Pressure ulcer prevention practices and associated factors among nurses in public hospitals of Harari regional state and Dire Dawa city administration, Eastern Ethiopia

Asmare Getie, Amsalu Baylie, Agegnehu Bante, Biftu Geda, Firehiwot Mesfin

Abstract

Introduction

Pressure ulcer is one of the major challenges in hospitals; which endanger patient safety, prolonging hospital stay and contributed to disability and death. Data regarding to pressure ulcer prevention practice are very important to take action. However in Ethiopia, there are limited researches that have been conducted and there is clearly paucity of information on this regard. Hence, this study aimed to assess pressure ulcer prevention practice and associated factors among nurses in public hospitals of Eastern Ethiopia.

Methods

A cross-sectional study was conducted among randomly selected 422 nurses who were working in the public hospitals of Eastern Ethiopia. Data were collected from the 1st February to the 1st March 2018 using pretested structured self-administered questionnaire and observational checklist. The collected data were entered into EpiData version 3.1 and exported to SPSS version 22.0 for analysis. Bivariable and multivariable logistic regression with crude and adjusted odds ratios along with the 95% confidence interval was computed and interpreted accordingly. Pressure ulcer prevention was determined based on mean calculation; a result above the mean value was categorized as good pressure ulcer prevention practice, and a P-value of <0.05 was considered to declare a result as statistically significant.

Results

In this study 51.9% (95% CI: 47.1%, 56.4%) of nurses were reported that they have good pressure ulcer prevention practice. On observation 45.2% of nurses were practicing proper pressure ulcer prevention activities. Pressure ulcer prevention practice were statistically associated with nurses with bachelor degree and above qualification level (AOR = 1.7, 95% CI: 1.02, 2.83), availability of pressure-relieving devices (AOR = 2.2, 95% CI: 1.34, 3.63),
being satisfied with their job (AOR = 1.65, 95% CI: 1.09, 2.52) and good knowledge (AOR = 2.3, 95% CI: 1.48, 3.55).

**Conclusions**

In this study the self-reported practice and results from observation was substantially low. Continuing education and training should be considered for nurses to enhance their practice regarding pressure ulcer prevention practice.

**Introduction**

Pressure ulcers (PU) are lesion or injury to the skin or underlying tissues resulting from unrelieved pressure, shear, friction, or a combination of all these, usually over a bony prominence that may result in tissue death. It resulted from tissue compression between a bony prominence and an external surface for a prolonged period of time [1]. The consequences of pressure-induced skin injury range from non blanchable erythema of intact skin to deep bone [2]. The ulcer imposes a significant burden not only on the patient, but the entire health care system [3]. Pressure ulcers occur across all health care settings, with the highest incidence in the hospital. More recent data, however, recognized that the incidence of PU differs by care area, with patients in intensive care units, medical and surgical wards are at high risk of development of pressure ulcer [4, 5].

People with medical conditions that limit their ability to change positions or those who spend most of their time in bed or chair are mostly at risk of pressure ulcers. The elderly, patients with spinal cord injury and persons who are sedated from trauma or surgery are mainly at risk of developing pressure ulcer [6]. But, any person at any age could potentially develop a pressure ulcer if they were exposed to sustained unrelieved pressure, friction and shear forces for prolonged period of time [6, 7]. Peripheral vascular diseases, diabetic mellitus, smoking, prolonged immobility, poor nutritional status, incontinency, impaired sensation, use of steroids and aging, pressure, shear, friction, and moisture are considered as the factors which contributed to the development of pressure ulcers. Nurses’ knowledge and practice are also recognized as extrinsic factors for pressure ulcer formation [8–10].

Pressure ulcers are a largely preventable patient safety problem if appropriate interventions are implemented early and they are considered as an indicators to measure quality of nursing care and patient safety in the health care setting [11]. Pressure ulcers remain a severe and potentially life-threatening problem across all health care settings around the world. According to NPUAP report in 2017, showed that nearly 2.5 million patients develop PU every year and 60,000 patients died due to complication related to PU each year when it is not properly managed. In African, PUs is a common devastating complication among hospitalized patients and it affects 13.84% patients in Nigeria and 16.8% in Ethiopia [12, 13].

Different studies were conducted in different part of the world to assess pressure ulcer prevention practice among nurses and the result revealed that pressure ulcer prevention practice was not adequate [14, 15]. Similarly in Ethiopia the proportion of nurses who had good practice towards pressure ulcer ranged from 48.4% to 67.3% [6, 16]. Pressure ulcers have been identified as a common and worldwide health problem that continues to cause of much discomfort and pain for patients and also lead to decreased quality of life, delayed healing, increase patient’s hospital stay, reduced performance, contributed to disability and death [16]. The financial expenditure for health care for patients who have developed a PU ranges from $750 million to greater than $1 billion [17].
Poor pressure ulcer prevention practice increases the incidence and prevalence of complications associated with PU in most healthcare settings. So, preventing pressure ulcers has become a key focus of many healthcare facilities in the world and it is a vital part of nursing care. Even though nurses make prevention as part of their routine care, several studies revealed that shortage of supplies for pressure ulcer prevention, heavy work load/lack of staff, patient’s condition, lack of pressure ulcer related knowledge and job satisfaction were the identified barriers that hinder to carrying out appropriate pressure ulcer prevention practice [18]. Even though different researches were done on nurses’ practice towards pressure ulcer prevention globally, most of the researchers depended on self-administered response which could have limitation due to bias. Therefore, this study will supplement self-administered response by observation of actual performance by using observation check list. There is lack of evidence concerning nurses’ practice towards pressure ulcer prevention in Ethiopia and there is no study in the study area. Therefore, this study aimed to assess Pressure ulcer prevention practices and associated factors among nurses in public Hospitals of Eastern Ethiopia.

Methods

Study area, design and period

An institution based cross-sectional study was conducted in public hospitals of Harari Regional state and Dire Dawa city administration, Eastern Ethiopia from the 1st February to the 1st March, 2018. Harar is the capital city of Harari regional state, which is 523 Km away to East from capital city of Ethiopia, Addis Ababa. Based on 2007 census conducted by Central Statistical Agency of Ethiopia (CSA), Harari region has a total population of 183,415 of whom 92,316 were male [19]. In Harar there are five Hospitals. This study was conducted in three government hospitals. Hiwot Fana Specialized University Hospital (HFSUH) is a teaching hospital of Haramaya University with a total of 161 beds. Jugal Hospital (JH) is a regional referral hospital of Harari regional state with 95 beds. There are a total of 363 nurses working in governmental hospitals of Harari regional state.

Dire Dawa City Administration located in the eastern part of the country at a distance of 515 km from the capital city. According to the 2007 Census, Dire Dawa had a total population of 341,834, of whom 170,373 women [19]. Currently, there are two government hospitals in this city; Dilchora referral hospital and Sabian Primary hospital. Dilchora is a referral hospital of Dire Dawa city administration with a total of 190 nurses and Sabian Primary Hospital is also another Hospital of Dire Dawa city administration with a total of 60 nurses.

Study population

All nurses working in Harari regional state and Dire Dawa city administration public hospitals were considered as the study population for this study. Nurses who were working for at least six months and available during data collection period were included. Those nurses who didn’t work in wards through rotation before and during the study period were excluded.

Sample size determination

The sample size was calculated using single population proportions using the assumption of 95% CI with 5% margin of error, and double population formula using Epi Info Version 7 for individual factors using the assumption of 80% power and 1:1 ratio of exposed to non-exposed. The calculated sample size was 384 and after adding 10% non-response rate the final sample size became 422.
**Sampling procedure and sampling technique**

The sample for both observational checklist and self-administered questionnaire were taken by proportional allocation for each five public hospital and the individual participant was selected by simple random sampling for the self-administered questionnaire and for the observation the participants were selected purposively among those nurses assigning to bed ridden patients or patients at risk for pressure ulcer (Fig 1).

**Data collection tools**

The data were collected from the study individuals using a pretested structured self-administered questionnaire and observational checklist. English version questionnaire was used for both the interview and observational checklist. The data collection tool was developed by reviewing different literature and consisted of five parts Part I: A socio demographic data, Part II: Knowledge level of the respondent (15 items), which was developed by reviewing previous articles [16, 20–22], part III: Questions on practice of pressure ulcer prevention (8 items), Part

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**Fig 1.** Schematic diagram of the sampling procedure for the study to assess pressure ulcer prevention practice and associated factors among nurses working in public hospitals of Eastern Ethiopia, 2018.

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IV: Job satisfaction of the respondent (14 items), it was adopted from Job Satisfaction Survey (JSS) [23], and part V: Questions on factors associated with pressure ulcer prevention practice.

Observation checklist was adapted from previous study (18 items) related to prevention of occurrence of PU while nurses giving pressure ulcer prevention care to the bed ridden or at risk patients. Each item was then categorized as 'done' and 'not done' [8, 16, 18].

Data collection procedures and data collectors

Five diploma trained nurses facilitated the data collection and two BSC nurses supervised the data collection. Data were collected through structured self-administered questionnaire and observational checklist. The non-participatory observation was done prior to distributing self-administered questionnaire and oral consent was given for those nurses who were going to be observed. Observation using observational checklist was done for 10% of the study population to assess the actual pressure ulcer prevention practice among nurses who were assigned to patients identified at-risk for pressure ulcer or bed ridden and used as a supplement to a study.

Data quality control

Training was given for data collectors and supervisors regarding to objectives, questionnaires, checklist and ways of conducting the data collection. Before the actual data collection, pretest was conducted in 5% of sample size. After pretest any ambiguity, confusions, difficult words and differences in understanding were revised. Completeness and consistency of questionnaire were checked before and immediately after data was collected by each data collectors and supervisors. Double data entry was done by two data clerks and consistency of the entered data was cross checked by comparing the two separately entered data.

Data processing and analysis

The collected data were cleaned, coded, and entered in to Epi Data 3.3.1 statistical software package. The statistical analysis was done using SPSS version 22. Frequency distribution for selected variables was done. The statistical significance and strength of the association between independent variables and an outcome variable were measured by the bivariate logistic regression model. For analysis of the outcome variable, practice of pressure ulcer prevention, the mean and above was coded as "1" and below the mean was coded as "0". A variable P-value less than 0.2 was candidates to multivariable logistic regression model and a p-value less than 0.05 was considered as significantly associated. Finally, the results of the study were presented using tables, figures, and texts based on the data obtained. Descriptive statistics was carried out for the observation of pressure ulcer prevention practice of nurses and percentage of done was calculated and used.

Operational definitions

Good knowledge. Nurses, who scored the correct answers for knowledge related questions' regarding PUP above or equal to the mean value were considered to have good knowledge [16].

Job satisfaction. A worker who have scored above or equal to the mean score were considered to have job satisfaction [24].

Bedridden patients. Are patients who are unable to move out of bed or confined to bed due to old age, physical impairment, mobility problems, illness or injury or arising from medical restriction to ambulate [25].
Ethical approval and consent to participant

Officially written approval letter was obtained from the Institutional Health Research Ethical Review Committee (IHRERC) of the College of Health and Medical Sciences, Haramaya University. Besides, an official letter was issued from the College of Health and Medical Sciences, Haramaya University to the director of each hospital. After securing permission from each hospital administrator, the actual data collection and observation was commenced after obtaining written and signed voluntary consent from each study participant. All information collected from the participants was kept confidential.

Results

Socio-demographic characteristics

In this study, a total of 401 study participants were involved, with a response rate of 95.02%. From the total number of respondents, more than half 237 (59.1%) were males and the mean age of the respondents was 29.63 + 6.67. Regarding educational status nearly three-fourth of the respondents 306 (76.3%) were BSC and above degree holders in nursing with a mean work experience of 6.42+ 5.509 (Table 1).

Knowledge about pressure ulcer

More than half 227 (56.6%) of the study participants were found to had a good knowledge about pressure ulcer prevention methods. Among nurses involved in this study, less than one...
fifth 44(11%) of nurses were trained on pressure ulcer prevention. Regarding job satisfaction, nearly half 198 (49.4%) of the respondents were satisfied with their job (Fig 2).

Work environment and patient related characteristics

Regarding the ward distribution, nearly one-fifth (21.9%) of the respondents was working in medical ward, followed by gynecologic/obstetrics ward (20.4%) and surgical ward (20%). Nearly one-third, 139 (34.7%) of nurses were reported that the presence of guideline for pressure ulcer prevention practice. More than one fourth (27.2%) of nurses reported as they had pressure reliving device in their working area. From the total study participants, 244 (60.8%) had work load. In this study, more than half 213 (53.1%) of the respondents informed that patients were not cooperate in PUP care in their working area (Table 2).

Pressure ulcer prevention practice

More than half of the study participants 215 (53.6%) were always performing skin care as a routine work, while 206 (51.4%) and 202 (50.4%) nurses sometimes maintain the head of the bed at or below 30-degree and advised care givers to use cream respectively. Nearly one-third of the respondents, 155 (38.7%) reported that they had never used a risk assessment scale to assess pressure ulcer risk and 159 (39.7%) nurses sometimes used a risk assessment scale (Table 3). Overall, 208 (51.9%) (95% CI: 47.1%, 56.4%) of nurses reported that they have good pressure ulcer prevention practice (Fig 3).

Results from observation checklist

To strengthen the findings from the interview obtained through questionnaire, observation was done by using observation check list that included medical, surgical, ICU and orthopedic ward in each hospital. Out of 42 observed participants, majority 35 (83.3%) of them were assessed and provide pain management for patients who experience pain. All of the nurses
observed during study period were not using an assessment tool to assess pressure ulcer risk and majority (97.6%) did not re-position patients at risk every two hours. In general from observational findings, the proportion of nurses who were practicing proper pressure ulcer prevention practice was 19 (45.2%) (Table 4).

Table 2. Work environment and patient related characteristics of study participants in public hospitals of Harari regional state and Dire Dawa city administration, Eastern Ethiopia, 2018 (n = 401).

| Variable                        | Category        | Frequency | Percent |
|---------------------------------|-----------------|-----------|---------|
| Working unit                    | Medical         | 88        | 21.9    |
|                                 | Surgical        | 80        | 20      |
|                                 | Orthopedics     | 26        | 6.5     |
|                                 | Gynecologic/obstetrics | 82  | 20.4 |
|                                 | ward            | 41        | 10.2    |
|                                 | ICU             | 65        | 16.2    |
|                                 | OPD             | 19        | 4.7     |
| Presence of guide line for PUP  | Yes             | 139       | 34.7    |
|                                 | No              | 262       | 65.3    |
| Availability of PRD             | Yes             | 109       | 27.2    |
|                                 | No              | 291       | 72.8    |
| Workload                        | Yes             | 244       | 60.8    |
|                                 | No              | 157       | 39.2    |
| Team work among staff           | Yes             | 267       | 66.6    |
|                                 | No              | 134       | 33.4    |
| Patient cooperativeness in PUP care | Yes             | 188       | 46.9    |
|                                 | No              | 213       | 53.1    |

Table 3. Pressure ulcer prevention practice among nurses working in public hospitals of Harari regional state and Dire Dawa city administration, Eastern Ethiopia, 2018 (n = 401).

| Nurses practice on pressure ulcer prevention | Rate of nurse’s practice |
|---------------------------------------------|--------------------------|
|                                            | Never | Sometimes | Always |
| Performing skin assessment                 | 96    | 23.9      | 196    | 48.9  | 109 | 27.2 |
| Using assessment scale                     | 155   | 38.7      | 159    | 39.7  | 87  | 21.7 |
| Documenting all data related to PU assessment | 89    | 22.2      | 172    | 42.9  | 140 | 34.9 |
| Assess and provide pain management         | 53    | 13.2      | 135    | 33.7  | 213 | 53.1 |
| Using pillows or foam wedges between bony prominences. | 95    | 23.7      | 151    | 45.1  | 125 | 31.2 |
| Placing water filled glove under the patient’s leg | 131   | 32.7      | 178    | 44.4  | 87  | 22.9 |
| Using or advising care givers to use creams or oils | 94    | 23.4      | 202    | 50.4  | 105 | 26.2 |
| Using absorbent pads or diapers that wick and hold moisture | 95    | 23.7      | 188    | 46.9  | 118 | 29.4 |
| perform skin care as a routine work        | 56    | 14.0      | 130    | 32.4  | 215 | 53.6 |
| Encouraging and providing nutrition and fluids for malnourished patient as ordered | 58    | 14.5      | 134    | 33.4  | 209 | 52.1 |
| Monitoring patient’s intake and out put    | 62    | 15.5      | 158    | 39.4  | 181 | 45.1 |
| Maintaining the head of the bed at or below 30-degree | 50    | 12.5      | 206    | 51.4  | 145 | 36.2 |
| Using of lift sheets or lifts equipment during transfer and position changes. | 94    | 23.4      | 180    | 44.9  | 127 | 31.7 |
| Turning patient every two hours            | 73    | 18.2      | 178    | 44.4  | 150 | 37.4 |
| Bed making and maintain the bed linens are clean, dry and wrinkle free at all times. | 49    | 12.2      | 153    | 38.2  | 199 | 49.6 |
| Providing back massage.                    | 90    | 22.4      | 189    | 47.1  | 122 | 30.4 |
| Giving advice for patient or care giver regarding pressure ulcer prevention | 57    | 14.2      | 167    | 41.6  | 177 | 44.1 |
| Avoid massaging bony prominences           | 110   | 27.4      | 174    | 43.4  | 117 | 29.2 |

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Table 4. Observation checklist for pressure ulcer prevention practice among nurses working in public hospitals of Harari regional state and Dire Dawa city administration, Eastern Ethiopia, 2018 (n = 42).

| Observation Items                                                                 | Frequency          |
|----------------------------------------------------------------------------------|--------------------|
| Performing skin assessment                                                      | 18(42.9) 24(57.1)  |
| Using assessment scale                                                          | 0 42(100)          |
| Documenting all data related to PU assessment                                     | 15(35.7) 27(64.3)  |
| Assess and provide pain management                                               | 35(83.3) 7(17.7)   |
| Using pillows or foam wedges between bony prominences.                           | 2(2.8) 40(95.2)    |
| Placing water filled glove under the patient’s leg                               | 4(9.5) 38(90.5)    |
| Using or advising caregivers to use creams or oils                               | 6(14.3) 36(85.7)   |
| Using absorbent pads or diapers that wick and hold moisture                     | 12(28.6) 30(71.4)  |
| Performing skin care                                                            | 17(40.5) 25(59.5)  |
| Encouraging and providing nutrition and fluids for malnourished patient as ordered | 33(78.6) 9(21.4)   |
| Monitoring patient’s intake and out put                                          | 27(64.3) 15(35.7)  |
| Maintaining the head of the bed at or below 30-degree                            | 29(69.05) 13(30.95) |
| Using of lift sheets or lift equipment during transfer and position changes.     | 7(16.7) 35(83.3)   |
| Turning patient every two hours                                                  | 1(2.4) 41(97.6)    |
| Bed making and maintain the bed linens are clean, dry and wrinkle free.          | 21(50) 21(50)      |
| Providing back massage                                                          | 3(7.1) 39(92.9)    |
| Giving advice for patient or care giver regarding pressure ulcer prevention      | 6(14.3) 36(85.7)   |
| Avoid massaging bony prominences                                                 | 5(11.9) 37(88.1)   |
| Over all PUP practice, Good, Poor                                                | 19 45.2            |
|                                                                                | 23 54.8            |

Fig 3. Pressure ulcer prevention practice level among nurses working in public hospitals of Harari regional state and Dire Dawa city administration, Eastern Ethiopia, 2018.
Factors associated with pressure ulcer prevention practice

Bivariate analysis results showed that educational qualification level of the nurse, work experience, training, availability of pressure relieving device in working area, presence of pressure ulcer prevention guideline, work load, knowledge and satisfaction level of nurses were significantly associated with pressure ulcer prevention practice.

Variables with a p value of <0.2 in the bivariate analysis were candidate for multivariable analysis. In multivariable logistic regression analysis, educational qualification level, availability of pressure relieving device, knowledge and satisfaction level of nurses’ were identified to be significantly associated with practice of pressure ulcer prevention.

Nurses who had bachelor degree & above were nearly two times more likely to have good practice towards prevention of pressure ulcer as compared to those nurses who had diploma. Availability of pressure relieving device with in the hospital was associated with nurses’ pressure ulcer prevention practice, those nurses who responded to have Pressure ulcer prevention equipment were two times more likely to have good practice towards prevention of pressure ulcer than the counterpart. Those participants who had good knowledge about pressure ulcer prevention were 2.3 times more likely to have good practice when compared to those who had poor knowledge. Nurses who were satisfied with their job were nearly two times more likely to have good practice of pressure ulcer prevention than the counterpart (Table 5).

Discussion

The finding of this study showed that 51.9% (95% CI: 47.1%, 56.4%) of nurses had good pressure ulcer prevention practice. On observation, the proportion of nurses who were practicing proper pressure ulcer prevention practice was 45.2%. Pressure ulcer prevention practice, were

Table 5. Bivariate and multivariable analysis result for factors associated with pressure ulcer prevention practice among nurses working in public hospitals of Harari regional state and Dire Dawa city administration, Eastern Ethiopia, 2018 (n = 401).

| Variables                  | Category | Practice level | COR (95% CI) | AOR (95% CI) |
|----------------------------|----------|----------------|--------------|--------------|
| Educational qualification  | Diploma  | 38             | 57           | 1.00         | 1.00         |
|                            | Bsc & Above | 170           | 136          | 1.87 [1.17, 2.99] | 1.7 [1.02, 2.83] |
| Year of experience         | < 5 years | 106            | 108          | 1.00         | 1.00         |
|                            | 6–10 years | 78             | 61           | 1.3 [0.84, 2] | 1.32 [0.84, 2.08] |
|                            | > 10 years | 24             | 24           | 1.02 [0.54, 1.91] | 1.15 [0.59, 2.24] |
| Presence of guide line for PUP | Yes    | 79             | 60           | 1.00         | 1.00         |
|                            | No       | 129            | 133          | 0.74 [0.48, 1.11] | 0.74 [0.46, 1.19] |
| Availability of PRD        | Yes      | 72             | 37           | 2.23 [1.41, 3.53] | 2.2 [1.34, 3.63] |
|                            | No       | 136            | 156          | 1.00         | 1.00         |
| Training on PUP            | Yes      | 28             | 16           | 1.00         | 1.00         |
|                            | No       | 180            | 177          | 0.58 [0.3, 1.11] | 0.88 [0.43, 1.78] |
| Knowledge level about PUP  | Good     | 139            | 88           | 2.4 [1.6, 3.6] | 2.3 [1.48, 3.55] |
|                            | Poor     | 69             | 105          | 1.00         | 1.00         |
| Job Satisfaction level     | Satisfied | 116           | 82           | 1.71 [1.15, 2.53] | 1.65 [1.09, 2.52] |
|                            | Not satisfied | 92           | 111          | 1.00         | 1.00         |
| work load                  | Yes      | 117            | 127          | 0.67 [0.45, 1] | 0.7 [0.45, 1.07] |
|                            | No       | 91             | 66           | 1.00         | 1.00         |

* = p-value <0.05,

** = p-value <0.001, CI = Confidence Interval, COR = Crude odds Ratio, AOR = Adjusted Odds Ratio.

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significantly associated with current educational qualification of nurses, availability of pressure
reliving device, job satisfaction and pressure ulcer related knowledge.

The prevalence of self-reported practice of nurses in this study is in line with the results of the
studies conducted in India (48.2%) and Gondar University Hospital; Northwest Ethiopia (48.4%)
[3, 6]. The finding of this study was higher than studies conducted in United Arab Emirates
(10.3%) and Egypt (6.6%) [16, 26]. This difference may be due to difference in availability of
resources, settings in which data collection was done, study population, the study design used
and measurement criteria to categorize nurses’ level of practice. On the contrary the finding of
this study was lower than a study conducted in Addis Ababa (67.3%) [27]. This discrepancy
might be due to deference in knowledge of the nurses concerning prevention of pressure ulcer.

From this current study what nurses mostly never do is using assessment scale to assess
pressure ulcer 38.7% (95%CI (33.4%, 43.6%). This was also supported with observational study,
All, of the nurses observed during study period were not use any assessment tool to identify
patients with at risk of pressure ulcer. This might be due to lack of evidence based nursing
practice and in-service training on prevention of pressure ulcer.

This study showed that nurses who had bachelor degree and above were nearly two times
more likely to have good practice towards prevention of pressure ulcer as compared to those
nurses who had diploma. This is in line with studies conducted in Spain, Jordan and Korea
[26–28]. This might be due to increasing educational level, nurses may able to understand
and employ a risk assessment tool in a better way than that of diploma graduates. In addition,
it could also be due to the basic knowledge and in-depth training received during academic
years, which is different than that received by diploma nurses. Because bachelor degree and
above nurse’s education is more comprehensive, they have a deeper knowledge base to draw
on in areas such as clinical practice and critical thinking.

The odd of good practice of pressure ulcer prevention was 2.3 times higher among nurses
with good knowledge of pressure ulcer prevention than the counterpart. This finding is similar
with studies conducted in Ethiopia and Egypt showed that there were positive relationship
between knowledge and practice of the nursing staff regarding pressure ulcer prevention [6,
29, 30]. This might be due to the fact that good knowledge improves the confidence and readi-
ness of nurses to perform their routine activities.

In this study availability of sufficient pressure-relieving devices or equipment was an inde-
pendent predictor for nurse’s pressure ulcer prevention practice. This is supported by different
studies which found that Scarcity of pressure relieving equipment was the identified factors
which limit nurses’ practice of pressure ulcer prevention [16, 31, 32]. This might be due to the
fact that adequate access to sufficient equipment may encourage nurse’s motivation and ability
to prevent patients from developing pressure ulcer. The availability of sufficient equipment in
the workplace plays a key role in facilitating care delivery, decrease in stress, minimized delay
to care, and patient satisfaction.

In this study job satisfaction was nearly two times more likely to have a good pressure ulcer
prevention practice than the counterpart. This finding was consistent with studies conducted
in different part of Ethiopia in which nurses who satisfied with their job were more likely to
have good pressure ulcer prevention practice [6, 16]. This could be due to the fact that when
the nurses satisfied with their job, they could experience meaningfully, greater responsibility,
and better use of their knowledge and skills in their job and such situation leads to be moti-
vated in their work to apply all their knowledge and experiences on practices related to preven-
tion of pressure ulcer. It might also due to the fact that, since they are satisfied with their job,
they might be eager in helping and caring for patients.

The findings of this study were interpreted cautiously in light of some limitations. The use
of a cross-sectional survey design did not allow for the generalization of the findings beyond
the sample from which data was gathered. The collected data was based on self-report, and observational check list, therefore, the finding may not be consistent. The data was collected only from nurses and observation was done while the have given care for the respondents, but there are other predictors like nutritional status which can be collected from the respondents and can be an independent factors for pressure ulcer. Therefore in this study some independent factors which can be contributed for pressure ulcer was not be incorporated. Despite these limitations, this study has provided the foundation for future empirical studies among nurses who are working in health institutions and the clinical practice can be improved based on the findings. Future studies may use qualitative design to understand and address the key drives why the pressure ulcer prevention practice was low.

Conclusions

In this study, more than half of nurses were reported that they had good practice towards pressure ulcer prevention practice. Educational qualification level, Availability of PU relieving devices, being satisfied with their job and having good knowledge about pressure ulcer prevention were found to be independent predictors for good pressure ulcer prevention practice. Nurses should provide patient centered care and show commitment in applying pressure ulcer prevention methods to improve the quality of nursing care. They should update their knowledge on pressure ulcer prevention both in theoretical as well as practical aspect and those who had better knowledge should also teach their respective colleagues who had deficits for the improvement of nursing care.

The hospital administrators should strive for preventing occurrence of pressure ulcer through training and educating nurses, monitoring compliance and providing feedback, and embedding the practice of pressure ulcer prevention in the institutional safety culture and patient engagement. Researchers can do further investigation to identify other factors by using other tools and study design.

Supporting information

S1 File.
(DOCX)

Author Contributions

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Validation: Asmare Getie, Amsalu Baylie, Agegnehu Bante, Biftu Geda.
References

1. Baghaei R, Azar S. The Effect of New Guideline Training among Iranian Nurses for Pressure Ulcer Prevention International Journal of Medical Research & Health Sciences. 2016; 5(11):215–22.

2. Edsberg LE, Black JM, Goldberg M, McNichol L, Moore L, Sieggreen M. Revised National Pressure Ulcer Advisory Panel Pressure Injury Staging System. Journal of Wound, Ostomy, and Continence Nursing 2016; 43(6):585–97. https://doi.org/10.1097/WON.0000000000000281 PMID: 27749790

3. Sawant N, Shinde M. Nurses Knowledge and Practices towards Prevention of Pressure Ulcer in Tertiary Care Hospital International Journal of Science and Research (IJSR) 2017; 6(5):739–45.

4. Bredesen M, B., I., Bjørn K, Gunningberg L, Hofoss D. Patient and organisational variables associated with pressure ulcer prevalence in hospital settings: a multilevel analysis. BMJ Open 2015.

5. Köse I, Yeşil P, Öztunc G, Eskimez Z. Knowledge of Nurses Working in Intensive Care Units in Relation to Preventive Interventions for Pressure Ulcer. International Journal of Caring Sciences 2016; 9(2):677–86.

6. Abebe D, Daniel M. Assessment of Nurses’ Knowledge, Attitude, and Perceived Barriers to Expressed Pressure Ulcer Prevention Practice in Addis Ababa Government Hospitals, Addis Ababa, Ethiopia. Advances in Nursing 2015; 2015:1–12.

7. Johansen E, Bakken L, Moore Z. Pressure Ulcer in Norway: A Snapshot of Pressure Ulcer Occurrence across Various Care Sites and Recommendations for Improved Preventive Care. Healthcare 2015; 3:417–28. https://doi.org/10.3390/healthcare3020417 PMID: 27417771

8. NPUAP/EPUAP. Treatment of pressure ulcers: quick reference guide. European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel. 2014.

9. Tayyib N, Coyer F, Lewis P. Saudi Arabian adult intensive care unit pressure ulcer incidence and risk factors: a prospective cohort study International Wound Journal. 2015:912–9. https://doi.org/10.1111/iwj.12406 PMID: 25662591

10. Albuquerque M, A., Souza M, A., Torres V, S., Porto V, A., Soares M, J., Torquato I, M assessment and prevention of pressure ulcer by nurses from intensive care: knowledge and practice Journal of nursing 2014; 8(2):229–39.

11. Özyürek P, Yauzu M, Yıldız Ö. Investigation of the risk factors of pressure ulcers in intensive care unit patients. East J Med 2016; 21(1):1–9.

12. Onigbinde A, Ogunsanya G, Oniyangi S. Pressure ulcer incidence among high risk inpatients in Nigeria. Br J Nurs. 2012; 20(12):1–12.

13. Tihtinta A, Fedesa M, Daniel S. Prevalence of Bed Sore and its associated Factors among Patients admitted at Jimma University Medical Center, Jimma Zone, Southwestern Ethiopia, 2017 Cross-sectional study. Ortho & Rheum. 2017; 8 (4).

14. Nasreen S, Afzal M, Sarwar H, waqas A. Nurses Knowledge and Practices Toward Pressure Ulcer Prevention In General Hospital Lahore. Saudi Journal of Medical and Pharmaceutical Sciences 2017; 3 520–7

15. Källman U, Suserud B. Knowledge, attitudes and practice among nursing staff concerning pressure ulcer prevention and treatment—a survey in a Swedish healthcare setting. Scand J Caring Sci. 2009; 23:334–41. https://doi.org/10.1111/j.1471-6712.2008.00627.x PMID: 19645807

16. Nurhusien N, Fisha Z, Sinafkishe A, Yohhanes M. Knowledge and practice of nurses towards prevention of pressure ulcer and associated factors in Gondar University Hospital, Northwest Ethiopia. BMC nursing. 2015; 14(34):1–8.

17. Lupear S, Overstreet M, Krau S. Perioperative Nurses’ Knowledge of Indicators for pressure ulcer development in the surgical patient population Nurs Clin N Am 2015; 50 (2015): 411–35. https://doi.org/10.1016/j.cnur.2015.03.006 PMID: 25999080

18. Mwebaza I, Katende G, Groves S, Nankumbi J. Nurses’ Knowledge, Practices, and Barriers in Care of Patients with Pressure Ulcers in a Ugandan Teaching Hospital. Nursing Research and Practice. 2014; 2014:1–6.

19. CSA. Population and housing census of Ethiopia. Central Stastical Agency. 2007.

20. Werku, Menji Zeleke Argaw, Hunde BM. Nurses’ Knowledge and Perceived Barriers About Pressure Ulcer Prevention for Admitted Patients in Public Hospitals in Addis Ababa, Ethiopia American Journal of Internal Medicine 2017; 5(4):1–6
21. Shrestha N, P S. Knowledge of Pressure Ulcer Management among Nurses Journal of Gandaki Medical College-Nepal 2016; 09(02):47–51.
22. Uba M, N., Alih F, I., Kever R, T., Lola N. Knowledge, Attitude and practice of nurses towards pressure ulcer prevention in university of Maiduguri teaching hospital, Borno state, North-Eastern, Nigeria. International Journal of Nursing and Midwifery. 2015; 7(4):54–60.
23. Spector PE. Job satisfaction survey norms. 2011.
24. Zewdie A. Assessment on Magnitude of Needle Stick and Sharp Injuries and Associated Factors among Health Care Workers in East Gojjam Zone Health Institutions, Amahara Regional State, Ethiopia Global Journal of Medical research Diseases 2013 13(3).
25. Puneet B, Singh M. Profile of Home-based Caregivers of Bedridden Patients in North India. Indian Journal of Community Medicine. 2011 36(2):114–9. https://doi.org/10.4103/0970-0218.84129 PMID: 21976795
26. Cho I, Parkb HA, Chunge E. Exploring practice variation in preventive pressureulcer care using data from a clinical data repository. International Journal of Medical Informatics. 2011; 80(1):47–55. https://doi.org/10.1016/j.ijmedinf.2010.10.019 PMID: 21130682
27. Hidalgo P, P., Fernández G, Medina L, Ortega L. Pressure ulcer care in Spain: nurses’ knowledge and clinical practice. Journal of Advanced Nursing 2007; 58(4):327–38 https://doi.org/10.1111/j.1365-2648.2007.04236.x PMID: 17442040
28. Saleh M, Y., N., Al-Husami M, Anthony D. Pressure ulcer prevention and treatment knowledge of Jordan Nurse. Journal of Tissue Viability 2013(22):1–11.
29. Taha A, S.. nurses knowledge and practice related to pressure ulcer at intensive care unit journals oe International accadamiic research for multidiplinary 2014; 2(2):247–62.
30. Miftah A, Solomon A, Mihretu K. evidence based practice among health professionals in hospitals of north west ethiopia: A cross sectional stydy. International Journal of Evidence-Based Healthcare 2017:1–10. https://doi.org/10.1097/XEB.0000000000000101 PMID: 28263246
31. Strand T, Lindgren M. Knowledge, attitudes and barriers towards prevention of pressure ulcers in intensive care units: A descriptive cross-sectional study. Intensive and critical care nursing, 2010; 26:335. https://doi.org/10.1016/j.iccn.2010.08.006 PMID: 20870408
32. Al-Ghamdi A. Factors Affecting Nurses’ Compliance in Preventing Pressure Ulcer Among Hospitalized Patients at King Abdulaziz University Hospital. American Journal of Nursing Science 2017; 6(5):387–95