Factors Affecting Nurses' Performance Regarding Use of Physical Restraints in Critical Care Unit

Ola Abdelaty Ahmed*, Asmaa Hamdi Mohamed* Abdelhalim Mohamed Abdelhalim**
* Medical Surgical Nursing **Technical Health Institute, Faculty of Nursing, Ain Shams University

Abstract

Background: Physical restraints are any devices or materials attached to patients' bodyprevent the patient from pulling the connected devices. **Aim:** assess factors affecting nurses' performance regarding use of physical restraint in critical care unit. **Design:**Descriptive exploratory designs were used. **Setting:** The study was conducted in Medical Intensive Care Unit at Ain Shams University Hospital, Egypt. **Subjects:** A convenient sample of 36 nurses was recruited from the previously mentioned setting. **Tools:** A structured interview questionnaire to assess nurses'demographic data and nurses' knowledge about physical restraint, use of physical restraint observational for assessing nurses' practice and questionnaire for assessing factors affecting nurses' performance regarding use of physical restraint. **Results:** Half of the studied nurse had satisfactory knowledge level. All the studied nurses had unsatisfactory level of practice. The majority of the studied nurses reported that the degree of experience is one of the most important factor affecting use of physical restraints properly,less than two third of the studied nurses reported that, separation of ICU patients' in a private room affects their ability to monitor the patients. No statistically significant relation between nurses' level of knowledge and their demographics data. **Conclusion:** most common factors affecting use of physical restraint is absence of clear policies to conduct physical restraint, no written consent for patient's approval on application of physical restraint and in addition to absence of continuous education about use of physical restraint. **Recommendations:** Developing hospital policy and procedure for physical restraints to be available for all nurses and physicians. A hospital consent policy for obligating doctor and nurses to get approval from patient or his / her family before application of physical restraint.

Key words: Critical care unit - Nurses' performance - Physical restraint

Introduction

Critically ill patients are characterized by having life-threatening illnesses or injuries which necessitate continuous monitoring and intensive care. As a result, they are attached to life support and monitoring equipment. Since they may harm themselves unintentionally by removing endotracheal tubes, taking out vascular access, arterial lines, or monitoring equipment, they need protection to ensure their safety **(Bray, Hill & Robson, 2004).**

Physical restraint is a physical or mechanical method of involuntarily restricting patient's movement and physical activity. It is used to limit movements that could be harmful to the patient who are confused, agitated, or disoriented, so that, the patient is protected from causing harm to self or to other (**Ackly & Ladwing, 2011).**

The use of physical restraints in health care setting has become a major area of concern for health professional, patients, and their families **(Lee, Chan &Yeung 2010).** Physical restraints are a common practice in healthcare, with prevalence rates ranging between 15% and 66% in nursing homes and between 33% and 68% in hospital settings **(Hamers & Huizing, 2005).** Over the past few decades, physical restraints become used for patients in acute care setting **(Miles & Irvine, 2012).** The use of physical restraints dates back to the middle Ages, when mentally ill patients were immobilized by this type of devices **(Aschen, 2015).** In a study in the United States, the intensive care units (ICUs) accounted for 56% of all restraint days despite having only 16% of all the patient-days **(Mion, Minnick & Leipzig,2010).** A steady decline over the past several decades coincident with regulation controlling the restraint use was reported. However, some nursing facilities still report physical restraint use from 26% to 56% **(Agens, 2010).** In Egypt, physical restraint is a more conventional practice in ICUs. There are no available guidelines or legal regulations concerning physical restraint use **(Al-Khaled, ElSoussi & Zahran, 2011).**

Nurses' perceptions and knowledge play an important role in this care practice, it was deemed important to develop a restraint policy and educate nurses to implement it because hospitals in Egypt have not any policies and there are illegal uses of restraint **(Kandeel&Attia, 2013).**

There are many factors which affect use of physical restraints such as hospital facilities to perform different types of physical restraints, level of nurses' education related to physical restraints, hospital policy which guides for how to perform physical restraints and how to prevent complication, nurses' over load, Dilemmas in patient care are an inevitable consequence of nursing accountability. Nurses struggle to balance their responsibility to protect patients' rights of freedom with their obligation to prevent harm to patients and staff **(Braine, 2015).**

Aim of the study

This study aims to assess factors affecting nurses' performance regarding use of physical restraint in critical care unit through the following:

Significance of study:

The common complications of physical restraint reported by the nurses in their study are skin complications (skin abrasions, edema and contusions) while small proportion reported occurrence of agitation. Recent studies carried out in Mansoura university hospital ICUs revealed that, most of restrained patient developed pressure sore, limb edema, restricted circulation and skin laceration due to lack of nurses knowledge and documentation of physical restraining and recommended need for standard guidelines and polices for physical restraint practices in Egyptian ICUs (**Hafez, 2011)**.

1-Assessment of nurses' knowledge regarding physical restraint.
2- Assessment of nursing practice regarding use of physical restraint

3- Assessment of factors affecting nurses' performance regarding use of physical restraint.

Subjects and Methods

Research design

Descriptive and exploratory designs were used in carrying out.

Setting: This study was conducted in Medical Intensive Care Unit at Ain Shams University Hospital.

Subjects:A convenience sample of 36 nurses was recruited from the previously mentioned setting

Tool for data collection

The following three tools were used to collect data:

I-Self-administered questionnaire: It wasused to assess nurse's knowledge regarding caring for restrained patient which involves two parts, as follow:

1st part: It included demographic characteristics of nurses under study such as gender, age, and level of education and years of experience.

2nd part: It included 44 true and false questions concerned with assessment of nurses' knowledge regarding definition of physical restraint, indication for use of physical restraint, types of physical restraint, complication of physical restraint and nursing care for patient with physical restraint.

II- Physical restraint observational checklist*:* to assess the level of nurses practice regarding use of physical restraints

ш- Factorsaffecting nurses' performance regarding use of physical restraint questionnaire: to assess the factors affecting nurses' performance regarding use of physical restraint which consisted of 19 questions divided into two parts as follows:

Part 1: concerned with the nurses related factors.

Part 2:concerned with the hospital related factors.

A pilot study was carried out on 10% of the nurses under the study to test applicability of the developed tools and the study, the clarity of the included questions as well as estimated and the average time consuming needed to complete all questions. Nurses who shared in the pilot study were included to the study sample as there were no needed modifications.

Fieldwork

Upon having official permissions from Ain Shams University hospital, the nurses included in the study were interviewed individually and groups to explain the aim of the study at the beginning of data collection and their approval (oral consent) to participate in the study were obtained.

Data were collected over three months, from beginning of January 2017 to the end of march 2017; the researcher visited the research setting four days weekly (Saturday, Sunday, Monday, Tuesday) during morning shift from 9:00am to 1:00pm in the previously mentioned setting, according to lack of fixed schedule so that all staff rotate in morning shift during study performed.

First;the researcher used the observational checklists to observe the

nurse's practice regarding using physical restraint prior to administering the knowledge assessment questionnaire to ensure the maximal realistic observation of the nurse's practice and minimize the possibility of bias.

The nurses were observed throughout their practice regarding assessment, preparation, application of physical restrain and post application care.

Second; self-administered knowledge assessment questionnaire and the checklist for assessment of factors affecting nurses' performance regarding use of physical restraint questionnaire wnurses caring of patient with physical restraint to assess their knowledge about physical restraint, its care and factors affecting their performance regarding .

All tools required about 20-30 minutes to be filled in by every nurse.

Ethical considerations

Obtaining research approval from ethical committee before starting the study.Explainingthe aim of the study to the director of the unit to take here permission to conduct the study. The aim and purpose of the study were explained to the study participants prior to data collection to get their cooperation. The participants were assured that the information which will be obtained will be confidential and used only for the purpose of the study, and oral consents were collected. Nurses were informed that they are allowed to choose to participate or withdraw from the study at any time.

Statistical analysis

All the collected data were organized, coded, entered into the excel sheet on the computer and analyzed using the statistical package for social science (SPSS) 16.0, Microsoft office excel is used for graphic presentation.

Data were presented using descriptive statistics in the form of number and percentage, Chi-square (X^2) and p- value test were also used to test the significance of result was considered as follow:

$p>0.05$ not significant (NS)

$p<0.05$ significant (S)

$p<0.01$ highly significant (HS)

Results

Table(1): illustrates that half of the studied nurses (50%) were between 20-30 years old, the lowest proportion for nurses (8.3%) were between 40-50 years old and about less than three quarters of them (72.2%) were females . less than half of them (44.4 %) had nursing experience from 10 to less than 20yrs. one third of them (33.3%) was between one to five years old and more than one third of them (41.7%) had an ICU experience above10 years. Two third of them (66.7%) were diploma nurses.

Table (2): Regarding the studied nurses' total knowledge level, showes that, 50% of the studied nurse had satisfactory knowledge level and 50% of them had unsatisfactory level of knowledge with the details as follow; more than two third of the studied nurses (69.4%) had unsatisfactory level of knowledge regarding definition of physical restraint. 55.6% of the studied

nurses had satisfactory level of knowledge regarding indication for use of physical restraint. 83.3% of them had unsatisfactory level of knowledge regarding types of physical restraint. 52.8% of them had unsatisfactory level of knowledge regarding complications of physical restraint. Also more than two third of the studied nurses (69.4%) had satisfactory level of knowledge regarding precautions and nursing care for the physically restrained patient.

Table (3): Regarding total nurses' practice level, this table shows that, all the studied nurses (100%) had unsatisfactory level of practice regarding physical restraint specially nurses' practice regarding preparation and documentation.

Concerning the personal factors affecting nurses' performance regarding list of physical restraints,

Table (4):showed that, 72.2% of the studied nurses are feeling irritable when patient's family enters the patient's room when they are restraining the patient. 88.9% of the studied nurses reported, they learnt about the physical restraints in the nursing course they studied. More than half of the studied nurses (61.1%) aren't able to care for a large number of patients at the same time. The majority of the studied nurses (91.7%) believe that, the degree of experience is one of the most important factors affecting how to use physical restraints in a proper manner. Also 72.2% of the studied nurses see that physical restraint is an effective treatment to reduce the patient's agitation and prevent health problems. Moreover, one third of the studied nurses (33.3%) believe that physical restraint is the best way to reduce the movement of the patient and prevent pulling the devices they are connected.

Table (5): showed that, all of studied nurses (100%) reported that, the physical restraints should be applied based on written medical order, 63.9% of the studied nurses reported that, design of the ICU setting and separation of ICU patients' in a private room affects their ability to monitor the behavior of the restrained patients. 41.7% of the studied nurses perform patient's restraints without medical order in emergency situation. One third of the studied nurses (38.9%) reported that, the number of patients is large in relation to the number of the nurse. While, only 2.8% of the studied nurses reported the presence of clear policies to conduct physical, also reported that the hospital policy requires obtaining written consent for applying physical restraint from the patient or his/her family.

Table (6): showed that there was no statistically significant relation between nurses' level of knowledge and their age (with P value 0.2359).

Table(7): showed This table shows that, there were no statistically significant differences between nurses' satisfactory and unsatisfactory knowledge regarding physical restraint and their gender (with P value 0.4568).

Table (8): showed that there was no statistically significant relation between nurses' level of knowledge and their years of experience in intensive care units (with P value 0.7851).

Table(9): showed that there was no statistically significant relation between nurses' level of knowledge and their level of education (with P value 0.2053).

Table (1): Demographic Characteristics of the Studied Nurses (n=36)

Demographic Characteristics	No	%
Age		
Less than 20 yr.	0	0%
20-<30 yr.	18	50.0%
30-<40 yr.	15	41.7%
40-<50 yr.	3	8.3%
≥ 50 yr.	0	0%
Gender		
Male	10	27.8%
Female	26	72.2%
Years of experience in nursing profession		
less than one year	0	0%
1-<5 yr.	8	22.2%
5-<10 yr.	8	22.2%
10-<20 yr.	16	44.4%
≥ 20 yr.	4	11.1%
Years of experience in intensive care units		
less than one year	1	2.8%
1-<5 yr.	12	33.3%
5-<10 yr.	8	22.2%
≥ 10 yr.	15	41.7%
Level of education (qualification)		
Diploma	24	66.7%
Nursing Technical Institute	8	22.2%
Bachelor of Nursing	4	11.1%
Postgraduate	0	0%

Table (2): Nurses' level of knowledge regarding physical restraints (n=36)

Knowledge items	Satisfactory		Unsatisfactory	
	NO	%	NO	%
• Definition of physical restraint	11	30.6%	25	69.4%
• Indications for the use of physical restraint	20	55.6%	16	44.4%
• Types of physical restraint	6	16.7%	30	83.3%
• Complications of physical restraint	17	47.2%	19	52.8%
• Precautions and nursing care for the physically restrained patient	25	69.4%	11	30.6%
Total level of knowledge	18	50.0%	18	50.0%

Table (3): Nurses' level of practice regarding use of physical restraints (n=36) .

Procedure	Satisfactory		Unsatisfactory	
	NO	%	NO	%
Assessment	1	2.8%	35	97.2%
Preparation	0	0.0%	36	100.0%
Procedure	2	5.6%	34	94.4%
Post procedure	1	2.8%	35	97.2%
Documentation	0	0.0%	36	100.0%
Total level of practice	0	0.0%	36	100.0%

Table (4): Personal factors affecting the nurses' performance regarding use of physical restraints (n=36) **.**

Personal factors	Yes	
	NO	%
• Feeling irritability during presence of family when restraining the patient	26	72.2%
• Learning about physical restraint through the nursing course	32	88.9%
• Inability to care for large number of patients at the same time	22	61.1%
• The degree of experience affecting applying physical	33	91.7%
• Believing that physical restraint is an effective intervention to reduce the patient's agitation and prevent health problems.	26	72.2%
• Convincing that physical restraint is the best way to reduce the movement of the patient and prevent pulling the devices connected to him	12	33.3%

Table (5): Organizationalfactors affecting the nurses' performance regarding use of physical restraints (n=36).

Organizational factors	Yes	
	NO	%
• Hospital policy guarantees the right to refuse to restrain	9	25.0%
• Clear hospital policies to conduct physical restraint	1	2.8%
• Hospital policy requires the registration of the patient's restraints	5	13.9%
• Hospital policy indicate that the physical restraints should be performed based on written medical order	36	100.0%
• Hospital policy indicate that the physical restraints can be applied without the doctor's order in case of emergency	15	41.7%
• The number of patients is large in relation to the number of nurses	14	38.9%
• All types of physical restraint are available in the ICU	4	11.1%
• The hospital system imposes legal responsibility for nurses in case of patient's harm due to use of physical restraint	6	16.7%
• The hospital system requires obtaining written consent for applying physical restraint from the patient or his/her family	1	2.8%
• The hospital system requires reviewing the presence of written consent from the patient or any of his/her family to carry out the physical restraints every shift	6	16.7%
• The design of the ICU setting and separation of every patient in a private room affects the nurses' ability to monitor the restrained patients	23	63.9%
• Presence of continuous education about use of physical restraint and its care improve nurses performance regarding use of restraint	6	16.7%
• One of the supervisor's responsibility is to ensure that the use of physical restraint in a proper way to prevent complications of the patient	13	36.1%

Table (6): Relation between demographic characteristics of the studied nurses and their knowledge about physical restraints

Age	Knowledge				X^2 Test		
	Unsatisfactory (N = 18)		Satisfactory (N = 18)				
	N 18	%	N 18	%	X^2	P	Sig
20 - <30 yrs.	7	19.4%	11	30.9%	2.9	0.2359	NS
30 - <40 yrs.	10	27.8%	5	13.9%			
40 - 50 yrs.	1	2.8%	2	5.6%			

NS: Non significant P>0.05

Table (7): Relation between nurses' level of knowledge and their gender (n=36) .

Gender	Knowledge				X^2 Test		
	Unsatisfactory (N = 18)		Satisfactory (N = 18)				
	No 18	%	No 18	%	X^2	P	Sig
Male	6	16.7%	4	11.1%	0.56	0.4568	NS
Female	12	33.3%	14	38.9%			

NS: Non significant P>0.05

Table (8): Relation between nurses' level of knowledge and years of experience in intensive care units (n=36)

Years of experience in intensive care units	Knowledge				X^2 Test		
	Unsatisfactory (N = 18)		Satisfactory (N = 18)				
	N 18	%	N 18	%	X^2	P	Sig
less than one year	0	0.0%	1	2.8%	1.07	0.7851	NS
1 - <5 yrs.	6	16.7%	6	16.7%			
5 - <10 yrs.	4	11.1%	4	11.1%			
≥10 yrs.	8	22.2%	7	19.4%			

NS: Non significant P>0.05

Table (9): Relation between nurses' level of knowledge and level of education (n=36)

Qualification	Knowledge				X^2 Test		
	Unsatisfactory (N = 18)		Satisfactory (N = 18)				
	N 18	%	N 18	%	X^2	P	Sig
Diploma	11	30.6%	13	36.1%	3.17	0.2053	NS
Nursing Technician Institute	6	16.7%	2	5.6%			
Bachelor of nursing	1	2.8%	3	8.3%			

NS: Non significant P>0.05.

Discussion:

Demographic characteristics of the studied nurses:

Regarding to nurses age; the present study showed that half of the studied sample were young adults from 20 to 30 years old, indicating that most nurses were juniors while nurses' between 40-50 years old represent the lowest percentage, this finding is in agreement with **Al-Khaled, Zahran and El-Soussi(2011)** who conducted a study about nurses' related factors influencing the use of physical restraint in critical care units and found that, about half of the studied sample between 20 to 30 years old, and disagree with **Mohamed and Ali (2015)** who conducted a study to assess nurses practice to physical restraint practices in ICU units at three teaching

hospitals in baghdad, and found that, half of the study between 40-50 years old.

Regarding years of experience in nursing profession;the current study indicated that, less than half of the study subjects had nursing experience from 10 to less than 20yrs, this finding is in disagreement with **Yonis and Ahmed (2017)** who conducted a study about physical restraint and maintenance of critically ill patient's safety in intensive care unit and found that, half of study sample was less than five year of experience in nursing filed.

Nurses' level of knowledge and practice regarding physical restraint:

Assessment of nursing knowledge is important because knowledge plays a causal role in attitude or behavioral consistency. The present study found that, half of the studied sample had unsatisfactory level of knowledge about physical restraints. From the investigator point of viewrelated this study more than three quarter of the study nurses' studied physical restraint through the nursing course. The current study finding is in agreement with **Al-Khaled, Zahran and El-Soussi**(**2011**) who found that, more than half of the study subjects had satisfactory knowledge level, also in the same line with **Azab and Negm (2013)** who found that, more than half of study had satisfactory knowledge level. While, the finding disagree with **Taha and Ali (2013)** who found that, all study subjects in their study had unsatisfactory knowledge level pre training program about physical restraint, also the finding disagree with **Nasrate, Saharawi and Darawad (2017)** whofound that, more than half of studied sample hadunsatisfactory knowledge level pre training program about physical restraint.

Nurses' level of practice regarding physical restraints:

Concerning total nurses' practice regarding physical restraints, the present study revealed that, all the studied nurses had unsatisfactory level of practice regarding physical restraint especiallypreparation and documentation. This finding is in the same line with **Yonis and Ahmed (2017)** whofoundthat, the nurses' total practice score were unsatisfactory and inadequate before applying clinical educational guidelines.

Personal factors affecting the nurses' performance regarding use of physical restraints:

The present study results showed that, most of nurses reported that, the most important personal factors affecting the nurses' performance are two factors; the degree of experience and the nursing educational courses.These findings are evident through their lack of knowledge regarding physical restraint.

The present study revealed that, more than two third of nurses are feeling irritability during presence of family when restraining the patient, from the investigator's point of view, this may be due to the culture of the community which considers that, the restraints is shameful and represents a derogation from the patient right and not way of treatment.

Most of those studied nurses learning about physical restraint through the nursing course, this finding disagree with **Al-Khaled, Zahran and El-Soussi (2011)** who found that, nurses' performance in applying and maintaining restraining increases with the increase in nurses' qualification. This can be explained by the fact that B.Sc. nurses received some training on restraining

while they were undergraduates as a procedure included in the nursing fundamental course. Nurses graduated from the technical institute of nursing received also training on restraining, although it is brief. While, nurses graduated from the secondary nursing school did not receive any classes or clinical training.

Slightly lower than two third of the studied nurses can't care for large number of patients at the same time, this finding is consistent with **Azab and Negm (2013)** who found that, more than half of the respondent nurses indicated that their use of PR is higher when there is shortage of nursing staff. Also, use of PR increase with increasing of patient/nurse ratio in the ICU setting. This finding may be due to when patient / nurse ratio is more than two / one, this affects nursing ability to follow the patient and prevent him from harming himself, so, restraint use increase.

Most of those surveyed nurses see that, the degree of experience is affecting applying physical restraint، in the same line **Al-Khaled, Zahran and El-Soussi(2011**) found that there is a significant relationship between nurses' performance and nurses' experience and showed that nurses with a higher experience are performing the procedure of restraining better than others.

Slightly lower than three quarters believing that physical restraint is an effective intervention to reduce the patient's agitation and prevent health problems, while although, only one third of the study subjects are convincing that, physical restraint is the best way to reduce the movement of the patient and prevent pulling the devices connected to him. This finding disagree with **Mohamed and Ali (2015)** who found that, most of the nurses prefer restraining patients for increasing security, preventing patients from falling down from hospital beds or preventing dislodgement of medical equipment.

Organizationalfactors affecting the nurses' performance regarding use of physical restraints:

The present study result shows that all nurses see that hospital policy indicate that the physical restraints should be performed based on written medical order, this result disagree with **Al-Khaled, Zahran and El-Soussi(2011)** who found lack of written policies and procedures in ICUs guiding physical restraining. This finding may be attributed to lack of cooperation between nurse and physician or lack of physicians' knowledge regarding their role in participating in the decision of restraining a patient.

These results disagree with **Azab and Negm (2013)** who found in their study that, a small proportion of the respondent nurses (18%) use PR only with a physician's order. Also similar finding was reported by **Jonghe (2013)** who found that, PR was usually started and removed without written medical orders or clearly established local policies. Also, **Choi and Song (2013)** found that; 94% of restraint applications were not directed by the physicians, implying that they were initiated by the nurses.

This result shows that, there is alreadya doctor's order only for restraining the patient, and the doctors write retrain order without details about the type, duration, or how to follow the patient after restraining or when it should be removed.

Concerning availability of physical restraint tools which use in different types

of physical restraint the present study revealed that,lack of tools which provided by the hospital for all type of physical restraints, this finding agree with **Mohamed and Ali (2015)** who found that, the lack of standard material specifically produced for physical restraint in this hospital, only a few of the ICU nurses reported using special physical restraint materials.

Concerning presence of hospital policy that guarantees the right to refuse to restrain, the present study found that, one quarter of the studied nursessee that the Hospital policy guarantees the right to refuse to restrain. In the same line**Azab and Negm (2013)** found that, about 71% of the respondent nurses disagreed with the statement that "family members have the right to refuse the use of restraints"; about 56% of them indicated that they never tell family members why the patient is being restrained or explain why the restraint is being applied. Also, **Yonis and Ahmed (2017)** found that, about half of nurses disagree with telling the family that restraining their patient is a part of care.

Concerning presence of clear policies to conduct physical restraint and hospital policy requires the registration of the patient's restraints, the current study revealed that, there is no clear policy for recording patient's restraint or how to follow a patient during use of physical restrain, also no available guidelines to protect patient's health during applying physical restrain. The same results agree with **Yonis and Ahmed (2017); Mohamed and Ali (2015); Azab and Negm (2013);Taha and Ali (2013) and Al-Khaled, Zahran and El-Soussi (2011**)who found that, there are no hospital policies for physical restraint procedure and documentation.

Concerning the number of patients in relation to the number of nurse's the present study revealed that, one-thirds of the study nurses see that the number of patients is not enough compared to the number of nurses. In the same context **Azab and Negm (2013)** found a relationship between patient/nurse ratio and a high restraint rate. According the investigator's point of view, this may be due to patient / nurse ratio more than two / one and this affects nursing ability to follow the patient and prevent him from harming himself.

Concerning legal responsibility for nurses in case of patient's harm due to use of physical restraint, the present study showed that, the hospital does not consider the physical restraint important procedure and does not develop a special policy to physical restraints, also nurses do not know their responsibilities and legal problems that may be encountered in the event of health problems of the patient.

Concerning the requirement of obtaining written consent for applying physical restraint from the patient or his/her family, present study showed that, the hospital does not have a policy and there is no consent for applying physical restraint, also, patients and their family do not know their rights. This finding agree **Al-Khaled, Zahran and El-Soussi**(**2011**) who found that, the nurses do not take the patient's consent to apply physical restraint.

Concerning the availability of all types of physical restraint in ICU, the present study revealed that, the hospital doesn't provide equipment for different types of restraint so, that nurses perform one types of restraint (limb restraint) using gauze bandage. This finding is supported by **Martin (2012); Benbenbishty, Adam and Endacott**

(2010) and Hurlock and Kielb (2006) who reported that, one type of restraint (wrist restraint) is the most applied method for restraints in ICU. In the same line the result agree with **Azab and Negm (2013)** who found that, the majority of the respondent nurses reported use of gauze bandage and cotton only for physical restraints due to the lack of appropriate tools for each type of physical restraint.

Concerning to the design of the ICU, as a factors affecting nurses' performance regarding applying physical restraint present study showed that, two-third of the studied nurses reported that, separation of patient in a private room affects their ability to monitor the restrained patient. this finding reveals one of the most important reason for increased incidence of complications due to physical restraint.

Concerning presence of continuous education about use of physical restraint and its care, the present study showed lack of continuous education for nurses regarding physical restraints about types, how to perform, complications and nursing care, this finding is supported by **Mohamed and Ali (2015)** whofoundthat,nurses did not receive special education or any in-service training about physical restraint practices. Also, **Nasrate, Saharawi and Darawad (2017)** found that 57% of nurses did not take any PR educational programs and more than half of them did not know if there hospital has PR policy that should integrate it in PR educational programs.

Moreover, **Cannon, Sprivulis and Mccarthy (2001)** found that, the majority of nurses did not obtain any particular learning or in-service preparation about PR, additionally **Lane and Harrington (2011)** found lack of both educational program and good management practices. Also, **Azizpour, Moosazadeh and Esmaeil (2017)** foundlack of training program for nurses to improve effective use of these instruments, minimizing its side effects and recommendations to reduce the use of physical restraints.

Concerning the supervisor's responsibility to ensure that the use of physical restraint in a proper way to prevent complications of the patient, the present study found that, about one third of studiednurses reported that, the nurses supervisors take the responsibility to ensure that the use of physical restraint in a proper way.This result is reflecting absence of real supervision of nursing practices in terms of physical restraint because there are no policies regulating the process of physical restraint .

Conclusion

Based on findings of the present study, was concluded that, half of the studied nurses had satisfactory knowledge level regarding use of physical restraint. All of them had unsatisfactory level of practice. The most important personal factors affecting use physical restraint is the degree of nursing experience, while the less reported factor is that the nurses consider the physical restraint the best way to reduce the movement of the patient and prevent pulling the devices. The most reported organizational factors include: design of the ICU setting and separation of ICU patients' in a private room, absence of clear policies to conduct physical restraint accordingly, no written consent for patient's approval on application of physical restraint, unavailable of all types of physical restraint and the hospital doesn't imposes legal responsibility for nurses in case of patient's harm due to use of physical restraint, in addition to absence of

continuous education about use of physical restraint.

Recommendations

- Developing hospital policy and procedure for physical restraints to be available for all nurses and physicians in order to follow.
- Improved Physical conditions in ICU settings provide equipment for all types of restraint.
- In-service training programs based on best practice guidelines for nurses working in ICU to improve nurses' practice regarding use of physical restraint and emphasizing the importance of procedure.
- Further researches concerning factors affecting nurses' performance and concerning the effect of applying educational program regarding use of physical restraint on their performance.

References

Ackly, B. and Ladwing, J. (2011). Nursing diagnosis handbook (9th Ed.). St. Loius: Mosby/Elsevier.

Agens, J. (2010). Chemical and Physical Restraint used in the older Person. *British Journal of Medical Practitioners;* 3(1), 302-305.

Al-Khaled, T., ElSoussi, A. and Zahran, E. (2011). Nurses' Related Factors Influencing the use of Physical Restraint in Critical Care Units. *J. Am. Sci.;* 7(8), 13-22.

Aschen, R. (2015). Restraints: Does position make a difference? Issues in Mental Health Nursing; 6(1), 87-92.

Azab, S. and Negm, L. (2013). Use of Physical Restraint in Intensive Care Units (ICUs) At Ain Shams University Hospitals, Cairo. Journal of American Science; 9(4), 230-240. (ISSN: 1545-1003). Available at: *http://www.jofamericanscience.org.*

Azizpour, M., Moosazadeh, M. and Esmaeil, R.(2017). Use of Physical Restraints in Intensive Care Unit.*Acta Medical Mediterranea;* 4(2), 33: 129.

Benbenbishty, J., Adam, S. and Endacott, R. (2010). Physical Restraint Use in Intensive Care Units across Europe: The PRICE Study**.** *Inten. Crit. Care Nurs J;*26(4), 241-245.

Braine, M. (2015). The Minimal and Appropriate use of Physical Restraint in Neuroscience Nursing.*British Journal of Neuroscience Nursing;* 1(4), 381-386.

Bray K., Hill, K. and Robson, W. (2004). British Association of Critical Care Nurses Position Statement on the use of Restraints in Adult Care Units. *Nurse Critical Care*; 199-212.

Cannon, M.E., Sprivulis, P. and Mccarthy, J. (2001). Restraint Practices in Australa- Sian Emergency Departments.*Australian and New Zealand Journal of Psychiatry;* 35(1), 464-467.*https://doi.org/10.1046/j.1440-1614.2001.00925.x.*

Choi, E. and Song, M. (2013). Physical restraint use in a Korean ICU.*Journal of Clinical Nursing;* 12(1), 651-659.

Dunbar, J. and Neufeld, R. (2012). Partnership beyond restraints: A statewide educational intervention to reduce restraint use. *Annals of long-term care;* 8(9), 47-54.

Hafez, E. (2011). Problems Encountered Among Patients Utilizing Physical

Restraint In Mansoura University Hospitals. *Faculty of Nursing, Zagazig University.*

Hamers, J. and Huizing, A. (2005). Why do we use physical restraints in the elderly? ZeitungfuGerontologie and Geriatrie; 38: 19-25.

Hurlock, C. and Kielb, C. (2006).A Learning Plan to Minimize Patient Restraint in Critical Care.*CACCN;*17(1), 12–18.

Kandeel, N. and Attia, A. (2013). Physical Restraints Practice in Adult Intensive Care Units in Egypt.*Nursing Health Science;* 15(4)، 79-85**.**

Lane, C. and Harrington, A. (2011). The Factors That Influence Nurses' Use of Physical Restraint: A Thematic Literature Review**.** *International Journal of Nursing Practice;*17(1), 195–204.

Lee, T., Chan, M. and Yeung, S. (2010). Use of Physical Restraints on Elderly Patients: An Exploratory Study of the Perceptions of Nurses in Hong Kong.*Journal of Advanced Nursing;* 29(1), 153-159.

Martin, B. (2012). Restraint use in acute and critical care settings: changing practice. *AACN Clinical. Issues;* 13(3): 294–306.

Miles, H. and Irvine, P. (2012). Deaths Caused By Physical Restraints. The Gerontologist; 32(6), 762-766**.**

Mion, L., Minnick, A. and Leipzig, R.(2010). Patient-Initiated Device Removal in Intensive Care Units: A National Prevalence Study. *Crit Care Med;* 35(12), 2714-2720.

Mohamed, S. and Ali, H. (2015). Nurses Practice to Physical Restraint Practices in ICU Units at Three Teaching Hospitals In Baghdad. *KUFA Journal for Nursing Sciences;* 5(1), 1-9.

Nasrate, H., Shamlawi, A. and Darawad, M.W. (2017). Improving ICU Nurses' Practices of Physical Restraints in Jordan: Effect of an Educational Program. Health; 9(2), 1632-1643.Available at:***https://doi.org/10.4236/health.***

Taha, N. and Ali, Z. (2013). Physical Restraints in Critical Care Units: Impact of a Training Program On Nurses' Knowledge And Practice And On Patients' Outcomes. *J Nurs Care 2:135. doi:10.4172/2167-1168.1000135.*

Yonis, G. and Ahmed, S. (2017). Physical Restraint and Maintenance of Critically Ill Patient's Safety in Intensive Care Unit: Effect of Clinical Practice Guidelines on Nurse's Practice and Attitude. *Journal of Nursing and Health Science;* 6(4), 6-21.