experience, educational level and lack of materials were found to be significant predictors of nurses post-operative wound care practice. Those who had more

than five years of Work experience were 55% [AOR = 0.45; 95%CI; 0.23–0.85] times less likely to have poor nurses practice of post-operative wound care as compared to those who had less than two years of work experience.

Those who were MSc holders were 97% [AOR = 0.036; 95%CI; 0.004–0.29] times less likely to have poor nurses practice of post-operative wound care as compared to those who had diploma educational holders. Those who were do not have lack of materials during post-operative wound care practice were 71% [AOR = 0.29; 95%CI; 0.09–0.89] times less likely to have poor nurses practice of post-operative wound care as compared to those who were having lack of materials.

Table 4

Bivariate and multivariate analysis for nurses' practice and its associated factors of post-operative wound care in Mekelle Public Hospitals, Tigray, Ethiopia, 2019 (n = 375).

variables	Category	OR			
		COR	P value ≤ 0.25	AOR	P < 0.05
Age	less than 25	1	1	1	1
	25-34yrs	2.96(0.57–15.39)	0.19	2.83(0.48–16.66)	0.25
	35-44yrs	0.88(0.37–2.11)	0.79	0.86(0.35–2.14)	0.75
	> 44 yrs	0.56(0.24–1.47)	0.26	0.64(0.25–1.67)	0.37
Work experience	< 2 yrs	1	1	1	1
	2– 5 yrs	0.49(0.26–0.91)	0.025	0.45(0.23–0.85)	0.015
	> 5yrs	0.48(0.26–0.85)	0.013	0.47(0.26–0.86)	0.015
Educational level	Diploma	1	1	1	1
	Degree	0.04(0.005 – 0.35)	0.003	0.03(0.004–0.29)	0.002
	MSc	0.03(0.005–0.28)	0.002	0.03(0.004–0.25)	0.001
Training	Yes	1	1	1	1
	No	0.71(0.41–1.23)	0.23	0.72(0.39–1.34)	0.31
Work load	Yes	1	1	1	1
	No	1.99(0.89–4.47)	0.09	2.13(0.90–5.03)	0.08
Lack of materials	Yes	1	1	1	1
	No	0.32(0.11–0.95)	0.04	0.29(0.09–0.89)	0.03
Protocol presence	Yes	1	1	1	1
	No	2.11(0.7–6.40)	0.18	0.55(0.17–1.74)	0.31
Protocol effect	Yes	1	1	1	1
	No	1.45 (0.79–2.63)	0.22	1.57(0.81–3.05)	0.17

Note

Discussion

In this study, nurses' post-operative wound care practice of 375 nurses working in admitted patients of Mekelle public hospitals were analyzed. Among the total Nurse, majority 258(68.8%) of them had poor post-operative wound care practice. This result was higher than a study done in Tanzania Muhimbili National Hospital were 57.7% (9) and Khartoum State Alamal hospital 23.4%(13). This could be due to the difference in study population and staff commitment.

In the Preparation phase More than half (53.6%) of nurses were able to review physician order for dressing change procedures. this is less than a Study done in Khartoum State Alamal hospital66.7%(13). prepare necessary equipment's was done by 69.5%, and there is a relatively similar result in TanzaniaMuhimbili National hospital64.8% (9). Explain the procedure to patient or patient family was done by 46.1%which is lower than a study in Tanzania Muhimbili National hospital81.7%(20) and Khartoum State Alamal hospital59%(25). Provide privacy 9.1%. its lower than a Study in Nigeria 83.3% (15).Nurses hand washing before the procedures start was 27.7%. Lower than Study in Tanzania Muhimbili National Hospital 49.3%(9) and A study done in Kenya Mariakani cottage hospital 57.1% (17). This could be due to the difference in staff experience.

In the Applying of dressing technique phase, wear disposable glove to remove old dress was observed by 68.3% this is lower than a Study done in Tanzania Muhimbili National Hospitals 99%(20). Put on sterile glove was done by 81.9%,this is higher than a Study done in Tanzania Muhimbili National Hospital 63% (9).clean wound with antiseptic solution using gauze swab from least contaminated area to most contaminated 51.7%,its higher than a Study done in Tanzania Muhimbili National Hospital 34%,(9).Use separate gauze swab for each stroke 42.7%,lower than a Study done in Khartoum State Alamal hospital 55% (26).Cover the wound with sterile gauze 96.5%. its higher than a study done in Sudan Bahry Hospital 58.3% (16). This could be due to difference in material availability.

Regards to documentation and teaching phase, documenting after dressing any signs of inflammation, infection or wound progress were done only by 3.7% of the participants followed by record of date and time 8.5% after the procedure. This is better than a Study done in Tanzania Muhimbili National Hospital 0%(9)and lower than study done in Rwanda Butare Hospital 13%(8). This may be due to the different in nurse's habit towards documentation and hospital regulation.

Post-operative counseling and instructing the patient/relatives not to temper with the wound and nutrition was 13.6% of nurses. This result is Relatively similar with a Study done in Tanzania Muhimbili National Hospital 15% (9).This may be due to the similarity in study design and study participants. And its lower than a Study done in Khartoum State Alamal hospital 33.3%(13). This may be due to different study setting. Among the participants 14.4% of the answered that there is lack of familiarity with antiseptics. This result is lower than a study done in Mekelle public hospitals pediatric ward 26.6%(15). The possible

difference may be due to the present study is wider in scope than the previous one as well as due to the instrument variation.

Work experience was significantly associated with poor nurses practice of post-operative wound care. This result is supported by the studies conducted in Nigeria (15) and Iraq (9). Educational level was also significantly associated with poor nurses practice of post-operative wound care. This result is supported by the findings conducted in Jaban Baghdad (19). Lack of materials is also significantly associated with poor nurses practice of post-operative wound care. This result is supported with the studies conducted in kenyataMarakani (17). The possible reason might be due to the similarity of study design.

Conclusion

Nurses' practice was observed good in covering of the wound with sterile gauze, however regards to recording of inflammation and infection was the lowest practice observed by nurses. Over all nurses' practice towards post-operative wound care was poor performance. Nurses Practice of post-operative wound care depends on work experience, educational level and lack of materials.

Based on the above finding of the study the following recommendations were made: -

1. Government and non-governmental health care organizations should come to the aid of those institutions by providing wound dressing equipment, employment/training of nursing personnel who are specialized in wound care.
2. Ministry of Health and the hospitals should ensure that nurses are more trained. This can be achieved by providing more learning opportunities to nurses.
3. Highly qualified nurses should be engaged in training other staff nurses in the tenderized dressing techniques of postoperative wounds.
4. Further Studies are recommended which incorporate larger and more diverse samples of nurses in order to have a wide understanding about this phenomenon.

Limitation of the study

Shortage of literature particularly studies on similar topics in our country could be mentioned as some of the limitations.

Abbreviations

ACSH: Ayder comprehensive specialized Hospital, AICU: Adult Intensive Care Unit, AOR: Adjusted Odds Ratio, CHS: College of Health Science ,DC: Data Collector, ETB :.Ethiopian Birr, GynW: Gynecology Ward ,MSc: Master of Science, PICU: Pediatric Intensive Care Unit, PWA: Pediatric ward A,PWB: Pediatric Ward B, SW: Surgical Ward, SWA: Surgical ward A,SWB: Surgical ward B,SPSS :Statistical Program for Social Sciences, WHO :World Health Organization

Declarations

Ethics approval and consent to participate

Ethical clearance and approval was obtained from the institutional review board of Mekelle University CHS. Letters of permission was obtained from each hospitals Moreover, prior to conducting the study, the purpose and objective of the study was described to the study participants and written informed consent was obtained. The study participants were informed as they had full right to discontinue during the interview. Participants' confidentiality and any special data security requirements was maintained and assured by not exposing patients name and information. According the university ethical clearance rule and regulation, ethical clearance was obtained from institutional review board of Mekelle University (Reference number, MU/ 1266 /2019).

Consent for publication

Not applicable as there is no image or other confidentiality related issues.

Availability of data and materials

The datasets used during the current study is available from the corresponding author on reasonable request.

Competing interests

The author declares that they have no competing interests.

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Author's contribution

YT, KB and KB **make interpretation of the data and helping during analysis.** GL **prepares and submits** the manuscript. All author have read and approved the manuscript.

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Figures

Figure 1

Institutional related associated factors