

Caregiver's Knowledge and Practice Towards Pressure Ulcer Prevention: A Cross Sectional Descriptive Study

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Abstract: Globally, nurses are known to care for hospitalized patients and the presence or absence of pressure ulcers is being regarded as a performance measure of quality nursing care. The study aims to determine the knowledge and practice of caregivers towards pressure ulcer prevention for hospitalized patients in National Orthopaedic Hospital, Enugu, Nigeria. A cross sectional descriptive survey design was adopted among eighty five (85) caregivers who met the inclusion criteria and participated in the study. Ethical approval and informed consent of participants was obtained before data collection using a pre-tested semi-structured questionnaire and checklist. Descriptive analysis and Chi-square statistical test was used to test for association between variables. Results revealed poor knowledge 67.3% of pressure ulcer prevention among caregivers. Risk assessment scale is not an appropriate method for assessing an individual who is at risk for pressure ulcer development 22.4%, inadequate staffing 95.3%, heavy workload 92.9% were highest perceived barriers to pressure ulcer prevention. The test of hypothesis showed that there is a significant relationship between years of service of caregivers and knowledge of pressure ulcer $p = 0.000$. It was concluded that in-service training, recruitment of more staff and ensuring availability of the necessary equipment are some of the important steps to improve nurse's knowledge and practice regarding prevention of pressure ulcer among hospitalized patients.

Key words: Pressure ulcer, caregivers knowledge, practice towards pressure ulcer prevention, quality nursing care, data collection, heavy workload

INTRODUCTION

Globally, nurses are known to care for hospitalized patients and the presence or absence of pressure ulcers is being regarded as a performance measure of quality nursing care (Baharestani *et al.*, 2009). This is in line with declaration of American Nurses Association (ANA) which says that pressure ulcer prevention is primarily a nursing responsibility. According to the National Pressure Ulcer Advisory Panel (NPUAP), a pressure ulcer is localized damage to the skin and underlying soft tissue, usually over a bony prominence or related to a medical or other device. It can present as intact skin or an open ulcer and may be painful. Pressure ulcer occurs as a result of intense or prolonged pressure or pressure in combination with shear (Anonymous, 2016).

Nowadays, pressure injuries are recognized worldwide as one of the most common causes of harm to patients and preventable patient safety problem. Also, it is increasingly described as an indicator of the quality of care provided by health care organizations (Mersal, 2014). Pressure ulcers are common conditions among patients

hospitalized in acute and chronic care facilities and impose a significant burden on patients, their relatives and caregivers (Bours *et al.*, 2002). Pressure ulcers have been described as one of the most costly and physically debilitating complications, since, the 20th century. The pain and discomfort of pressure ulcer delays rehabilitation, prolongs illness and timing of discharge and also contribute to disability and death. These dramatically raise health care costs as a result of the need for supplies and nursing hours. Moreover, health care budgets expend billions of dollars worldwide on prevention and treatment of patients with extended hospital stays from pressure ulcer development (Bansal *et al.*, 2005). It has been estimated that the cost of treating pressure ulcer is 2.5 times higher than the cost of its prevention (Beeckman *et al.*, 2011). In USA, pressure ulcers remain a major health problem affecting approximately 3 million adults (Thomas, 2006). A systematic review of 31 studies found that pressure ulcers significantly limit many aspects of an individual's wellbeing, including general health and physical, social, financial and psychological quality of life

(Beeckman *et al.*, 2011). So, the burden of pressure ulcers goes beyond increasing health care costs to loss of life (Black *et al.*, 2011).

According to an international study by Gunningberg *et al.* (2001) has been identified that nurse's knowledge of the prevention of pressure ulcers is poor which reflected in their practices as they do not comply with best practice guidelines. Descriptive study conducted by Clark and Defloor in Sweden on nurse's knowledge and practice of existing guidelines on prevention of pressure ulcer found that majority of them had inadequate knowledge and practice to implement guidelines (Clark *et al.*, 2012). Similarly, a study in Belgian Hospital found that knowledge of nurses about the prevention of pressure ulcers was inadequate. Poor knowledge and practice of nurses have its own contribution for higher prevalence of pressure ulcers (Beeckman *et al.*, 2011; Thomas, 2006; Gunningberg *et al.*, 2001).

There are several factors that contributed to pressure ulcer development (Baharestani *et al.*, 2009; Mersal, 2014). These include advanced age, immobility, dehydration, co-morbidities, impaired sensory perception, altered tissue perfusion, malnutrition, anemia, organ system failure and infection as intrinsic factors and intensity and duration of pressure, friction, shearing and maceration as extrinsic factors (Sewchuk *et al.*, 2006). Some reasons for the high incidence of pressure ulcer might be related to nurse's knowledge and practice in terms of risk assessment and prevention methods. Knowledge, attitude and practice increased nurse's awareness of the problem of pressure ulcer and provided the basis for informed decision making and the framework to develop and maintain competency of delivering high quality of nursing care (Thomas, 2006).

Nurse's knowledge and practice are also viewed as extrinsic factors for pressure injury development, this is because, even if the prevention of pressure ulcers is a multidisciplinary responsibility, usually nurses play a major role and is considered to be an essential part of nursing care. Thus, preventing ulcer should be the goal of all nurses (Islam, 2014). Considering nursing services as a tool for the prevention of pressure ulcers it informed the researcher's decision to investigate nurse's knowledge and practice regarding pressure prevention if it is adequate or inadequate for quality nursing care as regards pressure ulcer prevention.

Anecdotal observation at National Orthopaedic Hospital, Enugu-Nigeria found a high incidence of pressure ulcers among patients confined to bed despite the numerous guidelines that have been developed and implemented in health care systems to assist nurses to take appropriate decisions to improve pressure ulcer

prevention, pressure ulcer still remains prevalent among hospitalized patients. The findings of the study were expected to describe the nurse's knowledge and practice regarding pressure ulcer prevention. The outcomes of this study will contribute to nursing education, nursing practice and future research in Nigeria. The aim of the study was to assess the caregiver's knowledge and practice towards pressure ulcer prevention for hospitalized patients in National Orthopaedic Hospital Enugu, (NOHE) Nigeria.

Highlights:

- Majority of caregivers are diploma holders in nursing
- There is poor knowledge of pressure ulcer prevention among caregivers
- Risk assessment scale is not an appropriate method for assessing an individual who is at risk for pressure ulcer development
- Documentation of all data relating to pressure ulcer development is not a way of preventing pressure ulcer

MATERIALS AND METHODS

Design: A cross-sectional descriptive survey design was used to collect data from nurses in NOHE.

Sampling: The study utilized total population of nurses working in the five selected in-patients wards of the hospital; (male ward 1, female ward 1, female ward 3, male ward 4 and acute burns ward). These wards were purposively selected for the study because the patients in these wards have reduced activity and stay for a relatively longer time due to the severity of their conditions than the patients in other wards. The total number of nurses in the inpatients wards was (93) but only (85) met the inclusion criteria and participated in the study. The inclusion criteria include:

- Being available at the time of administering the questionnaire
- Willingness to participate and consented to the study verbally
- Having worked in the selected wards for at least three months

Instrument for data collection: The instrument used for data collection was a structured questionnaire developed based on extensive literature review. The questionnaire consists of four sections:

Section A: Socio-demographic data. This section consists of (6) items.

Section B: Caregiver’s knowledge of pressure ulcer prevention: this section is composed of 21-item multiple choice questions which had been developed and modified from the Pressure Ulcer Prevention Guideline (PUPG).

Section C: Caregiver’s practice of pressure ulcer prevention: this is a 15-item structured questionnaire developed using a checklist of Yes/No.

Section D: Caregiver’s perceived barriers to pressure ulcer prevention: this section comprised of a 10 items which the respondents were allowed to tick as many as possible.

Ethical considerations: Ethical clearance letter was obtained from the Health Research Ethical Committee of National Orthopaedic Hospital, Enugu, after having met their prerequisites and was giving approval to obtain information from the nursing service division and also to carry out the study. The principles of confidentiality, anonymity and voluntary participation were applied.

Data collection: The researchers and trained research assistant administered the copies of the questionnaire directly to the respondents in various wards. Distribution and collection of questionnaire lasted for 5 days. The researchers and the trained research assistant distribute the copies of questionnaire to the nurses on morning, afternoon and night duties in order to make sure that all the respondents were reached. One day in the week was used for the distribution of the questionnaire per ward to avoid pre information among the participants. After 3 h of distribution, the copies of the questionnaire were retrieved. A total of 93 copies of questionnaire were administered and only 85 questionnaires returned meet the requirement for data analysis.

Data analysis: Data collected were analyzed and interpreted with IBM Statistical Package for the Social Sciences (IBM SPSS) Version 23 and descriptive statistics of frequency counts, percentages and mean were used to answer research questions relating to socio-demographic characteristics, knowledge and practice of caregivers regarding pressure ulcer prevention and caregiver’s perceived barriers to pressure ulcer prevention care.

RESULTS AND DISCUSSION

Table 1 shows the mean age of the nurses was 37.6 years with a minimum and maximum age of 25 and 56 years, respectively. The frequency of nurses between 31-40 years was 54.1%. Majority of respondents were female 87.1 and 76.5% were married. Most 69.4% had a diploma in nursing. Majority of respondents came from acute burns unit 27.1%.

Table 1: Nurse’s socio-demographic characteristics (N = 85)

Character/Items	Frequency	Percentage
Age		
M = 37.62	SD = 0.77	
21-30	13	15.3
31-40	46	54.1
41-50	21	24.7
51- 60	5	5.9
Gender		
Female	74	87.1
Male	11	12.9
Marital status		
Single	16	18.8
Married	65	76.5
Divorced	3	3.5
Separated	1	1.2
Professional level		
Diploma in nursing	59	69.4
Bachelor in nursing	17	20.0
Master in nursing	9	10.6
Years of service		
1-10	47	55.3
11-20	24	28.2
21-30	14	16.5
Ward/unit		
Male ward 1	13	15.3
Female ward 1	11	12.9
Male ward 4	21	24.7
Female ward 3	17	20.0
Acute burns unit	23	27.1

Table 2 shows that 59(69.4%) indicated that immobility is the most important factor for pressure ulcer formation in a patient with fractured hip and bedridden. Majority, 73(85.9%) of the respondents indicated that low albumin is the critical determinant for pressure ulcer formation. Most, 81 (95.3%) believe that head to toe skin assessment is for a patient with spinal cord injury who is at high risk for PU development while 66(77.7%) of the respondents are of the opinion that risk assessment scale appropriate for assessing an individual who is at risk for PU development. Majority 78(91.8%) are in agreement that turning position every two hours is significant activity for preventing skin damage. While 67(78.8%) of the caregivers are against the assertion to elevate the head of bed <30° and 65(76.5%) of the caregivers believe that scheduling of turning position is necessary for reducing PU formation. This shows that the overall nurse’s knowledge regarding pressure ulcer prevention was poor (M = 67.25%) with minimum and maximum scores of 21.2 and 95.3%, respectively.

Table 3 above shows that 79(92.9%) of the respondents indicated that identification of common contributing factors for PU development is a practice of prevention of PU. Majority 73(85.9%) asserted that skin assessment is a practice on prevention of PU while majority 80(94.1%) of the respondents indicated the assertion that use of risk assessment scale as a practice of prevention of PU is incorrect. Also, 69(81.2%) indicated that documentation of all data relating to PU development

Table 2: Distribution of the caregiver's knowledge on PU prevention (N = 85)

Nurse's knowledge towards pressure ulcer prevention (M = 67.3%)	Correct frequency (%)	Incorrect frequency (%)
High loading pressure is the contributory factor for pressure ulcer formation	51(60.0)	34(40.0)
Immobility is the most important factor for pressure ulcer formation in a patient with fractured hip and bedridden	59(69.4)	26(30.6)
Low albumin is the critical determinant for pressure ulcer formation	73(85.9)	12(14.1)
Head to toe skin assessment is for a patient with spinal cord injury who is at high risk for PU development	81(95.3)	4(4.7)
Braden scale is the risk assessment scale for pressure ulcer development.	21(24.7)	64(75.3)
Risk assessment scale is an appropriate method for assessing an individual who is at risk for PU development	19(22.4)	66(77.7)
Partial skin loss with blister and abrasion is the correct answer for the sign of stage II pressure ulcer	49(57.7)	36(42.4)
Non-blanchable redness or blue-gray discoloration is the sign for PU development	61(71.8)	24(28.2)
Application of topical cream is the appropriate method for skin care	22(25.9)	63(74.1)
Turn position for every 2 h is significant activity for preventing skin damage	78(91.8)	7(8.2)
Cleansing oil and using skin barrier cream or lotion is appropriate for preventing maceration for a patient having stroke with hemiplegia	51(60.0)	34(40.0)
Lift up the patient without dragging is a correct practice for maintaining skin integrity	36(42.4)	49(57.7)
Use pillow under the patient's leg to prevent heel ulcer	71(85.5)	14(16.5)
Vitamin C and E is important to maintain healthy skin	67(78.8)	18(21.2)
High protein and high calorie needs to be offered to a bedridden patient who has BMI<18.5	59(69.4)	26(30.6)
Serum albumin is an appropriate lab test for nutritional assessment of pressure ulcer patient	62(72.9)	23(27.1)
Turn position is an appropriate nursing care for managing mechanical load	76(89.4)	9(10.6)
Lift patient without dragging is appropriate activity to reduce friction for an elderly patient having fractured hip with skeletal traction	69(81.2)	16(18.8)
Elevate the head of bed <30° is the activity for reducing shearing force	18(21.2)	67(78.8)
Schedule of turning position is a necessary educational information for reducing PU formation	65(76.5)	20(23.5)
In-service training on pressure ulcer prevention is the best educational activity that enhances competency of staff nurses in preventing PU	51(60.0)	34(40.0)

Table 3: Caregiver's practice on prevention of PU (N = 85)

Nurse's practice on pressure ulcer prevention (M = 51.0%)	Yes (Correct) frequency (%)	No(Incorrect) frequency(%)
Identification of common contributing factors for PU development	79(92.9)	6(7.1)
Skin assessment	73(85.9)	12(14.1)
Use of risk assessment scale	5(5.9)	80(94.1)
Documentation of all data relating to PU development	16(18.8)	69(81.2)
Placing pillow under the patient's leg	77(90.6)	8(9.4)
Advising caregiver to use creams or oil	39(45.9)	46(54.1)
Provide vitamin and food	27(31.8)	58(68.2)
Monitoring a protein and calorie diet	11(12.9)	74(87.1)
Avoid dragging the patient	57(67.1)	28(32.9)
Use of a special mattress	31(36.5)	54(63.5)
Avoidance of massage	49(57.7)	36(42.4)
Avoid using donut-shape (ring) cushion	13(15.3)	72(84.7)
Turning a patient position every 2 h	81(95.3)	4(4.7)
Always attend seminars for PU prevention	9(10.6)	76(89.4)
Giving advice to the patient or caregiver regarding PU preventive care	83(97.7)	2(2.4)

is not a practice of prevention of PU. Also, 72(84.7%) indicated that to avoid using donut-shape (ring) cushion is not a practice on prevention of PU. Most 81(95.3%) of the respondents agree that turning a patient position every 2 h is a practice on prevention of PU. While 83 (97.7%) of them indicated that giving advice to the patient or caregiver regarding PU preventive care as a practice on prevention of PU. This shows that the overall nurse's practice regarding pressure ulcer prevention was poor (M = 51.0%) with minimum and maximum scores of 5.9 and 97.7%, respectively.

Table 4 shows that majority 95.3, 92.9 and 90.6% reported that inadequate staffing, heavy workload and shortage of pressure relieving devices, respectively as barriers to prevention of pressure ulcer. More than two-third of the respondents 87.1, 81.2, 77.7 and 75.3%

Table 4: caregiver's perceived barriers to PU prevention (n = 85)

Barriers to PU prevention	Yes frequency (%)	No frequency (%)
Inadequate staffing	81(95.3)	4(4.7)
Lack of universal guideline on PU prevention	50(58.8)	35(41.2)
Inadequate coverage about PU during training	74(87.1)	11(12.9)
Uncooperative patients	69(81.2)	16(18.8)
Lack of job satisfaction in nursing profession	23(27.1)	62(72.9)
Lack of time	64(75.3)	21(24.7)
Presence of other priorities other than PU	53(62.4)	32(37.7)
Shortage of pressure relieving devices in my unit	77(90.6)	8(9.4)
Inadequate knowledge about PU among nurses	66(77.7)	19(22.4)
Heavy work load	79(92.9)	6(7.1)

identified inadequate coverage on PU during training, uncooperative patients, inadequate knowledge about PU among nurses and lack of time, respectively as barriers. More than half of the respondents 62.4%, 58.8% revealed barriers to be presence of other priorities and lack of guidelines on PU prevention, respectively. However, majority (72.9%) disagreed on lack of job satisfaction in nursing as being a barrier to pressure ulcer prevention care.

Hypothesis one:

- H₀: there is no significant relationship between respondent's characteristics (professional level and years of service) and caregiver's knowledge towards pressure ulcer prevention

Table 5 above shows the relationship between respondent's characteristics (professional level, years of service) and caregiver's knowledge towards pressure

Table 5: Relationship between respondent's characteristics and knowledge towards pressure ulcer prevention

Respondent's characteristic	Professional level			R	X ²	p-values
	Diploma in nursing	Bachelor in nursing	Master in nursing			
Caregiver's knowledge towards pressure ulcer prevention						
Below average	9	0	0	11.227	50.647	0.000
Average	17	0	0	0.014	104.680	0.000
Above average	0	37	22	0.776	85.000*	0.000
Respondent's characteristic	Years of service					
Caregiver's knowledge towards pressure ulcer prevention	1-10 years	11-20 years	21-30 years			
Below average	14	0	0	11.444	51.415	0.000
Average	12	12	0	0.782	84.381	0.000
Above average	0	25	22	0.782	64.505*	0.000

ulcer prevention. The result of the table indicated that there is a significant relationship between professional level and below average ($r = 11.227$; $p = 0.000$). Average ($r = 0.014$; $p = 0.000$) and above average ($r = 0.776$; $p = 0.000$). Also a significant relationship was identified between years of service and below average ($r = 11.444$; $p = 0.000$) Average ($r = 0.782$; $p = 0.000$) and above average ($r = 0.782$; $p = 0.000$). This shows that professional level and years of service of the respondents may influence their knowledge of pressure ulcer prevention among the respondents.

Regarding the socio-demographic characteristics of the nurses, findings from the study revealed that majority 54.1% of the nurses were within the age range of 31 and 40 years while the least group of the nurses 5.9% fall between the age ranges of 51-60 years. This shows that majority of the nurses were at the middle age of their working career 87.1% of them are females; more than half 76.5% of the nurses are married. The greater percentage of nurses 55.1% were working for one-ten year in National Orthopaedic Hospital, Enugu. This is a clear indication that the respondents were not novices in the nursing profession.

Findings revealed poor knowledge 67.3% of pressure ulcer prevention among nurses. This level of knowledge is below the anticipated because as nurses working in a recognized specialist tertiary referral hospital they are expected to be well experienced. The finding of this study is comparable with other studies conducted in different parts of Nigeria. In a study conducted in Ogun South Western Nigeria where 78 (70.27%) of nurse respondents had low (<59% correct) prevention knowledge scores (Ilesanmi *et al.*, 2012) and the study done in Bornu State, North Eastern, Nigeria where findings revealed overall low level of knowledge among nurses on pressure ulcer prevention (Uba *et al.*, 2015). This poor level of knowledge may not be unconnected to their formal educational and training experience. This study found out most of the nurses 69.4% had nursing diploma, this limited formal educational background and training may be a

factor related to nurse's poor knowledge. Item analysis supports this explanation. This revealed that the items that the lowest percentages of nurses answered correctly were questions that related to updated information about pressure ulcer prevention. These included that the risk assessment scale is an appropriate method to assess pressure ulcer risk or Braden scale is the risk assessment scale for pressure ulcer development. The findings of this study are similar to a previous study in adequate training on pressure ulcer prevention care in Irish nurses was one barrier to nurses accessing to up-dated information about pressure ulcer prevention (Moore and Cowman, 2012).

The lack of learning resources for nurses to up-date their knowledge would be another reason for the poor knowledge. In Nigeria, there is a lack of learning resources for nurses to up-date their knowledge. Current nursing journals are not available even at the nursing institutes or hospitals only some old nursing journals are available at the nursing libraries. These facts indicate that nurses still have an inadequate knowledge in some areas of pressure ulcer prevention due to their knowledge not being up-to-date either by lack of formal training or reading text books or journals.

Result also indicated that the practice towards pressure ulcer prevention among nurses was poor 51.0%. The level of knowledge was higher than the level of their practice. In this study, nurse's practice was not reflected by their knowledge. This result is not in accord with the finding of a study in Bangladesh where the practice of nurses on pressure ulcer prevention was higher than their knowledge (Islam, 2014). A possible reason for explaining this poor level of practice may be due to certain factors. First, the shortage of nursing staff and heavy workload may be factors that make them stressed up thus, making them have poor attitude to practice of prevention of pressure ulcer despite their higher knowledge. The current ratio of nurses to patients in Nigeria is 1:15, this inadequate nurse to patient ratio may limit the implementation of quality care to prevent pressure ulcers

development (FMH., 2015). A previous study indicated that a majority of nurses reported lack of staff and lack of time as barriers to carry out pressure ulcer prevention care into effective practice (Uba *et al.*, 2015; Moore and Cowman, 2012).

Education and training, administrative support and supplies of equipment are particularly essential for nurses to prevent the development of pressure ulcers. In this study hospital, no in-service education or training or adequate supplies of equipment are available for preventing pressure ulcer development. For example, there is inadequate pressure relieving equipment. One study found that nurses in Nigeria intervention for pressure ulcer prevention are based on tradition and not evidenced-based interventions (Ilesanmi *et al.*, 2012). The provision of guidelines for practice to prevent pressure ulcers is an important factor for nurses in providing standard nursing care. The researcher's experience in Nigeria suggests that nurses have limited access to up-to-date evidence-based guidelines for practice in pressure ulcer prevention. No organizational policy or guidelines have yet been developed for nurses to prevent pressure ulcers. The researcher assumed that there were other important factors that might contribute to nurse's practice regarding pressure ulcer prevention. These were not explored in this current study. Those factors include values, beliefs, social norms, purpose and awareness. Future studies should explore these factors to determine whether they are related to practice or not.

An item analysis of the results showed that only 15.3% of nurses did not use donut shape cushion at bony prominences and only 18.8% document all information related to pressure ulcer risk. Overwhelming 94.1% of nurses in this current study did not use a risk assessment scale to assess pressure ulcer which implies that more than three fourth of nurses did not use a risk assessment scale. This is in accord with the study conducted in South Eastern, Nigeria which found that 88% of the nurses did not use any risk assessment tool to identify patients at risk of pressure ulcer (Ingwu *et al.*, 2015). Approximately three-fifths of the nurses 84.7% used donut shape cushion at bony prominences. These results indicate that nurses lacked current up-dated knowledge and information regarding nursing care activities for pressure ulcer prevention. Extensive education and in-service training and evidence-based nursing practice about pressure ulcer prevention are required to develop their competencies and might improve nurse's practices in this field.

Though more than half of the respondents reported all the items as barriers to pressure ulcer prevention besides lack of job satisfaction in nursing profession but

a greater majority reported inadequate staffing, heavy work load, uncooperative patients and inadequate pressure relieving equipment in the wards as barriers to nurse's practice in pressure in prevention of pressure ulcer. This study also favored the above claim in which respondent's practice of pressure ulcer prevention was found to be poor which was <70%. Similarly study conducted in England showed that majority of the nurses reported lack of staff and time as barriers to implementing effective care practices related to prevention of pressure ulcer (Moore and Cowman, 2012). The poor practice can be explained by the fact that shortage of nursing staff limits the working time available for each patient's care. Especially in countries like Nigeria where there is inadequate nurse to patient ratio may limit the implementation of quality care related to pressure ulcer prevention.

Developing a system for assessing nurse's knowledge and practice routinely as regards patients care particularly on pressure ulcer prevention, implement guidelines for quality care as regard pressure ulcer prevention practices and organize seminar and workshop for nurses to enhance their knowledge and practice was the recommendations for the study.

CONCLUSION

Nurse's knowledge and practice towards prevention of pressure ulcer was found to be poor which is unsatisfactory for professional caregivers. Inadequate staffing, heavy workload and inadequate pressure relieving equipment were some of the barriers to effective practices of pressure ulcer prevention reported by the nurses. In-service training, upgrading courses and ensuring availability of the necessary equipment are some of the important steps to improve nurse's knowledge and practice regarding prevention of pressure ulcer.

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