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Nurses' Knowledge of Pressure Ulcer Risk Assessment and Prevention Strategies: A Cross-Sectional Study in Nigeria

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ABSTRACT

The development of PUs consequently results in significant physical, financial, and emotional burdens on the affected patients and their relatives including healthcare providers. This study aimed to assess knowledge of pressure ulcer risk assessment (PURA) and prevention strategies among nurses at University College Hospital (UCH), Ibadan, Nigeria. A cross-sectional descriptive design among 264 nurses was selected through a simple random sampling technique using a structured pre-tested questionnaire for data collection. Data were analyzed using descriptive and inferential statistics. The level of significance is set at a p-value <0.05. The mean age of participants was 40.59 ± 9.88 years. Findings revealed that an average of 51.1% of respondents had adequate knowledge of PURA. However, adequate knowledge of pressure ulcer prevention strategies was recorded among just a little above average 67.8%. Analysis of Variance (ANOVA) showed no significant relationship between respondents' level of education and their knowledge of pressure ulcer risk assessment as well as their knowledge of pressure ulcer prevention strategies (p>0.05). Knowledge of pressure ulcer and prevention strategies was inadequate. Nurses need regular training programs to improve their knowledge and skills in PURA and the prevention of pressure ulcers among at-risk patients according to international best practices in order to bridge the previously identified gaps.

Keywords: knowledge; nurses; pressure ulcer risk assessment; prevention strategies

INTRODUCTION

Pressure ulcers, otherwise known as bed sores/pressure sores/pressure injuries or decubitus ulcers, are localized wounds/injuries to the skin and underlying tissues over bony prominences of the body such as occiput, ears, shoulders, elbows, hips, buttocks, knees, ankles, and heels; primarily caused by prolonged pressure in combination with moisture and friction between bony structures and the skin which reduces blood circulation, oxygen supply, essential nutrients, which can result to tissue ischemia and necrosis around the area(s), it can also lead to serious complications including death (Akiseku et al., 2020; Headlam & Illsley, 2020; Service, 2020). Pressure ulcers (PUs) in healthcare remain a global concern due to their health consequences, significant economic burdens, and challenge to healthcare providers, as it directly reflects the quality of healthcare a patient receives in the hospital (Fletcher & Hall, 2020; Jiang et al., 2020). The development of PUs is regarded as a "never event" that should never happen in a healthcare setting; it is considered evidence of serious harm to the patient when it happens because PUs is preventable (Delmore et al., 2019). The prevalence of PUs remains unacceptably high worldwide, ranging from 1.1%-35.8%, with its development ranging from four to thirty-three days and eight days on average (Gould et al., 2019; Jansen et al., 2020; Jiang et al., 2020). Incidence of hospital-acquired pressure ulcers (HAPUs) in healthcare facilities is also on the increase; rates vary depending on the clinical setting, ranging from 2.2% to 23.9% in long-term care to 0% to 17% in home care, and over 60,000 hospitalized patients die each year from complications associated with this menace (Boyko et al., 2018). In the United States of America, it was estimated that over 2.5 million people develop PU each year (Strazzieri-Pulido et al., 2017), an annual cost of treatment of about $26.8 billion to the US government (Padula & Delarmente, 2019), the additional cost of $43,000 per related hospital stay (Gould et al., 2019) among who (60,000) die due to its complications such as osteomyelitis and sepsis (Khojastehfar et al., 2020). In Europe, the cost of PbicerU prevention is more cost effective than its treatment (Delmore et al., 2019). In Asia, the prevalence of PUs in China was 1.67% (Guo et al., 2018)

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and 3.3% in Turkey (Biçer et al., 2019). In Africa, PUs prevalence was 19.3% in Tunisia (Ghali et al., 2018). In Nigerian, there is a paucity of current literature on the prevalence of PUs. However, one of the available publications, a study on the prevalence of PUs in a descriptive study among SCI patients while on admission in a tertiary health facility (UCH) in Ibadan, documented that the prevalence of pressure ulcers was 47.7% (Iyun et al., 2012). Another study on PUs prevalence among hospitalized adults in six University Hospitals in South-West Nigeria revealed that the prevalence of PUs in these Hospitals ranged from 0% to 6.9%, thus giving an overall prevalence of 3.22% (Adegoke et al., 2013). An essential component of preventive strategies is the Pressure Ulcers Risk Assessment (PURA), using a standardized risk assessment scale in individual patients at risk of PUs and prompt implementation of necessary strategies to curb it (Huang et al., 2021). Knowledge provides the foundation for informed decision-making, promotes high-quality nursing care delivery competency, and evidence-based practices leading to the quality and safety of nursing care to patients (Halász et al., 2021). Professional nurses are primarily responsible for the patient's skincare and PUs preventive measures (Sardari et al., 2019). This study aims to assess knowledge of Pressure Ulcers Risk Assessment and Prevention Strategies among nurses at a Tertiary Hospital in Nigeria.

Despite advances in healthcare technology, the incidence of hospital-acquired pressure ulcers (HAPUs) in healthcare facilities is increasing, and over 60,000 hospitalized patients die each year from complications associated with this menace (Boyko et al., 2018). Previous studies have identified inadequate knowledge of pressure ulcers risk assessment and prevention strategies among nurses as a major contributing factor to the development of PUs among “at-risk” patients (Awad & Hewi, 2020; Ebi et al., 2019; Fletcher & Hall, 2020; Huang et al., 2021; Saranasinghe & Seneviratne, 2021; Sen, 2020; Sengul & Karadag, 2020). The development of PUs consequently results in significant physical, financial, and emotional burdens on the affected patients and their relatives, including healthcare providers (Aloweni et al., 2019; Dlungwane, 2020; Jackson et al., 2019). Therefore, all nurse clinicians need to have the necessary skills and competencies for Pressure Ulcer Risk Assessment and preventive strategies (Campoi et al., 2019). Studies on knowledge of PURA and prevention strategies among nurses are scanty generally in Nigeria, and none existed previously in the study setting. Findings from this study will shed light on the knowledge of PURA and prevention strategies among nurses which will inform appropriate policies and interventions at the facility. It will also add to the existing body of knowledge and contribute to the scanty literature on the subject matter in the country. Furthermore, this study will serve as a valuable resource for future researchers on the subject matter.

A study on the knowledge and perception of nurses on the use of the Braden Scale in predicting patients’ pressure ulcer risks in selected hospitals in Ondo State showed that the majority of nurses had good knowledge of the Braden scale (Edward et al., 2021). However, a study on nurses’ Knowledge of Pressure ulcer Prevention in Ogun State, Nigeria, reported that most participants (81%) had inadequate knowledge of the Braden Scale (Ilesanmi & Oluwatosin, 2016). Findings of a study using a quasi-experimental design on the effectiveness of the designed educational programme for nurses using Braden Scale to predict pressure ulcer risk among 99 nurses sample size selected using convenience sampling technique at Port-said University, Port-Said, Egypt with questionnaire for data collection, reported a highly statistically significant difference ($p=0.001$) between pre educational programme phase and post educational programme phase in relation to all items of nurse's knowledge of Braden scale criteria and components as predictive risk assessment of pressure ulcer using the knowledge of Braden scale (Qalawa & El-Ata, 2016). Another quasi-experimental research design on the effect of implementing standardized preventive guidelines for pressure ulcers on nurses' performance in Egypt among 99 nurses recruited into the study by accidental sampling technique using a knowledge questionnaire, attitude scale, and observational checklist for data collection displayed that there was a highly statistically significant difference ($p<0.001$) between nurses' knowledge in Braden Scale between pre (1.03 ± 1.59) and post (7.29 ± 1.44) implementing standardized preventive guidelines for pressure ulcers (Ibrahim & Qalawa, 2020).

Findings from a study on nurses’ knowledge and practices toward pressure ulcer prevention in General Hospital Lahore reported that nurses’ level of knowledge on the use of risk assessment scale for pressure ulcers was poor among the majority (80.6%) of the participants (Nasreen et al., 2017). A quasi-experimental study on the effectiveness of the structured teaching program on the knowledge of staff nurses regarding the use of the Braden Scale on pressure sore in selected Hospitals, Mehsana, among 100 nurses selected using non-probability purposive sampling using a self-structured questionnaire, documented that post-test mean (20.88 ± 2.60) was apparently higher than pre-test mean knowledge score (9.72 ± 2.77); hence the structured teaching was effective in increasing the Knowledge of staff nurses regarding use of Braden scale on pressure sore (Dayalal et al., 2020). Another similar study among 75 samples selected using purposive sampling technique on the effectiveness of planned teaching program regarding the use of Braden Scale for pressure sore on knowledge and practices among staff nurses working in selected Hospitals International using questionnaire and observational checklist revealed that there was a significant difference between scores knowledge of respondents in pressure sore risk assessment pre (7.813) and post (12.51) test of teaching program (Pandhare & Dhudum, 2018). Furthermore, a pre-experimental study on the effectiveness of an interventional program on nursing

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staff's knowledge concerning the prevention of pressure ulcers at the intensive care unit in Al-Diwaniyah Teaching Hospital, India, using non-probability (purposive) sampling among 27 nurses at the aid of questionnaire reported that the application of the interventional program has the beneficial effects on nursing intensive care unit staff' in which participants' knowledge domains in the prevention of PU increased in post-test (1.77±0.138) as compared to their pre-test (1.08±0.096), the interventional program was highly significantly (p< 0.0001) associated with the respondents' knowledge of PUs risk assessment (Noor & Hassan, 2021).

In addition, a quasi-experimental study designed to the assessment of the effectiveness of planned teaching programs on knowledge and skill in the use of the Braden Scale for predicting risk and prevention of pressure ulcers among 40 nurses using a convenience sampling technique with data collection through a questionnaire documented that the planned teaching program was statistically significant (P<0.001) with the respondents' knowledge in the use of Braden Scale for predicting risk of pressure ulcers, in which majority (97.5%) of nurses had inadequate knowledge in the pre-test (7.15±2.45) and above average (67.5%) had adequate knowledge in post-test (21.45±2.06) which shows that there was an inadequate knowledge in pre-test and an adequate knowledge in post-test among staff nurses in using Braden scale for predicting risk and prevention of pressure ulcers after planned teaching program (Sham et al., 2020). A similar quasi-experimental research design study on the effectiveness of a designed educational program for nurses using the Braden Scale to predict pressure ulcer risk using convenience samplings among 99 samples and a questionnaire for data collection found a highly statistically significant difference (p= 0.001) between nurses' total scores of knowledge of Braden scale as a predictive risk assessment of pressure ulcer before and after a training program (Qalawa & El-Ata, 2016).

The findings of a descriptive study on nurses' knowledge and attitudes towards prevention of pressure ulcers among 460 participants showed lack of knowledge towards prevention of pressure ulcers (Halász et al., 2021). Likewise (Fletcher & Hall, 2020) in a cross-sectional survey on nurses' knowledge, attitudes, and behaviors in pressure injury prevention in mainland China among 1,806 nurses from 10 tertiary general hospitals in Hunan Province, documented that knowledge of participants in PUs prevention was insufficient. In addition, a study on knowledge, attitudes, and perceived barriers for prevention of pressure ulcers among 150 nurses at the National Hospital of Sri Lanka showed that participants' overall knowledge of prevention of PUs was low (Saranasinghe & Seneviratne, 2021). Study on determination of nurses' level of knowledge on the prevention of pressure ulcers among 471 nurses in two foundation hospitals in Turkey revealed that the overall knowledge of nurses in PUs prevention was extremely insufficient (Sengul & Karadag, 2020). Also a study on nurses' knowledge and attitudes towards prevention of pressure ulcers among 460 nurses showed insufficiencies in their knowledge towards PU prevention (Sardari et al., 2019). Study on 253 nurses' knowledge and practices towards pressure ulcer prevention in Medical College Hospital, Kolkata reported that participants' overall knowledge towards pressure ulcer prevention was poor (Sen, 2020). However, a study on knowledge, practice, and perceived barrier of pressure ulcer prevention among 220 nurses in a public hospital in Selangor revealed that majority of respondents had adequate knowledge (95.0%) of PUs prevention (Tharu et al., 2021). Also a study on knowledge, attitude and practice among caregivers towards pressure ulcer in spinal cord injury at rehabilitation center in Bangladesh found that knowledge of PU prevention was moderately high in the majority 73.2% of the participants (Mäki-Turja-Rostedt et al., 2021).

A pre-experimental research study on effect of pressure ulcer preventive nursing interventions on knowledge, attitudes and practices of nurses among hospitalized geriatric patients in Alexandria, Egypt among 40 nurses purposively selected with five data collection tools (structured nurses' pressure ulcer prevention knowledge questionnaire; nurses' preventive practices observational checklist for elders' pressure ulcers; nurses' attitude scale toward pressure ulcers prevention among geriatric patients; and nurses' perceived barriers of pressure ulcers prevention scale) revealed that the majority of the nurses had low level of knowledge of PUs prevention before (10.68±4.05) and a significantly high (P=<0.001) level of knowledge of PUs prevention (26.92±1.40) after application of interventions (Awad & Hewi, 2020). Another quasi-experimental study on effectiveness of an interventional program on nursing staff' knowledge concerning prevention of pressure ulcer at the intensive care unit in Al-Diwaniyah Teaching Hospital, India among 27 selected through non-probability purposive sampling using questionnaire documented that the application of the interventional program has the beneficial effects on intensive care unit nursing staff in which participants' knowledge domains in prevention of PU increased in post-test (1.92±0.125) as compared to their pre-test (1.20±0.141) with interventional program highly significantly (P<0.0001) associated with the respondents' knowledge of PUs prevention (Noor & Hassan, 2021).

Furthermore, a randomized controlled trial study on consistent practice for pressure ulcer prevention among nurses in long-term older people care among registered (141) and practical nurses (112) at two long-term older people care facilities chosen with convenience sampling and randomly allocated to intervention or comparison group using structured questionnaire depicted that the PU prevention practices after the intervention were significantly higher than

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before the intervention (Karimian et al., 2020). Another experimental control design study on effect of educational intervention on the knowledge and attitude of intensive care nurses in the prevention of pressure ulcers, in Iran among 67 nurses randomly assigned to the experimental or control group, data collection tools included the demographic characteristics questionnaire, the Pieper Pressure Ulcer Knowledge test (PUKT) and the Attitude toward Pressure Ulcer tool (APuP) revealed that PUKT questionnaire score in the experimental group improved from (15.68±3.42) to (29.75±12.33) (P=0.000), while in the control group it was (16.40±3.13) and (17.54±6.62) before intervention; furthermore, the APUP questionnaire score in the experimental group improved from (27.12±2.13) to (39.37±3.21) (P=0.000), while in the control group it was (27.65±1.71) and (28.37±5.00) before intervention; the study concluded that since, educational intervention improved the knowledge and attitude of nurses in preventing pressure ulcers; it is required to conduct appropriate educational interventions to improve their knowledge and attitude (Mohamed & Ibraheem, 2019). A quasi-experimental research design study on effectiveness of designed educational programme for nurse's regarding use of Braden Scale to predict pressure ulcer risk with convenience sampling technique among 99 samples using questionnaire found a highly statistically significant difference between pre educational programme phase and post educational programme phase in relation to nurse's total scores of level of practice of Braden scale as a predictive risk assessment of pressure ulcer (Qalawa & El-Ata, 2016).

In addition, a quasi-experimental study design on effect of preventive bundle care on nurses' knowledge, compliance and patients' outcome in Egypt among available 30 nurses and a purposive sample of 85 adult patients using interview guide, questionnaire and observation checklist documented that respondents' knowledge about preventive bundle pre and post-implementation showed a general improvement in the mean knowledge scores of nurses in all items post-program implementation as majority 93.3% of respondents has satisfactory knowledge of PUs prevention post-intervention as compared to pre-intervention when very few 13.3% has satisfactory level of PUs prevention with highly statistically significant differences (p=0.000) (Awali et al., 2018). Similar quasi-experimental design study on effect of implementing standardized preventive guidelines for pressure ulcer on nurses' knowledge, attitude and performance in Egypt among 99 available nurses selected through accidental sampling technique using knowledge questionnaire, attitude scale, and 'observational checklist revealed that there was a statistically significant difference in nurses' knowledge pre and post implementing standardized preventive guidelines for pressure ulcer at p <0.001 (Ibrahim & Qalawa, 2020). Furthermore, a similar quantitative quasi-experimental study on effect of implementing pressure ulcer prevention educational protocol on nurses' knowledge, attitude and practices at Al-Noor Specialist Hospital Makkah, Kingdom of Saudi Arabia by (Seo & Roh, 2020) among a convenience sample size of 100 nurses questionnaire and observational checklist documented that nurses' knowledge increased post-test (96.37 ± 2.381) relative to the pre-test (74.04 ± 13.49) and stated that the findings of their study also support the validity of the PU educational procedure as the pre-test result was lower than post-test result. Another comparison group pretest-posttest design study on effects of pressure ulcer prevention training among nurses in long-term care hospitals in Korea (Seo & Roh, 2020), in which participants were conveniently assigned to team-based learning (n = 30) or lecture-based learning (n = 30) groups reported that both groups exhibited significant increases in scores for pressure ulcer prevention knowledge after the intervention as compared before it. However, the two groups had no significant differences in the pre-post difference scores for any of the variables.

This study aimed to assess knowledge of pressure ulcer risk assessment (PURA) and prevention strategies among nurses at University College Hospital (UCH), Ibadan, Nigeria.

METHOD

Study Design and Population

A cross-sectional descriptive design

Study Population

All nurses in the Department of Clinical Nursing of the facility.

Target Population

Nurses who met inclusion criteria at the selected units

Sample Size Determination

Leslie Kish's (1965) formula for determining sample size in a descriptive quantitative study 19.4% as the proportion of respondents who had adequate knowledge of PURA in a previous study (Nasreen et al., 2017) was used as follows:

Formula, Sample size (n) = $Z\alpha^2\ pq/d^2$

Where,

Zα = Standard normal deviate correspondingly to the probability α (the probability of making type 1 error at 5%) = 1.96

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p = proportion of respondents who had adequate knowledge of PURA in a previous study = 19.4% (0.194)
q = 1-p (1-0.194) = 0.806
d = Degree of precision considered by the researcher as statistically significant in the current study (5% = 0.05)
Therefore, sample size (n) = $1.96^2 \times 0.194 \times 0.806/0.05^2 \approx 240$
Considering 10% attrition rate, 10/100 × 240 = 24 nurses
Therefore, the total sample size (n) = 264 nurses

Sampling Technique

Simple random was used to select participants from selected units. Simple random was to select participants from selected units (Intensive care, Medical, Surgical, Nephrology, and Neuroscience units). A list of names of all nurses in each selected unit who fulfilled inclusion and exclusion criteria was generated. Their names were written separately in small pieces of paper, same rolled into balls and the balls were placed inside a container and mixed properly. Balls were drawn one after the other from the bag without replacement until the required number of balls forming sample size in each selected unit was reached. The names on the picked balls signified the chosen members of the population who formed the sample size for the study from each selected unit.

Method of Data Collection

Ethical Approval from University of Ibadan and University College Hospital Joint Ethics Review Committee with registration number UI/EC/22/0052 was obtained. Written permission to conduct the study at the study setting was sought for and granted by the management including the Director of Nursing and Head, Department of Clinical Nursing of facility. Same was also extended to the Deputy Directors of Nursing and Ward Managers in-charge of the selected Units. Data were obtained from respondents through a structured self-administered questionnaire after gaining their informed consent.

Data Analysis

Data were entered and analyzed using Statistical Packaging for Social Sciences (SPSS) version 25 and descriptive statistics. Hypotheses were tested using Analysis of Variance (ANOVA). Results were presented in descriptive statistics and charts in line with objectives of study. The level of significance set at p-value <0.05.

Ethical Considerations

Ethical Approval was obtained from the University of Ibadan and UCH Joint Ethics Review Committee with registration number UI/EC/22/0052. Permission was also granted by management of the study setting. Study was conducted in accordance with ethical standards laid down by 1964 Declaration of Helsinki.

RESULT

A total of 264 respondents were recruited into the study with 100% response rate. The data was presented with frequency table, chart, mean and standard deviation. The hypotheses were tested using Analysis of Variance (ANOVA) at 5% level of significant. Significant ones were further subjected to post hoc in other to ascertain where the differences were.

Socio-Demographic Characteristics of Respondents

In table 1., it was observed that the mean age of the respondents was 40.59 ± 9.880 years. A higher percentage 91 (34.5%) of the nurses were within the age group 30 to 39 years, followed by 40 to 49 years at 73 (27.7%). More than nine-tenth 254 (96.2%) were female while 10 (3.8%). The majority 100 (37.9%) were senior nursing officers (SNO) while 185 (70.1%) possessed Bachelor of Nursing certificate.

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Table 1. Socio-Demographic Characteristics of the Respondents

Socio Demographic	Frequency	Percentage
Age Group		
20 – 29 years	39	14.8
30 – 39 years	91	34.5
40 – 49 years	73	27.7
50 years & above	61	23.1
Mean Age ± SD	40.59 ± 9.880	
Gender		
Male	10	3.8
Female	254	96.2
Designation		
NO1	50	18.9
SNO	100	37.9
ACNO	15	5.7
CNO	35	13.3
ADN	55	20.8
DDN	9	3.4
Educational Status		
ND/HND in Nursing	62	23.5
Bachelor of Nursing	185	70.1
Postgraduate Diploma in Nursing	11	4.2
Postgraduate Degree in Nursing	6	2.3

Respondents' Knowledge of Braden Scale

It was observed that just average 50.4% of respondents had heard about Braden Scale, while few 9.5% of them of had had training on it. Furthermore, results depicted that more nurses ranging from 62.9% to 89.8% in about 8 out of 11 items assessing knowledge of Braden Scale (Table 2).

Table 2. Pre and Post Intervention Results of Knowledge of the Braden Scale

Items	Right Responses	
	Yes	No
Have you heard of Braden Scale before?	133 (50.4)	131 (49.6)
Have you received training on Braden Scale before?	25 (9.5)	239 (90.5)
	Correct	Wrong
What do you understand about Braden Scale?	229 (86.7)	35 (13.3)
Which risk factor/parameter in the Braden Scale can you assess patient's ability to respond to verbal command?	172 (65.2)	92 (34.8)
Which risk factor/parameter in the Braden Scale can you assess patient's ability to change and control body position?	172 (65.2)	92 (34.8)
Which risk factor/parameter in the Braden Scale can you assess the degree to which skin is exposed to moisture?	178 (67.4)	86 (32.6)
Which risk factor/parameter in the Braden Scale can you assess patient's ability to lift completely in bed/chair without sliding against sheets?	107 (40.5)	157 (59.5)
Which risk factor/parameter in the Braden Scale can you assess patient's usual food intake pattern?	237 (89.8)	27 (10.2)
Which risk factor/parameter in the Braden Scale can you assess patient's degree of physical activity?	193 (73.1)	71 (26.9)
The maximum possible Pressure Ulcer Risk Assessment score on Braden Scale is	102 (38.6)	162 (61.4)
The lowest possible Pressure Ulcer Risk Assessment score on Braden Scale is	166 (62.9)	98 (37.1)
Match the following PURA scores using Braden Scale, with the appropriate interpretation:	34 (12.9)	230 (87.1)
The higher the PURA score the lower the risk of developing a pressure ulcer and vice versa	98 (37.1)	166 (62.9)

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In overall, the result showed that more than half 52.3% of the respondents had moderate knowledge of the Braden Scale, followed by poor knowledge at 34.5% and only few 13.3% had adequate knowledge of Braden Scale (Figure 1).

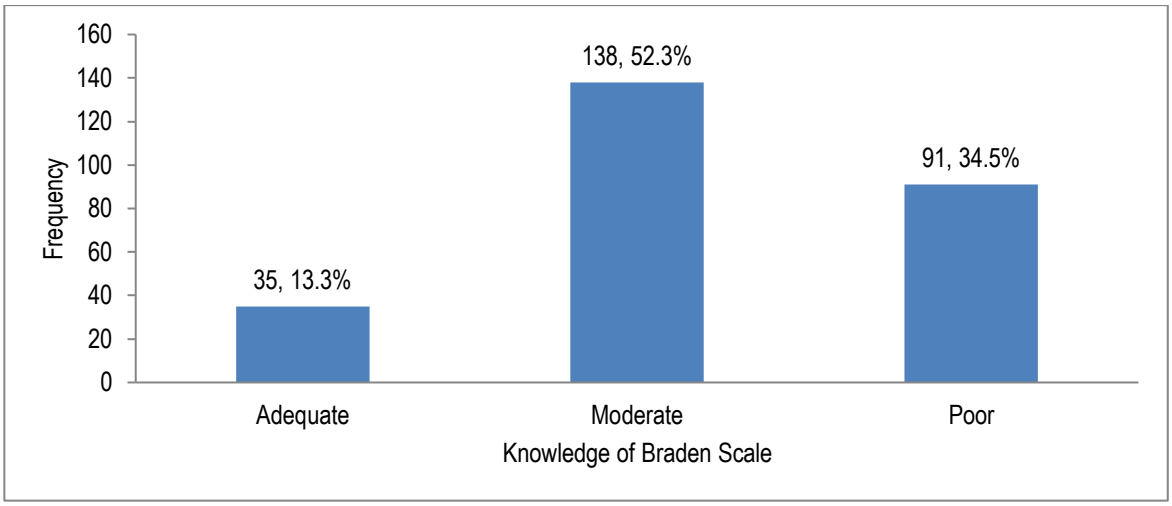

Figure 1. Nurses' Knowledge of the Braden Scale

Respondents' Knowledge of Pressure Ulcer Risk Assessment

The findings revealed that more nurses ranging from 66.3% to 98.1% had knowledge in about 5 out of 8 items examined under knowledge of PURA (Table 3).

Table 3. Respondents' Knowledge of Pressure Ulcer Risk Assessment

Items	Right Responses	
	Correct	Wrong
Risk factors for development of pressure ulcers include immobility, incontinence, impaired nutrition and altered consciousness	259 (98.1)	5 (1.9)
All new patients should be assessed within 8 hours of admission into the ward for risk of developing pressure ulcer	241 (91.3)	23 (8.7)
How often should PURA be carried out on patients "at risk" of developing pressure ulcer	175 (66.3)	89 (33.7)
Is it necessary to do PURA for patient when his/her condition deteriorates?	228 (86.4)	36 (13.6)
Health personnel most accountable for Pressure Ulcer Risk Assessment in patients is	144 (54.5)	120 (45.5)
What should you report about your patient's skin every shift?	195 (73.9)	69 (26.1)
A PURA score above 18 is associated with increased pressure ulcer risk	64 (24.2)	200 (75.8)
A low-humidity environment may predispose a patient to pressure ulcers development	99 (37.5)	165 (62.5)

In overall in Figure 2, the result showed that just about average 51.1% of respondents had adequate knowledge of pressure ulcer risk assessment.

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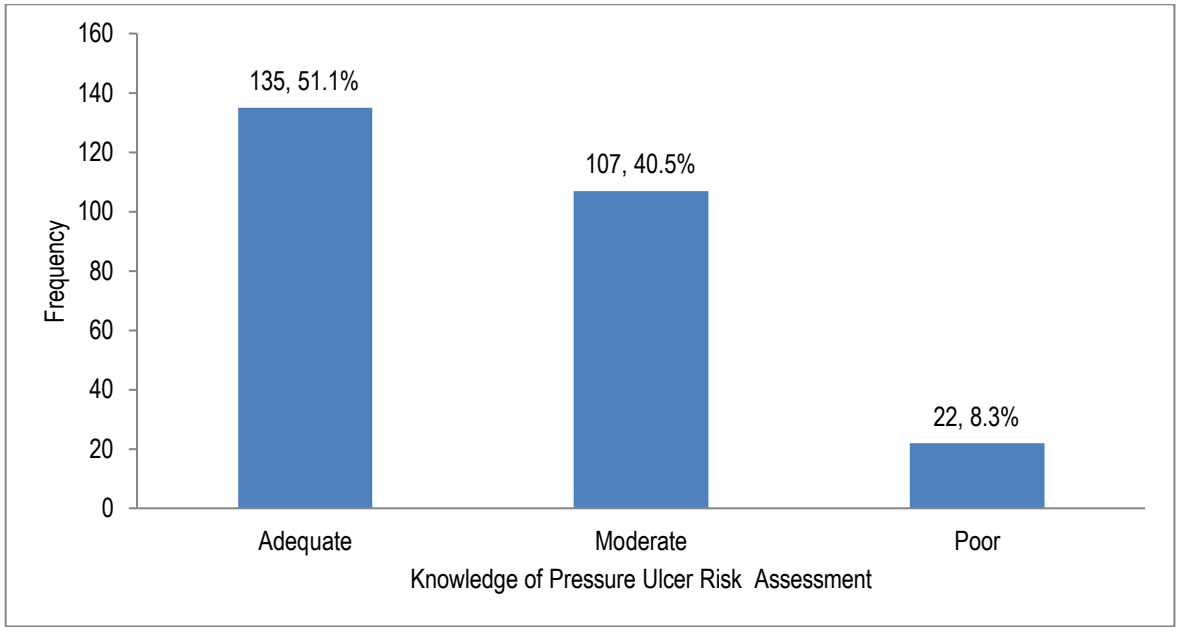

Figure 2. Respondents' Knowledge of Pressure Ulcer Risk Assessment

Respondents' Knowledge of Pressure Ulcer Prevention Strategies

It was observed that majority of respondents ranging from 70.8% - 99.2% had knowledge of pressure ulcer prevention strategies in about 12 out of 15 items assessing used to assess this domain (Table 4).

Table 4. Respondents' Knowledge of Pressure Ulcers Prevention Strategies

Items	Right Responses	
	Correct	Wrong
Pressure Ulcer Risk Assessment for all new patients within 8 hours of admission	255 (96.6)	9 (3.4)
Skin inspection at least once daily for hospitalized patient	256 (97.0)	8 (3.0)
Massaging bony prominences of patients at frequent intervals	56 (21.2)	208 (78.8)
8-hourly turning schedule of patients confined to bed or very ill	99 (37.5)	165 (62.5)
Encouraging patients on early ambulation including active and passive exercise	249 (94.3)	15 (5.7)
Dragging patients on bed, couch or wheelchair while positioning patients	233 (88.3)	31 (11.7)
Elevating heels or legs of patients confined to bed over a pillow	239 (90.5)	25 (9.5)
Using under lags/pads for patients with urine or fecal incontinence	239 (90.5)	25 (9.5)
Positioning patient's bony prominences in direct contact with one another	187 (70.8)	77 (29.2)
Proper reporting/documentation of findings and care rendered to the patients	259 (98.1)	5 (1.9)
Placing Water-filled gloves under patient's heels	58 (22.0)	206 (78.0)
Rubbing moisture barrier cream on patient's skin regularly to prevent skin dryness	248 (93.9)	16 (6.1)
Use of draw/lift sheet regularly to move patients	230 (87.1)	34 (12.9)
Maintain adequate hydration and nutritional intake	262 (99.2)	2 (0.8)
Nurse patients on Air/Water beds	258 (97.7)	6 (2.3)

In overall, it was observed in figure 3.3 that more than half 67.8% had adequate knowledge of pressure ulcers prevention strategies, 31.1% had moderate knowledge while 1.1% had poor knowledge.

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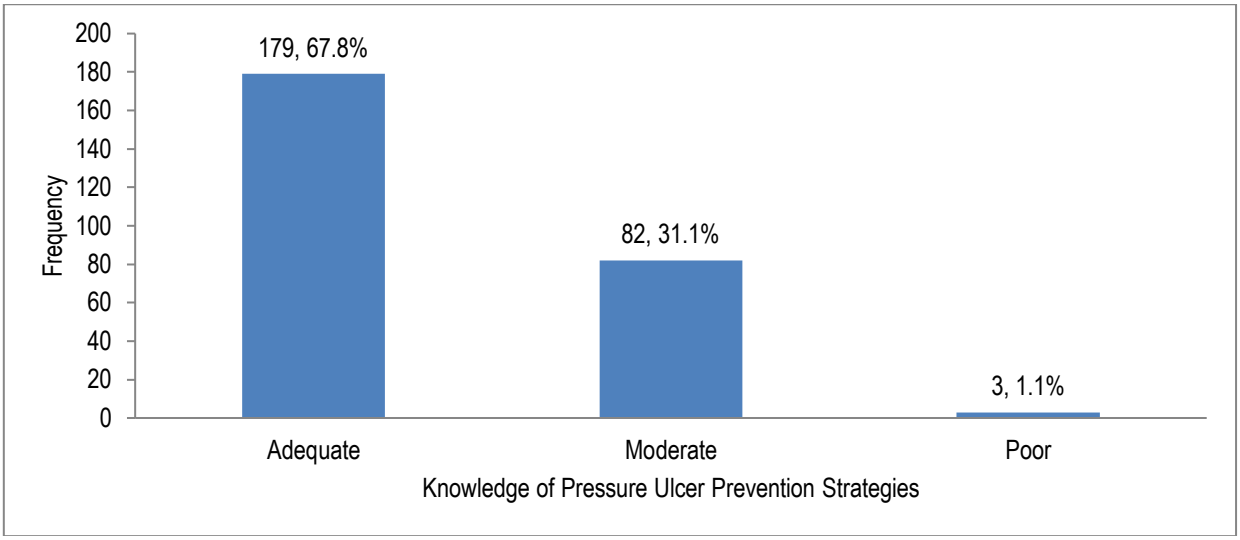

Figure 3. Respondents' Knowledge of Pressure Ulcer Prevention Strategies

Hypotheses

Hypothesis One: There is no significant relationship between respondents' level of education and their knowledge of Braden Scale

Information in Table 5 showed that there is significant relationship between the respondents' knowledge of the Braden Scale and their level of education, since p-value is less than significant level ($p<0.001$).

Table 5. Significant Relationship between Respondents' Knowledge of Braden Scale and their Educational Level

	Respondents' Level of Education	N	Mean	Std. Deviation	F	p-value
Respondents' Knowledge of Braden Scale	ND/HND in Nursing	62	6.26	3.008	3.591	0.014*
	Bachelor of Nursing	185	7.29	2.418		
	Postgraduate Diploma in Nursing	11	5.64	3.957		
	Postgraduate Degree in Nursing	6	8.00	2.966		

Hypothesis Two: There is no significant relationship between respondents' level of education and their knowledge of pressure ulcer risk assessment

In Table 6, it was observed that there is no significant relationship between respondents' level of education and their knowledge of pressure ulcer risk assessment since p-value is greater than significant level ($p>0.05$).

Table 6. Significant Relationship between Respondents' Knowledge of Pressure Ulcer Risk Assessment and their Level of Education

	Respondents' Level of Education	N	Mean	Std. Deviation	F	p-value
Respondents' Knowledge of PURA	ND/HND in Nursing	62	5.05	1.731	1.074	0.361
	Bachelor of Nursing	185	5.41	1.248		
	Postgraduate Diploma in Nursing	11	5.36	1.286		
	Postgraduate Degree in Nursing	6	5.50	1.378		

Hypothesis Three: There is no significant relationship between respondents' level of education and their knowledge of pressure ulcer prevention strategies

In Table 7, it was observed that there is no significant relationship between respondents' knowledge of pressure ulcer prevention strategies and their educational level since $p>0.05$.

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Table 6. Significant Relationship between Respondents' Knowledge of Pressure Ulcer Prevention Strategies and their Level of Educational

	Respondents' Level of Education	N	Mean	Std. Deviation	F	p-value
Respondents' Knowledge of Pressure Ulcer Prevention Strategies	ND/HND in Nursing	62	12.10	1.411	0.540	0.656
	Bachelor of Nursing	185	11.77	1.971		
	Postgraduate Diploma in Nursing	11	11.73	1.191		
	Postgraduate Degree in Nursing	6	12.00	1.095		

DISCUSSION

The mean age of the respondents was 40.59 ± 9.880 years which falls within the service years and implies also implies that majority of them were young nurses. Almost all participants were females. This might be due to the observed ratio of less male to female nurses in the nursing profession which is in tandem with the assertion that nursing is a female dominated profession. Educational distribution indicated that majority of them in both groups were university graduates of nursing science with few already had postgraduate degree in nursing. This will promote quality nursing practice, prepare the nurses to be able to meet patients' needs, function as leaders, engage in advanced science and be at-pal with other sister healthcare professionals in Nigeria and beyond.

This study revealed that only some respondents 13.3% had adequate knowledge while about average 52.3% of them had moderate knowledge of Braden Scale. The finding in the present study corroborates similar study which reported inadequate knowledge of Braden Scale among majority of respondents (Qalawa & El-Ata, 2016). This might be due to the need for policies in the concerned facility towards training and re-training of nurses on Braden Scale and integrating PURA in the nursing care of patients according to international best practices. However, the finding is different from similar study which showed that majority of respondents had good knowledge of Braden scale (Edward et al., 2021). Also, previous researchers in some quasi-experimental studies documented adequate knowledge of Braden Scale after a structured educational training on Braden Scale compared to before it in which the educational training was significantly related (Ibrahim & Qalawa, 2020; Qalawa & El-Ata, 2016). Furthermore, it was observed in this study that adequat knowledge of PURA was only recorded in just average 51.1% of respondents, while less than average 40.5% had moderate knowledge of PURA. This corroborates finding in a similar study reported poor knowledge of PURA among majority of the participants (Nasreen et al., 2017). This poor knowledge might be due to the non-availability of pressure ulcer risk assessment tool in the study facility, lack of previous training programs for nurses on PURA, and lack of study hospital policies towards mandatory PURA on "at risk" patients according to international best practices. Finding in the present study is also in tandem with findings of some quasi-experimental studies which documented poor knowledge of PURA pre-educational program while adequate knowledge was reported among the respondents post-educational program with high statistical significance (Dayalal et al., 2020; Noor & Hassan, 2021; Pandhare & Dhudum, 2018; Qalawa & El-Ata, 2016). The improved knowledge among respondents post educational program was not by chance but, as a result of educational intervention.

In addition, findings in the current study revealed that majority of 67.8% of the respondents had adequate knowledge of pressure ulcers prevention strategies. This is also in line with similar studies which reported adequate knowledge of pressure ulcers prevention strategies (Mäki-Turja-Rostedt et al., 2021; Tharu et al., 2021). However, the finding is not consistent with previous research where there was poor knowledge of prevention strategies among the respondents (Fletcher & Hall, 2020; Halász et al., 2021; Khojastehfar et al., 2020; Saranasinghe & Seneviratne, 2021; Sen, 2020; Sengul & Karadag, 2020). Moreover, in some quasi-experimental studies and randomized controlled trials studies, poor knowledge of pressure ulcer prevention strategies was reported at pre-educational intervention while adequate knowledge was documented at post-educational intervention which was significantly related (Awad & Hewi, 2020; Awali et al., 2018; Ibrahim & Qalawa, 2020; Karimian et al., 2020; Mohamed & Ibraheem, 2019; Noor & Hassan, 2021; Qalawa & El-Ata, 2016; Seo & Roh, 2020). This implies that application of the interventional program has the beneficial effects on intensive care unit nursing staff in which participants' knowledge. Furthermore, findings revealed significant relationship between the respondents' knowledge of Braden Scale and their level of education ($p<0.001$). However, there was no significant relationship between respondents' level of education and their knowledge of pressure ulcer risk assessment as well as their knowledge of pressure ulcer prevention strategies ($p>0.05$). This implies that respondents' level of education has nothing to do with their knowledge of PURA and PU prevention strategies.

Problem of Generalization: The study was carried out among a small number of respondents at a single healthcare facility, which limits the generalizability to other nurses at other healthcare facilities in the country. Had the

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number of the health facilities from which the participants were selected from increased to cover larger areas in the country, the results would have been much wider and easier to generalize.

CONCLUSION

In conclusion, this study revealed inadequate knowledge of pressure ulcer and prevention strategies among nurses at UCH, Ibadan, Nigeria. It also reflects the need for regular training and re-training to improve their knowledge and competencies in PURA and prevention of pressure ulcers. A structured education can bring a change in the nurses' knowledge which can also influence their clinical practices for delivery of quality and harm-free nursing care to their patients according to international best practices.

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DISCLOSURE AND CONFLICTS OF INTEREST

Authors hereby declare no conflict of interests.

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