

ADDIS ABABA UNIVERSTY COLLEGE OF HEALTH SCIENCE

DEPARTMENT OF EMERGRNCY MEDICINE



ASSEMENT OF KNOWLEDGE AND PRACTICE OF ADULT INTENSIVE CARE UNIT
NURESES AND THEIR BARRIERS ON PRESSURE ULCER PREVENTION AND
MANAGEMENT IN SELECTED PUBLIC HOSPITALS.

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ADDIS ABEBA UNIVERSITY, COLLEGE OF HEALTH SCIENCE, SCHOOL OF
MEDICINE, DEPARTMENT OF EMERGENCE MEDICINE

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List of abbreviations

ANA : American Nurses Association

AICU : Adult intensive Care Unit

EPUAP: European Pressure Ulcer Advisory Panel

NPUAP: National Pressure Ulcer Advisory Panel

PrUs : Presser ulcers

PUKAT: Presser ulcer Knowledge Assessment Tool

TASH: Tikuer Anbesa Specialized Hospital

Abstract

Background: Pressure ulcer is localized tissue necrosis that commonly develops on a bony prominence areas when soft tissue compressed for prolonged period of time. Critically ill patients are considered to be at greatest risk for pressure ulcer development. So that, nurses are the first line health professionals to provide adequate care.

Objectives: To assess knowledge and practice of Adult Intensive care Unit nurses and their barriers towards pressure ulcer prevention and management in selected public Hospital, Addis Ababa, Ethiopia 2017.

Methods: A descriptive cross-sectional survey was carried out among (N=128) Adult Intensive care Unit nurses in six selected public Hospitals. Simple random Sampling techniques was used to select sample hospitals in order to find research participants. In addition standardized questionnaire was used to collect data.

Result: The study findings showed that the level of nurses' knowledge regarding pressure ulcer prevention and management was good (Mean=18.52, SD±2.686), while the level of nurses' practice was poor (Mean=12.39, SD±4.70924). Shortage of pressure relieving devices, inadequate training and education and presence of other priorities other than pressure ulcers were majorly cited barriers to carry out PrU care efficiently. The nurses' knowledge has association (AOR= 2.499, p value = 0.028) with training but not with their practice and barriers. In addition nurses' practice has significant association with barriers.

Conclusions: In general, the study results indicates that nurses have good knowledge of PrU prevention and management but accounts poor practice. As a result the study recommends for the provision of in service training and fulfillment of proper equipments for AICU nurses and unit. The study finding implies the need for further researches and it will be used as point of reference.

Keywords: Pressure ulcer, Knowledge, Practice, Barriers

1. INTRODUCTION

Pressure Ulcer is also known as 'pressure sore, bed sores and decubitus ulcers'. It is associated with severe illness and immobility leads to localized injury on the skin and/or underlying tissue usually over a bony prominence areas, as a result of pressure, or pressure in combination with shear and/or friction as defined by the National Pressure Ulcer Advisory Panel (NPUAP) and European Pressure Ulcer Advisory Panel (EPUAP). [1]

Pressure ulcer has long been recognized as a major cause of morbidity, mortality and health care burden globally. [2]An estimated pressure ulcer incidence rate of 8.3% to 25.1 % in developed countries, and 2.1 % to 31.3 % in developing countries is exhibited. [3]The problem is still widely spread in health care facilities around the world. In Ethiopia, based on a study conducted in Wolaita Sodo University Teaching Hospital, 32 were developed pressure ulcer among 239 hospitalized patients with the prevalence rate of 13.4% [4] which is almost an average rate for developing countries patient's position change every two hour, friction and shearing forces, patients main diagnosis, medications in use and prolonged length of stay in hospital were general important association of prevalence.

Pressure ulcer is one of the most common complications for bed-ridden patients hospitalized in acute and chronic care services and impose a major burden on patients, their relatives and caregivers. Critically ill patients in ICU are considered to be at greatest risk for pressure ulcer development, as this patient group is likely to present with great attention, may require mechanical ventilation and consequent administration of sedation and pharmacological drugs potentially reducing peripheral circulation and be immobile. [5] These patients who are identified as being at risk should have a management plan to prevent development of pressure ulcer, improve healing and prevent complications of existing pressure ulcer. So that aggressive, ongoing pressure ulcer prevention programs, including thorough skin assessment and care, frequent repositioning and careful selection of support surfaces have demonstrated significant reduction of pressure ulcer incidence and time taken for treatment as well as dramatic cost savings. [5]

The prevention and healing of pressure ulcers requires knowledge and skills of the entire interdisciplinary health care team specially nurses as well as consumes large quantities of resources in terms of reusable equipment and nursing time. [6]

Pressure ulcer training and education is a fundamental component of pressure ulcer programs which promote awareness of pressure ulcer prevention and best practice. Also treatment and prevention of pressure ulcer, an important quality and care indicator for all healthcare institutions, require a multidisciplinary team having a holistic care approach.[7] So that nursing care has a major effect on pressure ulcer prevention and management. This is because nurses have a responsibility to monitor patient's skin in order to plan, implement and evaluate interventions that maintain skin integrity by using their knowledge and skill.

This study aim at assessing knowledge and practice of nurses and their barriers in Adult ICU towards pressure ulcer prevention and management in selected public hospital, Addis Ababa, Ethiopia.

1.1 Statement of the problem

Pressure ulcer is a serious condition that spreads across all the medical disciplines and considerable health care problem worldwide. [8] Several factors were contributed to pressure ulcer development. These were intrinsic factors such as advanced age (> 65 years), limited mobility, poor nutrition, co morbidities, incontinence (urinary more than fecal), impaired sensory perception, altered tissue perfusion, organ system failure, and infection and extrinsic factors like force and duration of pressure, shearing, friction and macerations. [9] Nurses' knowledge, attitude and practice are also viewed as extrinsic factors for pressure ulcer development [10].

Previous literatures reported that inadequate pressure ulcer related knowledge and skills contributes suggestively to the occurrence or worsening of Pressure ulcer. In addition inadequate knowledge was possible obstacles for practice like staff shortage, pressure relieving devices provision, and risk assessment tools.[11] The other contributing factors for pressure ulcer prevention practice and care planning was heavy work load and inadequate staff, shortage of pressure relieving devices, inadequate training, lack of universal guide line, presence of other priorities than pressure ulcer.[12,13]

So that nurses are the first line health professionals to provide adequate care for hospitalized patients but they are not fully aware the importance of using up-to-date pressure ulcer prevention protocols and may not have been exposed to current evidence-based practices; sometimes their practices can be influenced by awareness, experience, or habit. [14]Though, there are some studies focusing on whole nurses in hospitals, it is fact that there are no researches regarding Adult ICU nurses' knowledge, practice and their barriers on pressure ulcers prevention and management in public Hospitals in Ethiopia. Therefore, this study will emphasizes on filling the gap on assessment of nurses' knowledge, practice and their barriers towards pressure ulcer prevention & management in Adult ICU.

1.2 Significance of the study

The study describes the level of Adult ICU nurses' knowledge, practice and their barriers regarding pressure ulcer prevention and management. It also provide practical evidence to support an essential link between nursing quality of care on pressure ulcer prevention and management. On top of that deliver baseline data for higher authority to plan for an initiation of quality care improvement. The results of this study contribute to nursing education, nursing practice and as reference for future research in nursing. In addition, contributes to body of knowledge on this subject, in-service training and educational program can be design for nurses to improve their Knowledge and practice on prevention and management of pressure ulcer in public Hospitals.

2. LITERATURE REVIEW

2.1 Definition of pressure ulcer

Pressure ulcers are localized areas of tissue necrosis that develop when soft tissue is compressed between a bony prominence and an external surface for a prolonged period of time.[15] A pressure ulcer can occur due to pressure applied to soft tissue resulting in completely or partially obstructed blood flow to the soft tissue. Prolonged pressure from lying or sitting on a specific part of the body will impede capillary blood supply to an area and thus limit the delivery of oxygen and nutrients to tissue, placing patients at risk for skin breakdown.[16] Tissue hypoperfusion occurs when the interface pressure exceeds capillary pressure, thus increasing the likelihood of pressure ulcer development.

2.2 Prevention and management strategy of pressure ulcer

Internationally, the NPUAP, EPUAP and pan pacific pressure injury alliance (Australia, New Zealand, Singapore and honk Kong) published comprehensive evidence/based clinical practice guide line in 2014. The guide line was developed by an international team of over 100 clinical specialists and updated the 2009 NPUAP and EPUAP clinical guide lines. The guide line includes recommendations on strategies to prevent pressure ulcers including the use of pressure redistributing support surface, repositioning and maintaining appropriate nutritional support. In addition to these for management of pressure ulcer includes wound care (debridement, wound dressing) and use of topical agents.[17] Nurses have a crucial role in the prevention and management of pressure ulcers incentives to implement strategies for pressure ulcer prevention that are individualized, cost-effective, and evidence-based are fueled by current health care regulatory and financial environments. [18] The first step for pressure ulcer prevention is the assessment of the risk for acquiring a pressure ulcer. [19] After assessing the patient's risk for acquiring a pressure ulcer, a decision can be made as to what strategies should be used to prevent pressure ulcers. One such prevention strategy would be use of a specialized support surfaces to help reduce the pressure that the patient's body weight exerts on skin and subcutaneous tissue as it presses against the surface of the bed or chair. [19]

The use of low-friction slide sheets and air-assisted transfer devices reduce the risk of skin injuries that are caused by friction and shearing forces. [20]

One of the most important interventions for immobile patients is repositioning the patient on a regular schedule of at least every two hours. [20] Application of heel protector boots helps to prevent the development of pressure ulcers on the heel of patients. Preventative interventions should include nutritional assessments [21] the first step in treating a pressure ulcer is to relieve the source of pressure or shearing. [22] Evidence suggests that a proper support surface may reduce the chance that a deep tissue injury would progress to a full-thickness pressure ulcer. [22] If a pressure ulcer does occur, based on what stage the pressure ulcer is, treatment could involve management of local and distant infection, removal of necrotic tissue, and maintenance of a moist environment to promote wound healing. [21] Pressure ulcer treatment often involves different approaches that protect and promote healing of a pressure ulcer by using such interventions as wound dressings, topical applications and various different adjunct therapies such as electrical stimulation, light therapy, and vacuum-assisted devices and surgical repair.[23] In spite of these all effective measures nurses have to be knowledgeable and skillful on pressure ulcer prevention and management for overall quality improvement of patient care.

2.3 Knowledge of Nurses towards Pressure Ulcer Prevention and Management

A descriptive-exploratory design was performed among nurse team members working in direct care to adult and elderly patients at a university hospital in Brazil between January and March 2009. Participants were 386 professionals, to assess their knowledge on pressure ulcer prevention. Whom 64.8% were nursing auxiliaries/ technicians and 35.2% baccalaureate nurses. The outcomes showed that both nurses (mean 79.4%) and nursing auxiliaries/technicians' (mean 73.6%) knowledge was insufficient. [24]

A descriptive cross sectional study was conducted in the Adult Intensive Care Units of a university hospital located in Adana/Turkey between June and July 2014. The study was completed with the participation of a total number of 73 nurses. Percentages of correct responses to the sub-titles about preventive interventions for pressure ulcer was 75% for "Risk Assessment", 72.9% for "Assessment of the Skin", 56.9 %for "Positioning and Movements", 85.9% for "Regulating Nutrition", 55.4% for "Use of Support Surfaces"98.6%for "Education", and 99.3% for "Keeping Records" then study show that the majority of the participants' knowledge about the preventive interventions for pressure ulcer was good. [25]

A cross-sectional multi-centered study, conducted in Belgium, 2011 conducted with 145 nurses and nursing assistants to assess their knowledge and attitudes about Pressure ulcers prevention and the study association between knowledge, attitudes, and the compliance with Pressure ulcer prevention guidelines in nursing homes. The result indicated that nurses and nursing assistant's knowledge about Pressure ulcers was low. The mean knowledge score of nurses was 29.3% and 28.7% for nursing assistants. [26]

A self-reported cross-sectional survey design was used to collect data from nurses who were providing care to patients with pressure ulcer problems in Jordan between June and November 2012. They used a questionnaire, to collect data about nurses' knowledge of pressure ulcer prevention and treatment and to assess perceived barriers to carry out PU care. The overall participants' knowledge index was calculated and showed a mean score of 41.6 (SD = 8.8, Range=19.2-65.3) where knowledge index was normalized to a range (0,100). [27]

According to the study conducted in Bangladesh from November 2009-January 2010. Among (N=91) nurses' knowledge regarding pressure ulcer prevention was at very low level (Mean=57.79%, SD=9.20). Also found the highest levels of nurses' knowledge were; turn in the position every 2 hours to protect skin damage (100%), scheduling turning positions for reducing pressure ulcer formation (94.5%), recognizing the value of vitamin C&E to maintain healthy skin (92.3%) and elevating the head of bed at <30 degree reduce shearing force (85.7%). On the other hand, lowest percentages of nurses answered correctly were; applying a risk assessment scale for pressure ulcer development (12.1%) and determining low albumin to be the critical determinant for pressure ulcer development (23.1%). [10]

Descriptive research design was adopted to assess nurse's knowledge and practices related to pressure ulcer at intensive care unit at Benha University and Benha Teaching Hospital in Egypt. Data were collected between February- June, 2012 on 60 nurses working in Intensive Care Units of both Benha University and Benha teaching Hospital. Knowledge questionnaire sheet and observation checklist was used. The findings showed that more than two thirds of the studied sample had unsatisfactory knowledge level which was 70%. [28]

A descriptive cross sectional design employed to determine nurses' knowledge, practices and barriers to care pressure ulcers patients in Uganda, 2014 teaching hospital participants were (N =56) registered practicing nurses were sampled. Self-administered questionnaire used to collect data. The nurses had limited knowledge about critical parameters of pressure ulcers. Generally the study proposed that nurses' knowledge regarding pressure ulcer had inadequate about how pressure ulcers developed. [11]

A cross-sectional survey was undertaken that aimed to assess nurse's knowledge, practice and factors associated with Pressure ulcer prevention in Gondar University Hospital in North-west Ethiopia, between March and April 2014. Data were collected among 248 nurses. The study results showed that more than half 54.4% of nurses had good knowledge, while a section 45.6 % of the respondents did not. From the six dimensions on three of knowledge regarding prevention of pressure ulcer on risk assessment, skin care and management for mechanical loads the nurses had a poor knowledge. But, they possessed a good knowledge on factors related to pressure ulcer formation (M = 71.9, SD = 25.2), benefit of nutrition to maintain healthy skin (M = 69.9, SD = 29.1) and importance of staff training (M = 60.7, SD = 34.2) So that knowledge of nurses in relation to prevention of pressure ulcers was insufficient. [29]

A cross-sectional study design, in three Addis Ababa Government Hospitals, 2015 with a total of 217 qualified nurses participated in the study and data were collected through pre-tested self-administered questionnaire. McDonald's standard of learning outcome measured criteria was used to categorize nurses' level of knowledge regarding pressure ulcer prevention. The participants 76 (38.8%) had inadequate knowledge. [12]

Another cross sectional multi-center study was undertaken that aimed to assess nurse's knowledge, attitude and practice towards pressure ulcer prevention in six selected public hospitals in Addis Ababa, from April-May 2015 nurses participated in the study (N=356) who were working in the selected public hospitals. The study result showed that nurses' knowledge was 63.85% which indicated that the nurses' knowledge regarding pressure ulcer prevention is at the low level. [13]

2.4 Practice of Nurses towards Pressure Ulcer Prevention and Management

A study conducted in Bangladesh from November 2009-January 2010 one medical college hospital with the objective of examining nurses' knowledge, attitude, and practice regarding pressure ulcer prevention. The staff nurses overall level of practice regarding pressure ulcer prevention was moderate ($M = 77.55\%$) and five out of six sub-dimensions were at the moderate levels. Those five sub-dimensions were: identifying factors for pressure ulcer formation (77.65%), risk assessment tool (74.17%), nutrition to maintain healthy skin (77.41%), management of mechanical load (77.65%), and educational program for patient, family, and staff (75.09%). In contrast, only one sub-dimension of skin care (82.05%) was at high level [10]

Descriptive research design was adopted to assess nurse's knowledge and practices related to pressure ulcer at intensive care unit at Benha University and Benha Teaching Hospital in Egypt from February- June 2012. 60 nurses working in Intensive Care Units. Both unit nurses were participated on observation checklist. The findings showed that two thirds of the studied sample had unsatisfactory practice level which was 70%. [28]

A descriptive cross sectional design employed to determine nurses' knowledge, practices and barriers to care pressure ulcers patients in Uganda, 2014 teaching hospital participants were ($N = 56$) Ugandan registered practicing nurses were sampled. A compound of self-administered questionnaire and an observation checklist were utilized. Prevention practices were observed to be unreliable and uncoordinated related to a significant shortage of staff and logistics for pressure ulcer prevention the study shown that only 28.6% of the nurses had turned patients on a two-hourly basis. But on a daily basis they were conducting patient education (96.4%), encouraging a balanced diet (58.9%), and using pressure reduction devices (33.9%). [11]

A cross-sectional survey was undertaken that aimed to assess nurse's knowledge, practice and factors associated with Pressure ulcer prevention in Gondar University Hospital in Ethiopia, between March and April 2014. Data were collected among (N=248) using a structured questionnaire. The study results showed that 48.4% of nurses had good practice on prevention of Pressure ulcers suggesting that practice of nurses in relation to prevention of Pressure ulcers was insufficient. [29] Another cross sectional multi-center study was conducted in six selected public hospitals in Addis Ababa, Ethiopia from April-May 2015 (N=356) participants were in the study. The result showed that nurses' practice towards pressure ulcer prevention was at very low level (33.42%) with minimum scores of 5% and maximum scores of 100% ,which found that 33.42% of nurses do pressure ulcer prevention practice, 44.42% do pressure ulcer prevention practice sometimes and 24.16% never do pressure ulcer prevention practice. [13]

2.5 Barriers for Pressure Ulcer Prevention and Management

A descriptive study conducted in four ICUs Swedish hospitals, 2009 to investigate registered nurses' and enrolled nurses' knowledge, attitudes and perceived barriers opportunities towards pressure ulcer prevention. Questionnaires were distributed to registered nurses and enrolled nurses. Findings reported that barriers were lack of time (57.8%) and severely ill patients (28.9%); opportunities were knowledge (38%) and access to pressure relieving equipment (35.5%). [30]

A self-reported cross-sectional survey design was used to collect data from nurses who were providing care to patients with pressure ulcer problems in Jordan between June and November 2012. Stated that half of subjects regarded barriers for pressure ulcer prevention, Lack of staff was the most commonly cited barrier to carrying out Pressure ulcer prevention measures (87%; n=208), followed by lack of time (84%; n=202).The 'patient' was considered by many participants to be a barrier (68%; n=162), in terms of patients being uncooperative or medically unstable, which makes prevention difficult also lack of policies and guidelines about PrU prevention (50%; n=120) , lack of Cooperation with other health professionals (51%; n=121) and lack of job satisfaction (57%;n=137) [26]

A descriptive cross sectional study conducted in Uganda,2014 with (N=56)promoted that shortage of nurses leads them heavy workloads (94.6%) the most mentioned potential and actual barriers to carry out pressure ulcer prevention and management. In addition, the study also found that inadequacies of supplies for pressure ulcer prevention and management (80.4%), uncooperative patient (62.5%), lack of pressure ulcer prevention guide line (50%), poor access to literature (37.5%), inadequate training about pressure ulcer (23.2%) and lack of multidisciplinary initiative (46.4%) [11]

A cross-sectional study design, in three Addis Ababa Government Hospitals in Ethiopia, 2015 with a total of 217 qualified nurses participated in the study and data were collected by self-administered questionnaire. The result stated that the most frequently reported barrier to carrying out pressure ulcer prevention practices was unbalanced nurse to patient ratio (67.9%; $n = 133$), followed by lack of job satisfaction (64.3%; $n = 126$) [12]

A cross-sectional multi-center survey was undertaken in six selected public hospitals in Addis Ababa, Ethiopia from April-May2015.Study aimed to assess nurse's knowledge, attitude and practice towards pressure ulcer prevention. The challenges of nurses' reported to carry out pressure ulcer prevention were only 7(2%) of participants had not reported any challenge for preventing pressure ulcer while 349 (98%) had reported the following major challenges such as heavy work load and inadequate staff, shortage of pressure relieving devices, inadequate training, lack of universal guide line, presence of other priorities than pressure ulcer and lack of job satisfaction in nursing in preventive practice of pressure ulcer prevention. [13]

OBJECTIVES

General objective

1. To assess knowledge and practice of Adult ICU nurses and their barriers towards pressure ulcer prevention and management in selected public Hospitals, Addis Ababa, Ethiopia from December 2016-June2017.

Specific objective

- i. To examine the level of nurses' knowledge regarding pressure ulcer prevention and management.
- ii. To determine the level of nurses' practice regarding pressure ulcer prevention and management.
- iii. To identify the barriers that AICU nurses face for pressure ulcer prevention and management.

4. STUDY METHODOLOGY

4.1 Study area and period

As Addis Ababa is the capital city of Ethiopia, and seat of African union and Economic Commission for Africa is situated at the heartland of Ethiopia, with total population of 3,195,000 of whom 1,515,002 males and 1,679,998 females which includes until Hamile, 2006 EC/ July, 2014 GC. The city encompasses 6 zones and 28 woredas also holds 34 private hospitals, 86 health centers and 13 public hospitals. The study was undertaken in six selected public Hospital nurses who are working in Adult ICU these are Tikuer Anbesa specialized hospital, Menilik II Hospital, St. Paul's Hospital, Zewditu Memorial Hospital, Yekatit 12 Hospital and AaBet Hospital where they provide intensive care for critically ill patients. TASH was established in 1956 E.C and one of the tertiary referral hospital under the Federal Ministry of Health in Ethiopia. Moreover, the hospital is an academic center that provides education for many recruited medical, nursing and other departments which is availing its service having been organized under the umbrella of Addis Ababa University. It has different departments and staffs total 600 beds, 627 staff nurses and 202 staff physicians. Adult ICU in this hospital has 12 beds, 37 staff nurses 3 MSC nurses 7 Anestologist. Yekatit 12 Medical college hospital was established in 1915 E.C. It is one of the known hospitals run by Addis Ababa City Health Bureau It has different departments, staffs and total 420 beds ,342 staff nurses and 98 staff physicians. Adult ICU in this hospital has 12 beds, 2 Anestologist and 22 staff nurses. Zewditu memorial hospital was built, owned and operated by the seventh Day Adventist Church then after nationalized during the Military regime in 1976 E.C. Today Zewditu Hospital is activated by Federal Ministry of Health under Addis Ababa health Bureau. It has different departments and staffs total 182 beds, 277 staff nurses and 62 staff physicians. Adult ICU in this hospital has 6 beds and 15 staff nurses. St. Paul's referral Hospital was established in 1963 under the Federal Ministry of Health. It has different departments. Adult ICU in this hospital has 25 staff nurses. AaBet hospital is a branch of St Paul's hospital which is organized two year back located Arada sub city around Yohanes church. It provides emergency service for 24 hours and have a total of 257 staff nurses. Adult ICU in this hospital has 12 beds and 40 staff nurses.

Menilik II referral hospital was established in 1844E.C after Menilek's Adwa victory. It runs by Addis Ababa City Health Bureau with different departments and total 635staffs.203 staff nurses and 59 staff physicians. Adult ICU in this hospital has 6 beds, 14 staff nurses.

The study was undertaken in selected six public Hospitals from December 2016 to June 2017.

4.2 Study design

The study was conducted hospital based cross-sectional study. To this end, a quantitative descriptive method was used. Because it enables to collect numerical data and perform quantitative analysis using statistical procedures, in order to determine the level of knowledge and describe practices related to pressure ulcer prevention and management among Adult ICU nurses in selected public Hospitals.

4.3 Source and study population

4.3.1 Source population

All qualified nurses working AICU in public Hospitals.

4.3.2 Study population

All Adult ICU nurses working in six randomly selected public Hospitals was invited to participate in the study.

4.4 Sample size determination

All Adult ICU nurses working in selected public Hospitals.

4.5 Sampling technique

Simple Random Sampling (Lottery method) was used to select six public hospitals and take all nurses who are responsible to provide care for bedridden and critically ill patients in Adult intensive care units.

4.6 Eligibility criteria

4.6.1 Inclusion criteria

1. Nurses who were working in Adult ICU \geq one month.
2. Those who were willing to participate in the study.
3. Those who were available during the time of the study.

4.6.2 Exclusion criteria

1. Those who were not available during the time of the study (annual, maternal, sick leave...) and reluctant to participate in the study.

4.7 Data collection procedure

Structured questionnaires was Self-administered to collect data. The questionnaires contain variables related to: Socio-demographic, Knowledge, Practice and barriers of nurses ‘towards pressure ulcer prevention and management. The data collection was over a period of one month facilitated by 5 coordinators from staff nurses also supervised by 1 supervisor and principal investigator (PI). Training was provided by the principal investigator for data collection facilitators before the actual data collection time. Each of the nurses available during the time of the study in the units was approached and explanation pertaining to the purpose of the study was clearly provided in a way that provides simplicity as to what is to be achieved so that each of them are requested for participation. Then the nurse who wish to participate was read and sign a consent form.

4.8 Data collection instrument

Quantitative data was collected using standardized questionnaire adapted and selecting from Pressure Ulcer Knowledge Test (PUKT) developed by Pieper and Mott, 1995.[31] This instrument has been widely used among nurses in other countries to evaluate knowledge of PU prevention strategies. In its original version, the PUKT is a 47-item test designed with 3 options True, False and I don’t know to measure knowledge of PU prevention and management. So that it was a valid tool for this study. Practice test and barriers related questions was modifying and selecting from previous literatures. [10, 11, 12]

4. 9 Study variables/ measurements

4.9.1 Dependent variables

- Knowledge related to pressure ulcer prevention and management
- Practices related to pressure ulcer prevention and management

4.9.2 Independent variables

- Socio demographic(age, sex, educational level, formal training and working experience)
- Hospital factors (Inadequate facility, training, guide line, poor access to literatures)
- Nurses’ factors (heavy work load, lack of time, job satisfaction, multidisciplinary)
- Patient factors (uncooperative and severely ill patients)

4.10 Operational definitions

Knowledge - is the awareness of the nurse about pressure ulcer prevention and management.

Good knowledge- Nurses, who scored above the mean value towards prevention and management of pressure ulcer knowledge test questions.

Poor knowledge- Nurses, who scored below/equal to the mean value towards prevention and management of pressure ulcer knowledge test questions.

Practice - is the performance of the nurse about pressure ulcer prevention and management.

Good practice- Nurses, who scored above the mean value related to prevention and management of pressure ulcer practice test questions.

Poor practice- Nurses, who scored below/equal to the mean value related to prevention and management of pressure ulcer practice test questions.

Barrier- is an obstacle of nurses to perform pressure ulcer prevention and management.

4.11 Data quality assurance

The quality of data was assured through careful design before actual data collection and Pretested of the questionnaire was done in the total of 5% of study population in Ras-Dessta hospital. The data was checked frequently during collection and examine for completeness at the end of each day during collection.

4.12 Data entry and analysis procedure

The data obtained from the participants socio-demographic characteristics, level of knowledge, practices and barriers regarding management and prevention of pressure ulcers on questionnaire were collected, coded and entered into SPSS (Statistical Package for Social Sciences) version 20.0 for data analysis using descriptive statistics for describing and analyzing the quantitative data. Data were reported using means, percentages, and presented in tables.

4.13 Ethical consideration

Ethical clearance was obtained from departmental research of Addis Ababa University College of health science, school of medicine, department of emergency medicine prior to beginning of the study. Official letter of permission from the department was submitted to Tikur Anbesa specialized Hospital, Yekatit 12 Hospital, St. Paul's Hospital, Zawditu Memorial Hospital, Menilik II Hospital and AaBet Hospital in order to conduct the research. All the collected data was kept confidential and no one except the members of the research team had access to the collected information. Real name was not be mentioned or been attached to anything that participant said.

4.14 Dissemination of the result

The study result was presented to Addis Ababa University, faculty of medicine; department of emergency medicine and the documents with hard and soft copies are disseminated to concerned bodies.

5. RESULTS

5.1 Socio-demographic description of AICU nurses (N=128)

A total of 153 professional nurses were invited to participate in the study by distribute questionnaires to six public hospitals. The total number of completed and returned questionnaires was 128, making a response rate of 83.7%. Out of these 32 (25.0%) of them were from TASH, 23(18.0%) from St. Paul's 20 (15.6%) from Yekatit 12 medical college Hospital and others were from Zawditu Memorial Hospital 13 (10.2%), Menilik II medical college Hospital 13 (10.2%) and AaBet Hospital 27 (21.1%). Among 128 nurses 58(45.3%) were males and 70 (54.7%) were females. The mean ages of participants were 27.5 & SD \pm 8.41with minimum 21 and 46 years maximum. However, majority of them 95 (74.2%) were from age 21-29 years, 27 (21.1%) age from 30-38 years and 6 (4.7%) were age 39 -47 years. More than half 84 (65.6%) were single, 43 (33.6%) married and 1 (0.8%) divorced. Regarding educational status majority of them 114 (89.1%) were first degree holders while 13(10.2%) and 1(0.8%) were diploma and second degree holders in nursing, respectively. Nurses' experiences who are counted more than 10years were 6 (4.7%) while majority of them 91(71.1%) have 1mon-4 years of experience and 31(24.2%) have 5-10 years of experience in nursing profession. Nurses who received formal training towards PrU Prevention and management was 46(35.9%) while majority of them 82 (64.1%) weren't received training these all presented below in **Table 1**

Variable	Number N=128	Percent%
Sex		
Female	70	54.7%
Male	58	45.3%
Age		
21-29	95	74.2%
30-38	27	21.1%
39-47	6	4.7%
Mean= 27.5, SD \pm 8.41(Min = 21 :Max=46)		
Marital states		
Single	84	65.6%
Married	43	33.6%
Divorced	1	0.8%
Educational level		
Diploma	13	10.2%
Degree	114	89.1%
Masters	1	0.8%
Name of hospital		
TASH	32	25.0%
Zewditu	13	10.2%
Menilik II	13	10.2%
St. Paulo's	23	18.0%
Yekatit	20	15.6%
AaBet	27	21.1%
Work experience		
1mon.-4yrs	91	71.1%
5-10yrs	31	24.2%
Above 10yrs	6	4.7%
Formal training		
Yes	46	35.9%
No	82	64.1%

Table 1: - Socio demographic characteristics of Adult ICU nurses working in selected public hospitals Addis Ababa, Ethiopia 2017.

5.2 knowledge score of AICU nurses on pressure ulcer prevention and management (N=128)

Knowledge test questions distribution regarding pressure ulcer prevention and management based on 25 knowledge test questions. Each answer was given code “1” for correct answer and “2” for incorrect answer. The overall nurses’ knowledge percentage regarding pressure ulcer prevention and management was obtained from the table below by calculating all the correct responses percentage (total percentage sum= 1851.8) and dividing it by total number of knowledge test questions maximum score 25(100%). The overall knowledge percentage of nurse’s answered correctly regarding pressure ulcer prevention and management (P=74.07%, Mean=18.52, SD+2.686) with min 9 and max 24 scores. From one hundred twenty eight Adult Intensive Care nurses, more than half 53.1% of nurses had good knowledge, while the rest 46.9 % respondents had poor. The mean value as the cutoff point to categorize the nurses’ knowledge scoring above the mean as good and knowledge scoring below and equal to the mean as poor regarding pressure ulcer prevention and management. This study showed that the overall nurses’ knowledge was good regarding pressure ulcer prevention and management. The highest knowledge items in the sub-titles indicated that 84.1% for “Nutrition to maintain healthy skin”83.3% for “Risk assessment and Keeping records for PrU Development” these all presented below **figure 1andTable2.**

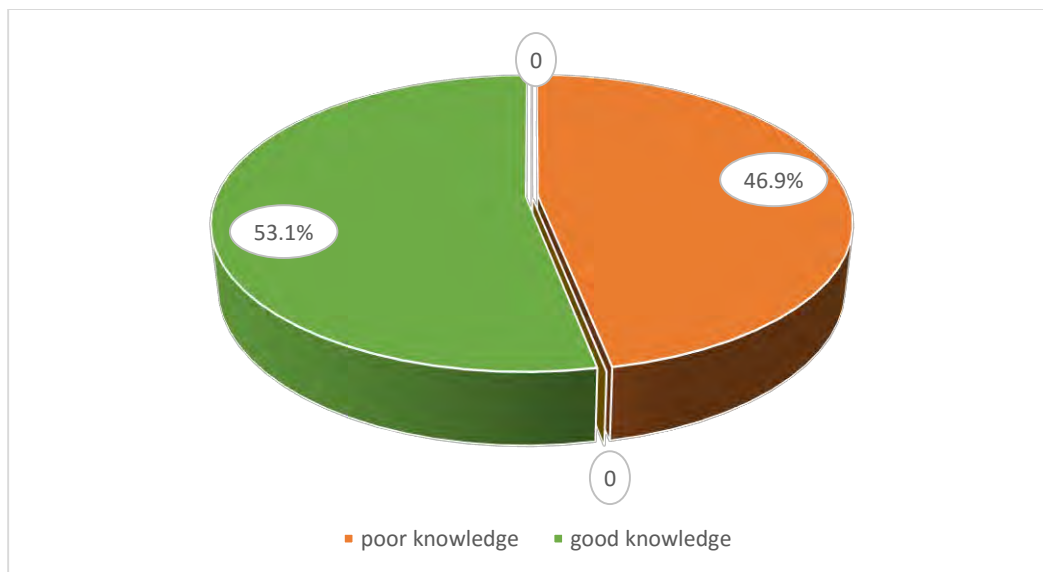


Figure 1. Showing level of nurses’ Knowledge regarding pressure ulcer prevention and management

Variables	correct F (%)	Incorrect F (%)
Risk factors for PU development		
Immobility, incontinency, impair nutrition and altered level of consciousness are risk factors for pressure ulcers development T	125(97.7)	3(2.3)
It is important to massage bony prominence F	22(17.2)	106(82.8)
Hot water and soap may dry the skin and increase the risk for pressure ulcer T	78(60.9)	50(39.1)
Risk assessment and Keeping records for PU Development		
Braden scale is the risk assessment tool use for pressure ulcer development T	69(53.9)	59(46.1)
The first sign for pressure ulcer development is non-bleachable redness or blue gray discoloration on intact skin. T	120(93.8)	8(6.3)
All patients have to be assessed on admission for risk of pressure ulcer development T	116(90.6)	12(9.4)
A turning schedule should be written and placed at the bedside T	112(87.5)	16(12.5)
All care given to prevent or treat pressure ulcer must be documented T	116(90.6)	12(9.4)
Skin care to prevent PU		
Bed ridden and incontinence patients skin cleaning should occur at the time of soiling and at routine interval T	104(81.3)	24(18.8)
Patient skin should be clean and dry to prevent risk of pressure ulcer development T	118(92.2)	10(7.8)
Lift up the patient without dragging is a correct practice for maintaining skin integrity T	84(65.6)	44(34.4)
One of appropriate method for skin care is applying topical cream T	108(84.4)	20(15.6)
Nutrition to maintain healthy skin		
An adequate dietary intake of protein and calories should be maintained during illness T	120(93.8)	8(6.3)
Serum albumin is test appropriate laboratory test for nutritional assessment of pressure ulcer patients T	90(70.3)	38(29.7)
Vitamin C and E are important to maintain healthy skin T	113(88.3)	15(11.7)
Mechanical Loading management		
Bed ridden patients have to be positioned every two hours T	120(93.8)	8(6.3)
Bony prominence should have direct contact with one another F	50(39.1)	78(60.9)
Shear is the force that occur when the skin sticks to the surface and the body slides T	82(64.1)	46(35.9)
Heel ulcer is prevented by putting pillow under the patients leg T	117(91.4)	11(8.6)
Friction may occur when moving a patient up in bed T	102(79.7)	26(20.3)
Elevating the head of bed<30 is one of nursing care for reducing shearing force T	94(73.4)	34(26.6)
Management and classification of PU		
Stage II pressure ulcer may be extremely painful due to exposure of nerve endings T	105(82.0)	23(18.0)
Pressure ulcer are sterile wounds. F	58(45.3)	70(54.7)
Eschar is healthy tissue and good for wound healing F	27(21.1)	101(78.9)
One of the complications of pressure ulcer is sepsis T	120(93.8)	8(6.3)

Table 2: - Overall knowledge score of Adult ICU nurses working in selected public hospitals Addis Ababa, Ethiopia 2017 E.C

5.3 Practice score of AICU nurses in preventing and managing pressure ulcer (N=128)

Practice test questions distribution regarding pressure ulcer prevention and management based on 20 questions. Each answer was given code “1” for yes and “2” for no. The overall nurses’ practice score regarding pressure ulcer prevention and management was obtained from the table below by calculating all the yes responses percentage (total percentage sum= 1239.3) and dividing it by total number of practice test questions maximum score 20(100%). The overall practice percentage of nurse’s perform always pressure ulcer prevention and management (P=61.96%, Mean=12.39, SD±4.70924) with minimum3and maximum20scores. From 128 Adult Intensive Care nurses, more than half 52.3% of nurses had poor practice, while the rest 47.7 % respondents have good practice. Mean value was used to classify AICU practice about pressure ulcer prevention and management. Nurses practice score above the mean value were taken as having good practice and those who score below and equal to the mean are considered as having poor practice. According to this study that the overall nurses’ practice was poor regarding pressure ulcer prevention and management. The highest practice response indicated that 84.4% they perform skin care as a routine work of their Unit these all presented below **in Table 3and figure 2**



Figure 2. Showing level of nurses’ practice regarding pressure ulcer prevention and management

PRACTICE QUATIONS	YES	
	Freq.	%
Doing skin assessment that guided by a standard nursing care available in their unit	65	50.8
Use risk assessment scale to assess pressure ulcer	56	43.8
Document all data related to pressure ulcer assessment.	71	55.5
Assess and provide management of pain in the patients who experience pain from any causes.	98	76.6
Perform skin care as a routine work of their unit.	108	84.4
Putting the pillow under the patient's legs from mid-calf to ankle to prevent heel ulcer.	102	79.7
Using or advising caregiver to use creams or oils on patients' skin in order to protect from urine, stool or wound drainage.	67	52.3
Paying more attention to pressure points during cleansing the soil or laceration	99	77.3
Perform lab test for assessing nutritional status followed by physicians' instruction	71	55.5
Providing vitamin and food for patients who are malnourish	50	39.1
Monitoring protein and calories diet in patient who is bedridden	57	44.5
Avoiding to drag the patients during repositioning	81	63.3
Always using a special mattress to prevent pressure loadings, such as foam, air	53	41.4
Avoiding massage over patient's bony prominences to prevent pressure ulcer formation	66	51.6
Advising and using donut-shape (ring) cushion at bony prominences to prevent pressure ulcer formation	60	46.9
Turning a patient position every two hour	91	71.1
Perform Cleaning, debriding, and dressing of pressure ulcers on daily basis	97	75.8
Always using proper dressing material	106	82.8
Always using sterile dressing for pressure ulcer	104	81.3
Giving advice to the patient or caregiver regarding pressure ulcer preventive care before discharge the patient from the unit	84	65.6

Table 3: - Overall practice score of Adult ICU nurses working in selected public hospitals Addis Ababa, Ethiopia 2017 E.C

5.4 Barriers of nurses 'towards pressure ulcer prevention and management (N=128)

Barriers towards PrU prevention and management were identified using a list of barriers related to assessment and carrying out PrU prevention and management practices. Participants were requested to mention the challenges (barriers) that nurses encounter which abstain them from carrying out pressure ulcer prevention and management. Among the nurses participated in the study 54(42.5%) of them had not reported as facing no challenge in preventing and managing pressure ulcer while 74(57.5%) reported major challenges such as shortage of pressure relieving devices (78.1%), inadequate training and education (68.8%), Heavy work load, lack of adequate staffing and equipment and Presence of other priorities other than pressure ulcers (68.0%) which presented below in **Table 4**.

Challenges to carrying out PU prevention and treatment	YES	
	Freq.	%
shortage of pressure relieving devices	100	78.1
Heavy work load and lack of adequate staffing	87	68.0
Lack of polices and universal guidelines	76	59.4
Inadequate training and education	88	68.8
Lack of equipment	87	68.0
Patients unstable and Uncooperative	58	45.3
Lack of time	44	34.4
Presence of other priorities other than pressure ulcers	87	68.0
Lack of multidisciplinary/ uncooperative among staff	55	43.0
Poor access to literature	64	50.0
Lack of job satisfaction in nursing profession	63	49.2
Have no any challenge	54	42.5

Table 4: - Barriers of Adult ICU nurses to provide pressure ulcer prevention and management selected public hospitals in Addis Ababa, Ethiopia 2017 E.C

Regression analysis of Nurses' Knowledge regarding pressure ulcer prevention and management with socio-demographic variables

Association among socio-demographic variables and respondents' knowledge score was by analyzed using binary logistic analysis. There is no statistical substantial association between knowledge of participants' sex, age, work experience with different years and educational level towards pressure ulcer prevention and management. But there is significant association between respondents' Knowledge and formal training on pressure ulcer prevention and management (AOR= 2.499, p value = 0.028, 95% CI (1.202-5.668))

Factors	KNOWLEDGE				
	Good	Poor	P value	COR(95%CI)	AOR(95%CI)
Sex					
Female	35	35	0.190	0.758(0.376-1.525)	0.603(0.283-1.285)
Male	33	25			
Age					
21-29	55	40	0.057	2.115(0.943-4.747)	2.420(0.975-6.006)
30-47	13	20			
Educational level					
Diploma	5	8	0.266	0.516(0.159-1.672)	0.495(0.144-1.709)
Degree & Masters	63	52			
Work experience					
≤ 5years	49	42	0.560	1.105(0.514-2.376)	0.769(0.319-1.857)
≥ 5years	19	18			
Formal training					
Yes	30	16	*0.028	2.171(1.030-4.578)	2.499(1.102-5.668)
No	38	44			

P < 0.05

Table 5: Association between socio-demographic characteristics and knowledge score of Adult Intensive Care nurses in selected public hospitals, Addis Ababa, 2017 E.C

Regression analysis of Nurses' Practice score regarding pressure ulcer prevention and management with socio-demographic variables

The study result found that nurses' practice score had no significant association with socio-demographic variables (age, sex, educational level, formal training and working experience) and knowledge score.

Factors	PRACTICE		P value	COR(95%CI)	AOR(95%CI)
	Good	Poor			
Sex					
Female	34	36	0.848	1.084(0.540-2.177)	0.930(0.445-1.947)
Male	27	31			
Age					
21-29	49	46	0.110	1.864(0.825-4.213)	0.477(0.192-1.183)
30-47	12	21			
Educational level					
Diploma	5	8	0.630	0.658(0.203-2.134)	1.350(0.397-4.590)
Degree & Masters	56	59			
Work experience					
≤ 5years	43	48	0.473	0.946(0.440-2.032)	1.375(0.576-3.282)
≥ 5years	18	19			
Formal training					
Yes	26	20	0.107	1.746(0.842-3.619)	1.876(0.873-4.029)
No	35	47			

P < 0.05

Table 6: Association between socio-demographic characteristics and practice score of Adult Intensive Care nurses in selected public hospitals, Addis Ababa, 2017 E.C

Regression analysis of Nurses' Practice and Knowledge score regarding pressure ulcer prevention and management with related barriers

Association found that nurses' knowledge wasn't correlated with their barriers regarding pressure ulcer prevention and management but there is significant association between respondents' practice and barriers. Shortage of PrU relieving devices were [AOR = 0.329, p value = 0.043, 95 % CI (0.112-0.964) and shortage of time [AOR = 0.258, p value = 0.001, 95 % CI (0.113-0.589)]. There is no significant association between hospitals' and work experience of AICU nurses but there is significant association between hospitals' and nurses working in AICU who have formal training on pressure ulcer prevention and management.

FACTORS	Good	Poor	P Value	COR (95%CI)	AOR (95%CI)	
Hospital factors						
Inadequate relieving devices	Yes	41	59	*0.043	0.278 (0.112-0.692)	0.329(0.112-0.964)
	No	20	8			
Universal guide line	Yes	24	52	0.077	0.187(0.087-0.404)	0.409(0.152-1.102)
	No	15	37			
Training	Yes	31	57	0.159	0.181(0.078-0.419)	0.463 (0.158-1.353)
	No	30	10			
Inadequate equipment	Yes	31	56	0.064	0.203(0.090-0.460)	0.411(0.161-1.053)
	No	30	11			
Poor access to literatures	Yes	26	38	0.515	0.567(0.281-1.142)	0.767(0.344-1.707)
	No	35	29			
Nurse factors						
Heavy work load	Yes	36	51	0.571	0.452(0.212-0.965)	0.767(0.305-1.923)
	No	25	16			
Lack of time	Yes	12	32	*0.001	0.268(0.121-0.592)	0.258(0.113-0.589)
	No	49	32			

Other priorities than PrU	Yes	37	50	0.153	0.524(0.247-1.113)	0.572(0.266-1.230)
	No	24	17			
Job satisfaction	Yes	24	39	0.119	0.466 (0.230-0.944)	0.529(0.237-1.178)
	No	37	28			
Multidisciplinary	Yes	21	34	0.103	0.510 (0.250-1.040)	0.548(0.266-1.130)
	No	40	33			
Patient factors						
Uncooperative patients	Yes	26	32	0.739	0.813(0.404-1.633)	1.138(0.532-2.436)
	No	35	35			
Name of hospital	Formal training			P value	COR (95%CI)	AOR (95%CI)
	Yes	no				
TASH	21	11		*0.031	0.308(0.106-0.897)	3.245(1.115-9.450)
Zewditu	5	8		0.931	0.941(0.241-3.679)	1.063(0.272-4.153)
Menilik II	3	10		0.382	1.961(0.434-8.860)	0.510(0.113-2.305)
St. Paulo's	5	18		0.244	2.118(0.600-7.478)	0.472(0.134-1.668)
Yekatit	2	18		0.049	5.294(1.010-27.748)	0.189(0.036-0.990)
AaBet	10	17		0.391	1.972(0.445-8.874)	0.519(0.123-2.319)

P < 0.05

Table 7: Association between barriers and practice score of Adult Intensive Care nurses in selected hospitals, Addis Ababa, 2017 E.C

6. DISCUSSION OF THE RESULT

The objective of this study was to assess knowledge and practice of Adult ICU nurses and their barriers towards pressure ulcer prevention and management in selected public Hospitals, Addis Ababa. The results of this study were based on the primary data gathered from nurses who had been working in AICU of six selected public hospitals. One hundred twenty eight participants were included who were available during the time of the study and willing to participate using standardized questionnaire. Mean value as the cut-off point was used to identify if participant have good or poor knowledge i.e. mean=18.52, SD±2.686 and for practice mean=12.39, SD±4.70924.

Association between independent variables and outcome variables was also examined. 54.7 % of the study participants were female, which indicated that the nursing profession is dominated by females. Similar results were found in a numerous studies. A study conducted in Turkey [25] found out 91.8% of nurses working in ICU were females. The same result was reflected in a cross sectional study conducted on nurses in Uganda [11] that mention 91.1% of the participants were females.

Of the study participant, 74.2% lies in a 21-29 years age group and 71.1% of them having an experience from one month to four years. Similarly a study conducted in Gondar [29] indicated that 83.1% of the participants were in the age group of 20-30 years. Another study conducted in three public hospitals located in Addis Ababa implied the majority of nurses in the study have 1 month to 4 years working experience. Based on these study result it can be concluded that nursing profession is populated with youth and novice medical professionals not neglecting the fact that difference in percentage may be due to sample size and study area.

In addition, 89.1% of the study participant were bachelor degree holder. Similarly a study carried out in Addis Ababa [12] indicated 77% of nurses were bachelor degree holders. This result go with the study result in Turkey [25] that mention 68.5% of ICU nurses participant were degree holders. In contrary a Ugandan [11] study states 83.9% of participant nurses were diploma holders.

6.1. Nurses' Knowledge towards Prevention and management of PrU

The current findings showed that the knowledge of participants was good concerning PrU prevention and management. More than half (53.1%) was above the mean 18.52 and overall knowledge percentage was 74.07%. The possible reasons for having a good knowledge were their educational background, 89.1% having a bachelor degree compared to those (10.2%) having diploma. Across sectional study done in Gondar University hospitals, 2014 (N=255) showed that more than half of nurses scored above the mean 54.4% had good knowledge [29], supporting the result in this study. Similarly another cross sectional study conducted in Turkey, 2012 in adult intensive care units (N=73), 74.1% nurses had good knowledge. [25] The similarity between the study results might be due to that majority of the respondents being a bachelor degree holders.

In contrary to the research finding in this study, a descriptive exploratory study in Brazil, 2009(N=386), showed that both nurses and nursing auxiliaries/technicians' knowledge was insufficient. [24] In addition, study conducted in Egypt, 2012 in intensive care unit among (N=60) critical care nurses 70% had unsatisfactory knowledge level. [28] The variation in the study results could possibly be due to different sample size, usage of instruments of measurement, participant's educational background, and using highest scoring measurement; as the Brazil's does.

Out of the six sub titles presented in the questioner to be measured in this study, participant exemplify highest knowledge in the section of "Nutrition to maintain healthy skin" scoring 84.1% which is parallel to study result in Turkey "Regulating Nutrition" which was 85.9%[25]. Followed by "Risk assessment and Keeping records"scoring83.3% and 80.8% for Skin care. In contrary, relatively lower percentage of nurses' knowledge was demonstrated for Mechanical Loading management which was73.5% and 60.5%for PrU management and classification. In addition the lowest percentage of knowledge assessment was illustrated in Risk factors for PrU development which rated 58.6%.As the study result indicated nurses accounted lower knowledge in couple of the sub sections and lack of continuous professional training about pressure ulcer prevention and management might be the reason for, indicating 64.1% of the nurses had not been employed in trainings.

There was a statistically significant difference between those who received training and total mean scores for their knowledge (AOR= 2.499, p value = 0.028, 95% CI (1.102-5.668) nurses who had formal training were 2.4 times more likely to have good knowledge than those nurses who didn't took training about pressure ulcers prevention and management. Similarly study result in Gondar indicated that there was significant association between those who received training and total mean scores for their knowledge. Unlike to this study finding, a research in Turkey showed no significant differences were detected in the knowledge level of the nurses between those who received and those who didn't receive training on pressure ulcer prevention. In addition there was significant association on hospitals' and nurses who work AICU nurses. Participants in TASH those who received training were 3.2 times [AOR = 3.245, p value = 0.031, 95 % CI (1.115-9.450) more likely to have good knowledge towards prevention and management of pressure ulcer as compared to those who didn't took training.

6.2. Nurses 'Practice towards Prevention and management of PrU

Findings of this study showed that 52.3 % have poor practice regarding pressure ulcers prevention and management. In relation to this, a study conducted in Gondar, 2014 using similar method and tool on nurses (N=248) showed that practice of nurses was (48.4%) insufficient [29]. Similarly, study conducted in Addis Abeba on nurses in six Government hospitals, 2015(N=356) found that (33.42%) of them had very low practice. [13] The slight difference in result might be due to measurement criteria to categorize nurses' level of practice. Likewise, a study conducted in Egypt, 2012 on nurses (N=60) showed that two thirds of the studied sample had unsatisfactory practice level. [28] Though the Egyptian study used observational checklist as data collection tool, the study findings reflected that participant nurses in both studies accounted poor practice regarding pressure ulcer. Another study in Uganda, 2014 (N=56) indicated that practices were observed to be unreliable and uncoordinated related to a significant shortage of staff. [11]

There was no significant association between nurses practice score and knowledge about pressure ulcers prevention and management ($p>0.05$). Similar result was reflected in Bangladesh, 2010 (N=91) indicating that there was no significant association between nurses knowledge and practice [$r = 0.14, p> 0.05$]. [10]

However, there was significant association on hospital factors and nurse factors. Participants who respond as having shortage of PrU relieving devices were [AOR = 0.329, p value = 0.043, 95 % CI (0.112-0.964)], results to have a less likely good practice towards prevention and management of pressure ulcer as compared to those who haven't. A study in Gondar pointed out similar results mentioning inadequate facilities and equipment in the work place were [AOR = 0.4, 95 % CI (0.19-0.83)] as having significant association with practice. In addition, those who responded having shortage of time for PrU prevention and management were [AOR = 0.258, p value = 0.001, 95 % CI (0.113-0.589)] also to have less likely a good practice regarding PrU prevention and management.

6.3. Nurses' perceived barriers towards Prevention and management of PrU

The study findings showed that major challenges of nurses on PrU prevention and management were shortage of pressure relieving devices (78.1%), this study result go with the result reported in Sweden mentioning lack of access to pressure relieving equipment as barrier opportunity toward PrU prevention. In addition, heavy work load and lack of adequate staffing and equipment (68.0%) were also challenges that participant mentioned. This finding was similar to findings of Studies conducted in Jordan [26] Uganda [11] Addis Abeba [12, 13]. In these studies, the most commonly reported barriers were lack of time, and PrU relieving equipments.

A self-reported cross-sectional study in Jordan, 2012 on hospital nurses (N=194) found that lack of staff and lack of time as barriers to PrU prevention indicating that pressure ulcer development can be directly affected by the number of nurses and time they spent at the bedside. [26] Another Study conducted in Uganda, 2014 (N=56) indicated shortage of staff (94.6%) which lead nurses to heavy work load and inadequate supply (80.4%) as the most challenging barrier in prevention of PrU [11]. Also a study conducted in Addis Ababa (2015) on six public hospitals' nurses (N=356) found that heavy work load, inadequate staff, shortage of PrU relieving device were majorly cited barriers in prevention of PrU. [14]

Inadequate training and education (68.8%), and Presence of other priorities than pressure ulcers in ICU ward (68.0%) were also mostly cited barriers having an impact to perform PrU prevention and management on time.

7. STRENGTH AND LIMITATIONS

7.1. Strength of the study

- Standard questionnaire was adapted from Pressure Ulcer Knowledge Test (PUKT) by (Pieper and Mott, 1995). [31]
- Practice and barrier questionnaire adapted and modified from other literatures.
- This study is a multi-center which is advantageous in making generalizations to all public hospitals in Addis Ababa.

7.2. Limitations of the study

- Dropout of some nurses from the study group because of long term leaves e.g. sick-leaves.
- It didn't involve the private hospitals.
- Time constraint

8. CONCLUSIONS AND RECOMMENDATIONS

8.1. Conclusions

The present study assessed the current knowledge, practice and their barrier of AICU nurses regarding PrU prevention and management in six selected public Hospitals, Addis Ababa.

Generally, the study result showed that:

- Nurses' overall level of knowledge was good regarding PrU prevention and management.
- Nurses' overall practice regarding PrU prevention and management was poor.
- Formal training about PrU prevention and management had significant association with nurses' Knowledge, but not with Practice.
- Shortage of PrU relieving devices and equipment's and shortage of time for PrU prevention and management had significant association with nurses' Practice.
- Similarly it can be concluded that shortage of pressure ulcer relieving devices and inadequate training and education as the dominant barriers face nurses to prevent and manage pressure ulcer.

8.2. Recommendations

The following recommendations are placed forward to improve nurses' knowledge, practice and their barriers regarding pressure ulcer prevention and management:

- Increase the training opportunities, up-to-dated, continuing education or refresher courses about PrU should be designed for ICU nurses who serve in public hospitals, in Addis Ababa. This should provide them with up-dated knowledge which can be translated in to practice. It is more helpful if a training program extended also from hospital nurses to nursing teachers to improve the knowledge they are expected to transmit to the students.
- Hospital administrators should facilitate modern and accessible equipment used for prevention and management of PrU to improve quality output of PrU care to decrease length of patient stay and healthcare costs.
- The researcher suggests for further studies to resolve problems mentioned in this study such as equipment shortage at national level and on the quality of PrU prevention and management.

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DECLARATION

I, the under signed declared that, this thesis is my original work and has not been presented for a degree in this or any other university, and all source materials used for the thesis have been fully acknowledge.

.NAME OF THE STUDENT: LINDA GASHAW (BSC NURSE)

Signature-----date-----

ADVISOR: Dr FINOTE DEBEBE (MD, ASS.PRO.EM)

Signature _____ Date _____

ADVISOR: HERIYA HUSSEN (EMCCN, AAULECTURER)

Signature _____ Date _____

ANNEXES

Information Sheet

Name of the investigator: LINDA GASHAW (BSC.MSC candidate)

Research title: assessment of knowledge and practice of adult intensive care unit nurses and their barriers on pressure ulcer prevention and management in selected public hospitals Addis Ababa, Ethiopia.

Research objective: the aim of this study is to assess knowledge and practice of Adult ICU nurses and their barriers towards pressure ulcer prevention and management in selected public Hospitals, Addis Ababa, Ethiopia from December 2016-June2017.

Study procedure: Simple Random Sampling (Lottery method) is used to select six public hospitals to takeout the designed objective of this study. These will be undertaken by quationnary.

Confidentiality: we would like assure you information will be kept confidential and used only for research purpose. No one except the members of the research team will have access to the information collected. Your correct answer can help the study to achieve the goals and personal information will not be notified also your name will not be mentioned therefore, you are kindly requested to respond with patience by putting sign√ on blank space.

Do you want to continue Yes _____ No _____

Thank you in advance for your participation!

INTRODUCTION-The quaternary has four sections.

Section 1 is related to your personal data

Section 2 is your knowledge about pressure ulcer prevention and management

Section 3 is your practice about pressure ulcer prevention and management

Section 4 is barriers regarding pressure ulcer prevention and management

SECTION 1: Socio- Demographic Data

Instruction: please fill in the blank space or tick mark (√) on your answer in the box as indicated

1. Age _____ years old

2. Gender

Female

Male

3. Marital status

Single

Married

Divorced

Widowed

4. Level of education

Diploma in nursing

Degree in nursing

Master of nursing

5. Which hospital you work?

Tikur Anbesa specialized

Menilik II

Yekatit 12

Zawditu Memorial

St. Paul's

Abet

6. How long have you been working in the unit?

1month-4 years 5-10 years above 10 years

7. Have you received any formal training on pressure ulcer prevention and management?

Yes

no

SECTION 2: Knowledge Test Questions

Instruction: Please read each statement carefully and tick the mark sign“√” in the conforming Column.

Nº	Question	True	False	I don't know	Code
1	Immobility, incontinence, impaired nutrition, and altered level of consciousness are risk factors for pressure ulcers development.				K1
2	Braden scale is the risk assessment tool use for pressure ulcer development.				K2
3	The first sign for pressure ulcer development is non-blanch able redness or blue gray discoloration on intact skin.				K3
4	One of appropriate method for skin care is applying topical cream				K4
5	Lift up the patient without dragging is a correct practice for maintaining skin integrity.				K5
6	Vitamin C and E are important to maintain healthy skin.				K6
7	Serum albumin is test appropriate laboratory test for nutritional assessment of pressure ulcer patients.				K7
8	Elevating the head of bed <30 ⁰ is one of nursing care for reducing shearing force.				K8
9	It is important to massage bony prominence.				K9
10	Friction may occur when moving a patient up in bed.				K10
11	Heel ulcer is prevented by putting pillow under the patient's leg.				K11
12	All patients have to be assessed on admission for risk of pressure ulcer development.				K12
13	Patient skin should be clean and dry to prevent risk of pressure ulcer development.				K13
14	Bedridden and Incontinence patients' skin cleaning should occur at the time of soiling and at routine interval.				K14
15	A turning schedule should be written and placed at the bed side.				K15
16	Stage II pressure ulcers may be extremely painful due to exposure of nerve endings.				K16
17	Shear is the force that occur when the skin sticks to the surface and the body slides.				K17
18	All care given to prevent or treat pressure ulcer must be documented.				K18
19	Pressure ulcer are sterile wounds.				K19
20	Eschar is healthy tissue and good for wound healing.				K20
21	Bony prominence should have direct contact with one another.				K21
22	Bed ridden patients have to be positioned every two hours.				K22
23	An adequate dietary intake of protein and calories should be maintained during illness.				K23

24	Hot water and soap may dry the skin and increase the risk for pressure ulcers.				K24
25	One of the complications of pressure ulcer is Sepsis.				K25

SECTION 3: practice Questions

Instruction: Please read each statement and tick the mark sign“√” in the conforming Column.

N_o	Questions	Always	Sometimes	Never	Code
1	I do skin assessment that guided by a standard nursing care available in my unit.				P1
2	I use risk assessment scale to assess pressure ulcer				P2
3	I document all data related to pressure ulcer assessment.				P3
4	I assess and provide management of pain in the patients who experience pain from any causes.				P4
5	I perform skin care as a routine work of my unit.				P5
6	I put the pillow under the patient’s legs from mid-calf to ankle to prevent heel ulcer.				P6
7	I use or advice caregiver to use creams or oils on patients’ skin in order to protect from urine, stool or wound drainage.				P7
8	I pay more attention to pressure points during cleansing the soil or laceration.				P8
9	I perform lab test for assessing nutritional status followed by physicians’ instruction.				P9
10	I provide vitamin and food for patients who are malnourish.				P10
11	I monitor a protein and calories diet in patient who is bedridden.				P11
12	I avoid dragging the patients during repositioning.				P12
13	I always use a special mattress to prevent pressure loadings, such as foam, air.				P13
14	I avoid massage over patient’s bony prominences to prevent pressure ulcer formation.				P14
15	I avoid using donut-shape (ring) cushion at bony prominences to prevent pressure ulcer formation.				P15
16	I turn a patient position every two hour.				P16
17	I perform Cleaning, debriding, and dressing of pressure ulcers on daily basis.				P17
18	I always use proper dressing material.				P18
19	I always use sterile dressing for pressure ulcer				P19

20	I give advice to the patient or caregiver regarding pressure ulcer preventive care before discharge the patient from the unit.				P20
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SECTION 4: Barriers to provide PU prevention and treatment

Instruction: Please read and tick the mark sign“√” in the conforming Column.

Questions	Yes	No
1) Shortage of pressure relieving devices on my unit.		
2) Heavy work load and lack of adequate staffing.		
3) Lack of polices and universal guidelines on prevention and management of pressure ulcers.		
4) Inadequate training and education about Pressure ulcer prevention and management.		
5) Lack of equipment for prevention and management of pressure ulcer		
6) Patients unstable and Uncooperative.		
7) Lack of time for prevention and management.		
8) Presence of other priorities other than pressure ulcers.		
9) Lack of multidisciplinary/ uncooperative among staff.		
10) Poor access to literature about pressure ulcer by nurses.		
11) Lack of job satisfaction in nursing profession.		
12) I don't have any challenge.		
13) Others, please specify		