

## Research Article

# Assessment of Nurses' Knowledge, Attitude, and Perceived Barriers to Expressed Pressure Ulcer Prevention Practice in Addis Ababa Government Hospitals, Addis Ababa, Ethiopia, 2015

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Received 12 August 2015; Revised 22 October 2015; Accepted 24 November 2015

Academic Editor: Ann M. Mitchell

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*Background.* Although pressure ulcer development is now generally considered as an indicator for quality of nursing care, questions and concerns about situations in which they are unavoidable remain. Awareness about the significance of the problem, positive attitude towards prevention, and an adequate level of knowledge are cornerstones to effectively prevent pressure ulcers. *Objective.* To assess nurses' knowledge, attitudes, and perceived barriers to expressed pressure ulcer prevention practice in Addis Ababa government hospitals. *Methods and Materials.* This is a cross-sectional study by design. A total of 217 eligible nurses participated in the study and data were collected through pretested self-administered questionnaire. *Results.* When queried, 61.2% of the respondents had adequate knowledge on pressure ulcer prevention practices, while 68.4% had favorable attitudes towards prevention practices. Moreover, 67.3% of participants had good pressure ulcer prevention practices. *Conclusion and Recommendation.* More than half of the nurses were found to have adequate knowledge about pressure ulcer prevention and their attitude towards it was overall favorable. Expressed pressure ulcer prevention practice was affected by the participant's level of knowledge, attitude, and barriers of care. To provide effective prevention of pressure ulcer, nurses' level of knowledge and attitude should be enhanced besides resolving these barriers.

## 1. Introduction

Pressure ulcer is defined by the National Pressure Ulcer Advisory Panel (NPUAP) and European Pressure Ulcer Advisory Panel (EPUAP) as "localized injury to the skin and/or underlying tissue usually over a bony prominence as a result of pressure, or pressure in combination with shear and/or friction." People most at risk of pressure ulcers are those with a medical condition that limits their ability to change positions, requires them to use a wheelchair, or confines them to a bed for a long time [1].

Pressure ulcers result when increased pressure exceeds the local capillary pressure. Depending on patient's severity of illness, less pressure may be adequate enough to obstruct

capillary blood flow and can result in decreased oxygen delivery to tissues and as a result pressure ulcers can develop within 2 to 6 hours. If patients who are at risk of pressure ulcer are identified, effective measures will be taken to prevent its occurrence [2].

There are several factors contributing to the development of pressure ulcers. These included prior ulcers, peripheral vascular diseases, diabetic mellitus, smoking, prolonged immobility, poor nutritional status, incontinency, impaired sensation, and aging as intrinsic factors and pressure, shear, friction, moisture, poor moving, and handling as well as therapeutic devices as extrinsic factors. Nurses' knowledge and attitude are also viewed as extrinsic factors for pressure ulcer formation [3].

World stop pressure ulcer day report in 2014 showed that nearly 700,000 patients were affected by pressure ulcers each year. Around 186,617 patients develop a new pressure ulcer in acute care each year. This has shown that in the year January 2012 to December 2013 between 4 and 6% of patients in acute care settings and more than 5–10% of patients in nonacute care had pressure ulcers. Pressure ulcers are accountable for 2% of preventable deaths [4].

According to 2014 Coloplast pressure ulcer summit report, 60,000 people died as a result of the complications of pressure ulcer globally [5]. Within the national context, studies that aim to investigate nurses' knowledge, attitude, and perceived barriers towards pressure ulcer prevention practice have not been conducted or could not be found.

A study that was conducted in Felegehiwot Referral Hospital, Bahir Dar, Ethiopia, on hospitalized patients to assess prevalence and associated factors of pressure ulcer revealed that 16.8% of them had pressure ulcer [6].

Nurses still showed poor compliance with the clinical guidelines regarding pressure ulcer prevention practice and put low priority on pressure ulcer prevention. Lack of knowledge is an apparent barrier for using the guidelines in clinical practice [7]. Increased knowledge about pressure ulcer prevention among nurses not only improves the practice of pressure ulcer care but also reduces hospital stay [8]. One study in Bahir Dar (Northwest Ethiopia) revealed the prevalence of pressure ulcer was 16.8%; this emphasized the need to enhance the knowledge and attitude of nurses regarding pressure ulcer prevention practice [6].

The attitude of nurses towards pressure ulcer prevention refers to their value related to risk assessment, maintaining healthy skin, management of mechanical loads, and education for patient and family [3]. Attitude is learned and is affected by knowledge and behavioral intent. It is used to express positive or negative feelings about a person, issue, or object. If a person holds a positive attitude toward an issue, this will increase the possibility of performing a supportive behavior related to that issue and vice versa [9].

If pressure ulcer occurred, it can cause decreased quality of life, infection, pain and disfigurement, alteration to sleep, delayed healing, increased morbidity and mortality rates, an increased need for intensive nursing and medical care, an increased workload for healthcare workers, and, as a consequence, increased healthcare costs [1]. A patient with pressure ulcer has a mortality risk that is 2 to 6 times greater than a patient with intact skin [10]. Despite its devastating effects, 95% of pressure ulcer can be prevented by managing both intrinsic and extrinsic risk factors as well as repositioning [11].

Although pressure ulcer development is now generally considered as an indicator for quality of nursing care, questions and concerns about situations in which they are unavoidable remain [12]. However, pressure ulcers are largely preventable. All patients who are identified as being at risk should have a management plan to prevent development of pressure ulcer, optimize healing, and prevent complications of existing pressure ulcer [13]. Even though nurses make prevention part of their routine, there are some barriers to practice and care planning such as inadequate time,

inconsistent documentation, lack of staff, lack of equipment, and lack of pressure ulcer related knowledge [3].

Awareness about the significance of the problem, positive attitude towards prevention, and an adequate level of knowledge are cornerstones to effectively prevent pressure ulcers [14].

## 2. Methods and Materials

*2.1. Study Design.* An institutional based cross-sectional study design was conducted to assess nurses' knowledge, attitude, and perceived barriers to expressed pressure ulcer prevention practices in Addis Ababa government hospitals.

*2.2. Study Area and Period.* The study was conducted in Addis Ababa at Black Lion, Ras Desta Damtew, and Saint Paul's hospitals. There are a total of 1129 nurses in these hospitals, among which 565 are found in Black Lion, 104 in Ras Desta Damtew, and 460 in Saint Paul's hospitals.

The study was conducted from April to May, 2015.

*2.3. Source Population.* The source population was all nurses working as staff in Addis Ababa government hospitals.

*2.4. Study Population.* The study subjects were all nurses working as staff in the 3 selected government hospitals in Addis Ababa (Black Lion, Saint Paul's, and Ras Desta Damtew hospitals) and those fulfilling inclusion criteria.

### 2.5. Eligibility Criteria

*2.5.1. Inclusion Criteria.* All staff nurses working in the 3 selected government hospitals in Addis Ababa (Black Lion, Saint Paul's, and Ras Desta Damtew hospitals) who were willing to participate and available during study period were included in the study.

*2.5.2. Exclusion Criteria.* Nurses who are in annual leave and seriously ill during data collection period in the 3 selected Addis Ababa government hospitals were excluded from the study.

*2.6. Sample Size Determination.* The sample size was determined by using a single population proportion formula and considering the following assumptions: prevalence ( $P$ ) of pressure ulcer 16.8% [6],  $Z$  = standard normal distribution value at 95% confidence level of  $Z_{\alpha/2} = 1.96$ , and margin of error ( $d$ ) = 5%:

$$n = \frac{(Z_{\alpha/2})^2 P(1 - P)}{d^2}$$

$$n = \frac{(1.96)^2 \cdot 0.168(1 - 0.168)}{(0.05)^2} \quad (1)$$

$$n = 215.$$

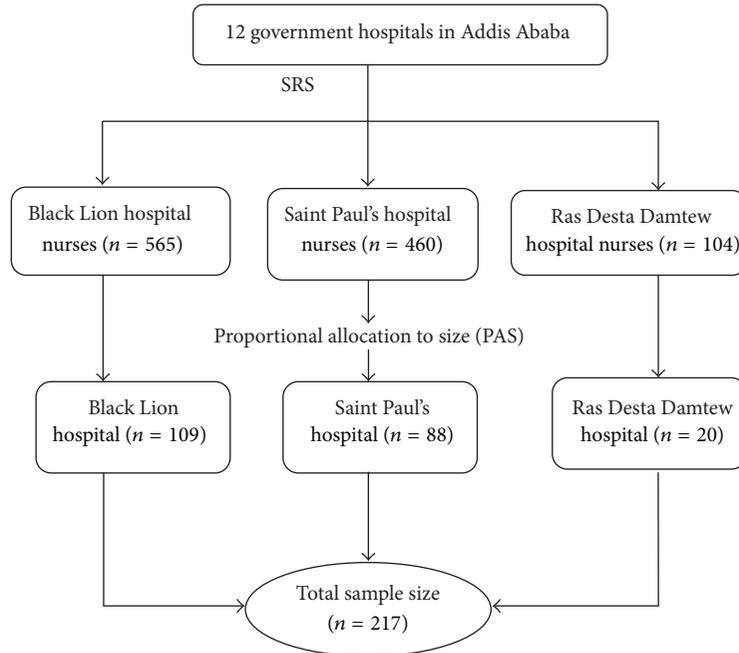


FIGURE 1: The schematic presentation of sampling procedure to select study participants from Addis Ababa government hospitals, 2015.

The final sample size was determined as follows by using correction formula:

$$n_f = \frac{n_o}{[1 + n_o/N]}, \tag{2}$$

where  $n_f$  is the final sample size,  $n_o$  is the initial sample size 215, and  $N$  is the number of staff nurses working in Addis Ababa government hospitals:

$$n_f = \frac{n_o}{1 + n_o/N} = \frac{215}{1 + 215/2400} = 197. \tag{3}$$

Considering a 10% nonresponse rate, the total sample size was

$$\begin{aligned} \frac{10}{100} \times 197 &= 20, \\ 20 + 197 &= 217. \end{aligned} \tag{4}$$

Hence, 217 staff nurses were included in this study.

**2.7. Sampling Procedure.** A simple random sampling (SRS) was used to select 3 hospitals from 12 government hospitals in Addis Ababa. After allocating nurses from the 3 selected government hospitals by proportional allocation to size (PAS), the participants were selected by using simple random sampling (Figure 1).

**2.8. Variables of the Study**

**2.8.1. Dependent Variable**

- (i) Expressed pressure ulcer prevention practice.

**2.8.2. Independent Variables**

- (i) Sociodemographic characteristics (years of experience and level of qualification).
- (ii) Knowledge of nurses on
  - (a) risk factors,
  - (b) complications,
  - (c) patients at risk of pressure ulcers.
- (iii) Attitude of nurses:
  - (a) Interest to give care.
  - (b) Willingness to take responsibility.
- (iv) Perceived barriers:
  - (a) Unproportionate nurse to patient ratio.
  - (b) Lack of guidelines.
  - (c) Shortage of time.
  - (d) Limited resource.
  - (e) Patient factors.
  - (f) Lack of evidence supported by research.

**2.9. Data Collection Methods**

**2.9.1. Data Collection Tool.** Data were collected using structured self-administered questionnaire. The questionnaire was adapted by reviewing literatures of similar studies and guidelines prepared to prevent pressure ulcers [15, 16].

**2.9.2. Data Collection Procedure.** The data were collected by 6 trained diploma nurses and were supervised by 3 BSc nurses having previous experience in data collection. Continuous follow-up and supervision were also made by principal investigator throughout the data collection period.

**2.9.3. Data Quality Assurance.** In order to maintain quality of the data, data collectors and supervisors were trained in data collection procedures by the principal investigator. The questionnaire has also been carefully designed and English version was used for data collection. Before actual data collection time, the questionnaire (tool) was checked for clarity, comprehensiveness, and content validity by an expert and pretested for reliability on 10% of the total sample at Debre Markos Referral hospital. Then, based on the finding of the pretest, the questions were modified for wording and clarity. The collected data were then reviewed and checked for completeness and consistency by the principal investigator on a daily basis.

**2.10. Data Processing and Analysis.** The data were entered in to EPI-data version 3.1, and then the data were cleaned and analyzed by using Statistical Package for Social Science (SPSS) version 21 statistical software. Descriptive statistics were used. Bivariate and multivariate logistic regression were computed to assess statistical association between the outcome variable and independent variables using Odds Ratio; significance of statistical association was assured or tested using 95% confidence interval (CI) and  $p$  value ( $<0.05$ ).

### 2.11. Operational Definitions

- (i) *Adequate knowledge:* nurses who answered greater than or equal to 80% of the knowledge questions correctly.
- (ii) *Inadequate knowledge:* those nurses who answered less than 80% of the knowledge questions correctly.
- (iii) *Favorable attitude:* those nurses who were positively worded and scored points more than the median in the attitude questionnaire.
- (iv) *Unfavorable attitude:* Those nurses who were negatively worded and scored points less than the median in the attitude questionnaire.
- (v) *Good expressed pressure ulcer prevention practice:* nurses who answered greater than or equal to 80% of expressed pressure ulcer prevention practice related questions correctly.
- (vi) *Poor expressed pressure ulcer prevention practice:* nurses who answered less than 80% of expressed pressure ulcer prevention practice related questions correctly.
- (vii) *Perceived barriers:* if nurses answered “agree” or “strongly agree” with the listed barriers in the perceived barrier questionnaire.

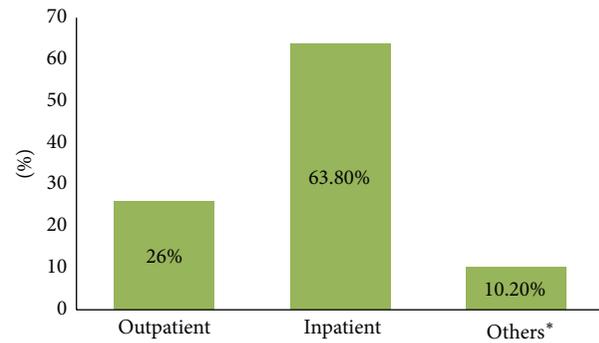


FIGURE 2: Current area of practice of nurses in Addis Ababa government hospitals, 2015. \*Nurses who work as metron, ward head, and triage.

**2.12. Ethical Consideration.** Ethical clearance was obtained from Addis Ababa University (AAU), College of Health Sciences, Department of Nursing and Midwifery, Institutional Review Board (IRB) research committee. After obtaining official letter from the department, a permission letter was provided to Black Lion, Saint Paul’s, and Ras Desta Damtew Hospitals before data collection. The study participants were informed about the objective, rationale, and expected outcomes of the study and written consent was provided for guaranteeing their choice of participation or refusal. All the information was recorded anonymously and confidentiality was assured throughout the study.

**2.13. Dissemination of the Result.** The final report of the study will be presented and submitted in the form of soft and hard copy to Addis Ababa University, College of Health Sciences, Department of Nursing and Midwifery. In addition, efforts will be made to present the findings on scientific conferences like professional associations and peer reviewed journal publications will also be considered.

## 3. Results

**3.1. Sociodemographic Characteristics.** A total of 217 nurses were included in the study. Of these, only 196 nurses voluntarily agreed to participate in this study, and 21 either refused or submitted incomplete questionnaires. This resulted in a response rate of 90.3%.

Out of 196 respondents, 133 (67.9%) were females. Moreover, the age of the participants included in this study ranged between 20 and 59 years with mean age of 27.93 (SD =  $\pm 6.596$ ) years. From the respondents, 142 (72.4%) were orthodox Christians and 134 (68.4%) were single. The majority, 151 (77%) of nurses, had bachelor degrees (Table 1).

Concerning current area of practice, about 51 (26%), 125 (63.8%), and 20 (10.2%) of nurses work in outpatient, inpatient, and other departments, respectively (Figure 2).

In addition, about 72 (36.7%) of nurses receive training about pressure ulcer prevention in the form of lecture whereas 70 (35.7%) of them did not receive training (Figure 3).

TABLE 1: Sociodemographic characteristics of nurses in Addis Ababa government hospitals, Ethiopia, 2015 (n = 196).

Variable	Frequency (n = 196)	Percent (%)
<b>Sex</b>		
Male	63	32.1
Female	133	67.9
<b>Age</b>		
20–29 years	139	71
30–39 years	44	22.4
≥40 years	13	6.6
<b>Ethnicity</b>		
Amhara	108	55.1
Oromo	45	23
Tigre	21	10.7
Others*	22	11.2
<b>Marital status</b>		
Married	54	27.6
Single	134	68.4
Divorced	5	2.5
Widowed	3	1.5
<b>Religion</b>		
Orthodox	142	72.4
Muslim	18	9.2
Protestant	30	15.4
Catholic	4	2
Others**	2	1
<b>Level of qualification</b>		
Diploma	39	19.9
Bachelor degree	151	77
Master's degree	6	3.1
<b>Years of work experience</b>		
1–4	112	57.1
5–10	58	29.6
>10	26	13.3
<b>Read literature on PU prevention</b>		
Always	25	12.8
Sometimes	120	61.2
Never	51	26

Key: \*Gurage and foreigners and \*\*Jehovah.

3.2. Nurses Knowledge about Pressure Ulcer Prevention. McDonald's standard of learning outcome measured criteria was used to categorize nurses' level of knowledge regarding pressure ulcer prevention. Nurses who scored <60, 60–69, 70–79, 80–89, and 90–100 were considered as having very low, low, moderate, high, and very high knowledge, respectively. Accordingly, 23 (11.7%), 19 (9.7%), 34 (17.3%), 16 (8.2%), and 104 (53.1%) of the participants had very low, low, moderate, high, and very high knowledge regarding pressure ulcer prevention, respectively. Generally, 120 (61.2%) of the participants had adequate knowledge about pressure ulcer prevention practice whereas 76 (38.8%) had inadequate knowledge.

TABLE 2: Mark of the respondents from 19 questions, Addis Ababa, Ethiopia, 2015.

Question	Frequency	Percent
1	1	0.5
3	2	1.0
5	4	2.0
6	1	0.5
8	4	2.0
9	3	1.5
10	2	1.0
11	6	3.1
12	7	3.6
13	12	6.1
14	15	7.7
15	19	9.7
16	16	8.2
17	24	12.2
18	40	20.4
19	40	20.4
Total	196	100.0

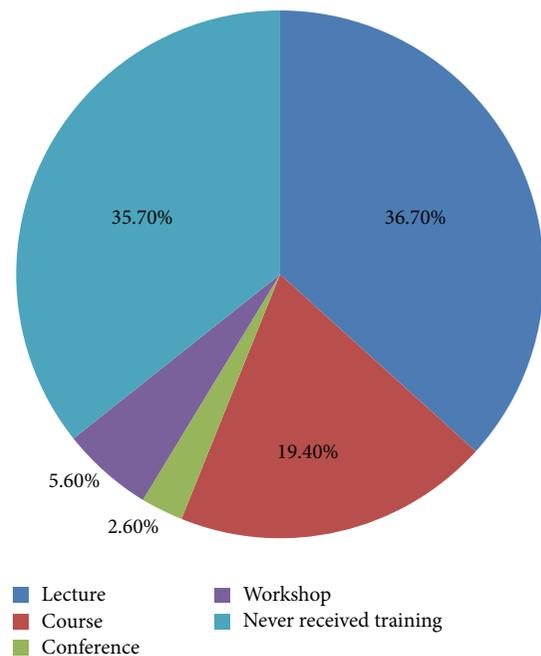


FIGURE 3: How respondents receive training about pressure ulcer prevention in Addis Ababa government hospitals, 2015.

A total of 19 questions were provided for nurses and they got marks out of 19 as follows (Table 2).

3.2.1. Knowledge of Facts about Pressure Ulcer. The majority, 174 (88.8%), of the participants were aware that pressure ulcer commonly occurred around bony prominences. About 43 (21.9%) of respondents did not know that pressure ulcers contribute to overall hospital costs incurred by the patient (Table 3).

TABLE 3: Distribution of right and wrong responses about facts of pressure ulcer prevention practice among nurses in Addis Ababa government hospitals, 2015.

Facts about pressure ulcer assessment	Response	Frequency (n = 196)	Percent
Pressure ulcer (PU) is marked against the caregiver as poor or nonexistent care	Right	152	77.6
	Wrong	44	22.4
Areas of skin are compromised as a result of unrelieved pressure	Right	161	82.1
	Wrong	35	17.9
Pressure ulcer occurs in immobile patients	Right	172	87.8
	Wrong	24	12.2
Pressure ulcer is developed in stages	Right	170	86.7
	Wrong	26	13.3
It commonly occurs around bony prominences	Right	174	88.8
	Wrong	22	11.2
Pressure ulcer can lead to permanent disabilities like bone destruction	Right	160	81.6
	Wrong	36	18.4
Sepsis is one of the complications of pressure ulcer	Right	168	85.7
	Wrong	28	14.3
Pressure ulcer contributes to the overall hospital costs incurred by patient	Right	153	78.1
	Wrong	43	21.9

3.2.2. *Risk Factors for Pressure Ulcers Development.* Nurses were asked to identify possible risk factors for pressure ulcers. Among 196 respondents, 180 (91.8%) identified prolonged immobility, 173 (88.3%) identified constant pressure/compression, and 139 (70.9%) identified anemia as a risk factor (Table 4).

3.3. *Nurses Attitude toward Expressed Pressure Ulcer Prevention Practice.* Scores for each attitude related question were summarized and the responses were then categorized into two variables, namely, favorable attitude and unfavorable attitude. Nurses who were positively worded for each attitude related question were categorized as having favorable attitude whereas respondents who were negatively worded for each attitude related questions were classified in the unfavorable attitude category. Finally, overall attitude score of the respondents were calculated. Those nurses who score above the median were considered as having favorable attitude while those who scored below the median were labeled as having unfavorable attitude. Accordingly, 134 (68.4%) of nurses had favorable attitude while 62 (31.6%) had unfavorable attitude toward expressed pressure ulcer prevention practice.

About 89.8% of nurses were positively intended (worded) to care for patients with pressure ulcers and about 56.6% of the participants believe pressure ulcer prevention is not time consuming (Table 5).

3.4. *Perceived Barriers to Pressure Ulcer Prevention.* Nurses were asked to indicate their agreement about the existence of specific barriers in the work environment. If nurses answered “strongly agree” or “agree” on the listed barrier, it was considered as a perceived barrier and if nurses answered “disagree” or “strongly disagree” on the listed barrier the barrier was

TABLE 4: Distribution of right and wrong responses about risk factors and patients at risk for pressure ulcer assessment among nurses in Addis Ababa government hospitals, 2015.

Risk factors and patients at risk assessment	Response	Frequency (n = 196)	Percent
Prolonged immobility	Right	180	91.8
	Wrong	16	8.2
Constant pressure/compression	Right	173	88.3
	Wrong	23	11.7
Friction/shear	Right	168	85.7
	Wrong	28	14.3
Moist surfaces in which patients lie	Right	153	78.1
	Wrong	43	21.9
Using improper support materials	Right	168	85.7
	Wrong	28	14.3
Diabetic mellitus	Right	160	81.6
	Wrong	36	18.4
Hypoxemia	Right	141	71.9
	Wrong	55	28.1
Malnutrition	Right	165	84.2
	Wrong	31	15.8
Anemia	Right	139	70.9
	Wrong	57	29.1
Ischemic heart diseases	Right	136	69.4
	Wrong	60	30.6
Spinal cord injury	Right	164	83.7
	Wrong	32	16.3

TABLE 5: The distribution of attitude towards expressed pressure ulcer prevention practice among nurses in Addis Ababa government hospitals, 2015.

Attitude component	Yes (%)	No (%)	Total (%)
In your view are all patients at potential risk of developing pressure ulcers (PU)?	105 (53.6)	91 (46.4)	196 (100)
Do you think pressure ulcer prevention is time consuming to carry out?	85 (43.4)	111 (56.6)	196 (100)
Do you have willingness to care for patients with pressure ulcer?	176 (89.8)	20 (10.2)	196 (100)
Do you feel that priority of care is given for patients who are at risk of pressure ulcer?	176 (89.8)	20 (10.2)	196 (100)
Do you believe that most pressure ulcers can be prevented?	179 (91.3)	17 (8.7)	196 (100)
Do you think patients who are admitted receive adequate prevention of pressure ulcer while in bed seated?	124 (63.3)	72 (36.7)	196 (100)
Do you think pressure ulcer risk assessment should be regularly carried out on all patients during their stay in hospital?	145 (74)	51 (26)	196 (100)
Do you perceive that nurses hold major responsibilities when patients are vulnerable to pressure ulcer?	165 (84.2)	31 (15.8)	196 (100)

TABLE 6: Perceived barriers to expressed pressure ulcer prevention practice in Addis Ababa government hospitals, 2015.

Perceived barrier	Yes (%)	No (%)	Total (%)
Disproportionate nurse to patient ratio	133 (67.9%)	63 (32.1%)	196 (100%)
Shortage of time	100 (51%)	96 (49%)	196 (100%)
Shortage of equipment	105 (53.6%)	91 (46.4%)	196 (100%)
Lack of training and education	110 (56.1%)	86 (43.9%)	196 (100%)
Lack of policies and guidelines	98 (50%)	98 (50%)	196 (100%)
Lack of evidence supported by research	85 (43.4%)	111 (56.6%)	196 (100%)
Patient factors	104 (53.1%)	92 (46.9%)	196 (100%)
Lack of job satisfaction	126 (64.3%)	70 (35.7%)	196 (100%)
Lack of pressure ulcer related knowledge	81 (41.3%)	115 (58.7%)	196 (100%)

not considered as a perceived barrier for expressed pressure ulcer prevention practice. Based on this assumption, disproportionate nurse to patient ratio was the most frequently reported barrier to carrying out pressure ulcer prevention practices (67.9%;  $n = 133$ ), followed by lack of job satisfaction (64.3%;  $n = 126$ ) (Table 6).

**3.5. Expressed Pressure Ulcer Prevention Practice.** McDonald's standard of learning outcome measured criteria was used to categorize nurses' level of practice regarding pressure ulcer prevention. Nurses who scored <60, 60–69, 70–79, 80–89, and 90–100 were considered as having very low, low, moderate, high, and very high practice, respectively. Accordingly, 41 (20.9%), 23 (11.7%), 17 (8.7%), and 115 (58.7%) of the participants had very low, moderate, high, and very high practice regarding pressure ulcer prevention, respectively. Generally 132 (67.3%) of the participants had good practice about pressure ulcer prevention whereas 64 (32.7%) had poor practice.

From the respondents, 180 (91.8%) identified regular turning of patients every 2 hours, 172 (87.8%) identified removing any tightly fitting clothes from the patient, and 168 (85.7%) identified protecting the skin during patient transfer as good pressure ulcer prevention practices (Table 7).

**3.6. Factors Associated with Expressed Pressure Ulcer Prevention Practice.** In bivariate logistic regression analysis, nurses'

overall knowledge, overall attitude, disproportionate nurse to patient ratio, lack of policies and guidelines, lack of evidence supported by research, lack of job satisfaction, and lack of pressure ulcer related knowledge were statistically associated with expressed pressure ulcer prevention practice with  $p$  value less than 0.05 at 95% confidence interval (Table 8).

After bivariate analysis, only those variables which were significantly related ( $p$  value < 0.05) were entered for further multivariate analysis. By adjusting potential confounders in multivariate logistic regression analysis; only nurses overall knowledge, disproportionate nurse to patient ratio, lack of policies and guidelines, and lack of job satisfaction were significantly associated with expressed pressure ulcer prevention practice. But participants' overall attitude, lack of evidence supported by research, and lack of pressure ulcer related knowledge were not significantly associated with expressed pressure ulcer prevention practice in multivariate analysis.

Overall knowledge level, disproportionate nurse to patient ratio, lack of policies and guidelines, and lack of job satisfaction were negatively associated with expressed pressure ulcer prevention practice. Nurses who have inadequate knowledge were 0.29 times less likely to practice expressed pressure ulcer prevention (AOR = 0.29 (0.010, 0.085)) as compared to knowledgeable nurses. Moreover, nurses who work in settings having disproportionate nurse to patient ratio were 0.294 times less likely to practice pressure ulcer

TABLE 7: Expressed pressure ulcer prevention practice among nurses in Addis Ababa government hospitals, Ethiopia, 2015.

Prevention strategies assessment	Response	Frequency (n = 196)	Percent
Regular turning/repositioning of patients every 2 hours	Right	180	91.8
	Wrong	16	8.2
Keeping patients' skins dry and moist	Right	163	83.2
	Wrong	33	16.8
Ensuring patient is well hydrated	Right	147	75
	Wrong	49	25
Encouraging patients to have a balanced diet	Right	157	80.1
	Wrong	39	19.9
Avoiding hot water when cleansing the skin	Right	134	68.4
	Wrong	62	31.6
Protecting the skin during patient transfer	Right	168	85.7
	Wrong	28	14.3
Removing any tightly fitting clothes from the patient	Right	172	87.8
	Wrong	24	12.2
Providing cushions on areas at risk of pressure ulcers	Right	170	86.7
	Wrong	26	13.3
Catheterization in case of incontinence patients	Right	156	79.6
	Wrong	40	20.4
Documenting prevention interventions	Right	163	83.2
	Wrong	33	16.8

TABLE 8: Bivariate and multivariate logistic regression analysis of factors associated with expressed pressure ulcer prevention practice in Addis Ababa government hospitals, 2015.

Variables	Response	Expressed pressure ulcer prevention practice				p value (overall)*
		Poor	Good	COR (95% CI)	AOR (95% CI)	
Overall knowledge	Inadequate knowledge	52 (81.3%)	24 (18.2%)	0.51 (0.024, 0.111)	<b>0.29 (0.010, 0.085)</b>	<b>0.001</b>
	Adequate Knowledge	12 (18.8%)	108 (81.8%)	1.00	1.00	
Overall attitude	Unfavorable attitude	27 (42.2%)	35 (26.5%)	1.00	1.00	0.508
	Favorable attitude	37 (57.8%)	97 (73.5%)	2.022 (1.078, 3.793)	1.387 (0.526, 3.652)	
Disproportionate nurse to patient ratio	Yes	50 (78.1%)	83 (62.9%)	0.474 (0.238, 0.945)	<b>0.294 (0.093, 0.927)</b>	<b>0.037</b>
	No	14 (22%)	49 (37.1%)	1.00	1.00	
Lack of policies and guidelines	Yes	46 (71.9%)	52 (39.4%)	0.254 (0.133, 0.486)	<b>0.213 (0.076, 0.596)</b>	<b>0.003</b>
	No	18 (28.1%)	80 (60.6%)	1.00	1.00	
Lack of evidence supported by research	Yes	35 (54.7%)	50 (37.9%)	0.505 (0.276, 0.925)	1.629 (0.541, 4.901)	0.385
	No	29 (45.3%)	82 (62.1%)	1.00	1.00	
Lack of job satisfaction	Yes	55 (85.9%)	71 (53.8%)	0.190 (0.087, 0.417)	<b>0.111 (0.037, 0.334)</b>	<b>0.001</b>
	No	9 (14.1%)	61 (46.2%)	1.00	1.00	
Lack of PU related knowledge	Yes	33 (51.6%)	48 (36.4%)	0.537 (0.293, 0.983)	0.699 (0.253, 1.932)	0.490
	No	31 (48.4%)	84 (63.6%)	1.00	1.00	

1.00 = reference; \* p value < 0.05 (significant) at 95% confidence interval.

prevention (AOR = 0.294 (0.093, 0.927)) than nurses who work in settings having adequate nurse to patient ratio.

Similarly, nurses who work in settings lacking specific policies and guidelines towards pressure ulcer prevention

were 0.213 times less likely to practice pressure ulcer prevention (AOR = 0.213 (0.076, 0.596)) than nurses who work in settings having policies and guidelines to pressure ulcer prevention. In addition, nurses who are not satisfied by their job were 0.111 times less likely to practice pressure ulcer

prevention (AOR = 0.111 (0.037, 0.334)) than nurses who reported satisfaction with their job.

#### 4. Discussion

The main purpose of this study was to assess nurses' knowledge, attitude, and perceived barriers to expressed pressure ulcer prevention practices. Though there are a plethora of studies that were done in an international context aiming to assess the knowledge, attitude, practice, and barriers towards pressure ulcer prevention; there is almost no study that was conducted on a national basis.

This study showed that 38.8% of nurses had inadequate knowledge about pressure ulcer prevention practice. This is less than a study done in Bangladesh, where 57.8% of nurses had inadequate knowledge [17], and in Jordan, where 73% of nurses had inadequate knowledge about pressure ulcer prevention [8]. The possible explanation could be lack of trainings and evidences supported by research.

Another factor that affects expressed pressure ulcer prevention practice was knowledge level. Knowledge level was significantly associated with expressed pressure ulcer prevention practice in this study. Nurses who have inadequate knowledge were 0.29 times less likely to practice expressed pressure ulcer prevention (AOR = 0.29 (0.010, 0.085)) as compared to knowledgeable nurses. While a study done in Bangladesh showed that there was no significant association between nurses knowledge and practice [ $r = 0.14$ ,  $p > 0.05$ ] [17]. This can be explained by differences in methodological approaches.

In this study, only 68.4% of the participants had favorable attitude toward pressure ulcer prevention practice; this is much lower than a survey done in Sweden where nursing staffs as a whole demonstrated positive attitude regarding pressure ulcer prevention [18] and similarly in Iraq where 99% of the nurses had positive attitude toward pressure ulcer prevention practice [19].

This study showed that the attitude of nurses was not significantly associated with expressed pressure ulcer prevention practice. However, a study done in Bangladesh showed a moderately positive relationship between nurses' attitude and practice [17].

Similarly, nurses who work in settings lacking specific policies and guidelines towards pressure ulcer prevention were 0.213 times less likely to practice pressure ulcer prevention (AOR = 0.213 (0.076, 0.596)) than nurses who work in settings having policies and guidelines to pressure ulcer prevention. Besides this, 50% of the respondents reported that lack of policies and guidelines were barriers to practicing pressure ulcer prevention. This was exactly congruent with a study done in Jordan, where about 50% of nurses identified that lack of specific policies and guidelines as an existent barrier to giving care for patients with pressure ulcer [9]. This can be explained by the fact that the presence of policies and guidelines that advocate for proper patient care is likely to increase the practice of nursing interventions such as pressure ulcer prevention.

In addition, nurses who are not satisfied by their job were 0.111 times less likely to practice pressure ulcer prevention

(AOR = 0.111 (0.037, 0.334)) than nurses who reported satisfaction with their job. In this study, 64.3% of nurses reported that lack of job satisfaction is a barrier to pressure ulcer prevention practice. This was relatively analogous with a study done in Jordan, where 57% of respondents identified lack of job satisfaction as an existent barrier to pressure ulcer prevention [9]. This could be due to the fact that if a person is not satisfied by an issue, then the possibility of performing a supportive action related to that issue will also be decreased.

Furthermore, 67.3% of the participants had good expressed pressure ulcer prevention practice, whereas a study in Bangladesh found that staff nurses perceived a moderate level of overall practice regarding pressure ulcer prevention [17]. The difference between the healthcare setups of Ethiopia and Bangladesh might explain the relatively discrepant results in pressure ulcer prevention practice.

Consistent with the studies done in Turkey [20] and Uganda [15], participants in this research reported some of the frequently applied pressure ulcer prevention practices. These include patient repositioning (91.8%), keeping patient skins dry and moist (83.2%), balanced diet (80.1%), protecting the skin during patient transfer (85.7%), documenting prevention strategies (83.2%), and removing any tightly fitting clothes from the patient (87.8%).

#### 5. Strengths and Limitations of the Study

*5.1. Strengths of the Study.* The major strength of this research lies in the fact that it has attempted to assess nurses' knowledge, attitude, and perceived barriers to expressed pressure ulcer prevention practice in Addis Ababa, Ethiopia. Thus, it can be first in the country. In addition, three government hospitals were included in the study to make the study representative and the questionnaire was pretested.

*5.2. Limitations of the Study.* The major limitations of this study include the following:

- (i) The fact that no study was conducted so far in Ethiopia on this topic; no enough literature was available to discuss in national context.
- (ii) The practice component may not be well addressed, as observational checklist was not used.
- (iii) The study may be subjected to response set bias from the respondents.
- (iv) The study was cross-sectional; therefore, it was difficult to know which occurred first the exposure or the outcome.

#### 6. Conclusion and Recommendation

*6.1. Conclusion.* Based on the finding of this study, the following are concluded:

- (i) More than half of the nurses were found to have adequate knowledge regarding pressure ulcer prevention.
- (ii) The outlook of nurses in Addis Ababa government hospitals towards pressure ulcer prevention was majorly favorable.

- (iii) The most reported barriers for expressed pressure ulcer prevention practice were disproportionate nurse to patient ratio, lack of policies and guidelines about pressure ulcer prevention, lack of evidence supported by research, lack of job satisfaction, and lack of pressure ulcer related knowledge.
- (iv) Pressure ulcer prevention practice was affected by the participant's level of knowledge and attitude.

## 6.2. Recommendations

### To FMOH and Policy Makers

- (i) The FMOH should give further trainings for nurses to enhance their knowledge on pressure ulcer prevention practice.
- (ii) Policy makers should prepare policies and guidelines to prevent pressure ulcer in hospitals.

### To Professional Nurses

- (i) Nurses need to enhance their attitude and knowledge on pressure ulcer prevention in order to further improve nursing practice in this area.
- (ii) Nurses, who had better knowledge, should also teach their respective colleagues who had deficits for the betterment of nursing care.

### To Health Service Managers

- (i) Health service managers should identify the perceived barriers of care and then minimize these barriers as much as possible to prevent pressure ulcer.
- (ii) They also should recruit nurses to balance their numbers with the respective patient in order to provide interventions such as pressure ulcer prevention.

## Appendix

See Tables 1, 2, 3, 4, 5, 6, 7, and 8 and Figures 1, 2, and 3.

## Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

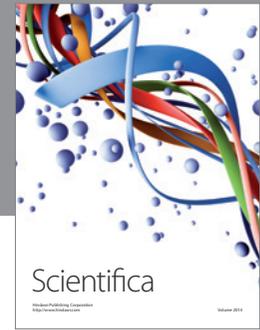
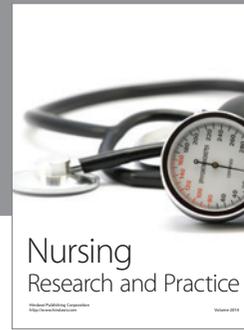
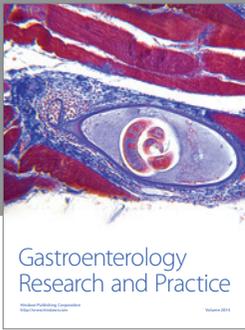
## Acknowledgments

The authors would like to thank Debre Markos University and Addis Ababa University for their financial support; the authors would also like to extend their gratitude to all the study participants.

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