Pressure Ulcer Preventive Measures Utilized and Its Perceived Effectiveness Among Nurses in Selected Hospitals in Benin City, Edo State, Nigeria

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Abstract

BACKGROUND

Pressure ulcers represent a largely preventable patient safety issue, serving as an indicator of nursing care quality and patient safety within healthcare settings. This study aimed to assess the utilization and effectiveness of pressure ulcer preventive measures among nurses in selected hospitals.

MATERIALS AND METHODS

This descriptive cross-sectional survey involved 304 nurses purposefully selected from surgical wards/units in the chosen hospitals. A well-structured, pretested questionnaire with a reliability index of 0.842 was employed for data collection. Descriptive statistics, including mean, frequency, and percentage, were used for data analysis.

RESULTS

Findings indicated that risk assessment (mean 3.67±0.56) was the most frequently used preventive measure, followed by skin repositioning every 2 hours (3.46±0.71), use of barrier creams (3.35±0.71), and the utilization of pressure-relieving devices such as air beds (3.33±0.75). Prophylactic sacral dressing (3.14±0.76) and massaging of bony prominences (3.17±0.86) were also commonly employed. The most effective measures were risk assessment (mean 2.66±0.5), repositioning every 2 hours (2.56±0.54), and skin assessment (2.54±0.54). Barriers to preventive measures included limited equipment (3.31±0.96), nursing shortages (3.12±0.77), lack of skill/training (3.09±0.85), and heavy workloads (3.14±0.82).

CONCLUSION AND RECOMMENDATION

This study highlights that risk assessment was the most used and effective preventive measure among nurses. Challenges, such as the lack of training and heavy workloads, hindered utilization. Recommendations include regular updates on best practices for staff, especially new nurses, to bridge the theory-practice gap and promptly implement research findings.

Keywords: *Pressure ulcer, Effectiveness, Preventive Measures, Utilized, Nurses*

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Introduction

Pressure injuries are localized damage to the skin or underlying tissue that usually occurs over bony prominent areas as a result of usually long-term pressure that occurs by staying in one position for too long (1). This preventable threat makes patients stay in the hospital longer than it should be; raises the cost of patient care, and causes pain and discomfort, which is not acceptable in the health care system (2). The consequences of pressure-induced skin injury range from non-blanchable erythema of intact skin to deep bone (3). The ulcer imposes a significant burden not only on the patient but the entire healthcare system (4).

More recent data, however, recognized that the incidence of PU differs by care area, with patients in intensive care units, and medical and surgical wards at high risk of development of pressure ulcer (4,5). Peripheral vascular diseases, diabetic mellitus, smoking, prolonged immobility, poor nutritional status, incontinence, impaired sensation, use of steroids and ageing, pressure, shear, friction, and moisture are considered the factors which contribute to the development of pressure ulcers. Nurses' knowledge and practice are also recognized as extrinsic factors for pressure ulcer formation (6).

Pressure ulcers remain a severe and potentially life-threatening problem across all healthcare settings around the world. According to the NPUAP report in 2017, showed that nearly 2.5 million patients develop PU every year and 60,000 patients die due to complications related to PU each year when it is not properly managed; the statistics of World Injury Day show that nearly 700,000 were affected by pressure injury each year; around 186,617 patients develop a new pressure injury in the acute care setting each year (7). This has shown that between January 2012–December 2014, about 4-6% of patients in the acute care setting had pressure injuries (8).

Incidence of PUs remains unsatisfactorily high worldwide, fluctuating from 1.1%-35.8%, with its development ranging from four to thirty-three days, and eight days on average (9, 10, 11). In Africa, PU prevalence was 19.3% in Tunisia (12). The pooled prevalence of pressure ulcers in Ethiopia was assessed using seven studies involving a total of 1881 participants. The pooled prevalence of pressure ulcers in Ethiopia was 11.7% (95% CI: 7.28, 16.13). The subgroup analysis showed that the estimated magnitude of pressure ulcers was 15.89% (95% CI: 13.32, 18.46); among studies, their sample size was greater than or equal to 250 (13). In Nigeria, few empirical studies exist on the prevalence of PUs. However, available studies show that the prevalence of PUs among SCI patients while on admission to a tertiary health facility (UCH) in Ibadan was 47.7% (14). Another study on PU 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% (15). PUs have a devastating complication among hospitalized patients and it affects 13. 84% of patients in Nigeria (16). Recently, there has been a report of increasing incidents of pressure injury in Africa's Hospitals, including Nigeria (17). Pressure injury makes patients stay in the hospital longer than they should be; they raise the cost of patient care, and cause pain and discomfort (18). The impact of pressure ulcers on the quality of life is significant, considering their influence on the physical, psychological, emotional, Spiritual, Social and financial dimensions of life.

Pressure ulcers are a largely preventable patient safety problem if appropriate interventions are implemented early and they are considered as an indicator to measure the quality of nursing care and patient safety in the health care setting (19). Nowadays, if a patient develops a pressure injury during hospitalization, it indicates poor quality of nursing care (20). Although preventing a patient from pressure injury is the responsibility of all health-care professionals primarily nurses are involved in direct patient care and take the forefront of providing pressure injury prevention care (21).

Many innovations have pointed to seeking reduced pressure ulcer formation during hospitalization: Different bed surfaces prevent pressure ulcers from forming while patients are in bed, and a new viscoelastic foam mattress has been proven to prevent new pressure ulcers from developing along with the healing of existing ulcers (22). The use of preventive pressure ulcer strategies such as risk assessment tools\scales like the Braden scale for predicting pressure ulcer risk, Norton scale, and Waterlow scale. The role of dressing in pressure ulcer prevention such as the use of multilayer Silicon-foam dressing on bony prominence. The use of water-filled gloves in preventing heel pressure ulcers. The question remains how knowledgeable and practicable nurses

are about these evidence-based measures? According to Etafa *et al*., nurses' practice towards pressure injury prevention is not reliable because they prioritize it at a very low level due to their inadequate knowledge about the serious consequences of evidence-based practice (23). Recent reports have shown increasing incidents of pressure injury among hospitalized patients in developing countries including (24). Therefore, it becomes pertinent to critically look into this area especially as it concerns nurses in Nigeria as there are dearth of empirical studies. Hence this study aimed to assess pressure ulcer preventive measures used and its effectiveness among nurses in selected public hospitals in Benin City, Edo state. This study aimed to comprehensively investigate pressure ulcer preventive measures employed by nurses in selected hospitals, evaluate the perceived effectiveness of these measures, and identify barriers influencing their utilization

Material and Methods

Research design/setting

A descriptive cross-sectional survey design was adopted in two purposely selected hospitals identified as health facilities A and B. They were chosen because they are major public hospitals that serve as referral centres and have a lot of bedridden patients. Health Facility A; this government-owned facility was established in 1973. It is the sixth the first generation teaching hospital in Nigeria. Health Facility B; It is a government-owned hospital established in 1902 both facilities are s made up of various departments that render specialized care to patients with varied problems. It is in charge of curative health care and training of health personnel.

Target population/sample size/ sampling technique

The study participants were registered nurses working in different wards/units in these hospitals. These wards include surgical, medical, orthopaedic, neuro-medical, neurological, gynaecology and obstetrics wards and the intensive care unit of the hospitals. Facility A has a population of 759 while Facility B has 136 making a total number of 895 nurses. A Sample size of 305 including a 10% attrition rate was obtained using the Taro Yamane (1967) Formula: $n = N/1+N(d)^2$.

To determine the sample size for the study, we employed the formula $n = 895/1 + 895(0.05)^2$, resulting in 276. Considering an attrition rate of 10%, we calculated 10% of 276, which is 27.6. Adding this to the initial sample size, we obtained 303.6, rounded up to 304 for practicality. The sample size was proportionally allocated to each facility: for Facility A, it was determined as $759/895 \times 304$, yielding 258, and for Facility B, the calculation was $136/895 \times 304$, resulting in 46.

Convenience sampling was used for this study due to the nature of nurse's duties so the researcher used respondents that are readily available during the time of data collection.

Instrument for data collection

A self-structured questionnaire was used for data collection. It consists of four sections which are A, B C and D. Section A consists of 9 questions that elicit demographic data of the participants, Section B comprises 10 close-ended questions on pressure ulcer preventive measures. Section C comprises 10 close-ended questions on the perceived effectiveness of pressure ulcer prevention. Section D comprises 10 close-ended questions on the barriers towards pressure ulcer prevention.

Validity/reliability of the research instrument

The reliability of the questionnaire was determined using a reliability test of internal consistency. A pretest was conducted by giving 30(10% of the sample size) nurses questionnaires in another hospital not used for this study. Data collected was analyzed using a split-half reliability test and the Cronbach's Alpha value of 0.842, 0.881 and 0.804 for BC and D respectively

Method of data collection

Data were collected with the help of research assistants who are nurses not participating in the study. The assistant was trained on the

method of data collection and the objective of the study. The respondents were identified and contacted, in person, at the various hospital wards. After informed consent gotten the questionnaire was administered to them. The researcher waited to collect the completed questionnaires. This was done everyday working day during the break time of the respondents.

Method of data analysis

Analysis was done using descriptive analysis; mean frequency and percentage in table and figure, while the hypothesis was done using chi-square and multiple logistic regression at a 0.05% significant level. All analysis was done using Statistical Package for Social Sciences (SPSS) version 25.0

Ethical consideration

Ethical clearance with protocol number ADM/E22/A/VOL.VII/14831129 and A732/T/1 were obtained from the research and ethical committee of the selected tertiary health facility. Other codes of ethics aimed at protecting the rights of individuals used as subjects of research were duly observed.

Table 1:
Socio demographic characteristics of participants

Variables	Attributes	Frequency	Percentage
Age in years	25-35	90	29.6
	36-45	104	34.2
	46-55	77	25.3
	56 and above	33	10.9
Sex	Male	82	27.0
	Female	222	73.0
Religion	Christian	248	81.6
	Islam	51	16.8
	Others	5	1.6
Marital status	Single	74	24.3
	Married	219	72.0
	Divorced	5	1.6
	Widowed	6	2.0
Educational Qualification	Diploma	116	38.2
	Bachelors	138	45.4
	Master degree	36	11.8
	PhD	14	4.6
Cadre of respondent	Nursing officer 1	89	29.3
	Nursing officer 2	87	28.6
	Principal Nursing Officer	53	17.4
	Assistant Chief Officer	21	6.9
	Chief Nursing Officer	54	17.8
Years of work experience	1-4 years	102	33.6
	5-10 years	142	46.7
	10 years	60	19.7
Area of practice	Medical	78	25.7
	Surgical	105	34.5
	Orthopedic	56	18.4
	Neurological	32	10.5
	Gynaecology	22	7.2
	ICU	9	3.0
	Others	2	0.7
Health facilities	Facility A	258	84.9
	Facility B	46	15.1

Results

The majority (34.2%) of participants were aged 36-45 years. Females constituted the majority of respondents (73%), and Christians made up the majority (81.6%). Additionally, the majority were married (72%), held a bachelor's degree (45.4%), and were either NO I (29.3%) or NO II (28.6%). Respondents with a working experience of 5-10 years accounted for 46.7%, and those with a surgical area of practice were the majority (34.5%). Facility A employed the highest number of participants (84.9%). Table 1.

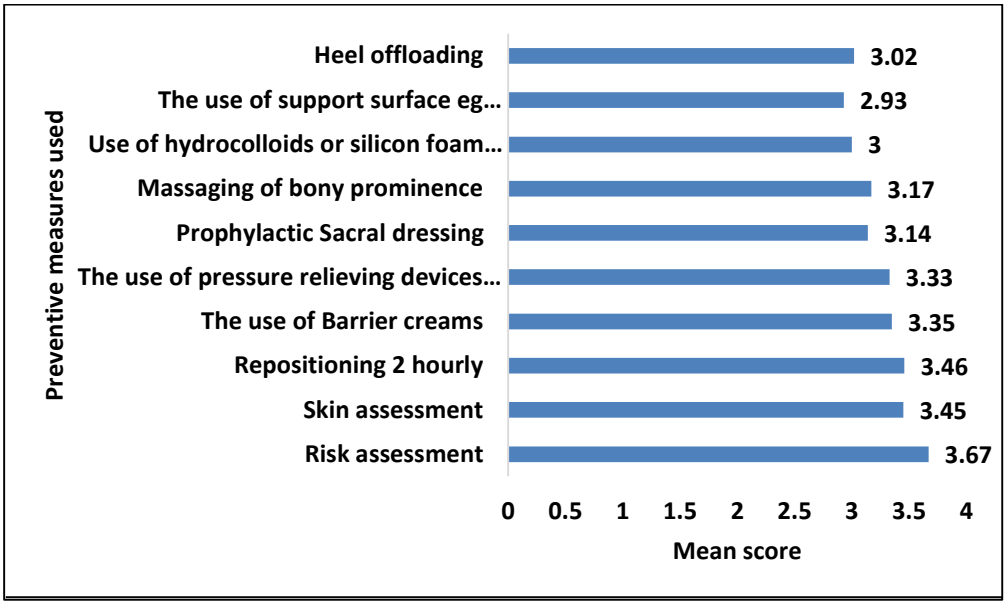

Figure 1:
Mean values of preventive measures used among the nurses

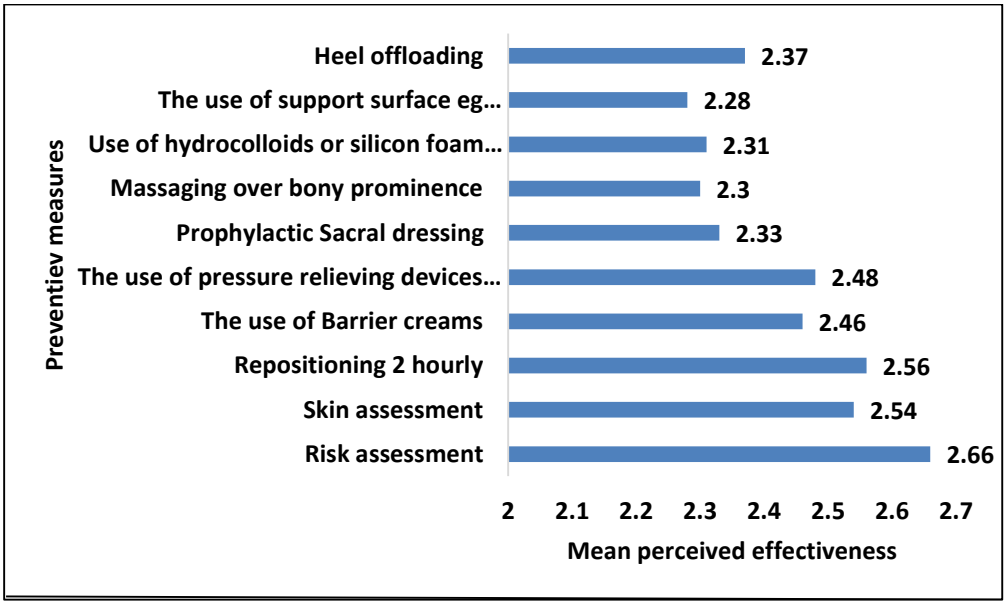

Figure 2:
The mean value of perceived effectiveness of pressure ulcer preventive measures

Figure 1 illustrates that risk assessment had the highest mean of 3.67±0.56, followed by skin repositioning 2 hourly with a standard deviation (St.D) of 3.46±0.71, assessment with St.D of 3.45±0.60, the use of barrier creams with St.D of 3.35±0.71, the use of pressure-relieving devices e.g., Air bed had a mean and St.D of 3.33±0.75, prophylactic sacral dressing had a mean and St.D of 3.14±0.76, massaging of bony prominence with St.D of 3.17±0.86, with the least preventive measures being the 'use of support surface e.g., polyurethane films' with St.D of 2.93±0.90.

Figure 2 shows that the most effective measures as perceived by the respondents are risk assessment with a mean and St. D of 2.66±0.5, followed by repositioning 2 hourly with a mean and St.D of 2.56±0.54, and skin assessment with a mean and St.D of 2.54±0.54. The use of support surface e.g., polyurethane films with a mean and St.D of 2.28±0.7 was considered the least effective measure by the respondents.

Figure 3 displays the mean values of barriers to pressure ulcer preventive measures utilization. One of the major barriers to pressure ulcer preventive measures utilization was limited equipment for the prevention of pressure ulcers with a mean and St. D of 3.31±0.96, followed by a shortage of nurses with a mean and St. D of 3.12±0.77, lack of skill/training on pressure ulcers with a mean and St. D of 3.09±0.85, heavy workload with a mean and St. D of 3.14±0.82, among others.

Discussion

Findings from the study reveal that risk assessment was the most utilized pressure ulcer (PU) preventive measure among the respondents, followed by skin repositioning 2 hourly, use of barrier creams, use of pressure-relieving devices (e.g., Air bed), prophylactic sacral dressing, massaging of bony prominence, with the least utilized being the 'use of support surface (e.g., polyurethane films)'. This differs from the study by Getie *et al*. in eastern Ethiopia, where more than half of the participants (53.6%) always performed routine skin care, and 51.4% and 50.4% of nurses sometimes maintained the head of the bed at or below 30 degrees, except for the use of cream, respectively (25).

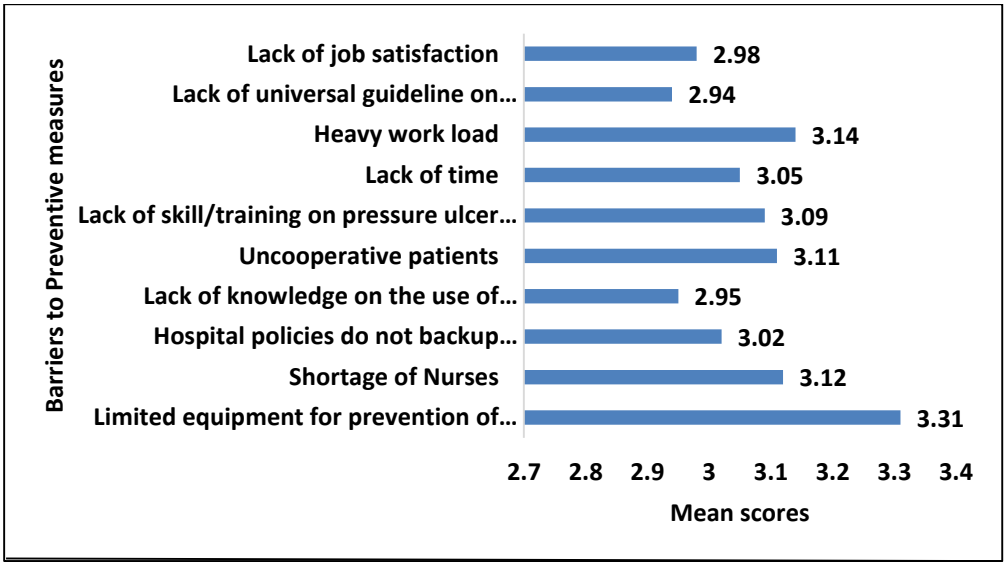

Figure 3:
Barriers to preventive measurers

In contrast to the present study, German hospitals found that repositioning was observed in less than half of the patients (46%), and a turning schedule was used in only one-third of all patients (32%). Pressure-reducing mattresses were not used in more than half (56%) of the patients. However, the current study aligns itself with evidence-based guidelines for PU prevention, emphasizing skin and risk assessment, mandatory nursing interventions, support surface application, heel protection, individualized regular planned repositioning schedules, nutritional support, and skin care (29, 30).

Nevertheless, the present study revealed the practice of massaging pressure areas or bony prominences among nurses. Similar findings were reported in other studies where a significant number of nurses (70.2% and 60%, respectively) consistently massaged pressure areas, which is an outdated practice and against recent recommendations (31, 32). Adequate knowledge of pressure ulcer prevention (PUP) strategies is crucial, as it informs decision-making interventions and ensures the appropriate type of PU preventive intervention. The variation in practices between hospitals or regions may be attributed to differences in admission cases and the availability of specific measures.

Evaluation of the perceived effectiveness of pressure ulcer preventive measures in this study showed that risk assessment is the most effective, followed by repositioning 2 hourly and skin assessment. This aligns with findings by Alison *et al*., who revealed that repositioning was perceived to be the most effective intervention (33). Other studies investigating the efficacy of repositioning and continuous bed pressure mapping also showed positive outcomes in reducing pressure ulcers (34, 35). However, a meta-analysis by Tayyib and Coyer revealed mixed evidence on the effectiveness of various strategies, emphasizing the need for further research (37). A study by Santamaria *et al*. demonstrated the clinical effectiveness of a silicone foam dressing in preventing heel pressure ulcers in critically ill patients (38).

The present study identified major barriers to pressure ulcer preventive measures utilization, including limited equipment, a shortage of nurses, lack of skill/training, and heavy workload. These findings align with studies reporting barriers such as heavy workload, inadequate staff, shortage of resources, lack of guidelines, and lack of knowledge and skill in pressure ulcer assessment and management. The low knowledge among nurses in developing countries, including Nigeria, highlights the need for in-service training, workshops, and clinical practice guidelines to promote evidence-based nursing practices and improve patient outcomes (23, 40, 41, 42, 43).

Limitations of the study

The study adopted a cross-sectional descriptive approach using questionnaires as instruments of data collection therefore the findings were based on the personal judgement and perception of the respondents. An experimental approach which is devoid of personal judgement and perception would have been more objective in considering the effectiveness of the different pressure ulcer preventive measures and finding out the pressure ulcer preventive measures that are most effective. Therefore, further research could be carried out on testing the effectiveness of different pressure ulcer preventive measures used by nurses in hospitals as identified in the present study

Conclusion

This study assessed pressure ulcer preventive measures utilized among Nurses in selected hospitals. This study revealed that the most pressure ulcer preventive measures used among the nurses were risk assessment, followed by skin repositioning 2 hourly, and the use of barrier creams, same measures were also reported as the most effective. However, one of the major barriers to pressure ulcer preventive measures utilization was limited equipment, shortage of nurses, lack of skill/training on pressure ulcer assessment and

prevention lack of universal guidelines and heavy workload.

Recommendations

Given the above conclusion the researchers recommend that regular updates on best practices should be shared among ward staff and new staff nurses to ensure excellent standards are maintained, reducing the theory–practice gap and the time lag between research findings and implementation. In-service training, upgrading courses and ensuring the availability of the necessary facilities and equipment are some of the essential steps to improve nurses' skills and practice as regards the prevention of pressure ulcers. Further research could also be carried out on testing the effect of different pressure ulcer preventive measures used in hospitals as identified in the present study

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