

Effect of an Educational Program on Nurses' Performance regarding Reducing Pressure Ulcer and Safety of Immobilized Patients

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Abstract

Background: Pressure ulcers remain a common problem in hospitals and the community. It is more common among immobilized patients and is often related to the high incidence of life-threatening complications that can be avoided by nursing care. **Aim of study:** Was to evaluate effect of an educational program on nurses' performance regarding reducing pressure ulcer and safety of immobilized patients. **Research design:** A quasi-experimental, pre-test and post-test intervention study design was implemented to achieve the aim of the current study. **Setting:** The study was conducted at the orthopedic department in Benha University Hospital, Qalyubia Governorate, Egypt. **Sample:** A convenient sample consisting of 50 nurses of both gender who assigned caring the immobilized patients and a purposive sample consisting of 80 patients. **Tools of data collection:** Four tools were used to collect data; **I:** Interview questionnaire. **II:** Observational check list for nurses' practice. **III:** Braden Scale and **IV:** Patient's assessment questionnaire. **Results:** Total knowledge level and total practice level mean scores immediate post and after one month follow up of the program implementation were higher statistically significant than preprogram. There was a marked decreased (improved) in total Braden scale post implementation of program, implementation of educational program was very effective in reducing pressure ulcer which was best predicted by patients' age, weight, chronic disease, and length of hospital stay. **Conclusion:** Application of the educational program is highly effective in improving (knowledge and practice) regarding reducing of pressure ulcer and safety of immobilized orthopedic patient, which supported the study hypotheses. **Recommendations:** Provide continuous education and training sessions for nurses caring for immobilized patient to improve their knowledge and practice about pressure ulcer prevention.

Keywords: Educational program, Nurses' performance, Reducing pressure ulcer, Safety of immobilized patients.

Introduction

Skin is the Human body's largest organ it is body's first line of defense. It functions as protector, regulator, sensor, metabolism and communicator. Pressure ulcer is the commonest problem which arises when tissue injury, ischemia and tissue necrosis has been occurred. It is prevalent in bedridden patient (Kottner & Blume-Peytavi, 2021).

A communal health problem amongst immobilized patients is pressure ulcer that

extend their period of hospitalization (Gillespie et al., 2020). Pressure Ulcers (PUs), also known as pressure injuries, are a common complication of prolonged bed rest or sitting. It has been established in numerous studies that PUs are a cause of morbidity, mortality, pain, and reduced health-related quality of life (Lustig et al., 2021).

According to the definition given by the National Pressure Ulcer Advisory Panel, a pressure ulcer is "localized damage to the skin

and/or underlying soft tissue usually over a bony prominence or related to a medical or another device as a result of excessive pressure” (Lechner et al., 2021).

Pressure ulcers remain a common problem in hospitals and the community. It concerns any patient, regardless of age or gender but, it is more common among immobilized patients. In the recent years, there has been considerable effort to decrease the number of pressure ulcers and related harm. The role of nurses is vital in preventing and managing this problem by using pillows to help the individual stay in the correct position, switching positions, and applying moisturizing cream to the body daily (Mäkinen et al., 2021).

The use of scales for assessing the risk of developing PU is of great value for nursing and provides systematic care planning for hospitalized patients, which facilitates the diagnosis, treatment, and prevention of these injuries. The Braden Scale is one of the instruments that help to detect the risks of developing PU, in addition to enabling nursing professionals to design better the preparation of the care prescriptions offered these patients (Jansen et al., 2020).

Patient safety is the most common topic in medical care. Typical patient-safety outcomes in the field of nursing are falls, hospital-acquired infection, hospital-acquired pneumonia and hospital-acquired pressure ulcer. These outcomes challenge the quality of care (Kalyani & Mohanasundari, 2021).

Furthermore, 80% to 95% pressure ulcers are preventable from severe harm or even death. It is the vital part of nursing care because all nurses are remaining forefront in the care of at risk patients and subsequent provision of preventive measure to minimize the bed sore among immobilized patients. (Gillespie et al., 2020) To reduce the rate of bed sore among immobilized patients, there is

need of special care and need to be educated. Repositioning, skin care, nutrition and education of health care workers are preventive interventions of pressure ulcer among immobilized patients (Minteer et al., 2020)

Aim of the Study:

The present study aimed to evaluate effect of an educational program on nurses' performance regarding reducing pressure ulcer and safety of immobilized patients.

Research hypotheses

To fulfill the aim of this study, the following research hypotheses were formulated

H1: The mean post-test nurses' knowledge and practice score would be significantly higher than pre-test knowledge and practice score .

H2: Pressure ulcer among patients post implementing program could be reduced comparing to preprogram participants.

Subjects and methods:

Research design:

A quasi-experimental design was utilized to achieve the aim of the study.

Setting:

The study was conducted at orthopedic department in Benha University Hospital; the orthopedic department has 17 rooms, include 68 beds.

Sample:

A convenient sample consisting of 50 nurses of both gender who assigned caring the immobilized patients and a purposive sample consisting of 80 patients at orthopedic department.

Tools of data collection

Four tools were used to collect data for this study:

Tool I - Interview Questionnaire: It was designed by the researcher through a review of recent relevant literatures and scientific

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references. It included two parts as the following:

Part (1): Nurses' demographic characteristics: This part was concerned with assessment of nurse demographic characteristics related to their age, sex, residence, educational qualification, years of experience in nursing, years of work in the care of orthopedic patients and training courses in reducing of bed sores.

Part (2): Nurses' knowledge assessment questionnaire (pre/post):

It designed to assess the nurses' knowledge related to pressure ulcer was, adapted from **Mohamed&Weheida (2015)** consisted of the following questions:-

- Concepts of pressure ulcer and possible complications (19 questions).
- Infection control regarding PU (4 questions).
- Preventive nursing care for PU (11 questions).
- Health education for patients (4 questions).

Nurses' knowledge scoring system:

All knowledge variables were multiple choice questions. The total numbers were 38 questions; they were scored as the following.

- Each correct answer was given one score.
- Each incorrect 'unknown or wrong' answer was given zero. With total knowledge score ranged from 0 to 38.

The knowledge score converted into percentage and categorized into:

- >75% was considered good level of knowledge (28.5 scores or more).
- 50 – 75% was considered average level of knowledge (19-28.5 scores).
- <50% was considered poor level of knowledge (Less than 19 scores).

Tool II- Observational check list for nurses' practice (pre/post) : It designed by the researcher aimed to assess nurses' practice to reducing of pressure sores it was after

reviewing of the relevant literature **Ostendorf et al, (2016), Linton et al, (2017) & Patricia et al, (2017)** it was included items regarding patients' position (turning patient), skin assessment, use supportive devices, bed sheet care and improve nutritional status. This tool was filled three times; the first time before the educational program implementation, the second time immediately after educational program implementation the third time after one month educational program implementation consisted of the following nurses' practice:

- Patients' position (turning patient) (4 steps).
- Use supportive devices (4 steps).
- Skin care (6 steps).
- Bed sheet care (14 steps).
- Improve nutritional status (5 steps).
- Risk assessment (5 steps).

Nurses' practice scoring system:

Practices scoring were distributed as, each step scoring from 0-2.

- Done correctly was scored as (2)
- Done incorrectly was scored as (1)
- Not done was assigned a scored as (0)

Total score of nurses' practice was classified into:

- $\geq 75\%$ was considered satisfactory level of practice.
- $< 75\%$ was considered unsatisfactory level of practice.

Tool III - Braden Scale (pre/post):

The Braden scale is a highly reliable instrument in the identification of patients at high risk of pressure ulcers (**Adibelli& Korkmaz 2019**) " risk assessment tool in predicting pressure ulcers" It was be used to assess knowledge about how to identify patients at risk for pressure ulcer.

It is a summated rating scale composed of six subscales: sensory perception, mobility, activity, moisture, nutrition, and friction and shear. The six subscales are rated from 1

(least impaired) to 4 (most impaired), except friction and shear, which rates from 1–3.

Braden Scale total score range

- Low risk: total score 18-23

- Moderate Risk: total score 11-17

- High risk: total score less than 11

Tool IV- Patients' Assessment questionnaire: It was included two parts as following:

Part (1): Patients' Socio-demographic characteristics: This part was concerned with assessment of patients' socio-demographic characteristics related to their age, sex, educational level, marital status.

Part (2): Medical History: It was designed by the researcher to identify diagnosis on admission, chronic disease (diabetes mellitus, renal disease and others), weight, circulatory disorder and length of hospital stay (days).

Tool validity:

The face and content validity of the tools were ascertained for comprehensiveness, relevance, simplicity, clarity and ambiguity through a jury of five experts from medical surgical nursing department, faculty of nursing, Benha University (two professor and three assistant professors). Also a prepared developed educational program which covered all items related to (nurses' performance regarding reducing pressure ulcer and safety of immobilized patients) based on newest current literature was revised by the same experts and all recommended modifications were done and the final form the tools was used for data collection.

Tool reliability:

Reliability was testing statistically to assure that the tools were reliable before data collection and it was evaluated using test-retest method by the Cronbach's alpha test which is used to measure the internal consistency. Cronbach's alpha for nurses' knowledge assessment questionnaire 0.813, for braden Scale 0.841 and observational

check list for nurses' practice was 0.836, which denotes the high internal consistency of the used tool

Ethical considerations:

Official permissions for data collection were generated from Hospital directors and head managers of the orthopedic department at Benha university hospital by the submission of a formal letter from the dean of Faculty of Nursing at Benha University. Also, the study approval was obtained from the ethical committee of Faculty of Nursing before initiating the study work. Once the researcher was granted approval, Nurses and patients' approval was taken after an explanation regarding the aim of the study; they were also informed that their participation is optionally, and that they have the right to withdraw at any time without any consequences. Then, nurses'/patients' oral consent to participate in the study was obtained. The researcher was assured maintaining anonymity and confidentiality of data. All information was gathered used only for their benefit and for the purpose of the study.

Pilot study:

Pilot study was conducted on 5 nurses (10%) of all nurses and also 8 patients (10%) of all patients at orthopedic department in order to test the clarity and applicability of the study tools and the guidelines, to estimate time needed for each tool to be filled in as well as to identify any possible obstacles that may hinder data collection. Based on the results of the pilot study the necessary modifications were done to have more applicable tools for data collection. Nurses involved in the pilot study were excluded from the main study. The pilot study was done two weeks before starting the study from beginning of December 2020 to end of December 2020.

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Field work (Data Collection):

The collection of data and application of educational program through the period from beginning of January 2021 to end of September 2021. The process of data collection was achieved three times through: The first time before implementing program (pre-test) to have baseline assessment about nurses' level of knowledge and practice, the second time immediately (post-test) and the third time one month later following implementation of program (posttest). The precautionary practices measure due to the spread of the Corona virus, infection control were taken as maintaining physical distance, wearing facemask, gloves, and using alcohol aseptic solution for both the researcher and the patients included in the study.

II- Assessment phase:

Assessment of the nurses' knowledge and practical skills was done. This assessment shed- light and was given more insight about the current knowledge level to help detecting knowledge and practice deficit, as it's the result was obtained from nurses' assessment sheet and the observational check list, as well as, literature review .Also assessment of the patients was be done.

III- Implementation phase:

- All available nurses in orthopedic department at Benha university hospital was recruited into the study.
- Immobilized patients they were hospitalized for more than two weeks in orthopedic department at Benha university hospital was be recruited into the study.
- The researcher attended the clinical setting in the morning & afternoon shifts three times weekly during the time of the study.

- Patients assessed before and after the implementation of the program (Tool III & IV).
- The researcher collected data before giving the nurses the educational program for reducing of pressure ulcer; the data were collected through filling the nurses' assessment sheet (Tool I) by the studied nurses, and the observational check list for nurses' practice was filled by the researcher (Tool II).
- Patients' assessment sheet was filled by the researcher.
- Educational program designed by the researcher based on the needs of the studied nurses to improve on nurses' knowledge, practice and safety of immobilized patients based on the related literature. It written in Arabic language.

The educational program has two parts:

1. Theoretical part: Knowledge booklet was given to each nurse.
 2. The practical part: Demonstration was done for each nurse as needed.
- Educational program implementation has taken (8) weeks.
 - The teaching sessions were conducted with nurses at morning and afternoon shift.
 - The total numbers of sessions were (6) sessions, the time of session ranged between 30-45 minutes. The nurses divided into group contains (4-5 nurses) to acquire the related information .The researcher continued to reinforce the gained information, answered any raised questions and gave feedback.
 - Overall objective:
 - * Improve nurses' performance related to reducing of pressure ulcer and safety of immobilized orthopedic patients
 - Specific objectives of sessions:

*Cognitive objectives: -Improve nurses' knowledge related to reducing of pressure ulcer and safety of immobilized orthopedic patients

*Psychomotor skills objectives: -Improve nurses' practice related to reducing of pressure ulcer and safety of immobilized orthopedic patients

◆ Teaching methods using lectures, discussions and demonstration were conducted. Teaching media using booklet, laptop, picture & video. Educational program were distributed to all nurses in the first day from starting educational program implementation.

IV: Evaluation phase:

- The post test for nurses' knowledge and practice was done by using the same tools of pretest to determine the effect of implementation of the educational program.
- Patient's assessment for bed sores was done by using the same tools of pretest to determine the effect of implementation of the educational program.
- Evaluation was done by using the same tools of the pretest through the following phases:

Phase 1: Immediately post-test evaluation was performed after implementing the educational program to evaluate effect of educational program on nurses' performance regarding reducing pressure ulcer and safety of immobilized patients.

An evaluation was done by using a (tool I, II, III & IV) In order to compare the change in the studied nurses' knowledge and practices and safety of immobilized patients.

Phase 2: Evaluation was done in the 1st month of follow up post educational program implementation to evaluate effect of an educational program on nurses' performance regarding reducing pressure ulcer and safety of immobilized patients. An evaluation was done by using a (tool I, II, III & IV).

Statistical Analysis:

Data analysis was performed using IBM SPSS (Statistical Package for Social Sciences) statistical software version 25. The data were explored. Descriptive statistics with mean and standard deviation (SD) for continuous variables and frequency for categorical variables were analyzed. Qualitative variables were compared using chi square test (χ^2) as the test of significance, and independent (t) test was used to compare mean score between two groups. Correlation coefficient (r) was used to test the correlation between quantitative data. Linear regression was used for multivariate analyses on risk of developing pressure ulcer as dependent factors. Statistical significance was considered as follows:

- P value >0.05 non- statistical significant relation.
- P value <0.05 statistical significant relation.
- P value <0.01 highly- statistical significant relation.

Limitations of the study:

1. The small number of nursing staff included in this study which does not allow generalized of the result.
2. The nurses have low interested for participation in the educational program session because they have workloads, heavy duties and much busy.

Results:

Table (1): Shows the distribution of the studied nurses according to their demographic characteristics. It was observed from the table that 56% of the studied nurses' aged between 30 to less than 45 years old and the nurses was mean age of 34.6 ± 10.6 years; females were more prevalent and constituted 76% of the studied nurses. As well, 50% were graduated from technical institute of nursing.

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Moreover, 56% of them had 5 to less than 10 years of experience in the orthopedic department with Mean \pm SD = 9.71 \pm 5.2 years. Furthermore, 32% had attended training courses on how to prevent pressure ulcer and 62.5% of them attended only one course.

Figure (1): Illustrates that, only 22% of the studied nurses had good level of total knowledge about pressure ulcer at pre implementation of program, however immediately post implementation of program changed to 80%, but after one month follow up slightly decline in level of knowledge was observed to 74%, respectively

Figure (2): Illustrates that, only 20% of the studied nurses had satisfactory level of total practice to reducing of pressure ulcer and safety of immobilized patients at pre implementation of program. While increased to 86% immediately post implementation of program, but there was a slightly decline in these results at one month of follow up to 80%.

Table (2): Shows the distribution of the studied patients according to their personal characteristics. It was found that 40% of the studied patients' aged between 30 to less than 45 years old. The mean age of the studied patients was 52.9 \pm 12.5 years; males were more prevalent and constituted 72.5% of the studied patients, 62.5% of them were married. As well, 60 % of them were intermediate education. Moreover, 67.5% were workers, while 59.3% of them need physical effort in work and 72.5% lived in rural areas.

Figure (3): Illustrates that, 75% of the studied patients had severe level of risk for pressure ulcer pre implementation of program. While decreased (improved) significantly immediately post implementation of program to 12.5% and to

5% after one month follow up of program implementation.

Table (3): Shows the correlation between the total mean scores of knowledge, the total mean of practice among the studied nurses and total mean of Braden scale scores among the studied patients, there was significant statistical correlation between nurses' knowledge, practice and total Braden scale of the studied patients pre implementation of program $p < 0.01$. Also, there was significant statistical negative correlation between nurses' knowledge, practice and total Braden scale of the studied patients at immediate post and after one month of implementation of the program ($r=0.214, -0.413$ & -0.404 at $p=.014, p=.000$ & $p=.000$ respectively) and ($r=0.226, -0.427$ & -0.419 at $p=.012, p=.000$ & $p=.000$ respectively).

Table (1): Distribution of nurses according to their demographic characteristics (No=50).

Nurses ' personal characteristics	Studied sample(n=50)	
	N	%
Age (year)		
18-<30	15	30
30-<45	28	56
45-<60	7	14
Mean ±SD	34.6±10.6	
Range	22-56	
Sex		
Male	12	24
Female	38	76
Education qualification		
Nursing Diplome	8	16
Nursing Diplome + specialty	8	16
Technical Institute of Nursing	25	50
Bachelor of Nursing	9	18
Postgraduate Studies	0	0.0
Years of experience in the orthopedic department		
2 yrs.	5	10
3-<5 yrs.	10	20
5-<10 yrs.	28	56
≥ 10 yrs.	7	14
Mean ±SD	9.71±5.2	
Range	2-32	
Attending any training courses on how to prevent pressure ulcer?		
Yes	16	32
No	34	68
If yes, how many training courses have you attended? (n=16).		
One	10	62.5
Two	4	25
Three	2	12.5

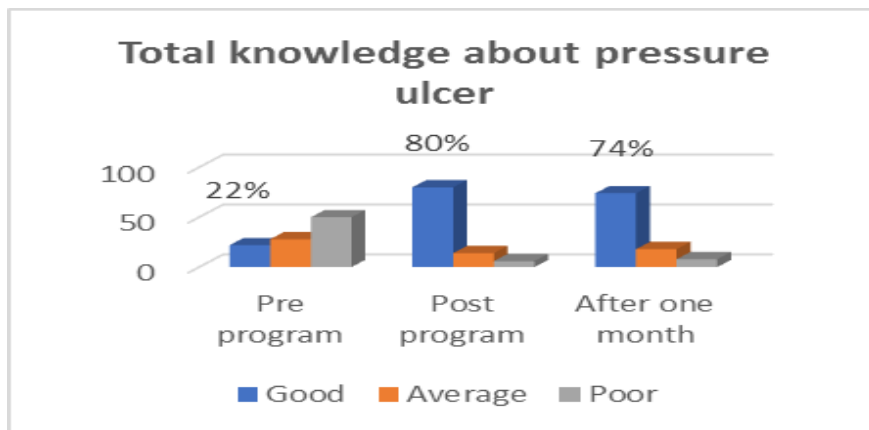


Figure (1): Distribution of the studied nurses according to total knowledge about pressure ulcer at pre, post and after one month of educational program (n=50).

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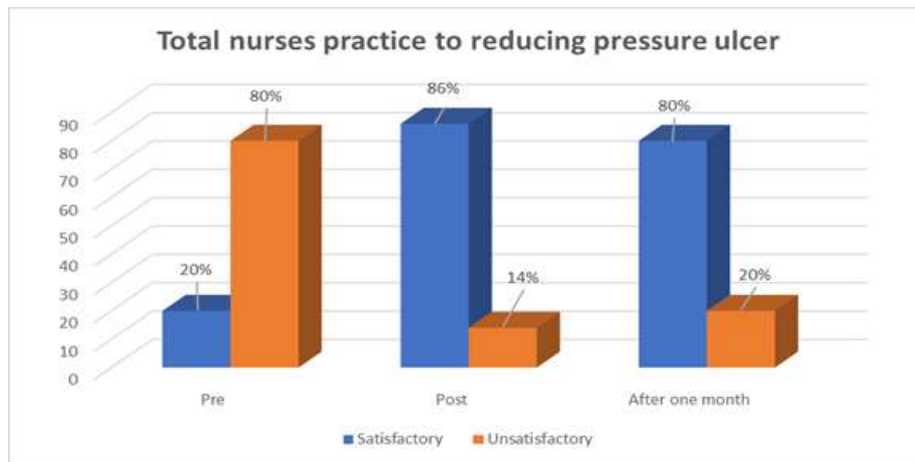


Figure (2): Percentage distribution of the studied nurses according to their total practice to reducing of pressure ulcer and safety of immobilized patients at pre, post and after one month of educational program (n=50).

Table (2): Distribution of the studied patients according to their socio-demographic characteristics (No=80).

Patients' personal characteristics	Sample(n=80)	
	N	%
Age (year)		
18-<30	12	15
30-<45	32	40
45-<60	25	31.3
≥ 60	11	13.7
Mean ±SD	52.9±12.5	
Range	18-67	
Sex		
Male	58	72.5
Female	22	28.5
Marital status		
Unmarried	15	18.8
Married	50	62.5
Widowed	10	12.5
Divorced	5	6.2
Educational level		
Illiterate	8	10
Read and write	12	15
Intermediate education	48	60
University education	12	15
Working status		
Working	54	67.5
Not working	26	32.5
If yes, what is the nature of work? (n=54).		
Need physical effort	32	59.3
Need mental effort	10	18.5
Need physical and mental effort	12	22.2
Residence		
Rural	58	72.5
Urban	22	27.5

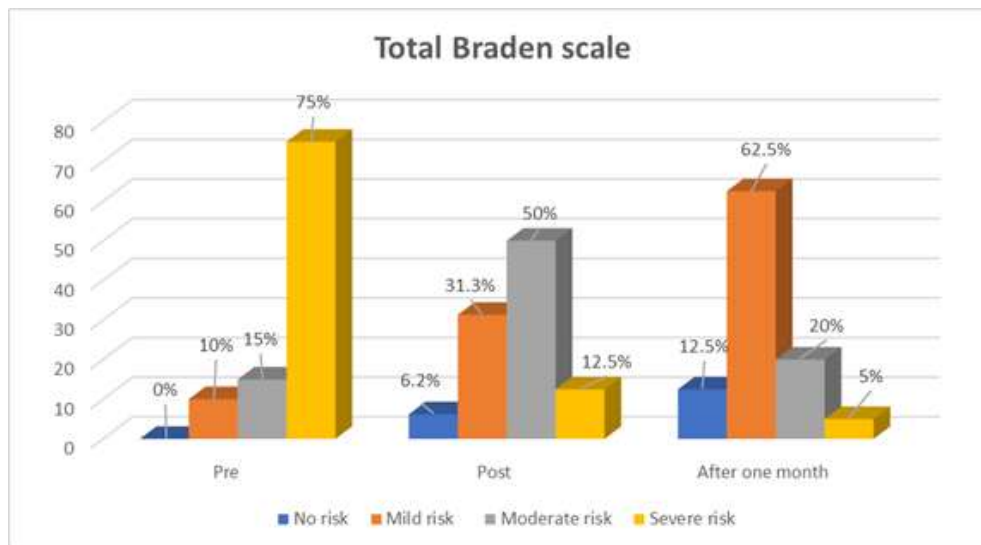


Figure (3): Percentage distribution of the studied patients according to Braden scale at pre, post and after one month of the program (n=80).

Table (3): Correlation between total nurses' knowledge and practice at pre, post and after one month implementation program and total Braden scale of the studied patients.

Variables		Total Braden scale		
		Pre	Immediate Post	After one month
Total nurses' knowledge	r	0.214	-0.413	-0.404
	p	.014*	.000**	.000**
Total nurses' practice	r	0.226	-0.427	-0.419
	p	.012*	.000**	.000**

Discussion

Pressure ulcers can occur in any person, regardless of age, who has, for example, limited mobility, cognitive impairment, palliative and end of life care needs or who is acutely ill. Other contributory factors include diabetes, compromised bladder or bowel function, or nutritional and hydration compromise **Webster, (2019)**. The results of the current study reported that more than half of the studied nurses' were aged from thirty to less than forty five years old with mean age of 34.6 ± 10.6 years. From the researcher's point of view this result may be due to the majority studied nurses who were working in orthopedic department in middle age of their

working carrier able to provide care for immobilized patients effectively and not novices in the nursing profession. This result was agreed with **Ebi et al., (2019)** who conducted a study entitled "Nurses' knowledge to pressure ulcer prevention in public hospitals in Wollega" whose results revealed that the majority of nurses were 38-47 years old. On the other hand, this result disagrees with **Mohamed & Weheida (2015)** who stated in his study entitled "Effects of implementing educational program about pressure ulcer control on nurses' knowledge and safety of immobilized patients" whose results revealed that the majority of nurses

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were less than 30 years old. As for gender, the majority of studied nurses were female. From the researcher's point of view this result may be due to males learned nursing recently in recent years, and before that, most of the nursing education was done by females. This study is agreement with **Ali (2019)** study about "Relationship between Nurses' Awareness, Practice and their Perceived Barriers towards Pressure Ulcer Prevention" who showed that the majority of the sample were female. Therefore this result was in the same line with **Hassan(2018)** who conducted a study entitled "Impact of educational guidelines about prevention of pressure injuries among infants in intensive care unit" who found that the majority 84% of studied nurses were females.

Concerning to educational qualification, the present study revealed that one-half of the studied nurses were graduated from technical institute of nursing. This could be explained in light of the known fact that Benha University have more than one nursing technical institute and a large number of students enroll in it and graduate after two years. Therefore, the number of graduates of the technical institute is more than any educational qualification of nursing. This result is in agreement with **Gaballah & El-Deen (2021)**. Who found in their study about "Pressure injury care program effects on nurse's performance and patients' pressure injury wound healing outcomes" study stated that half of the studied nurses were graduated from the Institute of nursing. Also this study disagreed with **Awali et al., (2018)** whose found in their study about "The Effect of Implementing Pressure Ulcer Prevention Educational Protocol on Nurses' Knowledge, Attitude and Practices." sixty-two percent of study sample achieved bachelor's degree in nursing. Regarding to years of experience in the orthopedic department; the findings of the current study clarified that more than one-half

of the studied nurses reported that they had five to less than ten years of experience in the orthopedic department; this might be related to the years of experience they have are consistent with their ages. This result is in agreement with **Gaballah & El-Deen, (2021)**. Who found in their study about "Pressure injury care program effects on nurse's performance and patients' pressure injury wound healing outcomes" study stated that half of the studied nurses were had 5 to less than 10 years' experience. Also this finding disagreed with **Lotfi et al., (2019)** mentioned in their study about "Iranian nurses' knowledge, attitude and behavior on skin care, prevention and management of pressure injury "these study illustrates that almost third of them had more than 14 years of experience, As for the training courses in prevent pressure ulcer that had been obtained; the findings of the present study revealed that nearly all of the studied nurses had not training courses. This result may be explained by mostly the nurses have workload that prevent them from attendance any training courses and the training courses specific to prevention of pressure ulcer were not held at the hospital moreover lack of interest from nurses. This result was in agreement with **Ingwu (2019)** they conducted a research about " Caregivers' knowledge and practice toward pressure ulcer prevention in national orthopedic hospital" study who shows that nearly all of study nurses were not participating in the training sessions related to pressure ulcer prevention in orthopedic patient. Also, similar finding was founded by **Lotfi et al., (2019)** illustrates that most of study nurses not having training about pressure ulcer.

Regarding nurses total knowledge, the present study illustrated that marked improvement in nurses' knowledge about pressure ulcer post implementation of program with a highly statistically significant

difference between pre, immediate post and after one month follow-up of the program implementation. Which reflect the positive effect of the educational program on improving nurses' level of knowledge. According to researchers' opinions, this improvement was significantly associated with more familiarity and understanding of the educational program, reinforcement of sessions, uses of multiple media as booklet with colorful and laptop to increase clarification and understanding, successful method to increase nurses' knowledge about pressure ulcer, take feedback during every session. This result was consistent with **Kathirvel et al., (2021)** they carried out a study entitled "Impact of structured educational interventions on the prevention of pressure ulcers in immobile orthopedic patients in India: A pragmatic randomized controlled trial" showed statistically significant improvement in knowledge on the prevention and management of PU. On the other hand the finding is disagrees with **Zeb et al., (2015)** who carried out a study about "knowledge and attitudes on pressure ulcer prevention among nurses working in neurological departments in tertiary care hospitals of peshawar" they found that the most of the nurses had good knowledge without implementation of the program.

Regarding nurses total practice the current study revealed that marked improvement in nurses' practice towards patient position, mobility, using supportive devices, skin care, bed sheet care, improve nutritional status and risk assessment post implementation of program with a highly statistically significant difference between pre, immediate post and after one month follow up of the program implementation. Which reflect the positive effect of the educational program on improving nurses' level practice. From the researcher's point of view this result may be due to uses of

multiple media as videos and laptop to increase clarification the skills. Recognize feedback during the session and the effectiveness of educational program implementation in enhancing nurses' practices throughout the program phases. Apply skills for study nurses to increase proficiency. This finding is similar to that of **Seo & Roh (2020)**. They conducted a study about "Effects of pressure ulcer prevention training among nurses in long-term care hospitals. Nurse education today" they reported that the Pressure ulcer prevention training is useful for enhancing nurses' pressure ulcer prevention knowledge, practice and attitudes. Also these findings are in harmony with a study carried out by **Yan et al., (2021)** mentioned in their study about "Effect of training programmes on nurses' ability to care for subjects with pressure injuries" study illustrated that Training may have a beneficial effect on improving the nurses' ability to care for subjects with pressure injuries, which was obvious in improving knowledge, practice, and attitudes post-training.

Regarding to patients' personal data; the results of the current study reported that less than one-half of the studied patients' aged from thirty to less than forty five years old with mean age of 52.9 ± 12.5 years. Therefore this finding disagreed with **El-Saidy & Aboshehata (2019)**, who conducted a study entitled "Effect of Skin Care and Bony Prominence Protectors on Pressure Ulcers among Hospitalized Bedridden Patients" and mentioned that mean age for the studied patients was 48.7 ± 13.3 years old. From the researcher point of view this attributed to several factors such as, criteria of selection of sample and increase probability of accidents are usually occur in the former age brackets or even more. As for gender, the results of the present study revealed that males were more prevalent and constituted less than three quarters of patients. This result was agreed

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with the study done by **Kathirvel et al., (2021)** whose study was about " Impact of structured educational interventions on the prevention of pressure ulcers in immobile orthopedic patients in India: A pragmatic randomized controlled trial" and reported that the more than half of patients' were male. Regarding the education level the result of the current study showed that, more than half of patients' received intermediate education. This result was incongruent with **Kathirvel et al., (2021)** who found that more than half of patients' had an education level of high school. From the researcher point of view, this may be due to that the study was conducted in the governmental hospital which accommodates many numbers of patients' with low socioeconomic levels with low educational level. As regards residence the present study findings revealed that less than three quarters of the studied patients lived in rural areas. The result comes in consistent with **El-Saidy & Aboshehata (2019)** who found that half of studied sample were living in rural. Regarding the medical history the result of the current study showed that, one-half of studied patients had pelvic fracture This result disagreed with **Ahn et al.,(2016)** who conducted a study entitled" Risk factors for pressure ulcers including suspected deep tissue injury in nursing home facility residents: analysis of national minimum data set 3.0. Advances in skin & wound care" and confirmed that the less than quarter had severe mobility limitations due to paralysis or hip fracture. As for studied patients' weights, the results of the present study revealed that less than half of patients' weights, between 80 to less than 90 kg with mean weight of 84.1 ± 8.5 kg. This result was disagree with **Aghale (2021)** who conducted a study entitled " The Effect of Silicone Pad on the Heel and Sacral Pressure Ulcer in Patients Undergoing Orthopedic Surgery "who documented that mean weight of 66.76 ± 10.60

kg. Concerning chronic disease, the present study revealed that less than half of studied patients had no any chronic disease, this finding were in incongruent with **Aghale (2021)** who found that majority of studied sample were don't have any chronic disease. Concerning length of hospital stay the results of the present study revealed that more than one third of studied patients hospitalized from two to less than three weeks. This finding disagreed with a study carried out by **Weheida & Mohamed (2015)** they stated that majority of studied patients were stayed the period of time ranged from (5-10) days.

Regarding total Braden scale among studied patients' pre and post program implementation. The current study clarified that, there was a marked decreased in total Braden scale post implementation of program with a highly statistically significant difference between pre, immediate post and after one month follow up of the program implementation. This finding was similar the study conducted by **Darmareja et al., 2020)** they performed a study about" The Effect Of Effleurage Massage Using Virgin Coconut Oil On The Risk Level Of Pressure Ulcers In Intensive Care Unit Patients" they noticed that results of the analysis show that the 34 immobilized patients in the ICU who had interventions showed either an increase in their Braden Scale scores or a decrease in their PU risk levels after the interventions. Another study conducted by **Alkadrie (2020)** whose study entitled " The Description of Implementation of Assisted Mobilization in Stroke Patients in Several Pontianak Hospitals in Predicting the Incidence of Pressure Ulcer" supported the current finding and asserted that minimize the risk of pressure ulcers. The predictive value of pressure ulcer in stroke patients using Braden Scale.

Concern correlation between total nurses' knowledge and practice throughout the program phases and total Braden scale of the

studied patients. The current study illustrated that there was significant statistical correlation between nurses' knowledge, practice and total Braden scale (levels of risk for PI) of the studied patients' pre implementation of program. Also, there was significant statistical negative correlation between nurses' knowledge, practice and total Braden scale (levels of risk for PI) of the studied patients at immediate post and after one month of implementation of the program. From the researchers' point of view, these findings add more support for applying the educational program to prevent pressure ulcer because it increase knowledge & enhance practice among nurses resulting in improving their performance and levels of risk for PI is decreased (patient safety). This result was consistent with **Okhovati et al., (2019)** in the study entitled "Effect of intensive care unit nurses' empowerment program on ability in visual differential diagnosis of pressure ulcer classification" who found that there was significant statistical negative correlation between nurses' knowledge, practice and total Braden scale also, the mean scores of nurses in the intervention group were significantly higher than the mean score of nurses in the control group ($P \leq .001$). This study indicates that the implementation of an empowerment program can increase the ability of nurses to detect pressure ulcers and decrease in their PU risk levels. Therefore this finding agree with, **Ghali et al (2019)** who conducted a study entitled "Incidence and risk factors of pressure ulcers in a Tunisian university hospital "who highlight those, the application of different nursing interventions resulted in a positive decrease in the incidence of pressure ulcers leading to either their prevention or at least decrease the risk of their development. To sum up the discussion of the current study, the study results documented that, the studied nurses patients' showed better improvement of the knowledge& practices resulting in

improving their performance and patient safety immediately post and follow up as compared to pre-educational program implementation which support the study hypothesis.

Conclusion

Implementation of educational program had been proven to be significantly effective in improvement of nurses' performance regarding reducing pressure ulcer and safety of immobilized orthopedic patients as illustrated from total knowledge level and total practice level mean scores immediate post and after one month follow up of the program implementation were higher statistically significant than preprogram, which supported the study hypotheses.

Recommendations

1. Provide continuous education and training sessions for nurses caring for immobilized patient to improve their knowledge and practice about pressure ulcer prevention.
2. The availability of printed booklet about pressure ulcer prevention and management will result in significantly better outcomes.
3. The importance of quality improvement and patient safety available to care providers and periodic supervision should be provided for immobilized orthopedic patients who are at risk for the development of pressure ulcers.
4. Further studies are proposed to investigate the effect of implementation of educational program on preventing, reducing pressure ulcer and improving safety of immobilized patients on larger sample from different settings to raise the efficiency of nurses' performance and generalize the results.

References

Adibelli, S., & Korkmaz, F. (2019). Pressure injury risk assessment in intensive care units: Comparison of the reliability and predictive

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validity of the Braden and Jackson/Cubbin scales. *Journal of Clinical Nursing*, 28(23-24), 4595-4605.

Aghale, M. (2021). The Effect of Silicone Pad on the Heel and Sacral Pressure Ulcer in Patients Undergoing Orthopedic Surgery. Maedeh Alizadeha, Somayeh Ghavipanjehb, Aylin Jahanbanc, Esmail Maghsoodid. *Turkish Journal of Physiotherapy and Rehabilitation*, 32, 3.

Ahn, H., Cowan, L., Garvan, C., Lyon, D., & Stechmiller, J. (2016). Risk factors for pressure ulcers including suspected deep tissue injury in nursing home facility residents: analysis of national minimum data set 3.0. *Advances in skin & wound care*, 29(4), 178-190.

Ali, N.(2019). Relationship between Nurses' Awareness, Practice and their Perceived Barriers towards Pressure Ulcer Prevention, master thesis, faculty of nursing, benha university, Pp.83-94.

Alkadrie, R. S. S. M. (2020). The Description of Implementation of Assisted Mobilization in Stroke Patients in Several Pontianak Hospitals in Predicting the Incidence of Pressure Ulcer.

Awali, Z. M., Nagshabandi, E. A., & Elgmail, A. (2018). The Effect of Implementing Pressure Ulcer Prevention Educational Protocol on Nurses' Knowledge, Attitude and Practices. *Nursing and Primary Care*, 2(4), 1-7.

Darmareja, R., Kosasih, C. E., & Priambodo, A. P. (2020). The Effect Of Effleurage Massage Using Virgin Coconut Oil On The Risk Level Of Pressure Ulcers In Intensive Care Unit Patients. *Jurnal Keperawatan Soedirman*, 15(3).

Ebi, W. E., Hirko, G. F., & Mijena, D. A. (2019). Nurses' knowledge to pressure ulcer prevention in public hospitals in Wollega: a cross-sectional study design. *BMC nursing*, 18(1).

El-Saidy, T. M. K., & Aboshehata, O. K. (2019). Effect of Skin Care and Bony Prominence Protectors on Pressure Ulcers among Hospitalized Bedridden Patients. *American Journal of Nursing*, 7(6), 912-921.

Gaballah, S., & El-Deen, D. S. (2021). Pressure injury care program effects on nurse's performance and patients' pressure injury wound healing outcomes. *Am J Nurs Res*, 9(3), 76-84.

Ghali, H., Chouket, R., Ben Cheikh, A., Khéfacha, S., Dhidah L, et al. (2019): Incidence and risk factors of pressure ulcers in a Tunisian university hospital. *Nursing and Health Care*, 4, 25-8.

Gillespie, B. M., Walker, R. M., Latimer, S. L., Thalib, L., Whitty, J. A., McInnes, E., & Chaboyer, W. P. (2020). Repositioning for pressure injury prevention in adults. *Cochrane Database of Systematic Reviews*, (6).

Hassan E. A., (2018). Impact of educational guidelines about prevention of pressure injuries among infants in intensive care unit, *Symbiosis Journal Nursing health care*, semantic scholar, available at <https://www.semanticscholar.org/faq>.

Ingwu, J., Nwaordu, A., Opara, H., Israel, O., & Ogbogu, C. (2019). Caregivers' knowledge and practice toward pressure ulcer prevention in national orthopedic hospital, Enugu, Nigeria. *Nigerian journal of clinical practice*, 22(7), 1014-1014.

Jansen, R. C. S., Silva, K. B. D. A., & Moura, M. E. S. (2020). Braden Scale in pressure ulcer risk assessment. *Revista Brasileira de Enfermagem*, 73.

Kalyani, V., & Mohanasundari, S. K. A(2021). Patient Safety: Preventing Pressure Ulcers. *Red*, 5(3).

Kathirvel, S., Kaur, S., Dhillon, M. S., & Singh, A. (2021). Impact of structured educational interventions on the prevention of pressure ulcers in immobile orthopedic

patients in India: A pragmatic randomized controlled trial. *Journal of Family Medicine and Primary Care*, 10(3), 1267.

Kottner, J., & Blume-Peytavi, U. (2021). Reliability and agreement of instrumental skin barrier measurements in clinical pressure ulcer prevention research. *International Wound Journal*.

Lechner, A., Kottner, J., Coleman, S., Muir, D., Beeckman, D., Chaboyer, W., & Balzer, K. (2021). Outcomes for Pressure Ulcer Trials (OUTPUTs) project: review and classification of outcomes reported in pressure ulcer prevention research. *British Journal of Dermatology*, 184(4), 617-626.

Linton, A., Duell, D., & Matteson, M. (2017). *Medical-Surgical Nursing E-Book*, 5th ed., Elsevier Health Sciences., USA., Pp457-458.

Lotfi, M., Aghazadeh, A. M., Asgarpour, H., & Nobakht, A. (2019). Iranian nurses' knowledge, attitude and behaviour on skin care, prevention and management of pressure injury: A descriptive cross-sectional study. *Nursing open*, 6(4), 1600-1605.

Lustig, A., Alves, P., Call, E., Santamaria, N., & Gefen, A. (2021). The sorptivity and durability of gelling fibre dressings tested in a simulated sacral pressure ulcer system. *International Wound Journal*, 18(2), 194-208.

Mäkinen, M., Haavisto, E., Lindström, V., Brolin, K., & Castrén, M. (2021). Finnish and Swedish prehospital emergency care providers' knowledge and attitudes towards pressure ulcer prevention. *International Emergency Nursing*, 55, 100873

Minteer, D. M., Simon, P., Taylor, D. P., Jia, W., Li, Y., Sun, M., & Rubin, J. P. (2020). Pressure ulcer monitoring platform—a prospective, human subject clinical study to validate patient repositioning monitoring device to prevent pressure ulcers. *Advances in wound care*, 9(1), 28-33.

Mohamed, S. & Weheida, S. (2015). Effects of implementing educational program about

pressure ulcer control on nurses' knowledge and safety of immobilized patients., *Journal of Nursing Education and Practice*, 5(3), pp.12-17.

Okhovati, S., Esmaeili, M., & Shariat, E. (2019). Effect of intensive care unit nurses' empowerment program on ability in visual differential diagnosis of pressure ulcer classification. *Critical care nursing quarterly*, 42(1), 89-95.

Ostendorf, W., Potter, A., & Perry, A. (2016). *Skills Performance Checklists for Clinical Nursing Skills & Techniques - E-Book*, 8th ed., Elsevier Health Sciences., USA., Pp277-278.

Patricia, A. Stockert, P., Hall, A., Potter, A., & Perry, A. (2017). *Fundamentals of Nursing: Standards & Practice*, 9th ed., Elsevier health science, USA, Pp982-989.

Seo, Y., & Roh, Y. S. (2020). Effects of pressure ulcer prevention training among nurses in long-term care hospitals. *Nurse education today*, 84, 104225.

Webster, J. (2019). *Prevention of Pressure Sores. Engineering and Clinical Aspects*, 4th ed., CRC Press, USA, P20.

Weheida, S. M. & Mohamed, S. A., (2015). Effects of implementing educational program about pressure ulcer control on nurses' knowledge and safety of immobilized patients. *Journal of nursing education and practice*, 5(3), 12.

Yan, B., Dandan, H., & Xiangli, M. (2021). Effect of training programmes on nurses' ability to care for subjects with pressure injuries: A meta-analysis. *International Wound Journal*.

Zeb, A., Ilyas, S. M., Kashif, M., Kompal, R., Darain, H., & Bahadar, S. (2015). Knowledge And Attitudes On Pressure Ulcer Prevention Among Nurses Working In Neurological Departments In Tertiary Care Hospitals Of Peshawar: A Multicenter Study. *Annals of Allied Health Sciences*, 1(2), 49-53.

تأثير البرنامج التعليمي على أداء الممرضين فيما يتعلق بالحد من قرحة الفراش وسلامة المرضى الغير قادرين علي الحركة

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لا تزال قرحة الفراش مشكلة شائعة في المستشفيات والمجتمع، ويمكن أن تحدث قرح الفراش لأي مريض بغض النظر عن العمر أو النوع، ولكنها أكثر شيوعاً بين المرضى الغير قادرين علي الحركة. لذلك هدفت الدراسة الي تقييم تأثير البرنامج التعليمي على أداء الممرضين فيما يتعلق بالحد من قرحة الفراش وسلامة المرضى الغير قادرين علي الحركة. تم استخدام تصميم شبه تجريبي لإجراء هذه الدراسة بإستخدام نهج الإختبار القبلي والبعدي لتحقيق هدف الدراسة. أجريت هذه الدراسة في قسم العظام التابع لمستشفى جامعة بنها، محافظة الفيوم، مصر. تم تطبيق هذه الدراسة علي (٥٠) ممرضة بقسم العظام و (٨٠) مريض غير قادر علي الحركة بقسم العظام بمستشفى بنها الجامعي. حيث كشفت النتائج أن تنفيذ البرنامج التعليمي أثبتت فعاليته بشكل كبير في تحسين أداء الممرضين فيما يتعلق بالحد من قرح الفراش وسلامة مرضى العظام الغير قادرين علي الحركة، مما يدعم فرضيات الدراسة. كما اوصت الدراسة توفير التعليم المستمر والدورات التدريبية للممرضين الذين يعتنون بالمرضى الغير قادرين علي الحركة لتحسين معرفتهم وممارستهم حول الوقاية من قرح الفراش.