

Knowledge, Attitudes and Practice of the Nurses towards Pressure Ulcer Prevention in Critical Care Units in Teaching Hospital Batticaloa, Sri Lanka

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Abstract: Introduction: Pressure ulcer still is identified as a major problem in hospital setting and prevalence of bed pressure ulcer in the critical care units is high in comparing to other general wards. The rate of pressure ulcer in Asian countries was found high rate from 2.1% to 31.3% in Intensive Care Units [15]. Methods: The study population was entire nurses who were working in all three critical care units. Study was completed with the participation of Fifty two Nurses. Data were collected using Pieper- Zulkowski pressure ulcer knowledge test questionnaire, Attitude towards prevention of pressure ulcer scale and questionnaire for Nurses' practice on pressure ulcer prevention. Results: This study found that mean of nurse's age was 32.10 ± 5.6 , min:23 max: 46, Majority were female (82.7%), more than half of were married (65.4 %), most of had a Diploma in Nursing (92.3 %), average length of service period was 7.083 ± 5.97 years ,most of them (86.5%) had not received in-service training. Overall knowledge level was at very low ($M=58.6 \pm 1.01$ min: 30.56 and max: 76.39), 48% of Nurses had a low-level knowledge, 46.2% of Nurses had very low level of Knowledge, only three Nurses (5.8%) had a moderate Knowledge level. Over all nurse attitude was neutral (74.79 ± 8.35). Majority (63.3%) express neutral level of attitudes, very few (13.5%) express negative attitudes and about one fifth (19.2%) had positive attitudes. Practice was at high level (79.98 ± 1.52 mini: 54.5 max: 100). 50% of Nurses had a high level of practice and 21.2 % had a very high level of practice, 15.4% of nurses had very low level. There was a significant moderate positive relationship among Nurses' knowledge and attitudes ($r = .36, p < 0.05$), knowledge and practice ($r = .63, p < 0.05$). Conclusion: The study found that majority of nurses had very low level of knowledge, neutral level of attitudes and high level of practice regarding pressure ulcer prevention and there was a significant positive relationship between knowledge and attitudes, knowledge and practice. This study makes awareness and concern about to improve the knowledge and attitudes of nurses on the pressure ulcer.

Keywords: Pressure ulcer, Knowledge, Attitudes, Practice.

1. INTRODUCTION

1.1 Background

The prevention of pressure ulcer is very much important for the safety of the patient and pressure ulcer often preventable nosocomial complication in critical care units; this is associated with several primary and secondary factors including responsibilities of nurses who are working at critical care units [5]. This study aims to examine the knowledge, practice and attitude of the nurses towards pressure ulcer prevention at critical care unit and identify the relationship among the knowledge, attitudes and practice and other pertinent variables such as teaching and training programme, years of service

experiences, proficiency in the area of preventive practice, shortage of nursing leadership, lack of facilities and equipment, inadequate number of nurses and excessive workloads, and personal belief. Multiple studies shows different prevalence in different settings that, patient who is at critical stage prone to high risk of just beginning PU [18], the incidence of pressure ulcers in the ICU ranges from 10% to 41%. [4] Another one of the study found that the rate of pressure ulcer in acute care units from 2.2% to 66% in UK and range from 0% to 65.6% in Canada [15]. The incidence of pressure ulcer in America is from 0.4% to 38% in acute care units 2.2% to 23.9% in chronic care and 0% to 17% in care at home [11]. The study conducted in Europe, 21.2% of patient who underwent surgery developed pressure ulcer in the first 2 days postoperatively [14]. The rate of pressure ulcer in Asian countries was found high rate from 2 2.1% to 31.3% in Intensive Care Units [15].

In Sri Lanka, pressure ulcer incidence rate and prevalence rate data regarding pressure ulcer were not available. There were no sufficient records about pressure ulcer in the hospitals of Sri Lanka. Though, as per the data from Nursing in charge of each respective unit, 10% -15% of patients developed the pressure ulcer after they admitted to critical care unit at teaching hospital Batticaloa Sri Lanka (Source, THB).

1.2 Justification

Data of sectional nursing in charge shows that 10% -15% of patients developed the pressure ulcer after they admitted to critical care unit at teaching hospital Batticaloa Sri Lanka and pressure ulcer is a causing mortality among the patient who are admitted in the intensive care units all over the world and causing a financial burden among the patient, their family members, and health department, hence it causes distress, pain, psychological problems, delaying recovery, increase the period of hospitalization and increased cost of hospital care [18]. Nurses are the most responsible professional to prevent the pressure ulcer; it would be most effective and efficient based on their knowledge, practices, and attitudes. [2]. The study method was a cross-sectional which would be feasible to conduct in Batticaloa Teaching Hospital in Sri Lanka and so far, no any study has been carried out in Teaching Hospital Batticaloa, Sri Lanka.

1.3 General Objectives:

To explore the level of knowledge, practice and attitudes of Nurses towards prevention of pressure ulcer at critical care units in Teaching Hospital, Batticaloa, Sri Lanka.

1.4 Specific Objectives

- i. To identify demographical characteristics of Nurses who are working in the critical care units.
- ii. To evaluate the theoretical knowledge on pressure ulcer prevention among the nursing staff who are working at critical care units.
- iii. To assess the activities on pressure ulcer prevention among the nursing staff who are working at critical care units.
- iv. To find out the attitudes on pressure ulcer prevention among the nurses who are working at critical care units.
- v. To understand the relationship among the knowledge, attitude and practice on pressure ulcer prevention among the Nurses who are working at critical care units.

2. METHODOLOGY

This cross-sectional descriptive study design was used to explore the nurses' knowledge, practice and attitude on pressure ulcer prevention and was carried out in all critical care units in teaching hospital Batticaloa, Sri Lanka including i) medical intensive care unit ii) surgical intensive care unit iii) coronary care unit. The study population in this study was the entire cohort of nurses who were working in critical care units; the sample was comprised of the whole study population. All available Nurses from all three critical care units are included to this study. There is no sampling technique adopted because the whole population considered a sample. Fifty-five Nurses were working in three critical care units. All nurses who had a role and responsibilities connected with direct patient care employed in all critical care units during the study period were eligible to participate in this study. The nurses who were on long leave (maternity leave) were exempted from this study and the nurse's work on relief also was not included in this study. Three nurses out of fifty were on long leave from all three units during the period of Study. The study was carried out from August 2018 to December 2018. The Study tools adopted by the other researcher and were divided in to four sections.

Section I. Demographic questionnaire

This section consists of seven items to evaluate the nurse’s demographic data includes age, gender, marital status, educational level, formal training received on pressure ulcer prevention, experience, working unit.

Section II. Pieper- Zulkowski pressure ulcer knowledge test questionnaire (PZPUKT)

This questionnaire was adopted to evaluate the level of nursing staff’s knowledge on pressure ulcer prevention which had been developed in 2012 by Pieper- Zulkowski [13] based on Pressure Ulcer Knowledge Test (PUKT) tool developed by Pieper Barbara and PZ-PUKT was recommended by NPUAP/EPUAP, it was composed 72 items that are answered as True or False or Do not know, do not know considered as wrong answer when the test score scheduled,. The tests are scored by total number of right answer and divided by total number of items to get percentage score. [13].

Nursing staff’s level of knowledge on the pressure ulcer prevention was categorized according to the McDonald standard of learning outcomes measured criteria. This criterion was developed for measure the student’s real performance of learning in their organization. Since McDonald' composite percent score was utilized to assess the exact learning outcomes of the nursing staff’s knowledge and practice on the prevention of pressure ulcer. Level of knowledge was grouped in to five [15].

Table I : Categories of Knowledge Level

Knowledge Level	The composite present of scores
Very low	Less than 60%
Low	60 to 69.99%
Moderate	70 to 79.99%
High	80 to 89.99%
Very high	90 to 100 %

Section III: Nursing staff’s Attitudes on the prevention of pressure ulcer

Attitude towards prevention of pressure ulcer scale is used in present study to identify the belief of the nursing staff’s regarding the prevention of pressure ulcer, it was adopted from Moore & Price who were developed and validated, the tool consisted 11 –items structured questionnaire depends on level of receiving, level of responding, and valuing on Bloom’s taxonomy affective domain and modified Pressure Ulcer Attitudes Questionnaire (PUAQ) [10]. This Attitude questionnaire consist of central themes as a key topic was covered in this questionnaire, these are I) Nursing staff’s attitudes towards pressure ulcer prevention ii) Nursing staff’s carry out, document and read pressure ulcer prevention strategies iii) Nursing staff’s perceived barriers towards pressure ulcer prevention iv) Nursing staff’s routinely use pressure ulcer risk assessment and pressure ulcer grading tools in clinical practice v) Nursing staff’s status of education in pressure ulcer prevention vi) Nursing staff’s nature of education on pressure ulcer prevention

According to the 5 points Likert Scale the respondent was requested to rate the five level of attitudes categorised from one to five, five = strongly agree, four =agree, three=neither agree nor disagree, Two = disagree, and One = strongly disagree. There are positive and negative questions in this questionnaire. The question number 1, 6, 7, and 11were negative questions and others are positive. The scores for the negative question were vice versa. 11 to 55 were the possible expecting total score and this was converted in to a percentage. The positive attitudes considered with higher score. The total attitudes score was categorised into 3 levels based on mean percentage and standard deviation, below mean-1SD carries low level, between mean ± SD carries neutral level above mean+1SD carries positive level of attitudes.

Section IV: Nursing staff’s Practice on Prevention of pressure ulcer questionnaire.

A questionnaire for Nursing staff’s practice on pressure ulcer prevention is used to assessed their practices, it was adopted from Shariful Islam who was developed and validated, it consisted 22 items depend on the level of imitation, manipulation and precision of psychomotor domain of Bloom’s Taxonomy [15]. This consisted of 3 points numerical rating scale, ranged from 1-3. 1= never, 2= sometimes, 3= always. Every item requested the respondents to point out the rate of their practice on prevention pressure injury. Practice components contain factors link with pressure ulcer development, skin care risk assessment, nutrition to maintain healthy skin, management of mechanical loads, and health educational program for staff, patients and their family. The expecting score align from 22-66. Then these scores were

converted to a one hundredth. A higher score was considered as higher practice level. This total score was grouped as very high, high, moderate, low, and very low.

The researcher requested the Nursing in charge in all three critical care units to assist to data collecting procedure. The researcher interpreted the aim of the study to the participants and was asked their corporation. After that researcher obtained written and verbal consent from the participants who were participated in this study, a questionnaire was dispersed to all 55 Nurses who were working in MICU, SICU and CCU and requested them to return within a week. Fifty-two Nursing staff returned back with a response rate of 94.54%. After the completion of data collection, the computerized statistical package of social sciences was used for entering, analysing and interpreting the data using descriptive and inferential statistics. Demographic data, knowledge level, attitudes level and practice level were described in frequency, percentage, mean range, and standard deviation and presented with descriptive statistics. The correlation and coefficient (r) were utilised to assess the relationship between the knowledge and attitudes, knowledge and practice, and attitudes and practice among the nurses.

Ethical approval for the study was attained from the ethical review committee of Bangladesh Health Professions Institute, Bangladesh. Permission for data collection was attained from director Teaching Hospital Batticaloa Sri Lanka. Participants were informed about the objectives of study and procedure of the study and also, they have rights to leave at any stage of the study without penalty and all the data were kept confidential and data destroyed after the completion of the study and 52 participants were signed on consent forms.

3. RESULTS

3.1 Demographic Characteristics of the Respondents

Mean of nurse's age was 32.10 (SD = ± 5.63) with a minimum age of 23 years and maximum age of 46 years. The range of more nurses was between 31 -41 years (46.15%), Majority of the Nurses were female staff (82.7%), more than half of the Nurses were married (65.4 %) others were unmarried, most of Nurses had a Diploma in Nursing (92.3 %), average length of service period of Nurses was 7.083 years (SD=±5.97) and range from one year to thirty years, however most of them (86.5%) had not received any types of in-service training. 25% were in Coronary Care Units(CCU), 34.6% were in the Surgical Intensive Care Unit and 21.40% were in the Medical Intensive Care Unit (MICU).

3.2 Knowledge of Nurses on the pressure ulcer prevention

The overall knowledge of the nursing staff on prevention of pressure ulcer was found at very low (M=58.6%, SD= ±1.01) with a minimum and a maximum score of 30.56% and 76.39% respectively.

Table 3.2.1; illustrate the number of Nurses (n) and frequency found in every group level of knowledge. It shows 48% of nursing staff had a low-level knowledge, 46.2% of nursing staff had very low level of Knowledge, only three Nursing staff (5.8%) had a moderate Knowledge level and no one had a high or very high knowledge level on prevention of pressure sore. Percentage of knowledge in each dimension of pressure ulcer preventive intervention information form was 54.94 % for staging of pressure ulcer, 53.84% for wound description and 65.55% for prevention of pressure ulcer, mean of the all subtitles was found very low level (M=58.6%) , but Nurses Knowledge on prevention of the pressure ulcer aspect is a little higher (M=66.1,SD=±1.2) than Nurses knowledge in staging of pressure ulcer (M=54.94,SD=±1.65) and wound description of the pressure ulcer (M=53.84,SD=±1.33).

Table 3.2.1: Mean percentage, Standard deviation and level of Nurses' Knowledge separated by each dimension.

Dimension of knowledge	M (%)	SD(±)	Level
Staging of the Pressure Ulcer	54.94	1.65	Very Low
Wound Description	53.84	1.33	Very Low
Prevention of Pressure Ulcer	65.55	1.20	Low
Total Score	58.6	1.01	Very low

Table: 3.2.2 shows Nurses' knowledge and their demographic characteristic such as i) Age, ii) Gender, iii) Marital status, iv) Education, and v) Service units, vi) Work experience.vii).Training received. There were no significant differences between the nurse's total mean score for their knowledge regarding prevention intervention of pressure ulcer and age, marital status, educational level, experiences in services, formal training received .(p > 0.05). There was a slight decrease

in the total knowledge on the prevention of pressure ulcer with slightly increased in age. Means score of the knowledge of the nurses who were at 26-30 years age group had higher (Low) than other groups (Very Low). There was a significant difference between the total mean score for their knowledge on prevention of pressure ulcer and gender, and service units ($p < 0.05$). Means score of the knowledge among the female nurse was high than male and there was a significant difference in means score of the knowledge between CCU and MICU, SICU, Means score of the knowledge of the nurses in the SICU and MICU were high than CCU.

3.3 Nurses Attitudes towards prevention of pressure ulcer:

Table: 3.3 shows Nursing staff's Attitudes level and their some demographic characteristic such as i) Age, ii) Gender, iii) Marital status, iv) Education v) Service units, vi) Work experience. vii) Training received regarding pressure ulcer prevention. T-test and ANOVA test were used to found the effect of some characteristic of nurses of attitudes them self. There was no significant difference ($p > 0.05$) detected between the means score of attitudes towards prevention of pressure ulcer and age, gender, marital status, education of the nurses, service units, experiences and training received.

Table 3.3: Distribution of Nursing staff's means score for Attitudes towards pressure ulcer prevention according to some demographic characteristics.

Demographic Characteristics	Attitudes Mean (SD)	Level of attitudes	P value
Age (years old)			0.68
20-30	74.46±8.05	Neutral	
31 – 40	75.60±8.28	Neutral	
41 – 50	71.81±2.01	Neutral	
Gender			0.78
Female	74.58±8.63	Neutral	
Male	75.75±7.21	Neutral	
Marital Status			0.55
Single	73.83±7.48	Neutral	
Married	75.75±8.84	Neutral	
Educational Status			0.24
Diploma in Nursing	74.39±8.44	Neutral	
BSc in Nursing	79.54±6.00	Neutral	
Service Units			0.16
CCU	71.04±8.31	Neutral	
SICU	75.55±5.79	Neutral	
MICU	76.45±9.76	Neutral	
Service Experience (years)			0.98
1 – 0.5	74.54	Neutral	
1– 5	75.27±8.1	Neutral	
6 – 10	74.93±7.31	Neutral	
11-15	74.31±10.66	Neutral	
16-20	70.90±14.54	Neutral	
21-25	==		
26-30	76.36	Neutral	
Formal Training received on pressure ulcer prevention			0.33
Yes	77.66±5.00	Neutral	
No	74.34±8.71	Neutral	

3.4 Nursing Staff's Practice on prevention of Pressure ulcer

Table: 3.4.1 over all nursing staff's practice regarding the prevention of the pressure ulcer was at high level (79.98 %, SD \pm 1.52) with minimum and maximum Scores of 54.55% and 100% in the order. 7.7% of the nursing staff obtained moderate level, 50% of Nurses had a high level and 21.1 % of Staff nurses had a very high level of practice concerning prevention of pressure ulcer, while 15.4% had very low level of knowledge.

Table 3.4.1: Frequency and percentage distribution of the nurses' Practice on pressure ulcer prevention (N=52).

Level of Practices		n	%
very low	(Less than 60 %)	8	15.4
low	(60 to 69.99 %)	3	5.8
moderate	(70 to 79.99 %)	4	7.7
high	(80 to 80.99 %)	26	50
Very high	(90 to 100 %)	11	21.1

Table 3.4.2: shows Mean percentage, Standard deviation and level of Nurses' Practice separated by each dimension. When taking into the consideration of each dimension of practice on pressure ulcer prevention, it was identified that four out of six dimensions of practices concerning to prevention of pressure ulcer were at a high level and other dimensions were low.

Table 3.4.2: Mean percentage, Standard deviation and level of Nurses' Practice separated by each dimension.

Practices in subtitle	M (%)	SD(\pm)	Level
Factors involves in pressure ulcer formation	80.28	1.42	High
Risk assessment	69.42	1.84	Low
Skin care	85.57	2.03	High
Nutrition to maintain healthy skin	85.57	2.03	High
Management of mechanical loads	86.17	1.80	High
Educational program for patient family and staff	66.34	2.34	Low

Table: 3.4.3 shows Nursing staff's Practice and their demographic characteristic such as i) Age. ii) Gender ii) Marital Status iv) Education v) Service units vi) Work experience. vii) Received formal training regarding pressure ulcer prevention. There were no significant differences ($p > 0.05$) detected between means score for their practice on pressure ulcer prevention and age, marital status., experience in the services and training received regarding pressure ulcer prevention but there was a slight decrease in the total practice means score on prevention of pressure ulcer with increased in age. Means score of the practice of the nurses who were at 41-50 years age group had lower (Low) than other groups (high) while according to practice means score for marital status there was a significant difference between single (moderate) and married (high), as per the means score for practice there was a significant difference ($p < 0.05$) found between who had received the training (moderate) and did not have (high). Meanwhile there was significant different ($p < 0.05$) detected between means score of practice and gender, female had high-level practice and male had low-level practice on pressure ulcer prevention there was a significant different ($p < 0.05$) detected between means score of practice and service units, nurse who was in the SICU and MICU had higher (high) practice level than CCU(low) , There was a significant difference ($p < 0.05$) found between knowledge and educational status, diploma nurses had high level practice than degree nurses.

Table 3.4.3 : Distribution of Nurses' means score for Practice on pressure ulcer prevention according to some demographic characteristics

Demographic Characteristics	Practice (M%)	Level of practice	P value
Age (years old)			0.373
20-30	81.53 \pm 14.79	High	
31 – 40	80.13 \pm 14.59	High	
41 – 50	69.88 \pm 21.74	Low	

Gender	Female	83.29±13.1	High	0.00
	Male	64.14±15.23	Low	
Marital Status	Single	78.26±16.24	Moderate	0.23
	Married	81.95±14.51	High	
Educational Status	Diploma in Nursing	81.53±14.47	High	0.009
	BSc in Nursing	61.36±12.44	Low	
Service Units	CCU	62.23±16.55	Low	0.00
	SICU	82.23±8.72	High	
	MICU	88.63±8.47	High	
Service Experience (years)	1 – 0.5	47.72	Very low	0.254
	1– 5	82.36±13.60	High	
	6 – 10	79.38±13.32	Moderate	
	11-15	80.06±17.39	High	
	16-20	69.64±26.63	Low	
	21-25	---		
	26-30	63.88	Low	
Formal Training received on pressure ulcer prevention	Yes	76.29± 16.04	Moderate	0.492
	No	80.55± 15.46	High	

3.5. Relationship between Nursing Staff's Knowledge and Attitudes, Attitudes and Practice, Knowledge and Practice about prevention of pressure ulcer.

Table 3.5: Shows correlation analysis shown that there was a significant moderate positive relationship among Nursing Staff's knowledge and attitudes ($r = .36, p < 0.05$), knowledge and practice ($r = .63, p < 0.05$), There was a non-significant and slight positive association between attitudes and practice ($r = .24, P > 0.05$) in prevention of pressure ulcer.

Table 3.5: Relationships among Nurses' knowledge, attitudes, practice on pressure ulcer prevention.

	Knowledge	Attitudes	Practice
Knowledge	1	0.36 **	0.63 **
Attitudes	0.36 **	1	0.24
Practice	0.63 **	0.24	1

P ** < 0.01

4. DISCUSSION

4.1. Level of knowledge

According to the finding overall knowledge of Nursing staff who were participated in the study was very low (M=58.6%) regarding pressure ulcer prevention, this finding of this study is congruence with other studies conducted in a different part of the world. In the study conducted in Iran, the finding revealed that nurses who were working in intensive care units had inadequate knowledge about pressure ulcer" [19]. Another study conducted in Nepal, found that "Nepalese critical care nurses' knowledge was at low level in pressure ulcer prevention [16], However a study conducted in turkey give a contradictory result compared to the present study, showed that "the total mean score level for knowledge on pressure

ulcer preventive intervention among the nurses at intensive care units was found to be good [8]. These differences among the different study could be due to countries differences where the study performed, unit differences where nursing staff works, difference in the tool used for evaluating knowledge [8]. There is some sense to explore the overall knowledge level at very low among the participants in this study. First, their basic education background could be one of the factors for low level in the prevention of pressure ulcer that contents of the pressure sore and depth of the contents may be inadequate in their basic education curriculum.

Majority of the nursing staff (86.6%) had no received formal training programme on prevention of pressure ulcer after the completion of the basic education in Nursing or during their service period which may be another reason for very low knowledge on prevention of pressure ulcer. However, there was no significant difference between the nurses who had received formal training and who did not have ($p > 0.05$). Hence this finding showed that training did not influence the nurse knowledge may be the result of the improper training and there may be a huge interval between each training session. Lack of chance to be trained to refresh the knowledge on pressure ulcer prevention might be the barriers to nurses from remember the theory, understanding the facts, and applying appropriate knowledge regarding pressure ulcer prevention in their practice, items analysis gives support for this description, this show that these are the most of the items which obtained the lowest percentage were basic theory to prevent the pressure ulcer, it might cause forgotten their theory part

Experiences of the nurses, this study revealed that there was negative statistically significant differences between knowledge of the nurses and different period of working experiences, it instituted the nursing staff with more years of working experiences (16-20 years) had a lower level of knowledge on pressure ulcer than those who had less working experience (1 – 5 years). This finding congruence with several previous studies, a study conducted by Shariful Islam in Bangladesh found that nursing staff with more years of experience had a lower level of knowledge than those had fewer years of working experiences. Meanwhile oppose to the present study that nurses with maximum working experiences (20 – 30 years) had higher knowledge (63.88%) than other groups of working experience below 20 – 30 years (Table:3.2.2). This result consistent with the study conducted in Turkey found that a statistically significant differences between nursing staff's years of experience and their knowledge mean score [8], both situations may have had fewer opportunities to received up to date information on pressure ulcer prevention.

The fourth one may be lack of learning sources and limited time for nursing staff to access the updated knowledge on pressure ulcer prevention. In Sri Lanka, very inadequate facilities of learning resources for nursing staff especially in the hospital premises, most of the hospital has no library for nursing staff with enough facilities, though the new library compartment was established for nursing staff in Teaching Hospital Batticaloa, Sri Lanka in 2016, there was no adequate books especially updated book, journal, magazine, article etc. Most of the nurses do not utilised this library due to lack of time, because especially ICU nurses could not spend much time at the library due to their duty and work overload by reason of the acute shortage of staff in intensive care units, all these above facts which are pointed out may be the reason for low level of knowledge. Also, they have very poor knowledge in some aspects of prevention of pressure ulcer since they don't have any formal training or lack of learning resources or time limitation of the usage of the library.

4.2. Level of attitude

According to the finding overall attitudes toward pressure ulcer prevention of nurses who are participated in the study was neutral (74.79%). This finding is consistent with other study conducted in the various part of the world. The study conducted in Bangladesh hospital revealed that majority of nursing staff showed a neutral level of attitude regarding the pressure ulcer prevention [15] and another study conducted at the ICU in Iran found that according to the result of the APuP, intensive care units Nursing staff's' attitude towards pressure ulcer prevention was moderate [19]. The present study shows that nursing staff neither care nor were uncared regarding development of pressure ulcer prevention, this indicates that nursing staff were not aware of preventive care for pressure ulcers or they did not have an idea on prevention of pressure ulcer development. There are some factors involving in neutral attitude it may be individual and or organizational. The awareness of nursing staff would be individual factors. Having very low level of knowledge about the prevention of pressure ulcer may lead them to have lack of awareness. Since the respondent group in this study showed very low level of knowledge, which may be the causes for the neutral level of attitude on prevention of pressure ulcer. Because of very low level of knowledge nurses don't know about latest or updated methods of prevention of pressure ulcer development and this may lead them to have poor attention or interest on pressure ulcer. This is supported by previous studies conducted in different part of the world. A very reason study conducted in Turkey in intensive care

units, have sought that extensive knowledge among individual nurses have been found to be more flexible and tolerant in their attitude [1]. Also another study carried out in Iran accord with present study that since the nurses had a more knowledge which lead them to be more favourable on their attitude toward pressure injury prevention" [19].

Another assumption factor was the age of the nurses could be the reason for the neutral level of attitudes towards pressure ulcer prevention. However, there was no significant difference detected between attitude toward the prevention of pressure ulcer and different group of age ($p>0.05$) (Table 3.3). This is supported by the available study, the study conducted in Bangladesh found that age would be related factors to nurse's attitude towards pressure ulcer prevention, however, there is no significant correlation between age and attitude [15], Working experiences would be another factor for attitudes towards pressure ulcer. In the present study there was no significant difference between attitudes towards pressure ulcer prevention and working experiences ($p>0.05$). However, this is contradicted with the study conducted by Habiballah in Jordan found that having higher experience and acquiring training on pressure ulcer prevention was the most influencing factor on attitude [7]. Therefore, the neutral level of attitude did not influence by both age and working experience. In addition, attitude towards the behaviour that generated from belief that a particular behaviour lead to particular outcomes such as prevention of pressure ulcer leading to decline information of pressure ulcer. Leaders or co-workers may influence on the performance of the nursing staff on the prevention of pressure ulcer, this could be a reason for the neutral attitude, this was supported by a study conducted by Strand and Lindgren in Sweden found that subject norms which is depend on the influence leader or co-workers on the activities of a certain behaviours such as pressure ulcer prevention" [18].

In organizational factors such as health care policy, facility policy, nurses' autonomy to handle the equipment and their scope and boundary to prevent pressure sore, further having the proper equipment and facilities could be obstructed on a positive attitude. A study conducted by Tigari in Iran, found the factors for discrepancy of attitude on prevention of pressure ulcer includes health policy, policies on the facilities, and also how much nurse have autonomy to use equipment and undertake intervention to pressure injury prevention within their scope of the responsibilities, further having appropriate facilities and tools can also promote desired outlook [19]. Another organizational factor is a shortage of staff in critical care units which can cause severe stress and work overload and make very difficulties to important intervention for preventing the pressure ulcer and affecting the favourable outcomes. This explanation was mentioned in the previous study conducted by in Turkey, found that shortage of staff at all areas causes overload and extreme stress make difficulties to do the necessary duties on pressure ulcer prevention and lack of amount of nurses in more patient per nurse, which affect nurses both mentally and physically. [1].

4.3. Level of practice

It was identified that nursing staff's practice on pressure ulcer prevention was high level (79.98%) and it is close to the very high level. This finding of present study is consistent with other studies conducted in a various part of the world. The study conducted by Dile and Mengistu in Ethiopia found that 63.3%, of the participants had a good expressed practice on pressure ulcer prevention [6]. However, another study opposes to this study, a study conducted by Shrestha in Nepal, found that the level of Nepalese critical care nurse practice was at very low" [16] However, a study conducted in Bangladesh found that the nursing staff practice regarding prevention of pressure ulcer was at a moderate level [15].

The present study found that four out of six dimensions of practices in pressure ulcer prevention except risk assessment and education programme for patient family and staff members were at a low level. The level of practice on the prevention of pressure ulcer was much higher than level of knowledge on prevention of pressure ulcer and neutral attitudes, hence nursing staff practice was not reflected by their knowledge and attitude. The average working experience was 7 years and it may be the reason for the high level of practice and furthermore Nursing supervisors, Nursing In Charge guiding also may be the influencing factors for high-level practice ,even though they had a favourable level on nurses' practice, still they did not attained to the very high level, this could be due to some factors such as shortage of staff nurses and restricted working time for direct nursing care of the patient in pressure ulcer pressure ulcer and under the organization factors did not reached the high level of practice on pressure ulcer prevention. Second reason could be education and Training. Majority of nurses did not receive the formal education and training programme on pressure ulcer prevention after completion of their basic study, it could be a reason for not attaining the high level of practice on prevention of pressure ulcer. Third, Priority for severity, he nurses who are working in critical care units aimed to give the priority for the severity of diseases and they focused on serving the patient life rather than a complication of the hospitalization such as pressure ulcer. According to the analysis, the result found nursing staff had a low level of practice

in the dimension of knowledge on assessment, staff education, so they need a proper knowledge on the assessment of pressure ulcer and formal training on prevention of pressure ulcer.

4.4. The relationship between nurses' knowledge and attitude, knowledge and practice, practice and attitude concerning pressure ulcer prevention.

The correlation analysis of this study found a significant positive relationship between knowledge and attitude ($r = .36$, $p < 0.05$), knowledge and practice ($r = .63$, $p < 0.05$), meanwhile there was a weak and non-significant relationship between practice and attitude ($r = .24$, $p > 0.05$), on pressure ulcer prevention of in critical care units, The analytical result revealed that moderate level of the significant positive correlation between knowledge and attitudes ($p < 0.05$), present study finding is consistent with other studies. A study conducted in Iran by Targari and Mirshekari found that statistically significant relationship between knowledge and attitudes [19]. Another study conducted in Turkey also supported to this finding, found that weak but significant positive correlation ($p < 0.05$ between nurse's attitudes score and knowledge score [1].

The present study also revealed that moderate positive significant correlation between knowledge and practice, this finding is supported by the study conducted by Norfairuziana in Malaysia found that there was a positive correlation between knowledge and practice among the nurses in intensive care units. [12]. However, analytical result revealed that there was no significant correlation between attitudes and practice, this is contradicted with the study conducted in Belgium found that was a significant correlation between attitude toward pressure ulcer prevention and application of adequate prevention. [3] Furthermore, this finding revealed that there is an interrelated relationship among the knowledge, attitude and practice. Knowledge, Attitude, Practice model (KAP model) states that one factor affects other factors [15] and There is a direct relationship between knowledge and behaviour, one practice reveals one's attitude and one's attitude reveals one's stock of knowledge. [15]. Association between knowledge and practice is concurrent with the KAP model that each component affects each other's and this is supported by the previous study conducted by Shariful Islam. Furthermore, current study is revealed that not only the knowledge and attitude determine practice, also there are some other factors contributing such as awareness, personal interest, traditional value, work policy, available preventable equipment, policy guideline, or nurse-patient ratio.

In practice and attitude the study finding did not support to the KAP model, nurses attitudes may influence due to their concern, awareness, purpose, belief or traditional belief influence by co staff or superiors when they worked for long period they may become a more expert in practice than their attitude [12]. Therefore, in this study attitudes did not influence the practice of the nursing staff. Knowledge is the basic component that initiates the change in nurses' attitudes and practices. [15]. It gives the message that nursing staff needs a further continuous nursing education and in-service training programme on pressure ulcer prevention.

5. CONCLUSION

5.1 Implication of study: It will help to know the scenario of the knowledge, attitudes and practice among the Nurses who are working at critical care units in Teaching hospital Batticaloa. It also will help to convey the message and recommendation to nursing body in Sri Lanka in a different discipline such as nursing practice, nursing education, and nursing administration, and suggestions for future research.

5.2 Limitations: Since this is a single hospital-based cross-sectional study, the results of this study cannot be generalized to the general population. But still be useful and relevant for our country especially regarding the awareness of pressure ulcer prevention. Finally, the data was collected through a self-administrated questionnaire and the answer may not be 100% reliable

5.3 Conclusion and Recommendations: The present study found that majority of nurses had very low level of knowledge, neutral level of attitudes and high level of practice regarding pressure ulcer prevention and there was a significant positive relationship between knowledge and attitudes, knowledge and practice. This study makes awareness and concern about to improve the knowledge and attitudes of nurses on the pressure ulcer prevention by revised the existing curriculum to include the updated information on pressure ulcer and its prevention, continuing education, refresh programme, training session related to the prevention of pressure ulcer to enhance their knowledge, attitude and practice of care in nursing profession.

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