Effect of Application Bundle Skin Care on Nurses’ Performance and Orthopedic Patients’ Skin Outcome: Quasi-Experimental Study

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Abstract

Treating severe pressure ulcers may consume considerable manpower, time, and medical resources. Pressure ulcers can be avoided and effectively treated when nurses conduct proper skin assessment and care for wounds appropriately. Research hypothesis: There was positive impact of bundle skin-care training on nurses’ performance and orthopedic patients’ skin outcome. quasi-experimental design was utilized at orthopedic units at Shebin El Koum teaching Hospital and Menofia University Hospital. Tools used for data collection were Pre-designed Questionnaire contained on nurses’ characteristics, Attitude Rating Scale and Nurses’ knowledge, also used Observational Checklist and BRADEN scale. The subject composed of 45 nurses and 90 orthopedic patients. Mean score of total knowledge pre-intervention was 6.83±3.1, while at the post was 9.95±2.1. Also, a mean score of total practice pre-intervention was 7.11±2.6, while at the post was 11.83±3.4, and, a mean score of total attitude pre-intervention was 5.02±2.8, while at the post was 7.82±1.9. Mean score of BRADEN scale at pre-intervention was 12.81±3.04, while at the post was 13.45±1.99. Application bundle skin care had a positive effect on nurses' knowledge, practice and attitude related skincare for orthopedic patients. So, there was an improvement at BRADEN score of patients post-application bundle skincare. Age, gender and previous hospitalization, BMI, and length had positive predictor effect on pressure sore risk. Skincare bundle for orthopedic patients is acceptable and has the potential to improve nursing care.

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One major risk for the orthopedic patient is the development of pressure ulcers during hospitalization due to limited of mobilization. A pressure ulcer is well-defined as local injury to the skin with or without underlying tissue over a bony prominence, due to pressure. Hazard factors contain pressure for a long time, friction, shave restricted mobility, nutrition, obesity and receiving treatment (Kumar, 2019). The furthermost used risk assessment tool in furthest care settings, including the orthopedic units, and current clinical practice guidelines was Braden Scale which designed by Braden and Bergstrom (Watkins et al., 2019).

Pressure Ulcer (PU) treatment and prevention can consume huge quantities of limited supplies, as nursing care and money. At United States, the economic budget of PUs arrays from 9.1 to 11.6 billion dollars each year. The total budget at the UK related PU treatment from 1999–2000 was 1.4 to 2.1 billion pounds per year (Ledger et al., 2020). A current systematic review debated that the treatment cost of PU higher than prevention. Therefore, prevention of PU considered a vital element related to the care of the patient (Seo and Roh, 2020).

Nurses have a significant role in providing nursing care to patients and aware about the adverse effects and preventive measures. The initial step in managing the actual or potential health hazards caused by immobility is to make an accurate assessment of a patient’s mobility status. These assessment data are a necessary baseline for the establishment of patient care goals. The nurse’s interventional care should support the normal functions of the body and preserving the strength and flexibility of the musculoskeletal system. All nursing actions are directed at providing a safe environment and preventing injury and complications (Delmore et al., 2020; Gautam and Thapa, 2020).

MATERIALS AND METHODS

The study aimed to,
Evaluate the effect of application bundle skin-care on nurses’ performance and orthopedic patients’ skin outcome through

1. Implementation of bundle skincare training for nurses
2. Assess the effect of application bundle skincare on nurses’ knowledge
3. Assess the effect of application bundle skincare on nurses’ practice
4. Assess the effect of application bundle skincare on nurses’ attitude
5. Assess the effect of application bundle skincare on orthopedic patients’ skin outcome

Research hypothesis
There was positive impact of bundle skincare training on nurses’ performance and orthopedic patients’ skin outcome

Research design
A quasi-experimental research design was conducted.

Research setting
The study was conducted at orthopedic units at Shebin El Koum teaching Hospital and Menofia University Hospital

Subject
The subject composed of 45 nurses who worked at the previous mentioned settings and who provided care for orthopedic patients and willing to participate at the study irrespective of their gender, age, qualification, and experience.

The subject composed of 90 orthopedic patients at the previous mentioned settings with inclusion criteria “Age 18-60”, both gender and suffered from limited mobility.

Tool for data collection
Pre-designed Questionnaire
It was designed by the researcher and was written in an Arabic language for gathering data in relation to the following parts:

Part 1
Nurses’ characteristics included gender, age, level of education, experiences, marital status and training course

Patients characteristics included age, gender, marital status, BMI, Length of stay and previous hospitalization.

Part 2
Nurses’ knowledge related to bundle skincare, the questionnaire questioner consisted of 12 closed-ended questions in the form of Multiple Choice Questions (MCQs), as a factor that contributes pressure ulcer, early signs of pressure ulcer development, an important vitamin for healthy skin and appropriate nursing care...etc. It was adapted by the researcher based on (Whitty et al., 2017).

Scoring system
The Questionnaire was contained of 12 questions, the total scores of the questionnaire were 12 grades, the right answer was scored as a single point, and the wrong answer was scored as a zero point. These scores were summed and were converted into mean scores at pre and post-intervention.

Part 3 – Attitude Rating Scale

Likert like type rating scale was used to assess the attitude of the nurses toward bundle skincare. It was adapted by the researcher based (Khojastehfar et al., 2020). This scale was consisted of 10 items, as pressure ulcer can be indicators for quality nursing care.

Scoring system

The total score of attitudes rating scale was 30 grades. Each statement was assigned a score according to nurses’ attitude, responses were “agree”, “uncertain”, “disagree” and were scored 3, 2 and 1 respectively and vice versa for negative statements; the scores were summed up and were converted into mean scores at pre and post-intervention.

II. Observational Checklist

It was adapted by the researcher based on (Artico et al., 2018). This checklist was used to assess nurse’s bundle skincare, it consisted from 15 items.

Scoring system

A scoring system was followed to assess nurses’ practice; each competency skill was assigned a score according to sub-items. The total score of nurses’ practices were 30 grades, each item was evaluated as “done completely” was taken two scores and “done” was taken one score and “not done” was taken zero scores. These scores were summed up and were converted into mean scores at pre and post-intervention.

Part III: BRADEN scale

It was adopted from (Bergstrom, 1988) and was used to assess predicting pressure sore risk; it consisted of moisture exposure, sensory perception, moisture exposure, activity levels, patient mobility….etc.

Scoring system

Scored on a 4-point Likert scale ranged from 1 signifying high risk to 4 signifying no apparent risk. The friction and shear subscale is scored on a scale of 1 to 3 with 1 signifying high risk and 3 no apparent risk. The total score can range from 6 to 23 and categorized as; very high risk (score <9), high risk (score ranging from 10 to 12), moderate risk (score ranging from 13 to 14), low risk (score ranging from 15 to 18) and no risk (score ranging from 19 to 23)

Ethical Considerations

Before initiating the study, Ethical approval was obtained from the Ethical Committee related to faculty of nursing. The objectives and benefits of the study was clarified by a researcher to studied subjects participated at the study. Verbal approval was obtained from the studied subjects before included at the study. Researcher secured the studied subjects about gathering data which used only for research purpose. Maintaining anonymity and confidentiality of subjects’ data. The nurses and patients were informed that participated at the study not obligatory and can withdrawal at any time from the study.

Content validity and reliability

It was ascertained by a group of experts in the medical surgical nursing department (5), to assess layout, format, accuracy, consistency, and relevancy of the tools. Reliability by using Cronbach’s Alpha for questionnaire = .864 and Cronbach’s Alpha for observational checklist = .879.

Fieldwork

Assessment phase

It should be noted that the researchers conducted the study regarding the results obtained from the pre-assessment of nurses. As well as during the first session, the researcher clarified the aim of the study and the parts of the tools. The questionnaire were distributed for nurses (pre) to assess their knowledge and attitude toward bundle skincare used an observational checklist for assessing nurses’ practice and used BRADEN scale for assessing pressure sore risk then calculated by using methods previously discussed. The educational program prepared and designed according to the nurses’ level of knowledge and practice. It was based on the greatest available evidence and guidelines: the International guidelines and guidelines of the Registered Nurses Association of Ontario (RNAO) (Lorente-Granados et al., 2020; Haesler, 2014). These policies included standards for assessment of risk, assessment of skin, surfaces support, hydration, nutrition and repositioning of patients.

Intervention and evaluation phase

Studied subjects divided into five groups, each group trained at fifth sessions each one-two hours in the form of questions sessions and seminars with the researchers, using brochures and speech. The nurses were informed about the place, time of training, and each group included.

First session

The nurses were presented to each other and were
informed about the structure and method of the meetings. Expectations of studied subjects about training program were known, and the questionnaires were finished by the nurses, observational checklist and BRADEN scale for patients.

**Second session**
Risk assessment “Intrinsic and extrinsic factors” were trained and discussed. Rapid and perfect observation of risk factors related to the development of pressure ulcer that is the 1st in active prevention. Risk assessment scales as BRADEN scale

**Third session**
Assessment of skin, an inspection of skin and assessment done at least one time each shift. Complete assessment scale and alteration at skin condition must be taught to the nurses.

**Fourth session**
Support of surface, turning frequently and unstable of patient weight can assist in managing the duration for which any given region of skin is exposed to pressure.

**Fifth session**
Hydration, Nutrition and repositioning of a patient: assess the nutrition status of patients at admission and providing perfect nutrition supplementation when necessary. Change the positioning of the patient is a significant component of preventing pressure ulcer.

At the end of each session, the participants’ names were written down. The educational slides, papers, and charts were accessible to the researcher and studied subjects for training. At the end of the intervention, nurses completed the questionnaires. The questionnaires were collected and observational checklist and BRADEN scale, as described above.

**Statistical design**
Data collected was revised, coded and entered using Personal Computer (PC). Computerized data entry and statistical analysis were achieved through the SPSS version 24. Data were presented using descriptive statistics in the form of mean ± S.D and Number/percentage. The linear regression model used to assess the relationship between a scalar response and one or more explanatory variables. T. test used to compare means pre and post-intervention.

Table 1 revealed that the mean age of studied nurses was 35.44 ± 8.11, 68.9% of them were female. Regarding marital status stated that 75.6% of studied nurses were married. While revealed that 22.2% of studied nurses had a bachelor degree, 31.1% of them had 10 - <20 years of experience. Also, according to a training program, 73.3% of studied nurses did not have a training program.

Table 2 revealed that the mean age of the studied patient was 39.12 ± 11.45, 54.4% of them were female. Regarding marital status stated that 78.9% of studied patients were married. Related BMI revealed that 41.1% of studied patients were normal. According to a length of hospitalization, stated that 33.3% of them ranged between 20 - >30 days. Also, 43.3% of studied patients had previous hospitalized

Table 3 demonstrated that the mean score of total knowledge pre-intervention was 6.83±3.1, while at the post was 9.95±2.1, so detected high significant difference at p-value <0.01. Also, detected that mean score of total practice pre-intervention was 7.11±2.6, while at the post was 11.83±3.4, so detected high significant difference at p-value <0.01. And, showed that the mean score of total attitude pre-intervention was 5.02±2.8, while at the post was 7.82±1.9, so detected high significant difference at p-value <0.01

Table 4 revealed that the mean score of BRADEN scale at pre-intervention was 12.81±3.04, while at the post was 13.45±1.99, so detected significant difference at p-value <0.05.

Table 5 presented that there was a highly significant correlation between nurses’ knowledge and practice at p-value <0.01. While there was a slight significant correlation between nurses’ knowledge and attitude related bundle skincare at p-value <0.01. Also, there was a slight significant correlation between nurses’ practice and attitude related bundle skincare at p-value <0.01.

Table 6 Related to the relation between knowledge and nurses’ characteristics, revealed that there was high significant relation with the level of education and training program at p-value <0.01, while there was slight significant relation with age and experience at p-value <0.05. But, there was no relation with gender and marital status at p-value >0.05.

According to the relation between practice and nurses’ characteristics, revealed that there was high significant relation with the level of education and training program at p-value <0.01, while there was slight significant relation with age and experience at p-value <0.05. But, there was no relation with gender and marital status at p-value >0.05.

Related to the relation between attitude and nurses’ characteristics, revealed that there was a slight significant relation with gender, level of education and training program at p-value <0.05. But, there was no relation with age, experience and marital status
Table 1: Distribution of studied nurses according to demographic data (N=45).

| Items                  | N  | %    |
|------------------------|----|------|
| **Age (year)**          |    |      |
| 20 – <30               | 13 | 28.9 |
| 30 - <40               | 17 | 37.8 |
| 40 or more             | 15 | 33.3 |
| **Mean SD**            | 35.44 ± 8.11 |
| **Gender**             |    |      |
| Male                   | 14 | 31.1 |
| Female                 | 31 | 68.9 |
| **Marital status**     |    |      |
| Married                | 34 | 75.6 |
| Unmarried              | 16 | 24.4 |
| **Level of education** |    |      |
| Diplom of nursing      | 11 | 24.4 |
| Technical institute of nursing | 22 | 48.9 |
| Bachelor degree        | 10 | 22.2 |
| Higher education       | 2  | 4.5  |
| **Years of experience**|    |      |
| 1 – <5                 | 9  | 20   |
| 5 – <10                | 9  | 20   |
| 10 – <20               | 14 | 31.1 |
| 20 or more             | 13 | 28.9 |
| **Training program**   |    |      |
| Yes                    | 12 | 26.7 |
| No                     | 33 | 73.3 |

Table 1 showed that BMI and length of hospitalization had high predictors effect on BRADEN score at p-value >0.05. While, Age, gender and previous hospitalization had slight predictor effect on BRADEN scale at p-value <0.05.

One of the main indicators of the nursing care quality in the health centers is the incidence rate of pressure ulcers; therefore, the nurses should have proper knowledge and performance on pressure ulcer in order to provide qualified nursing care and rehabilitation. Skin lesion and pressure ulcers are mainly preventable. Thus, their incidence is considered indicative of the quality of nursing care delivered (El-Saidy and Aboshehata, 2019).

Through the data analysis distribution characteristics of studied nurses, the present study detected that the mean age of studied nurses was 35.44 ± 8.11; more than two-thirds of them were female. Regarding marital status stated that three-quarters of studied nurses were married. While, revealed that less than one-quarter of studied nurses had a bachelor degree. Also, according to a training program, only one-quarter of studied nurses attended a training program. These results may be due to the policy of the hospitals was not prepared programs to improve the nurses performance in the orthopedic unit. These results supported with the study conducted by (Mohammed et al., 2020), who reported that around three-quarter of nurses were female and only less than one quarter enrolled at training courses. Also, a cohort with the study performed by (Hendy et al., 2020), who detected that mean age of studied nurses was 32.06 ± 3.90 and about two-thirds of them were female. Regarding the characteristics of the orthopedic patient, the current results detected that the mean age of the studied patient was 39.12 ± 11.45, more than half of them were female. Regarding marital status stated that more than three-quarters of studied patients were married. Related BMI revealed that more than one-third of studied patients were normal. According to the length of hospitalization, stated that one-third of them ranged between 20 - >30 days. Also, less than half of the studied patients had previous hospitalized. These results in cohort with the study performed by (Tran et al., 2019), who reported that mean age of studied patients was 70(16.6) and median length of stay was 4-10 days.
Table 2: Distribution of studied patients according to demographic data (N=90).

| Items                  | N   | %   |
|------------------------|-----|-----|
| **Age (year)**         |     |     |
| 18 – <28               | 13  | 14.4|
| 28 - <38               | 25  | 27.8|
| 38 - <48               | 29  | 32.2|
| 48 or more             | 23  | 25.6|
| **Mean SD**            | 39.12 ± 11.45 |
| **Gender**             |     |     |
| Male                   | 41  | 45.6|
| Female                 | 49  | 54.4|
| **Marital status**     |     |     |
| Married                | 71  | 78.9|
| Unmarried              | 19  | 21.1|
| **BMI**                |     |     |
| Underweight            | 14  | 15.6|
| Normal                 | 37  | 41.1|
| Overweight             | 18  | 20  |
| Obese                  | 12  | 13.3|
| Extreme obese          | 9   | 10  |
| **Length of stay/days**|     |     |
| 1 – <10                | 21  | 23.3|
| 10 – <20               | 20  | 22.3|
| 20 – <30               | 30  | 33.3|
| 30 or more             | 19  | 21.1|
| **Previous hospitalization** | | |
| Yes                    | 39  | 43.3|
| No                     | 51  | 56.7|

Table 3: Compare means a score of nurses related knowledge, practice and attitude at pre and post-intervention.

|                      | Pre     | Post    | T-test | P-value |
|----------------------|---------|---------|--------|---------|
| Total knowledge      | 6.83±3.1| 9.95±2.1| 5.162  | .009**  |
| Total practice       | 7.11±2.6| 11.83±3.4| 7.001  | .001**  |
| Total attitude       | 5.02±2.8| 7.82±1.9| 5.830  | .008**  |

Table 4: Compare means a score of patients related BRADEN scale at pre and post-intervention(90)

|                      | Pre N | % | Post N | % | T-test | P-value |
|----------------------|-------|---|--------|---|--------|---------|
| Severe risk          | 11    | 12.2| 4      | 4.4| 3.105  | .012*   |
| High risk            | 27    | 30 | 15     | 16.7|        |         |
| Moderate risk        | 38    | 42.2| 42     | 46.7|        |         |
| Mild risk            | 14    | 15.6| 29     | 32.2|        |         |
| Mean score           | 12.81±3.04| | 13.45±1.99| | | |
Table 5: Correlation between studied variables

|       | Knowledge | Attitude | Practice |
|-------|-----------|----------|----------|
| Knowledge | r.        | 0.388    | 0.562    |
| Attitude | r.        | 0.388    | 0.294    |
| Practice | r.        | 0.562    | 0.294    |

Table 6: Relation between nurses’ characteristics and their knowledge, practice and attitude (N=45).

| Items                        | Knowledge |            | Practice |            | Attitude |            |
|------------------------------|-----------|------------|----------|------------|----------|------------|
|                              | Mean      | X2         | Mean     | X2         | Mean     | X2         |
|                              |           | P VALUE    |           | P VALUE    |           | P VALUE    |
| Age (year)                   |           | F test     |           | F test     |           | F test     |
| 20 – < 30                    | 10.62±1.6 | 3.841      | 12.24±3.1| 2.641      | 7.60±1.9 | 1.021      |
| 30 - < 40                    | 9.50±2.11 | .011*      | 11.50±2.9| .018*      | 7.84±2.3 | .0513      |
| 40 or more                   | 8.12±2.30 |           | 10.91±3.6|           | 7.71±2.0 |            |
| Gender                       |           | T         |
| Female                       | 9.99±2.10 | .052      | 11.95±2.5| .061       | 7.89±2.0 | .011*      |
| Male                         | 9.88±3.00 | 1.013      | 11.64±3.8| 1.004      | 7.2±1.29 | 3.926      |
| Marital status               |           | T         |
| Married                      | 9.87±1.77 | 0.984     | 11.67±2.2| 1.105      | 7.76±1.8 | 0.998      |
| Unmarried                    | 9.96±2.04 | 0.561     | 11.87±2.4| 0.54      | 7.84±1.2 | 0.072      |
| Level of education           |           | F test     |           | F test     |           | F test     |
| Diplom                       | 7.99±2.06 | 5.130     | 10.11±1.9| 6.108      | 7.04±1.4 | 2.945      |
| Technical institute          | 8.96±1.91 | .007**    | 10.94±2.3| .003**     | 7.14±1.8 | .014*      |
| Bachelor degree              | 9.64±2.00 |           | 11.69±2.7|           | 7.91±1.9 |            |
| Higher education             | 10.5±1.44 |           | 12.24±3.6|           | 8.32±1.3 |            |
| Years of experience          |           | F test     |           | F test     |           | F test     |
| 1 – <5                       | 9.84±1.99 | 2.077      | 11.99±3.0| 3.016      | 7.80±2.1 | 1.036      |
| 5 – <10                      | 9.78±2.03 | .023*      | 11.81±2.6| .019*      | 7.75±2.0 | .059       |
| 10 – <20                     | 8.76±1.86 |           | 11.20±2.5|           | 7.81±1.9 |            |
| 20 or more                   | 8.54±2.50 |           | 11.01±3.5|           | 7.82±2.0 |            |
| Training program             |           | T         |
| Yes                          | 10.15±1.6 | 6.974      | 12.34±2.7| 5.922      | 7.96±2.0 | 3.021      |
| No                           | 8.47±2.70 | .003**    | 11.24±3.0| .008**     | 7.52±1.8 | .010*      |
Table 7: Multiple Linear regression model

|                     | Unstandardized Coefficients | Standardized Coefficients | Coefficients | T     | P. value |
|---------------------|-----------------------------|---------------------------|--------------|-------|----------|
| Age                 | .126                        | .188                      | 1.977        | .020* |          |
| Gender              | .102                        | .145                      | 1.002        | .034* |          |
| BMI                 | .246                        | .291                      | 3.021        | .009**|          |
| Length of hospitalization | .269                     | .352                      | 3.067        | .008**|          |
| Previous hospitalization | .109                     | .139                      | 1.118        | .029* |          |

ANOVA

| Model               | Df. | F    | P. value |
|---------------------|-----|------|----------|
| Regression          | 5   | 4.056| .004**   |

a. Dependent Variable: BRADEN scale
b. Predictors: (constant) Age, Gender, BMI, Length of hospitalization and Previous hospitalization

days. But regular with the study done by (Hughes et al., 1971), who demonstrated that mean length of stay was 25.6±3.2 and more than two-thirds were female.

The present results demonstrated that the mean score of total knowledge pre-intervention was 6.83±3.1, while at the post was 9.95±2.1, so detected high significant difference at p-value <0.01. Also, detected that mean score of total practice pre-intervention was 7.11±2.6, while at the post was 11.83±3.4, so detected high significant difference at p-value <0.01. And, showed that the mean score of total attitude pre-intervention was 5.02±2.8, while at the post was 7.82±1.9, so detected high significant difference at p-value <0.01. These results may due to an effective training program, using illustrative media as “PowerPoint and videos”, prepare program depended on pre-assessment and using easy language, and its concept is consistent with their scientific level. These results are similar with the study conducted by (Sardari et al., 2019) who presented that significant difference was observed between the nurses’ performance before and after training in the intervention group (P value<0.001). Also, supported with (Park et al., 2020) who demonstrated that Pressure injury training programs can improve nurses’ competency. And, regular with (Henry, 2019) who revealed that there was a statistically significant increase in knowledge after the education course (P < .05). Also, a cohort with the study done by (Aqoulah et al., 2018) who reported that efficiency of the educational training program about managing and improving the quality of nursing care documentation, knowledge and skills.

Regarding BRADEN scale, the current results revealed that the mean score of BRADEN scale at pre-intervention was 12.81±3.04, while at the post was 13.45±1.99, so detected significant difference at p-value <0.05. These results may due to enhancing practice skills of nurses as a result of using the bundle due to an increased awareness of the different aspects involved lead to providing comprehensive care and able to recognize the early signs of skin defect. These results cohort with the study performed by (Gupta et al., 2020) who reported that significant difference between BRADEN scale score at pre and post-program at p value<0.05. Also, agreement with the study conducted by (Yilmazer and Bulut, 2019), who revealed that nursing education and the evidence-based pressure injury prevention algorithm reduced pressure injury rates. Also, regular with the study by (Coyer et al., 2015) who reported that intervention patients had fewer skin injuries (> 3 pressure injuries/patient = 1/105) than did control patients (> 3 pressure injuries/patient = 10 / 102; P = 0.02). And, at the same line with (Awad et al., 2015) who detected that applying the evidence-based pressure ulcer care bundle reduced the progress of pressure ulcer in patients with a burn.

Related correlation between the studied variable, the present results stated that there was a highly significant correlation between nurses’ knowledge and practice at p-value <0.01. While there was a slight significant correlation between nurses’ knowledge and attitude related bundle skincare at p-value <0.01. Also, there was a slight significant correlation between nurses’ practice and attitude related bundle skincare at p-value <0.01. These results may due to nurses provided with a complete understanding of scientific principles underlying each step of
any procedure, so they become able to apply their knowledge effectively. These results are regular with the study done by (Saleh et al., 2019) who stated that there was a positive association between knowledge and practice of nurses. Also, supported with (Ingwu et al., 2019), who reported that improving nurses’ knowledge had a positive effect on the level of practice.

Related linear regression model, the current study showed that BMI and length of hospitalization had high predictors effect on BRADEN score at p-value <0.01. While, Age, gender and previous hospitalization had slight predictor effect on BRADEN scale at p-value <0.05. These results agreement with the study performed by (Cox et al., 2020) who detected that sex, age, and Braden Scale score on admission were all predictive of pressure injury. Also, supported with the study by (Sayan et al., 2020) who showed that occurrence of PU is associated with increasing age and severity of patient clinical status, as predicted by the Braden Scale score and increase the length of stay at the hospital.

Implication

In-service education for nurses may inspire their knowledge regarding nursing care providing for orthopedic patients and providing an opportunity for continuing education for orthopedic nurses to sustain knowledge and skills, as well as updated in orthopedic nursing. Relying on bundle care for most nursing procedures. A distinct orthopedic nursing training program must be designed and offered to these nurses in order to increase their skill, on the job training for orthopedic nurses on using a scale for risk skin assessment.

CONCLUSIONS

To conclude, Application bundle skin care had a positive effect on nurses’ knowledge, practice and attitude related skincare for orthopedic patients. So, there was an improvement at BRADEN score of patients post-application bundle skincare. Age, gender and previous hospitalization, BMI, and length had positive predictor effect on pressure sore risk. Skincare bundle for orthopedic patients is acceptable and has the potential to improve nursing care.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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