
PRESSURE ULCER AMONG CRITICAL CARE PATIENTS: CRITICAL CARE NURSES' KNOWLEDGE, PERCEPTION AND PRACTICE

**Marwa Mehrez Mahmoud¹, Warda Youssef Morsy², Karima Fouad
Elshamy³, Mona Mohamed El-Hady⁴**

¹ Demonstrator in Critical Care and Emergency Nursing Department ,Faculty of Nursing , Mansoura University,

² Professor of Critical Care and Emergency Nursing and Dean of Faculty of Nursing, Cairo University,

³ Assist. Professor of Medical Surgical Nursing, Faculty of Nursing , Mansoura university,

⁴ Lecturer of Critical Care and Emergency Nursing, Faculty of Nursing, Mansoura University

E-mail of corresponding author: dr_marwammm@yahoo.com

Abstract:

Background: Patient safety has become an area of interest in many countries. One of the most important types of patient safety is pressure ulcers that constitute an important sanitary problem that daily affects the patients and the health care systems. Several studies have indicated that nurses' knowledge, perception and practices about pressure ulcer (PU) prevention are inadequate. Therefore, the **aim of this study** is to assess nurses' knowledge, perception and practices regarding pressure ulcer at the Intensive Care Units (ICUs) of Mansoura Emergency Hospital. **Material and Methods:** A descriptive exploratory design was used to conduct this study on fifty nurses who involved in providing direct care for critically ill patients in Mansoura Emergency Hospital. Three tools were used for data collection: knowledge questionnaire, perception questionnaire and observation checklist. **Results:** the findings showed that three quarters of nurses had unsatisfactory knowledge, perception and practice regarding pressure ulcer prevention. Positive correlation was found between nurses' knowledge and perception ($r=.417$, $p=.003$). In contrast no correlation existed between nurses' knowledge and practices ($r= -.059$, $p= .682$). **Conclusion:** there is need for continuing education to upgrade nurses' knowledge, increase their perception and improve their practices regarding pressure ulcer prevention. **Recommendations:** enrichment of nurses' knowledge, perception and practices related to pressure ulcer prevention to be the cornerstone in care of critically ill patients. As well, replication of this study on large probability sample.

Keywords: Pressure Ulcer, Critical care patients, Nurses' Knowledge, Nurses 'perception, Nurses' Practice

Introduction:

Pressure ulcers are the common conditions among hospitalized patients in acute and chronic care facilities and impose significant burden on patients, their relatives and caregiver {1, 2,3}. More than

one million hospitalized patients develop pressure ulcers each year {8,9,10}. Different terminologies are used to refer to pressure ulcer, such as bed sore, decubitus ulcer, and pressure sore. The National Pressure Ulcer Advisory Panel , 2012 described a pressure ulcer as damage to an area of

skin from unrelieved pressure or pressure in combination with shear.

There are two types of risk factors which are affecting on developing pressure ulcer include intrinsic and extrinsic risk factors. Intrinsic risk factors such as immobility, sensory loss, age, disease, body type, poor nutrition and infection. While extrinsic risk factors include excessive pressure, friction and shearing forces, impact injury, heat, moisture and posture. {6,8,11}

The most common pressure ulcer location were buttocks, elbow, hips, heels, ankles, shoulders, back, and back of head {12,14,19}. Pressure ulcers were graded from I to IV: grade I (non blanchable erythema with intact skin surface); grade II (epithelial damage, abrasion or blister); grade III (damage to the full thickness of the skin without a deep cavity) and grade IV (damage to the full thickness of the skin with a deep cavity). {10,15}

Pressure ulcers prevention is a desired goal to maintain skin integrity. It is a challenging nursing responsibility. The process of pressure ulcers prevention requires skilled nursing assessment of the integumentary system and knowledge of risk factors, as well as an ongoing evaluation plan to monitor incidence and the efficacy of nursing care. Pressure ulcer assessment is

greatly aided by the availability of assessment tools. Assessment and evaluation are essential to quality nursing care. {4,5,27}

Nurses ' knowledge about pressure ulcer prevention has direct effect on nurses' practice, decreasing complications and optimizing patient care. In study conducted by {5, 6,12,14} mentioned that nurses who had knowledge based on scientific evidence had been able to make better design, higher quality care, shorten patient's hospital stay, reduce costs and bring better cost effectiveness for patient. {18,19}

Pressure ulcer was a significant financial burden to any health care system and had adverse effects on achieving goals of care. Pressure ulcers come at a high cost to everyone. They result in pain, suffering, diminished quality of life and even death for some residents. For a nursing, they represent extra staff hours and medical supplies spent caring for a preventable condition, as well as more residents hospitalized. {24,26,29}

Through empirical observation in (ICUs) at Mansoura Emergency Hospital, the researcher observed that most of the nurses need to improve their knowledge, perception and practices about pressure ulcer prevention. Moreover, many patients

in these units develop pressure ulcer within one or two weeks of admission. Because nurses have a pivotal role in management of critically ill patients they require special training about pressure ulcer prevention. Nurses have repeated contact with patient than any other health care professionals, so they should have the ability to assess and provide advanced nursing care for critically ill patients. Therefore the aim of the study to assess nurses 'knowledge, perception and practices about pressure ulcer prevention.

Aim of the study:

The aim of this study was to assess nurses' knowledge, perception and practice regarding pressure ulcer at (ICUs) of Mansoura Emergency Hospital.

Research Questions:

The research questions of this study were as follows:

1. What is the level of nurse's knowledge regarding pressure ulcer prevention?
2. What are nurses ' perceptions about pressure ulcer prevention?
3. What is the level of nurse's practice regarding pressure ulcer prevention?

Subjects and Methods:

Design of the Study: A descriptive exploratory design was utilized in this study.

Sample: A convenience sample of fifty nurses who had at least 6 months of working experience in ICU, involved in providing direct patient care, willing to participate voluntary and gave consent were recruited.

Setting: The study was conducted at the (ICUs) of Mansoura Emergency Hospital .

Tools of data collection

Three tools were used for data collection

Tool one: "Nurse's Knowledge Questionnaire" This tool was developed by the researcher. It consists of two parts:

Part A:"Socio-demographic data sheet " This part included nurses' age, educational level, years of experience in ICU and attending training programs/ workshops/ scientific conferences regarding pressure ulcer prevention.

Part B "Nurse's Knowledge Questionnaire"

This Questionnaire was developed by the researcher after reviewing the recent related literature {8, 10}. It was composed of 39 multiple choice

questions. It included factors related to pressure ulcer development, risk assessment, skin care, nutrition to maintain healthy skin, management of mechanical loads, and educational program for staff.

Scoring system: Each Correct response was given a score of 1 and incorrect response was given a score of 0, with 'undecided' answers included in the incorrect category. The scores obtained for each set of question was summed up to get the total score for nurses' knowledge. The total scores was computed out of 39(100%) classified into two categories as follow: unsatisfactory knowledge level < 75%, satisfactory knowledge level $\geq 75\%$.

Tool two: "Nurse's perception Questionnaire "

This tool was developed by the researcher. It was composed of 24 Items included factors related to pressure ulcer development, risk assessment, skin care and nutrition.

Scoring system: The subjects were asked to rate the 5 level of perception ranged from (0-4) 4=strongly agree,3= agree, 2= neither agree nor disagree, 1=disagree, and 0= strongly disagree. The possible total score ranged from 24 to 96 and it was then converted into percentage. The level of perception was categorized into two

groups.

-Less than 75% is considered low level of perception

-From 75% or more is considered high level of perception

Tool three : Nurses' practice observation checklist

This tool was developed by the researcher. It was composed of 19 items to assess nurses' practices toward pressure ulcer prevention , It included factors related to pressure ulcer development, risk assessment, skin care, nutrition to maintain healthy skin, management of mechanical loads, and educational program for patient, family, and staff.

Scoring system: each item scored on the bases of "Done" or "Not done", done scored (1 point), not done scored (zero). The scores obtained for each set of items were summed up to get the total score for nurses' practice. Total scoring was classified into two categories as follow: unsatisfactory practice level <85%, satisfactory practice level $\geq 85\%$

Protection of Human Rights

An official permission to conduct the proposed study was obtained from the ethical committee of Faculty of Nursing, Mansoura University and the hospital director. Written informed consent was obtained from each participant after explaining the aim of the study.

Pilot study

A pilot study was performed on 10% of sample and was excluded from the study.

Statistical analysis data

Upon completion of data collection, data were tabulated and analyzed using statistical package for social sciences (SPSS) program version 21, relevant statistical analysis was used to test the obtained data. Descriptive and inferential statistics were done such as mean and standard deviation; frequency; percentage; chi square test; and logistic regression. The level of significance was considered at the 5% level ($P = 0.05$).

Limitation of the study

This study was conducted on only of critical care nurses and excluded the nursing managers and supervisors.

Result

Table (1) shows that, nearly half of the studied nurses' age ranged between 25 to 29 years with mean age of (27.54 ± 4.82). Approximately two thirds of them were graduated from secondary nursing school and one third of them were having experience between 6 to 10 years in ICU with mean years of experience of (9.20 ± 4.751) and majority of them didn't attend training programs.

Figure (1) shows that (74%) of the studied subjects had unsatisfactory knowledge level regarding PU prevention.

Table (2) illustrate that the majority of studied subjects (100%, 90% and

90%) got correct answer regarding definition, classification and stages of PU.

Figure (2) shows that (80%) of the studied subjects had low level of perception regarding PU prevention.

Table (3) reveal that most nurses agreed with applying skin lotion to patient, cleanse patient immediately after soiled and assess risky patient at the first day of admission (96%, 96% and 90%) respectively.

Figure (3) shows that (94%) of the nurses had unsatisfactory practice level regarding PU prevention.

Table(4) portrays that all of the studied nurses didn't use risk assessment scale. As well, the majority of them (98%, 90%, 90% and 86%) didn't document all data related to PU assessment, didn't monitor a protein and calories, didn't attend seminars for PU prevention and didn't give advice to the patient or caregiver regarding PU preventive care before discharging respectively

Table (5) reflect that there was no significant relation between the studied nurses' demographic characteristics in relation to their age, years of experience in ICU and attending training programs to total knowledge score, except the educational level where ($F=10.254$, $P=\leq .001^*$) as bachelor degree nurses had the higher mean (48 ± 15.33).

Table (6) reflect that there was no significant relation between the studied nurses' demographic characteristics in relation to their age, educational level and attending training programs to

total perception score, except years of experience in ICU where (F=10.296, P= \leq .001*) as the nurses had experience ranged between 6 to 10 years, had the higher mean (146.89 \pm 7.11).

Table (7) reflect that there was no significant relation between the studied nurses' demographic characteristics in relation to their age, educational level and attending training programs to total practice score, except years of experience in ICU where (F= 12.09,

P= \leq .001*) as the nurses had experience ranged between 6 to 10 years, had got the higher mean (33.94 \pm 2.31).

Table (8) reveals that there was positive correlation between total knowledge score and total perception score of the nurses (r=.417 at p=.003*). While, there was no significant statistical correlation existed between total knowledge score and practice score of the nurses (r= -.059 at p=.682).

Table 1: Percentage distribution of Socio- demographic Characteristics of the Studied subjects (N=50)

Variables	Frequency %	
	No	%
<u>Age groups (years)</u>		
19-24	12	24.0
25 - 29	23	46.0
\geq 30	15	30.0
Mean \pm SD	27.54 \pm 4.82	
Min-Max	19-42	
<u>Educational level</u>		
Bachelor	12	24.0
Technical institute of nursing	6	12.0
Diploma secondary nursing school	32	64.0
<u>Years of experience in ICU by (year)</u>		
2- 5	10	20.0
6 - 10	19	38.0
11 - 15	14	28.0
• 16	7	14.0
Mean \pm SD	9.20 \pm 4.751	
Min-Max	2.0-22	
<u>Attending training programs</u>		
Yes	5	10.0
No	45	90.0

No: Number

SD: Standard Deviation

ICU: Intensive Care Unit

Min: Minimum

Max: Maximum

Figure(1) Nurses' knowledge level regarding pressure ulcer prevention

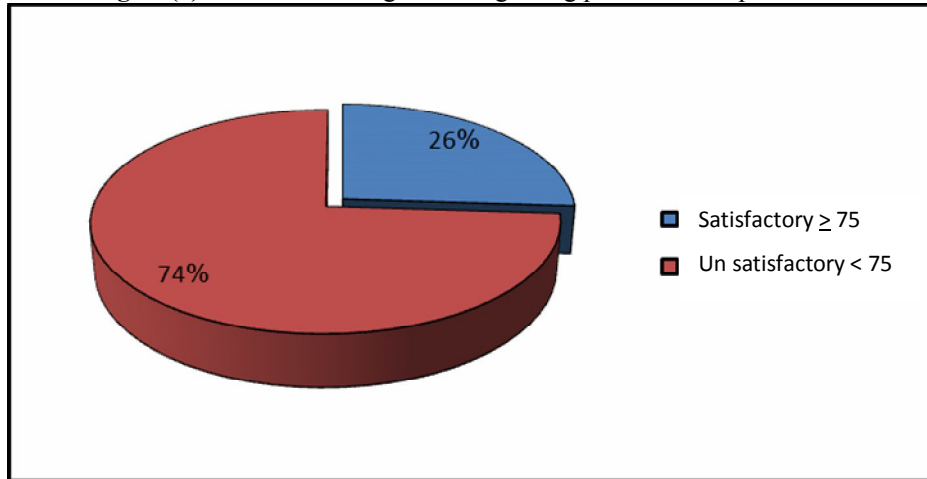


Table (2): percentage distribution of nurses 'knowledge regarding pressure ulcer prevention (N=50)

Variables	Frequency %	Correct		Incorrect	
		No	%	No	%
Pressure ulcer development					
Definition		47	94.0	3	6.0
Classification		45	90.0	5	10.0
Causes		37	74.0	13	26.0
Risk factor		18	36.0	32	64.0
Risk assessment					
Head to toe skin assessment		38	76.0	12	24.0
Risk assessment scale		2	4.0	48	96.0
Stages		28	56	22	44
Braden scale		0	0.0	50	100.0
Skin care					
Bed bathing		30	60.0	20	40.0
Prevent maceration		22	44.0	28	56.0
Topical cream		8	16.0	42	84.0
Mechanical load					
Repositioning		6	12.0	44	88.0
Proper lifting		35	70.0	15	30.0
Semi setting position		30	60.0	20	40.0
Nutrition					
Vitamins		21	42.0	29	58.0
Serum albumin		26	52.0	24	48.0
Educational activity for staff					
In service training programs		20	40.0	30	60.0

Figure (2) Nurses, perception level regarding pressure ulcer prevention

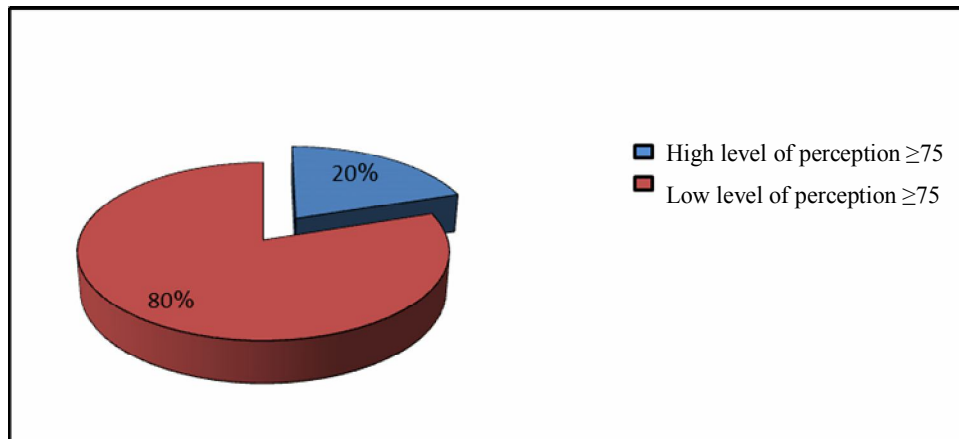


Table 3: : percentage distribution of nurses' perception regarding pressure ulcer prevention (N=50)

Variables	Strongly disagree		Disagree		Neither		Agree		Strongly agree	
	No	%	No	%	No	%	No	%	No	%
Risk factors										
High risk patients	2	4.0	17	34.0	5	10.0	20	40.0	6	12.0
Most risk factors is preventable	0	0.0	3	6.0	4	8.0	41	82.0	2	4.0
Prevention is time consuming	3	6.0	28	56.0	5	10.0	14	28.0	0	0.0
Risk assessment										
Assessment criteria	0	0.0	5	10.0	7	14.0	38	76.0	0	0.0
Assessment time	0	0.0	2	4.0	3	6.0	45	90.0	0	0.0
Risky patients	0	0.0	12	24.0	1	2.0	37	74.0	0	0.0
Documentation	0	0.0	12	24.0	8	16.0	30	60.0	0	0.0
Clinical judgment	0	0.0	10	20.0	0	0.0	30	60.0	10	20.0
Skin care										
Standard prevention	0	0.0	4	8.0	2	4.0	44	88.0	0	0.0
Skin lotion	0	0.0	20	40.0	0	0.0	48	96.0	0	0.0
Prevent soiling	0	0.0	2	4.0	0	0.0	48	96.0	0	0.0
Preventive care	0	0.0	22	44.0	0	0.0	28	56.0	0	0.0
Repositioning	1	2.0	1	2.0	10	20.0	26	52.0	0	0.0
Prevent occurrence	2	4.0	30	60.0	9	18.0	9	18.0	0	0.0
Quality of care	3	6.0	40	80.0	0	0.0	7	14.0	0	0.0
Nutrition										
Relation with PU	0	0.0	29	58.0	0	0.0	21	42.0	0	0.0
Nutritional assessment	0	0.0	30	60.0	2	4.0	18	36.0	0	0.0
Fluid intake	2	4.0	27	54.0	5	10.0	16	32.0	0	0.0

Figure (3):Nurses 'practice level regarding patient' safety

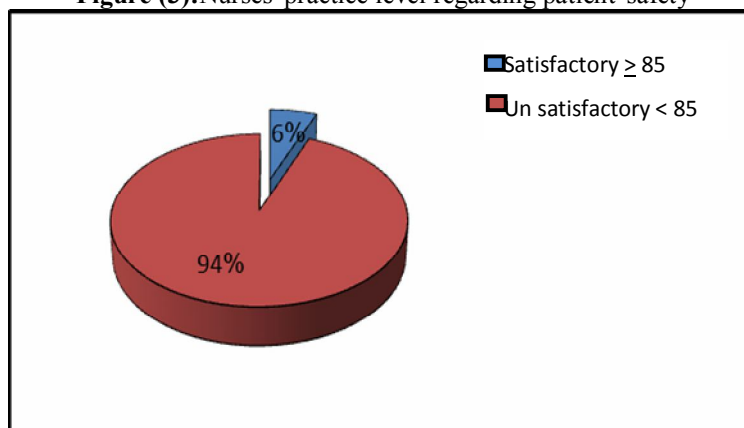


Table 4: Percentage distribution of nurses' practices regarding pressure ulcer prevention (N=50)

Variables	Frequency %	Done		Not done	
		No	%	No	%
Risk assessment					
Skin assessment		10	20.0	40	80.0
Risk assessment scale		0	0.0	50	100.0
Documentation		1	2.0	49	98.0
Pain management		35	70.0	15	30.0
Skin care					
Standardized care		10	20.0	40	80.0
Routine care		45	90.0	5	10.0
Supported device		12	24.0	38	76.0
Smoothing application		23	46.0	27	64.0
Nutrition					
Laboratory diagnostic studies		30	60.0	20	40.0
Malnutrition management		12	24.0	38	76.0
Nutritional assessment		5	10.0	45	90.0
Mechanical load					
Avoid dragging		10	20.0	40	80.0
Boney prominence care		18	36.0	32	64.0
Prevented mattress		45	90.0	5	10.0
Repositioning		28	56.0	22	44.0
Educational program					
In service education		5	10.0	45	90.0
Health education		7	14.0	43	86.0

Table5: Relationship between total knowledge score and demographic characteristics (N=50)

Variables	Mean ± SD	Test of significance
<u>Age (in years)</u>		
19-24	43.83±5.70	F=.45
25 - 29	46.21±6.40	P=.64
≥ 30	45.26±8.81	
<u>Educational level</u>		
Bachelor	48±15.33	F=10.25
Technical institute of nursing	47.41±4.03	P=≤.001*
Diploma secondary nursing school	44.09±5.36	
<u>Years of experience in ICU</u>		
2- 5	42.60±5.68	F=1.80
6 to 10	46.10±5.18	P=.160
11 - 15	44.07±8.52	
• 16	49.85±8.37	
<u>Attending training</u>		
Yes	46.60±0.89	t=.41
No	45.22±7.35	P=.68

Table 6: Relation between total perception score and demographic characteristics (N=50)

Variables	Mean ± SD	Test of significance
<u>Age (in years)</u>		
19-24	142.58±4.69	
25 - 29	145.26±8.94	F=1.87
≥ 30	140.40±7.346	P=.165
<u>Educational level</u>		
Bachelor	143.75±9.59	F=.043
Technical institute of nursing	43±6.48	P=.95
Diploma secondary nursing school	42.96±7.95	
<u>Years of experience in ICU</u>		
2- 5	140.70±5.79	F=10.29
6 to 10	146.89±7.11	P=≤.001*
11 - 15	141.71±8.44	
• 16	139.42±8.03	
<u>Attending training</u>		
Yes	144.06±7.41	t=2.60
No	135±6.92	P=.01

Table 7: Relationship between total practice score and demographic characteristics (N=50)

Variables	Statistical test	Mean ± SD	Test of significance
<u>Age (in years)</u> 19-24 25 - 29 ≥30		32.97±2.08 32.30±3.03 29.28±2.94	F=1.80 P=.160
<u>Educational level</u> Bachelor Technical institute of nursing Diploma secondary nursing school		32.63±3.38 29.61±2.66 31.52±3.04	F= 1.92 P=.157
<u>Years of experience in ICU</u> <5y 6 - 10y 11-15 >16y		31.63±.86 33.94±2.31 29.69±2.67 28.71 ±3.54	F= 12.09 P=≤.001*
<u>Attending training</u> Yes No		31.80±3.16 31.53±3.17	t=.178 P=.85

Table 8: Correlation between total score of knowledge, perception and practice of studied nurses (N=50)

Variables	Total knowledge scores	
	r	P value
Total perception score	.417	.003*
Total practice score	-.059	.682

Discussion:

Prevention of pressure ulcers for the patients is linked to nurses' perception, education and competence. Education increases awareness of the problem and gives a pathway for developing and maintaining competency. Thus pressure ulcer prevention is dependent on staff knowledge, perception and skill (Brain, 2007).

Concerning to nurses ' knowledge about pressure ulcer prevention, the result of the current study revealed that the nurses who participated in the study generally had unsatisfactory knowledge about how pressure ulcers developed. They also did not have current knowledge on how to stage the pressure ulcers, nor did they know the prognosis of unpreventable and

unmanaged PU that often lead to permanent disability and bone destruction. In addition they had inadequate understanding of the importance of interdisciplinary management.

This lack of nurses' knowledge may be related to their young age where nearly half of the sample were in age group 25 to 29 years, their formal educational background where two thirds of them were graduated from secondary nursing school and their training experience where most of them didn't receive received training courses regarding PU prevention. This findings is similar to Bry (2012) who reported that most of his sample had low level of knowledge regarding PU prevention as they didn't receive specialist training in wound care or were tissue viability nurses. However, these findings are contradicted by Islam (2010) who reported that the lack of nurses' knowledge pertaining to PU prevention can be result from lack of protocols and guidelines on PU prevention, curriculum gaps during training, lack of funding for organizing regular workshops, negative attitude of nurses whereby new information learned at workshops was not readily applied in clinical practice.

Concerning to nurses ' perception about PU prevention, recent study results indicated that the majority of nurses had low level of perception regarding PU prevention, which may be due to their lack of knowledge which is considered as obstacle to developing perception. This finding is supported by Moore (2005) who reported that knowledge can change attitudes which may lead to changes in

clinical outcomes. However this finding contradicted by Gail (2013) who reported that majority of his sample had positive attitude regarding PU prevention. Also the results 'finding indicates that nurses neither care nor were indifferent about the prevention of PU development. Moreover the findings of the present study revealed that nurses had low level of perception in some areas of PU prevention. Some nurses were "strongly agree" and "agree" that their personal clinical judgment was better than using risk assessment tool to assess PU risk. Majority of them stated that PU prevention cannot be independently provided by nurses, and most of them stated that the incidence of PU should be 0 %in their units. This result supported by Islam (2010) who reported that most of his sample use their clinical experience rather than use PU risk assessment tool.

Concerning to nurses ' practice about PU prevention, the current study demonstrates that the majority of the studied sample had unsatisfactory practice level. The reasons related to this low level of practice may be lack of education, lack of training concerning critical care nursing, lack of protocols and guideline. This finding is in agreement with Ivan (2014) who reported that potential and actual barriers to carrying out pressure ulcer prevention and management include shortage of human resources, lack of supervision and administrative support, lack of supplies and equipment, lack orientation program for the new appointed nurses and lack of cooperation between multidisciplinary health team

members. In addition to the nurses' practices based on traditions and imitation.

Conclusion

- Majority of nurses have unsatisfactory knowledge, perception and practice regarding PU prevention.
- Increased years of experience affect nurses' perception and practice regarding PU prevention. While, educational qualifications level affect nurses' knowledge regarding PU prevention
- There are positive correlation between nurses' knowledge and perception however, no correlation existed between nurses' knowledge and practice regarding PU prevention.

Recommendations

Based on the findings of this study, the following recommendations were suggested:

1. In-service training and refreshment courses about PU prevention should be designed for nurses. This should provide them with up-dated knowledge to understand PU prevention which can be translated into practice.
2. Develop protocols and guideline regarding PU prevention

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