

- **Basic Research**

## **Effect of Educational Nursing Guideline About Immobilization Complications Control on Nurses' Knowledge and Safety Practice**

**Soheir Mohammed Weheida<sup>1</sup>, Heba Gebril<sup>2</sup>, Narges Mohammed Syam<sup>3</sup>, Heba Mohamed<sup>4</sup>, Yasmin Fathy Mohammed Abed Elazeem<sup>5</sup>**

<sup>1</sup> Professor, Medical Surgical Nursing Department, Faculty of Nursing, Alexandria University, Egypt.

<sup>2-5</sup> Lecturer, Medical Surgical Nursing Department, Faculty of Nursing, Alexandria University, Egypt.

e-mail: [narges-seyam@alexu.edu.eg](mailto:narges-seyam@alexu.edu.eg)

### **Abstract**

**Introduction:** Prolonged immobility has multiple adverse effects on the major systems of the body which result in numerous deleterious consequences. Orthopedic nurses have an important role in actively preventing complications of immobility **Aim:** Determine the effect of implementation of educational guideline about immobilization complications control on nurses' knowledge and safety practice. **Research hypothesis:** Nurses who receive the educational nursing guideline exhibit improved knowledge and practice mean scores post implementation than pre. **Design** A quasi experimental research design was utilized. **Setting:** The study was conducted at the orthopedic surgery and traumatology departments at El. Hadara Orthopedic and Traumatology University Hospital, Alexandria, Egypt. **Subjects:** The subjects comprised a convenience sample of 50 nurses worked at orthopedic surgery and traumatology departments. **Tools:** Two tools were used; Tool I: Orthopedic Nurses' Knowledge regarding immobilization complications control questionnaire. Tool II: Nurses' practice Observational Checklist for immobilization complications control. **Results:** There was statistically significant improvement of nurses' knowledge and practice mean scores regarding prevention of immobility complications post implementation of educational nursing guideline. **Conclusion:** Educational nursing guideline shows a positive result in relation to the nurses' knowledge and safety practice mean score. **Recommendations:** Inservice training programs should be implemented to help the nurses to acquire and develop their knowledge and practice regarding caring of immobilized patients. Replication of the study on large probability sampling. **Keywords:** implementation of educational nursing guideline, immobilization complications control, nurses' knowledge, safety practice.

## **Introduction**

Immobility refers to a reduction in the amount and control of body's movement. It is a state in which a patient is unable to move easily or absolute lack of movement. Moreover, it is the inability to move the whole body or one of its parts. Immobility and complete bed rest can lead to life threatening physical and psychological complications and consequences. In addition, it can adversely affect all physiological bodily systems (Asfaw et al., 2021). Immobility is caused by the state of orthopedic patients conditions or by its treatments such as casts, tractions, splints, implants, and internal fixators (Potter et al., 2018; Elshamy et al., 2018). Adult patients in hospitals spend 95% of their time in beds or chairs. In addition, deconditioning, functional loss, and higher requirement for institutional post acute care are all linked to immobility during hospitalization (Ignatavicius et al., 2017; Hastings et al., 2018).

Prolonged immobility has a number of negative impacts on the body's major systems. For the cardiovascular system (reduced endurance, orthostatic hypotension, increased heart stress, and thrombus development), pulmonary system problems as reduced ventilation, atelectasis, and pneumonia. Musculoskeletal complications as disuse atrophy, contractures, disuse osteoporosis, joint stiffness, and discomfort. While renal stones and more frequent urinary tract infections are two main genitourinary issues. It's possible that patient may develop glucose intolerance, anorexia, constipation as gastrointestinal problems (Ebrahim et al., 2018; Rindsland, 2021).

Additionally, immobility can lead to a variety of psychological issues, including social isolation, low self-esteem, and despair. Also, boredom, worry, grief, and changed verbal/nonverbal communication patterns are common in patients with limited mobility. The patient's body image may be altered as a result of the change in mobility status, leading to low self-esteem and a sense of powerlessness (Curtin et al., 2017; Chatterley & Laurie, 2017). Complications like these are much easier to avoid than they are to treat. Many studies have demonstrated that immobility can have a variety of negative implications, including increased morbidity and death, longer hospital stays, higher healthcare costs, and a contribution to global disease burden. Furthermore, immobility-related problems were linked to a lower health related quality of life (Costa et al., 2016).

Orthopedic nurses play a critical role in actively reducing immobility-related problems. The majority of care is provided by an orthopedic nurse, including intensive supervision and care immediately following surgery, routine daily monitoring, and care plan management; all of which contribute to a shorter hospital stay (Abd El-Ghani et al., 2019). Cortes et al. (2019) conducted that a comprehensive review and found that encouraging adult medical inpatients to get out of bed and move improved walking speed, reduced pulmonary embolism, and reduced the average length of stay by two days when compared to standard

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treatment. The relevance of focused intervention programs, such as changing from a bed to a sitting position, standing, walking, and exercises; was highlighted in the study. As a result, educational nursing interventions are critical in minimizing immobilization related problems.

According to a study done at the Chinese Academy of Medical Sciences 2018 showed that lack of nursing knowledge, competence, and attitude toward the care of immobility issues worsens the situation among bedridden patients (Li et al., 2018). From general researchers' surveillance they found absence of nursing standardized polices and guidelines in relation to different nursing actions particularly immobility from Ministry of Health and local hospital policy.

### **Aim of the study**

This study was conducted to evaluate the effect of implementation of educational guideline about immobilization complications control on nurses' knowledge and safety practice

### **Research hypotheses:**

- 1- Nurses who receive the educational nursing guideline exhibit improved knowledge mean scores post implementation than pre.
- 2- Nurses who receive the educational nursing guideline exhibit improved practice mean scores post implementation than pre.

### **Materials and Method**

#### **Materials:**

**Research design:** A quasi experimental one-group pre-posttest design was used to conduct this study.

**Setting:** The study was conducted at the Orthopedic Surgery Departments which composed of two sections for male patients and two sections for female patients and traumatology departments which composed of one section for male patients and one section for female patients at El Hadara Orthopedic and Traumatology University Hospital, Alexandria University, Egypt.

**Subjects:** The study subjects comprised a convenience sample of 50 nurses, about 8-9 nurse for each section from the above-mentioned sections who are providing direct care for immobile patients. They are working all the days, three shifts per day: Morning from 8 AM to 2 PM, Afternoon from 2 PM to 8 PM and night from 8 PM to 8 AM.

**Tools of the study:** In order to fulfill the aim of the study, two tools were used for data collection.

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**Tool I: Orthopedic Nurses' Knowledge regarding immobilization complications control questionnaire:** It was developed by the researchers based on review of the recent relevant literature (Guedes et al., 2018; Hawken et al., 2018). To assess nurses' educational needs related to immobility, its complications, and preventive measures of these complications to develop the health education booklet accordingly. It consisted of two parts as the following:

**Part 1:** Nurses' Sociodemographic data: this part was used to collect data about orthopedic nurses as; age, gender, marital status, level of education, years of experience, and attendance of training program about immobility.

**Part 2: Orthopedic nurse's knowledge regarding immobilization complications control questionnaire:** This part incorporates an open, and/or closed ended questions of nurses' knowledge about concept, causes, complications of immobility, and preventive measures of immobility complications. The researchers developed it into Arabic language to be understandable by nurses.

**Scoring system:**

Nurses' answers regarding each of the knowledge question were scored on a 3-point Likert scale. A score of (2) was given to correct and complete answer, (1) score was given to correct and incomplete answer, while (0) score was given to wrong answer or don't know. The total knowledge scores were calculated; the total score for every nurse was summed up and converted into percentage). Nurses' knowledge total scores described as following:

1. Less than 50% of total score will be considered "poor knowledge level".
2. From 50%-75% of total score will be considered "pass knowledge level".
3. More than 75% of total score will be considered "good knowledge level".

**Tool II: Nurses' Practice Observational Checklist for prevention of immobilization complications among patients undergoing orthopedic surgeries:** An observational checklist was developed by researchers based on review of related the literature (Wu et al., 2018). This tool was used to assess the actual nurses' practice to prevent the immobility complications, it is comprised 100 items distributed into 9 observed nursing practice s as follows: Nursing performance regarding preventive measures of bed sores (15 items), preventive measures of musculoskeletal problems(10 items), preventive measures cardiovascular system complications(9 items), preventive measures of respiratory system complications(9 items), preventive measures of gastrointestinal system complications (8 items), preventive measures of urinary system complications (9items), Nursing performance regarding teaching patients' deep breathing and coughing exercises (15 items), changing patient positioning (10 items), and teaching patients range of motion exercises (15 items)

The gathered data was assess using 3 points Likert scale ranging from 0 to 2 where (0) means not having done, (1) means done incorrectly, and (2) means done correctly. The

total score was calculated and transfer into percentage, the level of satisfaction was evaluated as follows:

1. Total scores of <60% were considered unsatisfactory level of performance.
2. Total scores of  $\geq 60\%$  were considered satisfactory level of performance.

### **Method:**

- Ethical research committee permission was obtained from Faculty of Nursing, Alexandria University to conduct the study.
- An Approval of the Research affairs Committee, Faculty of Nursing, Alexandria University was obtained before conducting the study.
- An official letter sent from the Faculty of Nursing, Alexandria University to hospital director of El. Hadara Orthopedic and Traumatology University Hospital, Alexandria University for Taking their approval
- Tools I and II were developed by the researchers based on review of relevant literature.
- The study tools were revised by five experts in the fields of Medical Surgical Nursing and Orthopedic for content validity, completeness and clarity of the items.
- Reliability of the tools (I and II) was tested using Cronbach's alpha test. Reliability coefficient values were 0.93 and 0.84 respectively which indicated that the tools were reliable.
- A pilot study was conducted on 5 nurses who fulfilled the inclusion criteria to test the clarity, feasibility, and applicability of the study tools. Accordingly, the necessary modifications were done. These nurses were excluded in the study sample.
- Data was collected within 10 months, during the period between July 2019 and January 2020.
- **The study was carried out on four phases:**
- **Assessment phase (pretest):** Initial assessment of the study participants' knowledge was carried out through distribution of the arabic questionnaire (tool I). Researchers distribute the questionnaire to nurses during their break time and nurse were asked to fill it and return it back to the researchers during their break time. Assessment of nurse's practice carried out using tool II and covert observation was used three times in different three shifts to identify nurses' needs for education pre application of the educational nursing guideline.
- **Planning phase:** Educational nursing guideline was designed by researchers based on assessment phase and recent review of literature (Guedes et al., 2018; Hawken et al., 2018). The guideline's general objective is to improve nurses' knowledge and safety practice regarding immobility complications control. The educational nursing guideline was designed in arabic language. It included two parts:

- **The first part includes theoretical knowledge** about concept, causes, complications, and preventive measure of immobility complications. Illustrative educational booklet in a simple arabic language with simple pictures also was developed by the researchers. Booklet was formulated to be distributed to all nurses.
- **The second part includes practical procedures about:** Nursing practice regarding preventive measures of immobility complications as bed sores, musculoskeletal, cardiovascular, respiratory, gastrointestinal, urinary system complications. Also contains deep breathing and coughing exercises, patient positioning and range of motion exercises practices.
- The goal and expected outcomes of the nursing guideline:
  - Improved knowledge mean scores.
  - Improved practice mean scores.
- **Implementation phase:** The participants in the study group were divided into ten groups. Each group was including of 3-5 nurses. Each group was receiving 4 educational sessions (one for theory knowledge and three for clinical practice) scheduled as 1 session per week for one month duration. Each session was taking approximately 45-60 minutes. The educational content was delivered to nurses as scheduled in groups through face-to-face discussion. The content was presented using power point slides, and demonstration and redemonstration of preventive practices.

**The educational contents:**

- **First session** for knowledge about the concepts of immobility, causes, and its complications.
- **Second session** for clinical practice included preventive practices for pressure ulcer, musculoskeletal and cardiovascular system complications.
- **Third session** for clinical practice included preventive practices for gastrointestinal, urinary, and respiratory systems complications.
- **Fourth session** for clinical practice included nursing practices regarding teaching the patients deep breathing and coughing exercises, patient positioning and range of motion exercises.
  1. The researchers demonstrated all the procedures steps in front of the nurses while discussing with them the rationale and the precaution for each step.
  2. After each session nurses were asked about any unclear steps which needed repetitions or explanation.
  3. Feedback was given to each nurse immediately post redemonstration.
- **Evaluation phase: (posttest):**
  4. Nurses were evaluated twice: pre/post implementation of educational guideline using tool I part 2 (orthopedic nurse's knowledge regarding immobilization complications control questionnaire) for evaluation of nurses' knowledge level, and

tool II (nurses' practice observational checklist for prevention of immobilization complications among patients undergoing orthopedic surgeries) for evaluation of nurses' practice level.

5. Comparisons were carried out at pre/post implementation of educational guideline to identify the effects of the educational nursing guideline on the knowledge and practice of the studied nurses.

**Ethical Considerations:**

- 1- Informed consent was taken from nurses pre conducting the study after explanation of the study aim.
- 2- Nurses' privacy were respected.
- 3- Data confidentiality was assured.
- 4- Nurses were assured that they have the right to be withdrawn from the study at any time with no penalty.

**Statistical analysis of the data:**

- After data were collected, they were coded and transferred into specially designed formats, so be suitable for computer feeding. Verification processes were carried out to avoid any errors during data entry.
  - The suitable statistical program was utilized (IBM SPSS software package version 20.0) (Armonk, NY: IBM Corp) for both data presentation and statistical analysis of results.
  - Significance of the obtained results was judged at the 5% level.
  - Qualitative data were described using number and percent and Quantitative data were described using range (minimum and maximum), mean and standard deviation.
- A- Comparisons between data pre/ post application of the nursing guideline were carried out using these tests:
- i. **Chi-square test** for categorical variables, to compare between different groups.
  - ii. **McNemar and Marginal Homogeneity Test** used to analyze the significance between the different stages.
  - iii. **Fisher exact test** for normally distributed quantitative variables, to compare between two studied.
  - iv. **Monte carlo test** for normally distributed quantitative variables, to compare between more than two groups.
  - v. **Paired t-test** for normally distributed quantitative variables, to compare between two periods. (Beh & Lombardo, 2021).

## Results

**Table 1: Frequency distribution of the studied nurses according to their socio demographic characteristics (n = 50)**

<b>Socio demographic data</b>	<b>No.</b>	<b>%</b>
<b>Age</b>		
20 - <30	5	10.0
30 - <40	20	40.0
40 - <50	20	40.0
50 - 60	5	10.0
<b>Gender</b>		
Male	2	4.0
Female	48	96.0
<b>Marital status</b>		
Single	4	8.0
Married	42	84.0
Divorced	2	4.0
Widow	2	4.0
<b>Education Level</b>		
Diploma	33	66.0
Associate degree	4	8.0
Bachelors	11	22.0
Master's degree	2	4.0
<b>Years of experience</b>		
<1 year	4	8.0
1 - <5 year	5	10.0
5 -<10 years	7	14.0
10 - 20 years	34	68.0
<b>Attendance of training program about immobility.</b>		
Yes	3	6.0
No	47	94.0

**Table (1)** shows sociodemographic characteristics of the studied nurses (n = 50). The majority of studied nurses' age ranged between 30-50 years old. Nearly all of the subjects in the study (96%) were females. Additionally, the majority of the studied nurses were married. Also result showed that about two thirds of the studied nurses (66%) were diploma graduates. and had 10 to 20 years of experience (70%). As regard attendance of training program about immobility nearly all of the studied nurses (94%) hadn't had training courses.



**Table (2): Overall percent score of the studied nurses' knowledge regarding prevention of immobilization complications pre/post application of the educational nursing guidelines (n = 50)**

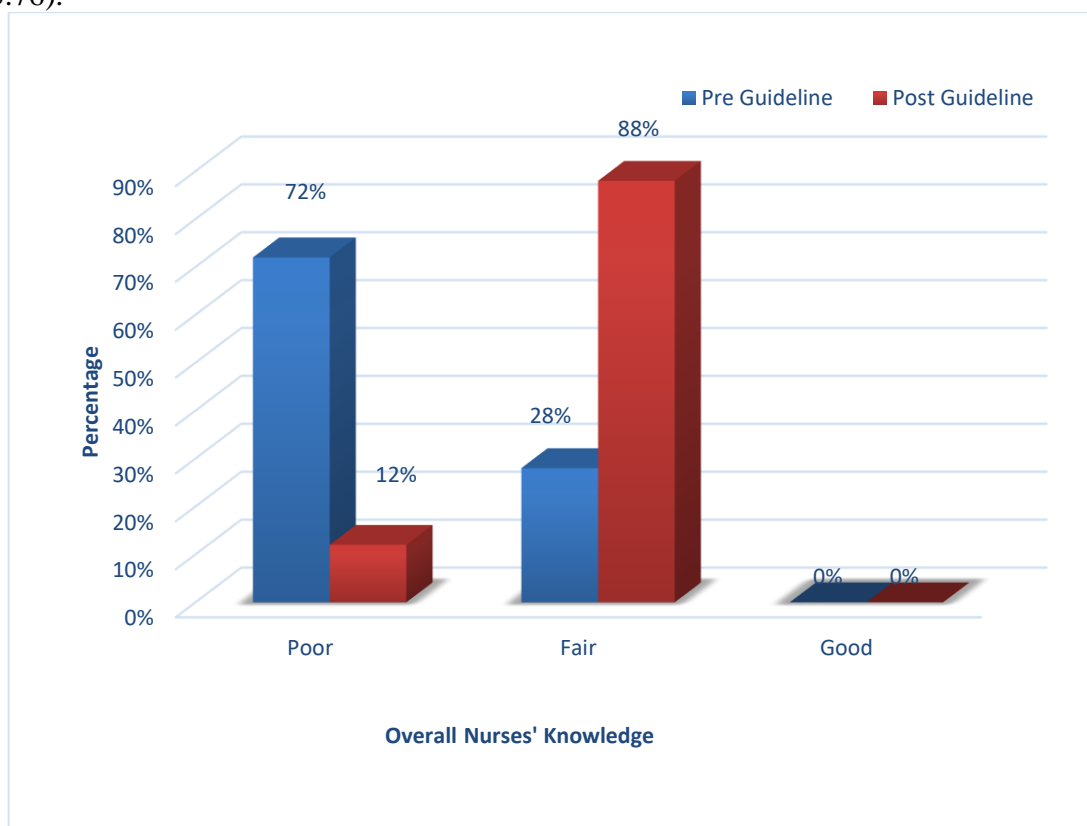
Nurses' Knowledge (%)	Pre guideline		Post guideline		Test of Sig.	p
	No.	%	No.	%		
<b>Concept of immobility</b>						
1. <50% Poor	34	68.0	10	20.0	$\chi^2= 16.531^*$	McN <0.001*
2. 50% - <75% Pass	16	32.0	40	80.0		
3. $\geq 75\%$ Good	0	0.0	0	0.0		
<b>Total score</b>	19.82 $\pm$ 2.49		21.36 $\pm$ 2.17		t= 3.297*	0.002*
<b>% score</b>	45.79 $\pm$ 8.89		51.29 $\pm$ 7.76			
<b>% Improvement</b>	9.43 $\pm$ 17.37					
<b>Causes of immobility</b>						
A- <50% Poor	38	76.0	4	8.0	MH 56.0*	<0.001*
B- 50% - <75% Pass	12	24.0	44	88.0		
C- $\geq 75\%$ Good	0	0.0	2	4.0		
<b>Total score</b>	16.62 $\pm$ 2.41		20.40 $\pm$ 1.92		t= 9.772*	<0.001*
<b>% score</b>	44.25 $\pm$ 10.03		60.0 $\pm$ 7.99			
<b>% Improvement</b>	24.88 $\pm$ 19.51					
<b>Complications of immobility</b>						
D- <50% Poor	11	22.0	3	6.0	MH 52.50*	<0.001*
E- 50% - <75% Pass	29	58.0	18	36.0		
F- $\geq 75\%$ Good	10	20.0	29	58.0		
<b>Total score</b>	13.0 $\pm$ 2.97		15.48 $\pm$ 1.97		t= 5.498*	<0.001*
<b>% score</b>	56.25 $\pm$ 18.56		71.75 $\pm$ 12.32			
<b>% Improvement</b>	32.59 $\pm$ 71.14					
<b>Preventive measures of immobility complications</b>						
G- <50% Poor	35	70.0	7	14.0	MH 63.0*	<0.001*
H- 50% - <75% Pass	11	22.0	39	78.0		
I- $\geq 75\%$ Good	4	8.0	4	8.0		
<b>Total score</b>	10.26 $\pm$ 2.81		13.52 $\pm$ 2.13		t= 6.236*	<0.001*
<b>% score</b>	39.13 $\pm$ 17.58		59.50 $\pm$ 13.32			
<b>% Improvement</b>	51.02 $\pm$ 54.19					
<b>overall nurses' knowledge</b>						
J- <50% Poor	36	72.0	5	10.0	$\chi^2= 31.030^*$	McN <0.001*
K- 50% - <75% Pass	14	28.0	45	90.0		
L- $\geq 75\%$ Good	0	0.0	0	0.0		
<b>Total score</b>	59.70 $\pm$ 5.53		70.76 $\pm$ 5.02		t= 11.565*	<0.001*
<b>% score</b>	46.07 $\pm$ 6.58		59.24 $\pm$ 5.97			
<b>Overall % Improvement</b>	19.49 $\pm$ 13.76					

$\chi^2$ : Chi square test  
Paired t-test

McN: McNemar test

MH: Marginal Homogeneity Test

**Table (2)** shows overall percent score of the studied nurses according to their knowledge regarding prevention of immobilization complications pre/post application of the educational nursing guideline. The table displays that the majority of the studied nurses had poor knowledge related to concept, causes, and the preventive measures of immobility complications pre guideline. (76%, 68%, 70% respectively), whereas the majority of them (88% and 80%, 78% respectively) had pass knowledge post guideline. As regards the knowledge of complications of immobility, 58% of the studied nurses achieved improvement in their knowledge, as they shifted from pass knowledge pre guideline. to good knowledge post guideline, and these results were statistically significant different (MH= 52.50, P<0.001). High statistically significant differences were detected between nurses' overall knowledge at pre/ post application of the nursing guideline. ( $\chi^2= 31.030^*$ , McN<0.001<sup>\*</sup>), with a mean percent improvement score in overall knowledge (19.49  $\pm$  13.76).



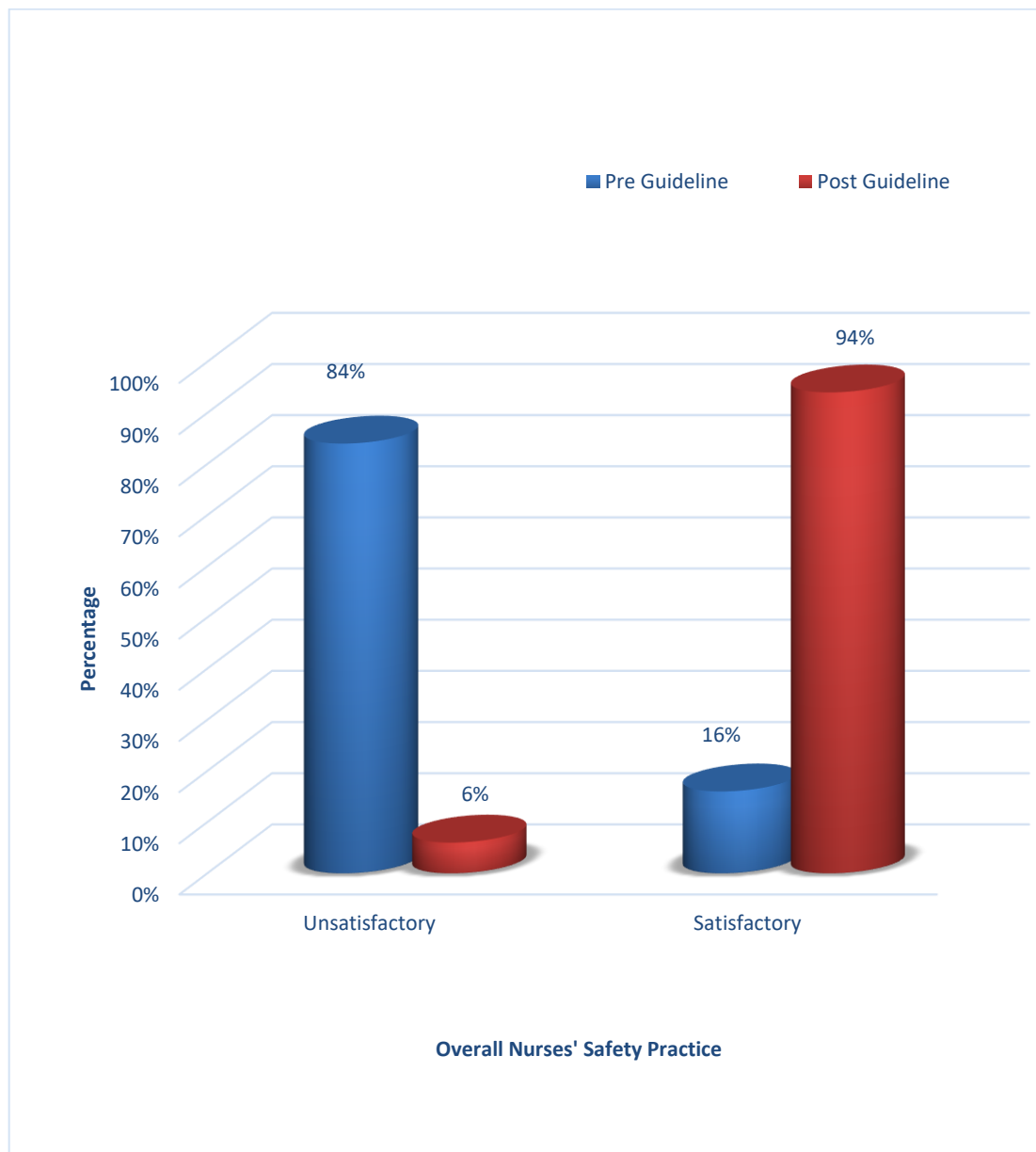
**Figure (1): Overall percent score of the studied nurses' knowledge pre / post application of the educational nursing guideline. (n = 50)**

**Table (3): Differences in the studied nurses' overall safety practice level regarding prevention of immobilization complications at pre/post application of the educational nursing guideline (n = 50)**

Nurses' overall Safety Practice	Pre-Guideline		Post-Guideline		Test of Sig.	P
	No.	%	No.	%		
M- <60% Unsatisfactory	42	84.0	3	6.0	$\chi^2=40.024^*$	McN<0.001*
N- $\geq$ 60% Satisfactory	8	16.0	47	94.0		
<b>Total score</b>						
Min. – Max.	7.0 17.0	–	20.0 – 26.0		t=22.315*	<0.001*
Mean $\pm$ SD.	11.62 $\pm$ 3.13		24.34 $\pm$ 1.67			
<b>% score</b>						
Min. – Max.	26.92 – 65.38		76.92 – 100.0			
Mean $\pm$ SD.	44.69 $\pm$ 12.04		93.62 $\pm$ 6.44			
<b>Mean percent Improvement</b>	127.3 $\pm$ 71.74					

$\chi^2$ : Chi square test    McN: McNemar test    t: Paired t-test    \*: Statistically significant at  $p \leq 0.05$

**Table (3)** exhibits differences in the studied nurses' overall safety practice level regarding prevention of immobilization complications at pre/post application of the educational nursing guideline. High statistically significant differences were found between nurses' overall safety practice pre/post guideline, as ( $\chi^2=40.024$ ,  $P<0.001^*$ ). Additionally, the majority of the studied nurses (84%) had an unsatisfactory level of overall safety practice pre guideline, and (94%) achieved satisfactory level post application of nursing guideline, with a mean percent improvement in their overall practice (127.3  $\pm$  71.74).



**Figure (2): Frequency distribution of the studied nurses according to their overall level of safety practice at pre/ post application of the educational nursing guideline (n=50).**

**Table (4): Relationships between sociodemographic characteristics of the studied nurses, and their overall knowledge scores pre/post application of the educational nursing interventions (n = 50)**

Selected Sociodemographic characteristics	Overall Nurses' knowledge scores											
	Pre-Interventions						Post- Interventions					
	Poor N=36		Pass N=14		Good		Poor N=5		Pass N=45		Good	
	No	%	No	%	No	%	No	%	No	%	No	%
<b>Age</b>												
1. 20 - <30	4	11.1	1	7.1	0	0.0	0	0.0	5	11.1	0	0.0
2. 30 - <40	14	38.9	6	42.9	0	0.0	0	0.0	20	44.4	0	0.0
3. 40 - <50	15	41.7	5	35.8	0	0.0	4	80.0	16	35.6	0	0.0
4. 50-60	3	8.3	2	14.2	0	0.0	1	20.0	4	8.9	0	0.0
<b>Test of sig</b>	<b>Mc=0.784 P=0.936</b>						<b>Mc=5.354 P=0.132</b>					
<b>Gender</b>												
▪ Male	0	0.0	2	14.3	0	0.0	0	0.0	2	4.4	0	0.0
▪ Female	36	100	12	85.7	0	0.0	5	100	43	95.6	0	0.0
<b>Test of sig</b>	<b>FET= 5.357 P=0.021*</b>						<b>FET=0.231 P=0.630</b>					
<b>Marital status</b>												
1. Single	4	11.1	0	0.0	0	0.0	0	0.0	4	8.9	0	0.0
2. Married	29	80.5	13	92.9	0	0.0	5	100	37	82.3	0	0.0
3. Divorced	2	5.6	0	0.0	0	0.0	0	0.0	2	4.4	0	0.0
4. Widow	1	2.8	1	7.1	0	0.0	0	0.0	2	4.4	0	0.0
<b>Test of sig</b>	<b>Mc=2.515 P=0.385</b>						<b>Mc=0.937 P= 1.000</b>					
<b>Education Level</b>												
1. Diploma	26	72.2	7	50.0	0	0.0	2	40.0	31	68.9	0	0.0
2. Associate degree	3	8.3	1	7.1	0	0.0	1	20.0	3	6.7	0	0.0
3. Bachelors	7	19.5	4	28.6	0	0.0	2	40.0	9	20	0	0.0
4. Master's degree	0	0.0	2	14.3	0	0.0	0	0.0	2	4.4	0	0.0
<b>Test of sig</b>	<b>Mc=5.457 P=0.112</b>						<b>Mc=3.456 P=0.296</b>					
<b>Years of experience</b>												
5. <1 year	3	8.3	1	7.1	0	0.0	0	0.0	4	8.9	0	0.0
6. 1 - <5 year	4	11.1	1	7.1	0	0.0	0	0.0	5	11.1	0	0.0
7. 5 - <10 years	5	13.9	2	14.3	0	0.0	0	0.0	7	15.6	0	0.0
8. 10 - 20 years	24	66.7	10	71.4	0	0.0	5	100	29	64.4	0	0.0
<b>Test of sig</b>	<b>Mc=0.405 P=1.000</b>						<b>Mc=5.457 P=1.000</b>					
<b>Attendance of training program about immobility.</b>												
9. Yes	2	5.6	1	7.1	0	0.0	0	0.0	3	6.7	0	0.0
10. No	34	94.4	13	92.9	0	0.0	5	100	42	93.3	0	0.0
<b>Test of sig</b>	<b>FET= 0.450 P=0.832</b>						<b>FET= 0.355 P=0.552</b>					

Mc=Monte carlo test    FET= Fisher exact test    \*: Statistically significant at  $p \leq 0.05$

**Table (4)** Presents relationships between sociodemographic characteristics of the studied nurses and their overall knowledge scores pre/post application of the educational nursing guideline. The table shows that there is a statistically significant association between gender and overall score of nurses' knowledge scores pre guideline (FET= 5.357, P=0.021\*), while there is no significant relation post guideline. Also, this table shows that no statistically

significant relations were detected between nurses' knowledge scores and their age, marital status, education level, years of experience duration, and attendance of training program about immobility pre/post application of the educational nursing guideline.

**Table (5): Relationships between sociodemographic characteristics of the studied nurses, and their overall safety practice scores pre/post application of the educational nursing guideline (n = 50)**

Selected Sociodemographic characteristics	Overall Nurses' Performance scores							
	Pre-Guideline				Post- Guideline			
	Unsatisfactory N= 42		Satisfactory N= 8		Unsatisfactory N=3		Satisfactory N=47	
	No	%	No	%	No	%	No	%
<b>Age</b>								
11. 20 - <30	3	7.1	2	25.0	1	33.3	4	8.5
12. 30 - <40	18	42.9	2	25.0	0	0.0	20	42.6
13. 40 - <50	18	42.9	2	25.0	2	66.7	18	38.3
14. 50-60	3	7.1	2	25.0	0	0.0	5	10.6
<b>Test of sig</b>	<b>Mc=5.213</b>		<b>P=0.114</b>		<b>Mc=3.868</b>		<b>P=0.295</b>	
<b>Gender</b>								
1. Male	1	2.4	1	12.5	0	0.0	2	4.3
2. Female	41	97.6	7	87.5	3	100.0	45	95.7
<b>Test of sig</b>	<b>FET=1.792</b>		<b>P=0.181</b>		<b>FET=0.133</b>		<b>P=1.000</b>	
<b>Marital status</b>								
1. Single	4	9.5	0	0.0	0	0.0	4	8.5
2. Married	35	83.3	7	87.5	2	66.7	40	85.1
3. Divorced	1	2.4	1	12.5	0	0.0	2	4.3
4. Widow	2	4.8	0	0.0	1	33.3	1	2.1
<b>Test of sig</b>	<b>Mc= 2.504</b>		<b>P=0.576</b>		<b>Mc=5.378</b>		<b>P=0.243</b>	
<b>Education</b>								
• Diploma	29	69.0	4	50.0	2	66.7	31	66.0
• Associate degree	3	7.1	1	12.5	1	33.3	3	6.4
• Bachelors	10	23.8	1	12.5	0	0.0	11	23.4
• Master's degree	0	0.0	2	25.0	0	0.0	2	4.3
<b>Test of sig</b>	<b>Mc= 7.841</b>		<b>P=0.036</b>		<b>Mc=3.506</b>		<b>P=0.428</b>	
<b>Years of experience</b>								
• <1 year	2	4.8	2	25.0	1	33.3	3	6.4
• 1 - <5 year	4	9.5	1	12.5	0	0.0	5	10.6
• 5 - <10 years	6	14.3	1	12.5	0	0.0	7	14.9
• 10 - 20 years	30	71.4	4	50.0	2	66.7	32	68.1
<b>Test of sig</b>	<b>Mc= 3.970</b>		<b>P=0.214</b>		<b>Mc=2.891</b>		<b>P=0.354</b>	
<b>Attendance of training program about immobility.</b>								
• Yes	2	4.8	1	12.5	1	33.3	2	4.3
• No	40	95.2	7	87.5	2	66.7	45	95.7
<b>Test of sig</b>	<b>FET=1.792</b>		<b>P=0.181</b>		<b>FET=4.228</b>		<b>P=0.040*</b>	

Mc=Monte carlo test FET= Fisher exact test \*: Statistically significant at  $p \leq 0.05$

**Table (5)** displays relationships between sociodemographic characteristics of the studied nurses, and their overall safety practice score pre/post application of the educational nursing

guideline (n = 50). The table elicits that there are no statistically significant relations were detected between nurses' practice scores and their age, gender, marital status, education level, and years of experience, and attendance of training program about immobility pre / post application of the educational nursing guideline.

## **Discussion**

Prolonged immobility has a variety of consequences on the body's various systems and can cause a negative physiologic reaction (Wu, et al, 2018). Immobility problems are the foremost health complications that linked to nurses' knowledge, practice and their attitude. Therefore, performing on-job training is an essential to improve nurses' knowledge, practice and their attitude regarding immobility complications (Asfaw et al., 2021) Therefore, holding continuing education programs for the nurses is necessary. Going with this context, the present study was carried out to determine the effect of implementation of educational guideline about immobilization complications control on nurses' knowledge and safety practice.

Regarding the age of studied nurses, the result of the present study showed that the majority of studied nurses' age ranged between 30-50 years old. This finding is consistent with El Sharkawy (2016) who study " Nursing practice toward prevention of pin site infection among orthopedic patient with external fixation" and emphasized that half of the nursing staff in an orthopedic unit in their study was between the ages of 40 and 60. While these findings were in contrast to Radhi & Tawfiq ( 2016) in their study entitled "Assessment of postoperative nurses' practices concerning care of fracture treated by external fixation." found that more than three quarters of the analyzed sample were in the age group of 20-39 years .

Finding of the present study revealed that, all the subjects in the study were females. It could be interpreted in that nursing is largely a female career in Egypt, and a small number of men compared to females are admitted to nursing education, the number of graduates is insufficient to cover all hospitals. This finding is in agreement with Mohamed et al., (2020) in research entitled "Nurses performance regarding orthopedic patients with external fixation at Zagazig University Hospitals" reported that female participant more than men.

As regarding to marital status, the current results showed that; the majority of the studied nurses were married. This finding is in the same line with Bader & Atiyah, (2017) in their research entitled "Nurses' knowledge toward dressing pin track external fixation in orthopedic ward at Al-Emamin Al-Khadam Teaching City" reported that the majority of the participants in the sample were married. Regarding to educational level this study showed

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that the majority of nurses were diploma degree in nursing. This could be due to that Bachelor nurse is preferred to work in departments that require high-tech care. This finding is consistent with the findings of Bader & Atiyah (2017) in their study entitled “Nurses’ knowledge toward dressing pin track external fixation in orthopedic ward at Al-Emamin Al-Khadam Teaching City” and El Sharkawy (2016) who study “Nursing practice toward prevention of pin site infection among orthopedic patient with external fixation” found that the majority of nurses in Baghdad and Alexandria were diploma holders.

Concerning nurses’ experience in orthopedic ward, about two thirds of the study subjects had more than 10 years of experience in orthopedic ward. This is in line with the findings of El Sharkawy (2016) in a study performed in Alexandria “Nursing practice toward prevention of pin site infection among orthopedic patient with external fixation” found that the majority of nurses had at least 10 years of experience.

Finally regard the training courses in the care of immobilized orthopedic patients nearly all of them hadn’t attend training courses. According to the researcher, the results could be related to the fact that on job training was lack due to a nursing staff shortage. This finding is consistent with Mousa (2019) in their study entitled "The effectiveness of educational program on nurses regarding prevention complications of immobility in El MekNimer University Hospital Shendi City-Sudan," found that the majority of nurses were not attending training courses or participating in hospital-sponsored training.

Regarding to knowledge the study revealed that there was lowest percentage of total knowledge pre-educational nursing guideline implementation, but there was improved post implementation. This finding supported by Mousa (2019) in their study entitled "The effectiveness of educational program on nurses regarding prevention complications of immobility in El MekNimer University Hospital Shendi City-Sudan," represented that, nurse knowledge of systemic complication of immobility was enhanced in post test and follow up tests with a very significant outcome.

In relation to nurses practice the study revealed that there was highly statistically significant difference between nurses’ practice score pre/post educational nursing guideline implementation. It was confirmed that the pre-educational nursing interventions on preventing complications in immobilized orthopedic patients were beneficial in terms of practice in the study subjects could be linked to improved knowledge about significant immobility issues, which could help nurses, perform better and avoid complications. Besides, utilizing appropriate sessions, demonstration and re-demonstration, and incentive, all of which are necessary for achieving the target level of practice. This finding was backed up by Parmar (2017) in research entitled “A Study to assess the effectiveness of PTP on prevention of complications of immobilized orthopedic patients in terms of knowledge and practice among staff nurses working in orthopedic units of selected hospitals of Ahmed abad

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City, Gujarat State” found that the mean post test practice score was greater than the mean pretest practice score with a mean difference. The mean post-test practice score is statistically considerably greater than the mean pretest practice score.

The present study shows also that there is no statistically significant association between overall nurses’ knowledge and practice mean score pre/post the application of educational nursing guideline and their socio-demographic data. It emphasized that the planned educational nursing guideline were effective in terms of improving knowledge and practice among staff nurses related to prevention of complications of immobilized orthopedic patients. These results agreed with Mohamed & Weheida (2015) in study entitled “Effects of implementing educational program about pressure ulcer control on nurses' knowledge and safety of immobilized patients” reported that a statistically significant correlation was found between level of knowledge and practice for the study group post implementation of program. Also, Saad et al., (2020) in study entitled “Effect of implementing guidelines for nurses caring for immobilized orthopedic patients on their performance” who concluded that majority of the studied nurses had unsatisfactory level of performance (knowledge and practice) regarding caring of immobilized orthopedic patients pre guidelines implementation. Meanwhile, the majority of the studied nurses had statistically significant improvement in their performance mean score post guidelines implementation.

As for relationships between socio demographic characteristics of the studied nurses and their overall knowledge score pre/post application of the educational nursing guideline. There is a statistically significant association between gender and overall score of nurses’ knowledge score pre guidelines implementation. Also, the result confirmed that there are no statistically significant relations were detected between nurses’ practice mean score and their socio demographic characteristics pre implementation. While there is a statistically significant association between training and overall score of nurses’ practice score post guideline implementation. This could be attributed to the effect of the educational nursing guideline in improving knowledge and practice for all nurses. This finding was consistent with the result of Asfaw et al., (2021) in their study entitled “Knowledge, attitude and practice of nurses towards major immobility complications and its associated factors at governmental hospitals in Addis Ababa, Ethiopia: A cross-sectional study recommended that, performing on-job training is an essential to improve nurses’ knowledge, practice and their attitude regarding immobility complications.

Hence, from the present study it could be concluded that implementation guideline confirmed the research hypotheses nurses exhibit higher knowledge and practice post implementing the educational nursing guideline. This could direct the attention to the importance of the implemented educational nursing guideline and its usefulness as a mean

for improving nurses' knowledge and practice toward controlling complications in immobilized orthopedic patient.

### **Conclusions**

Educational Nursing guideline improves the nurses' knowledge and safety practice measure regarding prevention of immobility complication and illustrates positive result

### **Recommendations**

Based on the results of the present study, the following recommendations are suggested:

- 1- Replication of the study on large probability sampling.
- 2- In service training programs should be prepared to help the nurses to acquire and develop their knowledge and practice skills regarding caring of immobilized patients.

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### الملخص العربي

تأثير تنفيذ الإرشادات التمريضية التعليمية عن التحكم في مضاعفات عدم الحركة على معلومات وممارسات السلامة للممرضات.

**المقدمة:** إن عدم القدرة على الحركة لفترات طويلة له آثار ضارة متعددة على أجهزة الجسم الرئيسية مما يؤدي إلى العديد من العواقب الوخيمة وتلعب ممرضات العظام دورًا مهمًا في الوقاية الفعالة من مضاعفات عدم الحركة.

**الهدف من الدراسة:** تحديد تأثير تنفيذ الإرشادات التمريضية التعليمية عن التحكم في مضاعفات عدم الحركة على معلومات وممارسات السلامة للممرضات.

**افتراضات البحث:** الممرضات اللاتي يتلقون الإرشادات التمريضية التعليمية لديهم مستوى اعلى فى المعلومات والممارسات بعد التنفيذ مقارنة بما قبله.

**منهجية البحث :** تم استخدام تصميم بحثي تجريبي لاجراء هذه الدراسة.

**مكان البحث:** تم اجراء هذه الدراسة بأقسام جراحة العظام والاصابات بمستشفى الحضرة الجامعى بالإسكندرية.

**عينة البحث:** اشتملت هذه الدراسة على عينة مائة من 50 ممرضة يعملون في أقسام جراحة العظام والكسور.

**أدوات البحث:** تم استخدام أداتين في هذه الدراسة لجمع البيانات.

الأداة الاولى :استبيانات معلومات ممرضات العظام اتجاه التحكم فى مضاعفات عدم الحركة.

الأداة الثانية :قائمة ملاحظة الممرضات اتجاه التحكم فى مضاعفات عدم الحركة.

**النتائج:** لقد اسفرت نتائج البحث عن الاتى: تحسن ذو دلالة إحصائية في مستوى معلومات وممارسات الممرضات فيما يتعلق بالوقاية من مضاعفات عدم الحركة بعد تنفيذ الإرشادات التمريضية التعليمية.

**الخلاصة:** : علي ضوء هذه النتائج نستخلص التالي:- يظهر تنفيذ الإرشادات التمريضية التعليمية نتيجة إيجابية في مستوى معلومات وممارسات السلامة للممرضات فيما يتعلق بالوقاية من مضاعفات عدم الحركة.

التوصيات: يجب تنفيذ برامج تدريبى أثناء الخدمة لمساعدة الممرضات على اكتساب وتطوير معلوماتهم وممارساتهم فيما يتعلق بالوقاية من مضاعفات عدم الحركة و يجب ايضا تكرار الدراسة على عينات أكبر عددا.