Nurses' Knowledge and Perceived Barriers to Carry out Pressure Ulcer Prevention Measures for Hospitalized Patients

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Abstract

Background: Pressure ulcers, called pressure sores or bedsores, represent a significant medical concern characterized by localized skin and underlying soft tissue damage. **Aim of the study**: to assess nurses' knowledge and perceived barriers to carry out pressure ulcer prevention measures for hospitalized patients . **Design**: A descriptive design **Setting**: The study was conducted at Sohag University Hospital. It encompassed all nurses in medical and surgical departments **Sample**: included all nursing staff (204) nurses who are working in medical and surgical departments. **Tools**: Two tools were used for data collection. Tool (I): Structured Interview Questionnaire sheet: This tool will consist of two parts: Part (I): Demographic data and Part (II): Knowledge assessment tool. Tool (II): Barriers to Carry out Pressure Ulcer Prevention. **Results**: In the study, over half (58.3%) of the nurses surveyed had moderate knowledge about pressure ulcers, while less than one-third (30.9%) had high knowledge and fewer than one-fifth (10.8%) had low knowledge. Additionally, nearly half (46.6%) experienced moderate barriers to implement prevention strategies, with one-third (33.3%) facing high barriers and one-fifth (20.1%) low barriers. **Conclusion:** The study's results indicated that most participants lacked training, and nurses did not recognize the significance of preventing pressure ulcers, heavy workload and inadequate staff, the lack of pressure-relieving materials and equipment in the workplace, with which to treat the injuries, were considered the main barriers to PU prevention. **Recommendations:** Nurses require additional continuing education, refresher courses, and training programs focused on the prevention of pressure ulcers.

Keywords: Knowledge, Perceived barriers, and Measures pressure ulcer prevention.

Introduction

Pressure ulcers, referred to as bedsores or pressure injuries, wounds develop on the skin and underlying tissues over bony areas of the body, including the head, ears, shoulders, elbows, hips, buttocks, knees, ankles, and heels. They occur due to prolonged pressure, moisture, and friction, which hinder blood circulation and diminish oxygen supply to the tissues, resulting in damage and necrosis. Pressure injuries may also lead to serious complications, including a heightened risk of death **(Iyabode et al., 2023)**.

Different factors play a role in forming pressure ulcers (PUs) and pressure injuries (PIs). The main factors include reduced mobility or activity and an increased risk of being subjected to static and dynamic frictional forces. A secondary factor contributing to this issue is a reduced ability to sense, resulting in less mobility or activity since individuals may refrain from moving if they don't feel discomfort. Additionally, nociceptive pain can occur due to damage to cells and tissues. When mobility issues are not present, the chances of developing PUs and PIs are lower; however, injuries related to medical devices may still happen **(Gefen et al., 2022)**.

Categorization of pressure ulcers by grade: Grade I: Characterized by non-blanchable erythema of intact skin. Grade II: Involves partial-thickness skin loss, affecting the epidermis and/or dermis. The ulcer appears as a superficial abrasion or blister. Grade III: Defined by full-thickness skin loss, which includes damage to or necrosis of subcutaneous tissue. This may extend down to, but not through, the underlying fascia. Grade IV: Marked by extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures, with or without full-thickness skin loss **(National Pressure Ulcer Advisory Panel (U.S.) et al. 2014)**.

The lack of knowledge and training has emerged as a fundamental barrier recognized by nurses in the prevention and treatment of pressure ulcers (PUs). The vast majority of interviewees indicated that their understanding of PUs is limited, often describing their knowledge as basic or solely based on personal experience. In addition to staff turnover, nurses identified inadequate staffing levels as a significant obstacle to effective PU prevention. Furthermore, the continuity of care for PUs is challenged by a lack

of consensus among staff and insufficient equipment necessary for their prevention**(Acosta-Hernández et al., 2023)**.

Effective incontinence management is vital to prevent skin impairment. This includes thorough cleansing, enhancing the skin's moisture barrier, regular repositioning, and protective strategies. Accurate assessment of pressure ulcers tailored to individual needs, along with education on skincare and risk assessment, is essential. Nurses play a critical role in prevention and must be knowledgeable about the signs, symptoms, and effective preventive measures for pressure ulcers**(Muhammed et al., 2020)**.

Nursing staff, along with other healthcare providers, play a crucial role in the prevention of pressure ulcers (PUs). The knowledge possessed by nursing staff is a significant factor in implementing evidence-based and effective PU prevention strategies. However, current research regarding the various factors influencing nursing staff's knowledge about PU prevention remains limited, Additionally, there is still a lack of clarity regarding which types of PU prevention training would be most beneficial for nurses. Consequently, more comprehensive information is needed to strengthen the existing evidence and enhance nurses' knowledge in this critical area **(Parisod et al., 2022)** .

Significance of the study

Pressure ulcers pose a significant challenge in healthcare, affecting up to 50% of patients in hospital environments. Effectively addressing this issue is essential for enhancing patient outcomes and overall healthcare quality (**Hultin et al., 2022)** . The prevalence of pressure ulcers varies widely, ranging from 0.4% to 38.0% in major hospitals, 2.2% to 23.9% in long-term care facilities, and 0% to 17% in home care settings. Notably, intensive care units exhibit a particularly high incidence at 9.4%, followed by orthopedic units at 8.0%, emergency departments at 7.7%, and neurosurgical units at 6.0% **(Li et al., 2020).**

Pressure ulcers are globally acknowledged as one of the five most prevalent causes of patient harm. Millions are affected around the world, yet the national pooled prevalence of pressure ulcers in Egypt remains largely unrecorded. This absence of data exposes a critical gap in understanding the extent of this issue within the Egyptian context, emphasizing the necessity for targeted research and intervention strategies to address the prevalence and impact of pressure ulcers in the country**(Shiferaw et al., 2020)** .

So, this study hoped to identify barriers to carry out pressure ulcer prevention measures for hospitalized patients.

Operational Definitions

The following operational definitions were used in this study:

Knowledge

It is an indicator of the quality of nursing care, and nurses can prevent PUs well if they have sufficient knowledge **(Gbadamosi et al., 2023)**.

Prevention Measures

Refers to the plans for, and the measures taken, to prevent the onset of pressure ulcers or other health problems before the occurrence of the undesirable health event **(Liu et al., 2023)**.

Aim of the Study

This study aimed to assess nurses' knowledge and perceived barriers to carry out pressure ulcer prevention measures for hospitalized patients**.**

Research Questions

1. What are the nurses' knowledge levels about preventing pressure ulcers?
2. What are the perceived barriers of the nurses regarding preventing pressure ulcers?

Research design

A descriptive research design was utilized in the study to investigate nurses' knowledge and perceived barriers to carry out pressure ulcer prevention measures for hospitalized patients**.**

Setting

The study was carried out at Sohag University Hospital and included all nurses from the medical and surgical departments (N=12 units). This encompassed various medical departments, including general medical, intermediate intensive care, and tropical units, as well as surgical departments such as general surgical, orthopedics, urology, plastic, and burn units. Additionally, critical care departments such as the ICU, CCU, stroke care unit, and trauma unit.

Sample

The study sample comprised a total of 204 professional nurses employed in medical and surgical departments, as previously delineated. Participants were selected based on specific inclusion criteria, which encompassed individuals of both genders, representing a diverse range of ages, educational backgrounds, and years of professional

experience. Additionally, all participants expressed a willingness to engage in the study.

Duration of data collection

Data was collected from medical and surgical departments at Sohag University Hospital. The data collection procedure was begun from June 2023 to December 2023.

Inclusion criteria

Both genders, with different age, educational levels, and years of experience, and willing to participate in the study.

Tools for Data Collection

Two tools were used for data collection.

Tool (I): Structured Interview Questionnaire sheet: This tool consisted of two parts:

Part (I): Demographic data: This part was used to identify information about nurses such as gender, age, years of experience, level of education, and previous training in pressure ulcers.

Part (II): Nurses' Knowledge assessment sheet:

This tool was developed by **(Islam, 2010)** and was modified by the researcher to easy understanding to assess the level of nurses' knowledge regarding pressure ulcer prevention. It was composed of 22-item multiple choice questions (MCQ) which had been modified and developed from the Pressure Ulcer Prevention Guideline. Knowledge elements included factors related to pressure ulcer development, risk assessment, skin care, nutrition to maintain healthy skin, management of mechanical loads, and best educational activity that enhances the competency of staff nurses in preventing pressure ulcers.

Scoring system: This tool scored "1" for the correct answer and "0" for the incorrect answer. The total score ranged from 0-22 and it was then converted into a percentage.

The total knowledge score was classified as the following: -

- High knowledge: >75%
- Moderate knowledge: 50 - 75%
- Low knowledge: < 50%

Tool (II): Perceived Barriers to Carry out Pressure Ulcer Prevention Questionnaire

This tool was developed by (**Moore & Price, 2004; Källman & Suserud, 2009; Tubaishat et al., 2013).** To assess the constraints or barriers that influence nursing staff to carry out pressure ulcer prevention such as lack of knowledge and training, shortage of staff to assist with carrying out pressure ulcer prevention, and lack of assistive devices, it contains (11items) of closed-ended questions ('Yes' or 'No' response)

Scoring system: The scoring system for barriers to carry out pressure ulcer prevention was calculated as: 1 if the answer (Yes) and zero if the answer (No). The validity of their tools was assessed to check the relevance coverage and clarity of the questions by the jury of experts in (Critical, Geriatric, and Medical-Surgical) departments as all the tools.

The total barriers score was classified as the following: -

- High barriers: >75%
- Moderate barriers: 50 - 75%
- Low barriers: <50%

Data collection procedure: It included two phases:

Planning and Preparation phase

Content validity

Content validity was established by three experts from Sohag University specializing in Critical, Geriatric, and Medical-Surgical Nursing. They were asked to evaluate the knowledge questionnaire and the barriers to implementing pressure ulcer prevention measures for hospitalized patients, focusing on clarity, relevance, comprehensiveness, understanding, and applicability.

Tool reliability

Reliability for the tool of knowledge questionnaire tested statistically using Cronbach's Alpha 0.923, and reliability was for the tool of barriers questionnaire tested statistically using Cronbach's Alpha 0.875**.**

Pilot study

In June 2023, a pilot study was conducted involving 10% of the study sample, equating to 20 participants. This pilot study aimed to evaluate the feasibility, objectivity, applicability, and clarity of the study tools, as well as to ascertain the time required for participants to complete the questionnaire. Following the pilot study, no modifications were made to the tools, and thus the 20 nurses who participated were included in the overall study sample.

Ethical considerations

- ❖ The research proposal was approved by the Research Ethics Committee of the Faculty of Nursing, Sohag University.
- ❖ An official permission was taken from hospital administrators to conduct the study.
- ❖ Written consent was obtained from nurses included in the study.

- ❖ The purpose and nature of the study as well as the importance was explained to the participants who met the inclusion criteria.
- ❖ Anonymity and confidentiality were assured.
- ❖ Participants were assured that participants in this study were voluntary and they had the right to withdraw from the study at any time without any rationale.
- ❖ Study sample privacy was considered during data collection.
- ❖ No risk for participants.

Data collection phase

Interviewing phase

At the beginning of the interview, the researcher greeted the nurses, introduced herself, explained the purpose of the study provided the nurses with all information about the study, and took oral consent to participate in the study. Data was collected by the researcher through the distribution of a self-administered questionnaire **(Tool no. I part I)**. The time needed to complete the questionnaire was (5 – 10 minutes).

Assessment phase

The researcher assessed nurses' knowledge regarding Pressure ulcers by using **(Tool no. I part II). It** took (15 – 30 minutes). Also, the researcher assessed barriers that influence nursing staff to carry out pressure ulcers by using **(Tool no. II)**. It took (15 – 30 minutes).

Administrative design

Before conducting the study, an official permission was taken from the Dean of the Faculty of Nursing-Sohag University to the director of Sohag University Hospitals and the director of medical -surgical department, in order to obtain approval to conduct the study after explanation the title and purpose of the study.

Statistical design

The collected data were organized, coded, computerized, tabulated, and analyzed by using the Statistical Package for Social Science (SPSS) program version 27. Data were presented using descriptive statistics in the form of frequencies and percentages for categorical data: the arithmetic mean (X) and standard deviation (SD) for quantitative data. While the qualitative variables were compared using the Chi-Square test (X^2), which was used for relation tests, and the person correlation coefficient (r) was used for correlation analysis.

Obstacles and limitations of the study

- Sometimes interviewing and assessment for nurses were postponed as many nurses were most of the time busy with patients during data collection
- The main limitation was using a self-report questionnaire to examine nurses' knowledge and barriers. The responses might not reflect actual nursing knowledge and barriers

Results

Table (1): Revealed that two-thirds of the nurses surveyed were female. Three-quarters of them were aged between 21 and 29 years old, and more than half held a degree from a Nursing Institute. Additionally, less than half were married and worked in the intensive care unit. Two-thirds had 1 to 5 years of experience. And the majority of nurses not participated in any previous training courses related to pressure ulcers.

Table (2): The majority of the nurses studied demonstrated a correct understanding of the "meaning of pressure ulcers." Additionally, over three-quarters correctly identified that "nursing care is a significant activity for preventing skin damage" and understood the "causes of pressure ulcer formation." However, two-thirds of the respondents provided incorrect answers regarding the "signs of stage II pressure ulcers," the "primary predictors for the development of pressure ulcers," and "appropriate laboratory tests for the nutritional assessment of pressure ulcer patients."

Table (3): The majority of the nurses surveyed indicated that barriers to effective pressure ulcer (PU) prevention include "heavy workloads and inadequate staffing," "insufficient training on pressure ulcer prevention," and "limited access to literature and reading resources." Conversely, less than half of the respondents disagreed with the statements regarding "lack of job satisfaction in the nursing profession" and "lack of cooperation among staff nurses."

Table (4) illustrates a statistically significant difference in the total knowledge levels of the studied nurses regarding pressure ulcers based on their age, educational background, years of experience, and previous training courses on pressure ulcers, with p-values of .045, .007, .036, and 0.05, respectively.

Table (5) indicates a statistically significant difference in the barriers faced by the studied nurses in implementing pressure ulcer prevention measures, correlated with their marital status, departmental affiliation, and previous training courses in this area, with p-values of .013, .002, and .045, respectively.

Table (6) demonstrates a strong statistically significant negative correlation between the knowledge of the studied nurses on pressure ulcers and the barriers to effective PU prevention, with a p-value of -0.000

Figure (1): Shows that more than half of the studied nurses had moderate knowledge level regarding pressure ulcer. While less than a third of them had a high knowledge level regarding pressure ulcers and less than one-fifth of them had a low knowledge level regarding pressure ulcers.

Results

Table (1): Distribution of the studied nurse's demographic data (n=204)

Demographic data	No	%
Gender		
Male	68	33.3
Female	136	66.7
Age		
< 20 Years	6	2.9
21-29	155	76.0
30-39	42	20.6
>40	1	0.5
Educational level		
Diploma	33	16.2
Nursing Institute	115	56.4
Bachelor	56	27.5
Marital status		
Married	95	46.6
Single	108	52.9
Divorce	1	0.5
Years of experiences		
<1 year	3	1.5
1-5 years	136	66.7
6:10 years	37	18.1
>10 years	28	13.7
Department		
Medical Departments	51	25.0
Surgical Departments	38	18.6
Trauma Departments	18	8.8
Intensive care Departments	97	47.5
Previous training courses about pressure ulcer		
No	166	81.4
Yes	38	18.6

Table (2): Distribution of the studied nurse's knowledge regarding pressure ulcer (n=204)

nurse's knowledge regarding pressure ulcer	Correct		Incorrect	
	No	%	No	%
Meaning of the pressure ulcer	179	87.7	25	12.3
Causes of pressure ulcer formation	160	78.4	44	21.6
Classifications of pressure ulcers	159	77.9	45	22.1
Risk factor for pressure ulcer formation with patient bedridden	158	77.5	46	22.5
Complications of pressure ulcer	150	73.5	54	26.5
Element is the primary predictor for development of pressure ulcer	64	31.4	140	68.6
assessment procedure do you use to assess pressure ulcer development in patients	152	74.5	52	25.5
Locations of pressure ulcers	136	66.7	68	33.3
First sign for pressure ulcer development	137	67.2	67	32.8
Sign of stage II pressure ulcer	62	30.4	142	69.6
Sign of stage III pressure ulcer	149	73.0	55	27.0
An appropriate method for assessing an individual who is at risk for pressure ulcer development	86	42.2	118	57.8
An appropriate method for skin care	110	53.9	94	46.1
Nursing care is significant activity for protecting skin damage	161	78.9	43	21.1
Nursing care activity is appropriate for preventing pressure ulcer for man having a stroke with hemiplegic	92	45.1	112	54.9
Nursing care is a correct practice for maintaining skin integrity	98	48.0	106	54.0
prevent heel ulcer	123	60.3	81	39.7
Nutrient needs to prevent pressure ulcer among bedridden patients	96	47.1	108	52.9
An appropriate lab test for nutritional assessment of pressure ulcer patient	74	36.3	130	63.7
An appropriate nursing care for managing pressure ulcer	172	84.3	32	15.7
Appropriate activity to reduce friction for patient having Pelvic fracture	140	68.6	64	31.4
Educational activity that enhances competency of staff nurses in preventing pressure ulcer	90	44.1	114	55.9

Figure (1): Percentage distribution for total knowledge score level regarding pressure ulcer among the studied nurses (n=204)

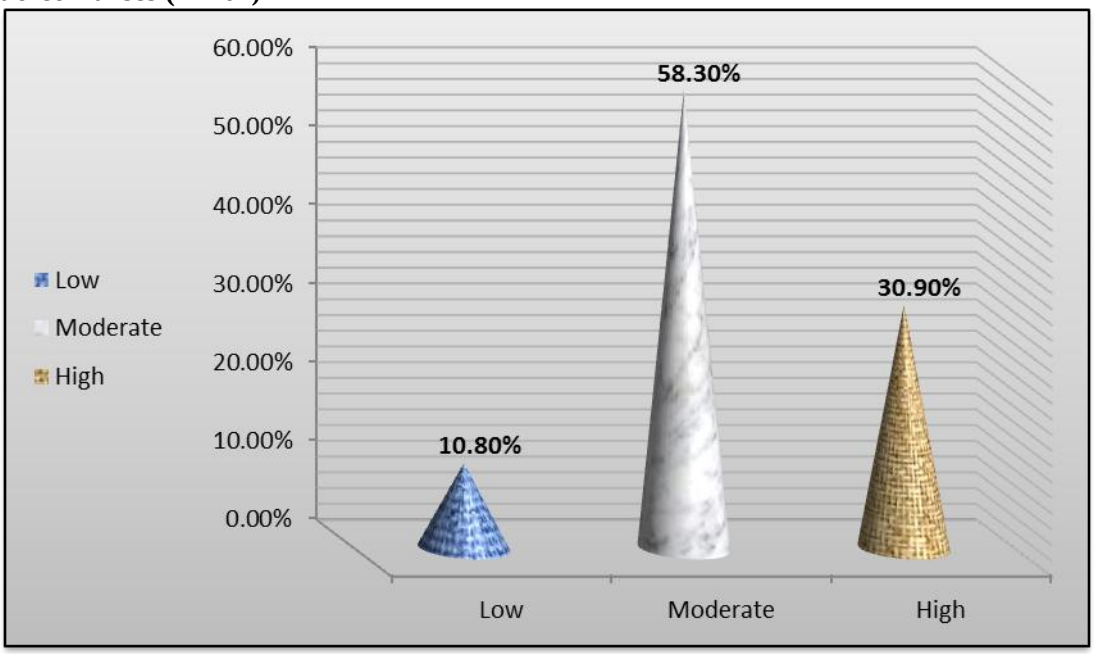

Table (3): Distribution of the barriers to carry out PU Prevention among the studied nurses (n=204)

Perceived Barriers	Yes		No	
	No	%	No	%
1. Poor access to literature and reading facilities	162	79.4	42	20.6
2. Heavy workload and inadequate staff	178	87.3	26	12.7
3. Lack of written protocol line on prevention of pressure ulcer	155	76.0	49	24.0
4. Inadequate training coverage of pressure ulcer prevention	167	81.9	37	18.1
5. Uncooperative patients	124	60.8	80	39.2
6. Lack of job satisfaction in nursing profession	107	52.5	97	47.5
7. Presence of other priorities than pressure ulcer	123	60.3	81	39.7
8. Shortage of resources (equipment/resource)	144	70.6	60	29.4
9. Inadequate knowledge about pressure ulcer among nurses	143	70.1	61	29.9
10. Lack of cooperation among staff nurses	105	51.5	99	48.5
11. I don't have any challenge	125	61.3	79	38.7

Table (4): Relation between the studied nurses' knowledge regarding pressure ulcer and their demographic data (n=204)

Demographic data	Knowledge						X^2	P – value
	High (n=63)		Moderate (n=119)		Low (n=22)			
	No	%	No	%	No	%		
Gender								
Male	27	13.2	34	16.7	7	3.4	3.808	.149
Female	36	17.6	85	41.7	15	7.4		
Age								
< 20 Years	2	1.0	3	1.5	1	0.5	5.810	.045*
21-29	52	25.5	87	42.6	16	7.8		
30-39	8	3.9	29	14.2	5	2.5		
>40	1	0.5	0	0.0	0	0.0		
Educational level								
Diploma	9	4.4	20	9.8	4	2.0	1.609	.007*
Nursing Institute	38	18.6	67	32.8	10	4.9		
Bachelor	16	7.8	32	15.7	8	3.9		
Marital status								
Married	21	10.3	60	29.4	14	6.9	8.620	.071
Single	42	20.6	58	28.4	8	3.9		
Divorce	0	0.0	1	0.5	0	0.0		
Years of experiences								
<1 year	1	0.5	2	1.0	0	0.0	6.834	.036*
1-5 years	49	24.0	72	35.3	15	7.4		
6:10 years	9	4.4	24	11.8	4	2.0		
>10 years	4	2.0	21	10.3	3	1.5		
Department								
Medical Departments	13	6.4	33	16.2	5	2.5	10.105	.120
Surgical Departments	18	8.8	19	9.3	1	0.5		
Trauma Departments	7	3.4	8	3.9	3	1.5		
Intensive care Departments	25	12.3	59	28.9	13	6.4		
Previous training courses about on pressure ulcer								
No	52	25.5	100	49.0	14	6.9	5.178	.005*
Yes	11	5.4	19	9.3	8	3.9		

* Statistically significant at p<0.05

Table (5): Relation between the studied nurses' barriers to carrying out PU prevention and their demographic data (n=204)

Demographic data	Barriers to carrying out PU prevention						X^2	P –value
	High (n=68)		Moderate (n=95)		Low (n=41)			
	No	%	No	%	No	%		
Gender								
Male	24	11.8	31	15.2	13	6.4	.187	.911
Female	44	21.6	64	31.4	28	13.7		
Age								
<20 Years	3	1.5	1	0.5	2	1.0	6.968	.324
21-29	46	22.5	77	37.7	32	15.7		
30-39	19	9.3	16	7.8	7	3.4		
>40	0	0.0	1	0.5	0	0.0		
Educational level								
Diploma	11	5.4	17	8.3	5	2.5	2.808	.590
Nursing Institute	115	20.1	48	23.5	26	12.7		
Bachelor	56	7.8	30	14.7	10	4.9		
Marital status								
Married	27	13.2	41	20.1	27	13.2	12.634[a]	.013*
Single	41	20.1	54	26.5	13	6.4		
Divorce	0	0.0	0	0.0	1	0.5		
Years of experiences								
<1 year	3	1.5	0	0.0	0	0.0	11.571	.072
1-5 years	39	19.1	70	34.3	27	13.2		
6:10 years	17	8.3	14	6.9	6	2.9		
>10 years	9	4.4	11	5.4	8	3.9		
Department								
Medical Departments	22	10.8	22	10.8	7	3.4	20.511	.002*
Surgical Departments	21	10.3	10	4.9	7	3.4		
Trauma Departments	5	2.5	11	5.4	2	1.0		
Intensive care Departments	20	9.8	52	25.5	25	12.3		
Previous training courses about on pressure ulcer								
No	56	27.5	82	40.2	28	13.7	6.202	.045*
Yes	12	5.9	13	6.4	13	6.4		

(*) Statistically significant at p<0.05

Table (6): Correlation between the studied nurses' knowledge regarding pressure ulcer and the barriers to carrying out PU prevention (n=204)

Variables	Total barriers to carry out PU prevention	
Total knowledge	**R**	**p-value**
	.259**	-.000

(**) highly statistically significant at p<0.01

Discussion

Pressure ulcers, commonly referred to as bedsores, are a persistent concern within healthcare settings. They are typically encountered in individuals with limited mobility and arise from prolonged pressure on specific areas of the skin due to body weight **(Malek Hosseini et al., 2024)**

The discussion highlighted the main findings as follows: According to the results of the present study, two-thirds of the participants were female. These findings align with those of a study conducted by (**Kathaliya Balram, 2024**) .Additionally, another study conducted by (**Al-khazali, 2023**) investigated that the relationship between gender and nurses' knowledge of pressure ulcer prevention reported similar results, indicating that two-thirds of their participants were female.

Regarding the level of education, the current study shows that more than half of the sample had a nursing Institute followed by a bachelor, less than half of them had information about pressure ulcer prevention measures and the majority of them hadn't Previous training courses about pressure ulcer, these findings are consistent with a study done by (**Wu et al., 2022)** who found that the majority of them hadn't Previous training courses about pressure ulcer and more than of them had a nursing Institute followed by a bachelor.

Regarding the distribution of the study sample for total knowledge about pressure ulcers. The present study results showed that based on the knowledge score more than half of the study had moderate knowledge levels regarding pressure ulcers. While less than a third of them had a high knowledge level regarding pressure ulcers and less than one-fifth of them had a low knowledge level regarding pressure ulcers. Similarly, this result agreed with a study done by **(Liang., et al. 2024)** who reported that highlighted significant disparities. A large segment exhibited only average knowledge. However, less than the third demonstrated good knowledge. Notably, only a very small number, displayed poor knowledge, which suggests a critical need for targeted educational interventions to enhance their competency in pressure ulcer management.

Concerning the assessment of the study sample's knowledge about pressure ulcers, the current findings indicate that item analysis supports this interpretation. The majority of the surveyed nurses demonstrated a correct understanding of the "meaning of pressure ulcer," while over three-quarters accurately recognized that "nursing care is a vital measure for preventing skin damage" and identified "the causes of pressure ulcer development." This outcome is consistent with a study conducted by (**Guerrero et al., 2023)** which revealed that most respondents possessed a strong understanding of pressure ulcer (PU) prevention in terms of etiology and classification. Furthermore, research by (**Saleh et al., 2019**) similarly showed that a significant proportion of staff nurses exhibited good knowledge regarding pressure ulcers. In contrast, findings from **(Nóbrega et al., 2023)** indicated that the highest percentage of errors occurred in questions related to the assessment and classification of pressure ulcers.

As regards presence the of barriers to carrying out PU prevention among the studied nurses. The present study results showed more than the majority of the studied nurses agree that the presence of barriers to carrying out PU prevention in " heavy workload and inadequate staff", "inadequate training coverage of pressure ulcer prevention" and " poor access to literature and reading facilities" respectively, while more than two-fifth of them disagree about "lack of job satisfaction in the nursing profession" and "Lack of cooperation among staff nurses" respectively. This result agreed with a study done by (**Etafa et al., 2018**) showed that the majority of them had reported different challenges. The most frequently cited barriers were heavy workload and inadequate staff, shortage of pressure-relieving devices (inadequate equipment and devices), and inadequate training about PU prevention.

In a comparable study by (**Azhar et al., 2022**) it was observed that there is a shortage of staff and equipment for the prevention of pressure ulcers. Conversely, the findings of this study are consistent with several recent research efforts in Africa that identify barriers to effective pressure ulcer prevention (**Saleh et al., 2019**).

Concerning the relationship between demographic factors and knowledge, this finding reveals a statistically significant difference between the overall knowledge levels of the studied nurses regarding pressure ulcers and their age, educational attainment, years of experience, and prior training in pressure ulcer management. This result is consistent with (**Halász et al., 2021**) which identified statistically significant differences in knowledge based on nurses' age and years of experience. However, it stands in contrast to other research conducted by (**Abd-Alameer & Kadhim., 2023)** and **(Alshahrani et al., 2023)** that found no statistically significant association between nurses' knowledge and their demographic characteristics, including age, gender, educational level, and experience in pressure ulcer prevention.

Concerning the relation between demographic data and barriers, the present study reveals a statistically significant difference in the barriers encountered by nurses regarding the implementation of pressure ulcer (PU) prevention, specifically influenced by their marital status, department, and prior training on pressure ulcers. From the researcher's perspective, this

can be attributed to the absence of hospital policies and guidelines on pressure ulcer prevention principles, as well as the fact that many nurses have not received any relevant training. Furthermore, a substantial number of the nurses were recent graduates. This finding contrasts with the study conducted by (**Abd-Alameer & Kadhim., 2023)** which reported no statistically significant association between nurses' barriers and their demographic characteristics, such as years of experience in pressure ulcer prevention and the existence of specific guidelines on the subject.

Concerning the relationship between nurses' knowledge of pressure ulcers and the barriers to implement prevention measures, a strong statistically significant negative correlation was found (P=-.000). This finding disagreed with the study (**Batiha., 2018**) who reports that indicated no correlation between knowledge and barriers to pressure ulcer prevention. But, a study conducted by (**Etafa et al., 2018)** revealed a negative correlation between barriers and knowledge associated with pressure ulcers.

From researcher's point of view, this is due to a sum of causes as not have enough information about pressure ulcers, hadn't not received any training about pressure ulcer preventive measures, there weren't enough nursing staff to help them while repositioning patients, hadn't enough equipment to help me with preventing of pressure ulcer.

Also, their heavy workload, shortage of equipment, and lack of adequate staff were the most reported barriers to PUP. This result matched with study done by **(Berihu et al., 2020)** revealed that the majority of the studied nurses had barriers such as lack of equipment, and insufficient staffing to carry out pressure ulcer prevention.

Providing regular health education and sustainable training on the prevention of PU for the health care provider is considered as a determinant component of pressure ulcer prevention possible to provide good nursing process to patients who are admitted in hospital. Qualities of care in a particular patient is maintained by the application of good nursing process and it prevents the incidence of PU. Knowledge and attitude of nurses have a significant effect on the type of nursing process and patient outcome intervention**(Gedamu et al., 2021).**

Conclusion

Based on the findings of the current study, it can be concluded that

The majority of the sample lacked training and nurses do not fully understand the importance of preventing pressure ulcers, despite being aware of their dangers. Additionally, some nurses remain indifferent to pressure ulcer care. Heavy workload and inadequate staff, the lack of pressure-relieving materials and equipment in the workplace, with which to treat the injuries, were considered the main barriers to PU prevention. This lack could be a result of the fact that restricted use of sufficient equipment and pressure-relieving materials may restrict the nurses' ability and motivation to prevent PU development.

Recommendations

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

1. The development an in-service training and refresher courses dedicated to pressure ulcer prevention is essential for nursing staff. These programs will equip nurses with updated knowledge, improving their understanding and application of pressure ulcer prevention strategies in their practice.
2. It is crucial to implement hospital policies and guidelines that enhance nurses' knowledge and awareness regarding pressure ulcer prevention. The hospital should be provided with specialized equipment like riser recliner chairs, profiling beds, and tilt-in-space wheelchairs to prevent pressure ulcers in low-mobility patients.
3. A repositioning procedure for pressure ulcer prevention should be delegated to students and practical nurses to overcome the barriers of heavy workload and inadequate staff.
4. Replication of the study on a large sample from different geographical settings in Egypt is recommended to obtain more evidential findings and more generalizable results on this point.

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