ISSN 0971-9032
Curr Pediatr Res2023; 27 (01): 1770-1779 www.currentpediatrics.com

Assessment of nurses' performance regarding decubitus ulcer prevention for hospitalized children.

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Received: *26 December, 2022, Manuscript No. AAJCP-23-85821;* **Editor assigned:** *28 December, 2022, Pre QC No. AAJCP-23-85821(PQ);* **Reviewed:** *11 January, 2023, QC No. AAJCP-23-85821;* **Revised:** *18 January, 2023, Manuscript No. AAJCP-23-85821(R);* **Published:** *25 January, 2023, DOI:10.35841/0971-9032.27.01.1770-1779.*

Abstract

Background: Decubitus ulcer is a common and highly pertinent professional care issue in hospitals associated with physical and psychological suffering, increased morbidity and mortality rate and higher costs for health care institution worldwide.

Aim: This study aimed to assess nurses' performance regarding decubitus ulcer prevention for hospitalized children.

Methodology: Design: A descriptive research design was used to achieve the aim of this study. Setting: This study was conducted at the pediatric intensive care unit affiliated to Beni-Suef university hospital. Sample: A purposive sample of 50 nurses was included in the study.

Tools: Two tools were used to collect the data: The 1st tool: A structured knowledge questionnaire sheet, to assess nurses' knowledge regarding decubitus ulcer. The 2nd tool: Observational checklist format, to assess nurses' practices regarding decubitus ulcer prevention.

Results: The study findings showed that, 82% of the studied nurses had unsatisfactory level of total knowledge. Also, 96% of the studied nurses had incompetent level of total practices.

Conclusion: In the light of the study findings, it can be concluded that, more than four fifth of the studied nurses had unsatisfactory level of total knowledge regarding decubitus ulcer and the most of them had incompetent level of total practices regarding decubitus ulcer prevention for hospitalized children. Meanwhile, there was a statistically significant relation between nurses' total level of knowledge and their age and previous attendance of training courses about decubitus ulcer. In addition, there was a statistically significant relation between nurses' total level of practices and their age, education, years of experience and previous attendance of training courses about decubitus ulcer. Also, there was a statistically significant positive correlation between nurses' total level of knowledge and their total level of practices.

Recommendations: Periodic educational programs for nurses in relation to decubitus ulcer prevention are necessary to improve their performance regarding decubitus ulcer prevention for hospitalized children.

Keywords: Nurses' performance, Decubitus ulcer, Hospitalized children.

Accepted on 18th January, 2023

Introduction

Decubitus ulcer, also known as Pressure Ulcer (PU), pressure sore and bed sore, now referred to as Pressure Injury (PI), is a localized injury to the skin and/or underlying soft tissue that usually occurs over a bony prominence as a result of pressure or pressure in combination with friction; the injury can present as intact skin or an open wound [1].

Decubitus ulcer is a significant and highly relevant professional care problem in hospitals and associated with physical and psychological suffering, increased morbidity and mortality rate and higher costs for health care worldwide. The impact of decubitus ulcers on quality of life is significant, as normal activities may be restricted because of pain and treatments. Costs associated with chronic wound care can substantially increase the burden on the health care system [2].

A great deal of attention is given for decubitus ulcer, it is a widely reached topic in the adult population, but emerging research has shown that this is a concern in the pediatric population as well. There is greater awareness that pediatric patients in certain health care settings at high risk of developing decubitus ulcer. It occurs as a consequence of unrelieved pressure that has resulted in damage to underlying tissue. It has most often been found in different anatomic areas as the occiput, sacrum, buttocks, heels, ankles, and scapula [3].

There are different types of forces other than pure pressure cause decubitus ulcer such as shear and friction forces that

cause a local breakdown of soft tissue as a result of compression between a bony prominence and an external surface. Children are at risk for forming and worsening of decubitus ulcers by remaining in a recumbent position for a period without moving. Essentially, blood circulation to an area is restricted by the pressure exerted on the tissue, usually located between a bone and the surface of a bed. After an extended amount of time with decreased tissue perfusion, ischemia occurs and can lead to tissue necrosis if left untreated [4].

Risk factors associated with the development of decubitus ulcers include intrinsic and extrinsic risk factors. Intrinsic risk factors such as immobility, malnutrition, infection, vasoactive medication, sensory perception loss, and poor tissue perfusion. While extrinsic risk factors include excessive pressure, friction, shearing forces and skin moisture [5].

According to the National Pressure Ulcer Advisory Panel (NPUAP), decubitus ulcer develops in four stages. In the first stage, skin is intact with the presence of non-blanchable erythema and may be itchy. The second stage, there is partial loss of skin thickness involving the epidermis and dermis, in this stage the wound bed is viable, pink or red, moist, and may also present as an intact or ruptured serum filled blister. The third stage, there is a full loss of skin thickness in which adipose is visible in the ulcer but not crossing the fascia beneath it and the lesion may be foul smelling. In addition, at the fourth stage, there is a full loss of skin thickness extending through the fascia with considerable tissue loss and the muscles, bones, tendons, or joints may be visible [6].

Many hospitalized children are suffering from decubitus ulcers especially in Pediatric Intensive Care Units (PICUs). The management of decubitus ulcer is more difficult than prevention because once the ulcer is occurred may extend from pain and suffering to end of life. Decubitus ulcer is believed to be preventable if appropriate care measures are early implemented to maintain skin integrity [7].

Prevention of decubitus ulcers is multifaceted and requires skills, knowledge and consistency in nursing practice. Risk assessment, skin assessment, repositioning and pressure relief are integral components of effective prevention of decubitus ulcers in children. The Preventive measures should meet the individual needs of each child [8].

The appropriate measures that can be taken to at risk children focus on two cardinal principles: Active movement and passive pressure reduction through frequent position changing. Furthermore, malnutrition, impaired perfusion and any underlying diseases that restrict mobility should be addressed with suitable therapy and associated symptoms such as pain should be treated [9].

Pediatric nurse has a pivotal role in preventing decubitus ulcer through applying the effective preventive measures such as, padding, regular repositioning, appropriate fixation of medical devices attached to children, nutritional support and use of skin moisturizers along with regular full skin assessment, in addition, the use of pressure relieving devices such as specialized mattresses, dressing over bony prominences and management of the risk factors as poor skin condition and poor nutritional status [10].

Significance of the study

Globally, the number of prevalent cases of decubitus ulcers in 2019 is 0.85 million case. Internationally, the prevalence rates of decubitus ulcer in the United States reported to be 10.2% to 32%, while the incidence rate reported to be 0.8% to 27% in PICUs. In Middle East a prevalence rate of 6.6% was recorded in Jordan, while the incidence rate among pediatric patients reported to be 13.1% in Saudi Arabia [11].

Children admitted to PICUs are a higher risk for developing decubitus ulcer than children admitted to general care units. The International Pressure Ulcer Prevalence Survey (IPUPS) indicated that hospital acquired decubitus ulcer prevalence rates were highest (12.1%) in the PICUs. There is an association between decubitus ulcer and increased morbidity and mortality rate. In addition, the decubitus ulcer can lead to serious infectious complications such as, bacteremia and sepsis. As a result, decubitus ulcer is an important health problem for children in PICUs [12-14].

From the researcher's point of view, lack of knowledge and practice regarding prevention of decubitus ulcers can lead to increased incidence and complication of decubitus ulcers which can lead to end of life of the children. Hence, the researcher found that is urgent to conduct this study to shed light on the assessment of nursing performance regarding decubitus ulcer prevention for hospitalized children.

Aim of the study

This study aimed to assess nurses' performance regarding decubitus ulcer prevention for hospitalized children.

Research questions

- What are the levels of nurses' knowledge regarding decubitus ulcer prevention for hospitalized children?
- What are the levels of nurses' practices regarding decubitus ulcer prevention for hospitalized children?
- Are there relations between nurses' performance and their characteristics?

Methodology

Technical design

The technical design for the study included research design, research setting, subjects and tools for data collection.

Research design

A descriptive research design was used to achieve the aim of the study.

Research setting

This study was conducted at the pediatric intensive care unit affiliated to Beni-Suef university hospital. The pediatric intensive care unit is at the fifth floor of the medical building of the hospital, consists of three rooms containing sixteen bed, eight mechanical ventilators, sixteen monitors. It receives children aged from one month up to 18 years old with serious and long-term diseases.

Research subject

A purposive sample was used to achieve the aim of this study. The study sample consisted of fifty nurses working at the previous mentioned setting and deal with children at risk for developing decubitus ulcer. Nurses have been selected according to the following inclusion criteria:

- Both sexes.
- Age more than 20 years.
- All registered nurses regardless their educational level.
- Nurses who are working at PICU from one year.
- Exclude the internship students.

Tools for data collection

Two tools were used in this study and were adapted and modified by the researcher after reviewing the related literature.

First tool: Structured knowledge questionnaire: The questionnaire was based on up dated review of related literature. It was adapted from Hassona, et al. [13,15] and it was written in a simple Arabic language. It consists of the following parts.

Part I: Socio demographic characteristics of the studied nurses: This part includes data about nurses' age, gender, marital status, and level of education, years of experience, and their attendance of previous training courses regarding decubitus ulcer (Q1-Q6).

Part II: Nurses' knowledge regarding decubitus ulcer prevention: This part concerned with nurses' knowledge regarding decubitus ulcer prevention such as; definition, causes, classifications of decubitus ulcer, sits of decubitus ulcer, risk factors of decubitus ulcer, time of assessment of decubitus ulcer, stages of decubitus ulcer, scale for decubitus ulcer assessment, complications of decubitus ulcer, and prevention of decubitus ulcer (Q7-Q36).

Scoring system: According to the responses obtained from the studied nurses, a scoring system was followed to assess the nurses' knowledge regarding decubitus ulcer prevention. Each question scored (2) for correct and complete answer, scored (1) for partially correct answer, and scored (0) for each incorrect or unknown answer. The total degree was 60 and then converted into percentage as the following:

- Satisfactory knowledge ≥ 75%
- Unsatisfactory knowledge<75%

Second tool: Observational checklist: It was adapted from Hassona, et al. [13-18] and modified by the researcher to assess nurses' practices regarding decubitus ulcer prevention for hospitalized children. It included all procedures needed for decubitus ulcer prevention. It included practices guidelines for prevention of decubitus ulcer, hand washing technique, and skin care.

Scoring system: According to the responses obtained from the studied nurses, a scoring system was followed to assess the nurses' practices regarding decubitus ulcer prevention. Each done step scored 1 and each not done step scored 0. The total degree of nurses' practices was 46 (18 scores for assessing practices guidelines for prevention, 15 scores for assessing hand washing, and 13 scores for assessing skin care) and then converted into percentage as following:

- Competent practices ≥ 85%
- Incompetent practices<85%

Validity

Tools of data collection were reviewed for their content validity by a panel of three experts in the field of pediatric nursing from the faculty of nursing-Helwan university and Beni-Suef university, they are selected to test the content validity of the tools and to judge its clarity, relevance, comprehensiveness, understanding and applicability. The opinion was elicited regarding the layout, format and sequence of the questions and all of their remarks were taken into consideration and the tools were considered a valid from the experts' point of view.

Reliability

Reliability of the data collection tools was tested using Cronbach's alpha coefficient which was (0.801) for structured knowledge questionnaire, (0.765) for practices guidelines for prevention of decubitus ulcer observational checklist, (0.703) for hand washing observational checklist, (0.734) for skin care observational checklist and (0.742) for nurses' total practice which indicates that data collection tools had good level of internal consistency.

Ethical considerations

An official permission to conduct the study was obtained from ethical committee of scientific research in faculty of nursing-Helwan University. The studied nurses were informed that participation in the study is voluntary and subjects were given complete full information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it would not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs were respected.

Operational design

The operational design included: preparatory phase, pilot study, and field work.

Preparatory phase: It included reviewing of past, current, national and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop the study tools for data collection and to get a clear picture of all aspects related to the research problem.

Pilot study: The pilot study was carried out in April 2022 on 10% (5 nurses) of the total study sample (n=50) to test the applicability, feasibility, practicability and clarity of questions and to estimate the time needed to complete the study tools. Based on the results, no modifications were done. Nurses in the pilot study were included in the main study sample.

Field work: The researcher interviewed with the studied nurses before collecting the data of the actual study and introduced herself to nurses. The researcher provided a simple explanation about the aim and the nature of the study to gain their cooperation, and how to fill the knowledge questionnaire and to assure the nurses about the anonymity of their answers and that the information will be used for scientific research only and will be strictly confidential. The researcher then distributed the questionnaire among the studied nurses; the questionnaire took about 15-20 minutes to complete. The nurses' practices were observed by the researcher in previously mentioned setting during their actual work in the morning and afternoon shift and recorded at observational checklist. Time consumed for assessing each checklist was about 5-10 minutes. Data collection of the study started at the beginning of April 2022 until the end of July 2022. The researcher attended to the previous mentioned setting from 9:00 am to 7:00 pm 3 days/ week (Saturday, Monday and Wednesday) within 4 months.

Administrative item

A written approval letter was being issued from dean of facultyof nursing-Helwan university. The letter was being directed to the general manager of Beni-Suef university Hospital asking for cooperation and permission to conduct this study. After explanation of the study aim, an official permission was obtained from the dean of faculty of nursing and the general manager of Beni-Suef university hospital. Consent was obtained from nurses ensuring complete privacy and total confidentiality.

Statistical item

The collected data were analyzed using Statistical Package for Social Sciences (SPSS 24.0) for descriptive statistics in the form of frequencies and percentages for categorical variables. Means and standard deviations were used for continuous variables. Pearson correlation coefficient (r) was used for measuring the correlation between numerical variables. Chi-square tests (χ^2) were used for correlating categorical variables. Additionally, regression analysis was used for predicting the relationships between study variables.

Results

Table 1 illustrated the socio-demographic characteristics of the studied nurses. About three quarters of studied nurses (74%) were aged between 20 and 25 years with mean ± SD (23.67 ± 3.54). Regarding studied nurses' gender, about two thirds of them (64%) were female. Concerning studied nurses' marital status, nearly two thirds of them (62%) were single. For their education, more than three quarters of studied nurses (76%) had technical nursing institute. Regarding years of experience in PICU, about three quarters of studied nurses (74%) had between one and three years of experience. Two thirds of studied nurses (66%) did not attend training courses about decubitus ulcer in PICU.

Socio-demographic characteristics	No.	%
Age		
20<25 years	37	74
25<30 years	12	24
≥ 35 years	1	2
Mean ± SD	23.67 ± 3.54	
Gender		
Male	18	36
Female	32	64
Marital status		
Single	31	62
Married	19	38

Education		
Technical nursing institute	38	76
Bachelor in nursing sciences	12	24
Years of experience in PICU		
1<3 years	37	74
3<5 years	12	24
≥ 5 years	1	2
Mean ± SD	2.76 ± 1.43	
Attending training about decubitus ulcer in PICU		
Yes	17	34
No	33	66

Table 1. Frequency and percentage distribution of the studied nurses regarding their socio-demographic characteristics (n=50).

Nurses' total knowledge	**No.**	**%**
Unsatisfactory knowledge<75%	41	82
Satisfactory knowledge ≥ 75%	9	18
Total	50	100%

Table 2. Frequency and percentage distribution of studied nurses' total level of knowledge regarding decubitus ulcer prevention (n=50).

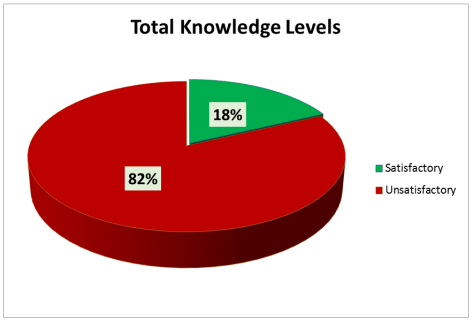

Figure 1. Percentage distribution of the studied nurses' total level of knowledge regarding decubitus ulcer prevention (n=50). Note: Satisfactory ( ); Unsatisfactory ( ).

Table 2 and Figure 1 illustrated that 82% of the studied nurses had unsatisfactory total level of knowledge about decubitus ulcer prevention, While, only 18% of them had satisfactory total level of knowledge.

Table 3 illustrated that the majority of studied nurses had incompetent practices regarding decubitus ulcer prevention practice, hand washing practice and skin care practice (98%, 92% and 98%) respectively.

Table 4 and Figure 2 revealed that 96% of the studied nurses had incompetent total level of practices about decubitus ulcer prevention. While 4% of them had competent to total level of practices.

Main items	**Competent**		**Incompetent**	
	No.	**%**	**No.**	**%**
Decubitus ulcer prevention practice guidelines	1	2	49	98
Hand washing practice	4	8	46	92
Skin care practice	1	2	49	98

Table 3. Frequency and percentage distribution of the studied nurses' main items of practices about decubitus ulcer prevention (n=50).

Nurses' total practices	No.	%
Incompetent practices<85%	48	96
Competent practices ≥ 85%	2	4
Total	60	100%

Table 4. Frequency and percentage distribution of studied nurses' total level of practices regarding decubitus ulcer prevention (n=50).

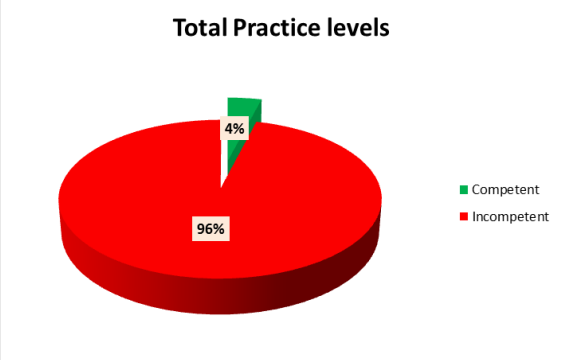

Figure 2. Percentage distribution of the studied nurses' total level of practices regarding decubitus ulcer prevention (n=50). **Note:** Competent ( ); Incompetent ( ).

Table 5 illustrated the relation between studied nurse's demographic characteristics and their total knowledge about decubitus ulcer. Using chi square test, there were significant statistical relation between studied nurses' total knowledge and their age (χ^2=6.064, P=0.048) and training (χ^2=5.219, P=0.022). The relations with other demographic characteristics were non-significant.

Table 6 displayed the relation between studied nurses' demographic characteristics and their total practice for decubitus ulcer. There were significant statistical relations between studied nurses' total practice and their age (χ^2=13.108, P=0.001), education (χ^2=8.333, P=0.004), experience (χ^2=7.031, P=0.030) and training (χ^2=4.427, P=0.035).

Socio-demographic characteristics	Knowledge levels				χ^2	P-value
	Satisfactory		Unsatisfactory			
	No.	%	No.	%		
Age						
20<25 years	4	8	33	66	6.064	0.048*
25<30 years	5	10	7	14		
≥ 35 years	0	0	1	2		
Gender						
Male	4	8	14	28	0.34	0.56
Female	5	10	27	54		
Marital status						
Single	7	14	24	48	1.16	0.282
Married	2	4	17	34		
Education						
Technical nursing institute	5	10	33	66	2.515	0.113
Bachelor in nursing sciences	4	8	8	16		
Years of experience in PICU						
1<3 years	5	10	32	64	2.636	0.268
3<5 years	4	8	8	16		
≥ 5 years	0	0	1	2		

Attending training about decubitus ulcer in PICU						
Yes	6	12	11	22	5.219	0.022*
No	3	6	30	60		
Note: Significant statistical relation between studied nurses' total knowledge and their age; *(χ2=6.064, P=0.048) and; * Training (χ2=5.219, P=0.022).						

Table 5. The relation between nurses' socio-demographic characteristics and their total level of knowledge about decubitus ulcer (n=50).

Socio-demographic characteristics	**Total Practice Levels**				**X^2**	**P-value**
	Competent		**Incompetent**			
	No.	**%**	**No.**	**%**		
Age						
20<25 years	0	0	36	72	13.108	0.001**
25<30 years	1	2	11	22		
≥ 35 years	1	2	1	2		
Gender						
Male	0	0	19	38	1.277	0.258
Female	2	4	29	58		
Marital status						
Single	0	0	30	60	3.125	0.077
Married	2	4	18	36		
Education						
Technical nursing institute	0	0	40	80	8.333	0.004**
Bachelor in nursing sciences	2	4	8	16		
Years of experience in PICU						
1<3 years	0	0	36	72	7.031	0.030*
3<5 years	1	2	9	18		
≥ 5 years	1	2	3	6		
Attending training about decubitus ulcer in PICU						
Yes	2	4	14	28	4.427	0.035*
No	0	0	34	68		
Note: significant statistical relations between studied nurses' total practice and their age,**(χ2=13.108, P=0.001), Education (χ2=8.333, P=0.004); *Experience (χ2=7.031, P=0.030) and *: Training (χ2=4.427, P=0.035).						

Table 6. The relation between nurses' socio-demographic characteristics and their total level of prctices about decubitus ulcer (n=50).

Table 7 displayed the correlation matrix between studied nurses' knowledge and their practice about decubitus ulcer. Using Pearson correlation coefficients, there were significant statistical positive correlations between studied nurses' total knowledge and total practice (r=0.755, P=0.000).

Variables		**Total practice**	**Prevention practice**	**Hand washing**	**Skin care**
Total knowledge	r	0.755	0.532	0.322	0.492
	P-value	0.000**	0.000**	0.022*	0.000**
Total practice	r		0.744	0.389	0.629
	P-value		0.000**	0.005**	0.000**
Prevention practice	r			-0.029	0.125
	P-value			0.844	0.386

Hand washing	r				0.029
	P-value				0.841

Note:

r: Pearson correlation coefficient.

**Correlation is significant at the 0.01 level (2 tailed).

*Correlation is significant at the 0.05 level (2 tailed).

Table 7. Correlation matrix between studied nurses' knowledge and their practice about decubitus ulcer prevention (n=50).

Table 8 summarized the regression analysis of nurses' total practice using knowledge as an independent variable. The ANOVA model was significant (F=63.518, P=0.000). The regression of coefficient for knowledge was (0.358, P=0.000). The coefficient of determination (R2) was (0.570) which means that 57% of the variance in nurses' total practice was explained by their knowledge level.

	Unstandardized coefficients		Standardized coefficients	t-test	P-value
	B	Std. Error			
Constant	11.982	1.465	-	8.178	0.000**
Knowledge	0.358	0.045	0.755	7.97	0.000**

Note: Independent variable: Knowledge. Dependent variable: Total practice.

Model AOVA: F=63.518, P=0.000**, R2=0.570

Table 8. Regression coefficients of simple linear regression of nurses' total practice for decubitus ulcer (n=50).

Discussion

Decubitus ulcer is a common problem among children in PICU and produces a significant burden on children patients, caregivers and health care system. Decubitus ulcer is an area of localized damage to the child skin, muscle or underlying tissue. It usually occurs over a bony prominence as a result of pressure or pressure in combination with friction. The pain and discomfort due to decubitus ulcer prolongs illness, rehabilitation, time of discharge and may lead to disability and death [19].

Nursing team members are responsible for direct and continuous care related to decubitus ulcer prevention and treatment. For nursing to achieve quality care, its practice needs to be based on the best evidence regarding the knowledge about this evidence on decubitus ulcer and should be part of all nursing professionals' knowledge base. Prevention of decubitus ulcer for the patients is linked to nurses' education and competence, thus decubitus ulcer prevention is dependent on nurses' knowledge and skill. Education increases awareness of the problem and gives a pathway for developing and maintaining competency. So, education programs should focus not only on prevention and treatment intervention, but also on the legal implications of correct child file documentation [20].

This study aimed to assess nurses' performance regarding decubitus ulcer prevention for hospitalized children. Regarding to the characteristics of the studied nurses, the present study revealed that nearly three quarters of the studied nurses were aged between 20 and 25 years with mean ± SD (23.67 ± 3.54). This finding was disagreed with, who conducted a study at Ain Shams University, Egypt, which entitled (Assessment of nurses performance in caring of children at risk and having decubitus ulcer) [17] and found that more than two fifth of studied nurses were in the age group from 25 years to less than 30 years. In the researcher's opinion, this may be due to most of those nurses were newly graduated and the younger age group is usually selected to work in the critical units.

As regards the studied nurses' gender, the current study revealed that nearly two thirds of them were female. This finding was in agreement with [18], who conducted a study at Cairo University, Egypt, which entitled (Impact of educational guidelines about prevention of pressure injuries among infants in intensive care unit) [12] and found that the majority of studied nurses were females. In the researcher's opinion, this may be due to that the males enrolled in nursing schools a few years ago.

In addition, the current study revealed that nearly two thirds of the studied nurses were single. This finding was in agreement with, who conducted a study at Abdulaziz university, Jeddah, Saudi Arabia, which entitled (The effect of implementing pressure ulcer prevention educational protocol on nurses' knowledge, attitude and practices) [1] and found that three fifth of the studied nurses were single.

Concerning the educational level, the present study revealed that more than three quarters of the studied nurses had graduated from technical nursing institute. This finding was disagreed with who conducted a study at a large Australian tertiary general hospital, which entitled (Australian nurses' knowledge of pressure injury prevention and management) [9] and found that more than three quarters of the studied nurses had bachelor degree. In the researcher's opinion, this may be due to the fact that the technical institutes of nursing provide the health agencies with large numbers of graduated nurses than faculties of nursing.

Related to years of experience, the current study revealed that nearly three quarters of the studied nurses had between one and three years of experience in the pediatric intensive care unit.

This finding was disagreed with, who conducted a study at Benha University, Egypt, which entitled "Effect of preventive bundle guidelines on nurses' knowledge and compliance regarding pressure ulcer among critically ill children at pediatric intensive care unit", [14] who found that more than two fifth of studied nurses have experience more than 8 year. In the researcher's opinion, this may be due to the fact that the majority of the studied nurses were recently graduated from technical institute.

Regarding the previous attendance of training courses about decubitus ulcer in pediatric intensive care unit the current study revealed that two thirds of the studied nurses hadn't attended training courses about decubitus ulcer. These findings were in the same line with who conducted a study at Wollega university, Ethiopia, which entitled (Nurses' knowledge to pressure ulcer prevention in public hospitals in Wollega: A cross-sectional study design) [7] who found that nearly two thirds of participants did not have previous training course regarding decubitus ulcer. In the researcher's opinion, this finding may be due to absence of continuing education department in the hospital, lack of motivation for training, As well as increased workload in pediatric intensive care units.

Regarding the studied nurses' total knowledge level, the current study revealed that more than four fifth of the studied nurses had unsatisfactory total level of knowledge regarding decubitus ulcer prevention. This finding was in agreement with Sayed, et al. [17] who found that nearly three quarters of the studied nurses had unsatisfactory level of total knowledge regarding decubitus ulcer prevention. In the researcher's opinion this may be due to inadequate attendance of training courses regarding decubitus ulcer, lack of qualification as more than three quarters of the studied nurses had graduated from technical nursing institute and may be due to some nurses after a long period of continuous working neglected to updating their knowledge regarding decubitus ulcer.

Regarding the nurses' total practice levels related to decubitus ulcer prevention, the current study revealed that the majority of the studied nurses had incompetent levels of total practice regarding decubitus ulcer prevention. This finding was in agreement with Mohamed, et al. [14] who mentioned that the majority of studied nurses had an unsatisfactory level of practice regarding decubitus ulcer prevention. In the researcher's opinion, this may be due to lack of training courses and years of experience which affects level of practice and lack of motivation of nurses to up to date their practices.

The current study revealed that there were significant statistical relations between studied nurses' total level of knowledge and their age and attending training courses about decubitus ulcer. This finding was approved with Sayed, et al, [17], who stated that there was significant statistical relation between nurses' total level knowledge and their socio demographic characteristics such as; age and attending training courses about decubitus ulcer. In the researcher's opinion, this result may be due to that this could be explained as; knowledge levels were low in nurses who didn't attend training courses and knowledge levels were high in nurses who attended training courses.

The findings of the current study revealed that, there were significant statistical relations between studied nurses' total practice and their age, education, years of experience, and attending training courses about decubitus ulcer. This finding was approved with Najjar, et al. [15], who concluded that, there was a highly statistically significant relation between nurses' total practices and their socio demographic characteristics such as; age, education, years of experience, and attending training courses about decubitus ulcer. In the researcher's opinion, this result may be due to that this could be explained as; practice levels were low in nurses who have younger age and practice levels were high in nurses who have older age in dependence of their experience.

Concerning correlation between studied nurses' total knowledge and total practice, the current study revealed that there was significant statistical positive correlation between studied nurses' total knowledge and total practice. This finding was in the same line with Mohamed et al. [14] who concluded that, there was significant statistical positive correlation between studied nurses' total knowledge and total practice. In the researcher's opinion, this finding might be due to that, nurses' practices directly influenced by their knowledge, besides that knowledge is the baseline for the practice and essential to achieve best practices and improve the quality of nursing care provided to children, also knowledge without practice had no effect.

Conclusion

In the light of the study findings, it can be concluded that, more than four fifth of the studied nurses had unsatisfactory level of total knowledge regarding decubitus ulcer and the most of them had incompetent level of total practices regarding decubitus ulcer prevention for hospitalized children. Meanwhile, there was a statistically significant relation between nurses' total level of knowledge and their age and previous attendance of training courses about decubitus ulcer. In addition, there was a statistically significant relation between nurses' total level of practices and their age, education, years of experience and previous attendance of training courses about decubitus ulcer. Also, there was a statistically significant positive correlation between nurses' total level of knowledge and their total level of practices.

Recommendations

In the light of the study findings, the following recommendations are suggested

- Periodic educational programs for nurses in relation to decubitus ulcer prevention are necessary to improve their performance regarding infection control and decubitus ulcer prevention for hospitalized children.
- Dissemination of standards protocols and guidelines book based on evidence-based practice containing all nursing

competencies related to decubitus ulcer prevention is essential.

- Disseminate and share the result of study with the administration including nurse administrator, hospital administration is necessary.
- Providing continuous health teaching to children at risk decubitus ulcer and their caregivers.
- Further interventions studies should be initiated to examine the level of knowledge, and practice after nurses participate in the service training programs.
- Furthers studies should be conducted to improve nurses' awareness and performance regarding decubitus ulcer prevention.

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