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Original Article

Knowledge, attitude and performance of nurses in intensive care units in the field of patients' physical restraint use and their related factors

Zahra Gheidari[1], Masoomeh Adib[2*], Tahereh Khaleghdoost Mohamadii[3], Ehsan Kazemnejad[4]

[1]MSc in Intensive Care Nursing, Social Determinants of Health Research Center, Shahid Beheshti Faculty of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran, [2] PhD Candidate in Nursing Education, Department of Medical-Surgical Nursing, Social Determinants of Health Research Center, Shahid Beheshti Faculty of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran, [3] Instructor, Department of Medical-Surgical Nursing, Social Determinants of Health Research Center, Shahid Beheshti Faculty of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran, [4] Associate Professor, Department of Biostatistics, Social Determinants of Health Research Center, Shahid Beheshti Faculty of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.

Correspondence: Masoomeh Adib, PhD Candidate in Nursing Education, Department of Medical-Surgical Nursing, Social Determinants of Health Research Center, Shahid Beheshti Faculty of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran, Email: adibmasoomeh@yahoo.com.

ABSTRACT

Introduction: Provision of care safely and in a secure environment is essential for patient improvement. Physical restraint in the intensive care unit is used to prevent disruption of patient care. However, an inappropriate use of physical restraint can have adverse physical, psychological, and social consequences on the patient. For the use of physical restraint, the nurses are key decision-makers and their knowledge, attitude and performance in relation to it play a key role in protecting the patient's safety. Purpose: The purpose of this study was to determine the knowledge, attitude and performance of nurses in intensive care units regarding the application of physical restraint of patients and their related factors in educational centers and hospitals affiliated to Guilan University of Medical Sciences in 2016. Procedure: 193 nurses of intensive care units of twelve educational centers of Guilan University of Medical Sciences participated in this cross-sectional research. Data were collected using a four-part tool consisting of demographic characteristics questionnaire, knowledge measurement, attitude and performance of nurses in intensive care units regarding the application of physical restraint of patients. Data was analyzed after encoding, by the use of SPSS software version 21 through descriptive and intuitive statistics. Data was described by using mean, standard deviation, median, and number and percentage. Spearman correlation coefficient was used to assess the relation of performance score with knowledge and attitude. Results: Results showed that 93.8% of nurses applied physical restraint and only 17.4% had a history of physical restraint retraining. Mean score of nurses regarding physical restraint was 11.04 ± 1.85, the mean score of nurses' attitude was 36.49 ± 5.02 and their mean performance was 36.95 ± 3.55. In this study, in terms of the regression of the non-homogeneous model, only the attitude score was considered as the performance-related predictor, so there was a significant positive relationship between attitude and performance scores (P = 0.001). So by increasing an average score of attitude, the average score of performance increases by 1.12 times (Odds Ratio: 1.12: CI. %95OR: 1.045-1.87). There is a meaningful relationship, in the regression of the matched model, between the attitude score and the performance score. (P = 0.003); so that by increasing the attitude score, the performance score increases by 1.1 times. (Odds Ratio: 1.12: CI. %95 OR: 1.048-1.19). Conclusion: The findings of the research highlights the need for in-service training courses for nurses and the allocation of lessons for nursing students from curriculum to include some subjects related to the safety and physical restraint of patients and increase in their ability to provide better clinical work.

Keywords: Patient safety, intensive care unit, physical restraint

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Introduction

Comfort and safety are the basic human needs and patient safety is the responsibility of all health providers. [1] Nurses have a responsibility to protect patients from any kind of injury. This can be challenging for nurses of the intensive care units which need to a safe environment for restless and hallucinated patients [2]. The importance of intensive care unit as an environment in which the focus should be on safety of patient is prominent [3]. Nearly 80% of the patients in the intensive care units may

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experience some degree of restlessness, confusion and hallucinations during their stay in the special department [4, 5]; its reasons are probably pain, underlying disease, sleep deprivation, hypoxia, mechanical ventilation, cardiac ischemia, alcohol deprivation or substance abuse, or metabolic abnormalities [2, 5]. Physical restraint is a common intervention in the intensive care unit, and the nurses often use it for patient safety and prevention of unexpected accidents [6, 7]. Physical restraint is defined as a means of limiting individual freedom of voluntary movement [8, 9]. The physical restraint of ailing patients is to prevent disturbance in patient care such as accidental going out of tracheal tube, life-protecting venous catheter, or other aggressive therapies [10]. Use of Physical restraint can be associated with unwanted dangerous side effects. The complications of the use of physical restraints are not limited to the ethical issue, namely, the disturbance of individual autonomy of the patient, but there are many evidences of harmful physical and psychological effects of the restraints [11]. These effects can include strangulation due to stuck in the rails around the bed or vest used, circulatory disturbances, damage to the skin integrity, compression wounds, muscle contractions, loss of mass and bone and skeletal tissue, fracture, urinary and stool incontinence, constipation, Urinary tract infections, pulmonary infections, mental state disorder such as confusion, stress, anger, depression, despair, insomnia, restlessness, shame, decreased self-confidence; these problems are observed mostly in the intensive care units [12, 13]. Studies have shown that physical restraint is more common in patients aged 65 and older, in patients with mild movement and cognitive impairment, patients requiring extensive and complex treatments that have a history of collapse. It should be noted that men fall under Physical restraint more than women [14]. It has also been reported that using Physical restraint can have a negative effect on the patient and his or her family [4].

Regarding the decision making responsibility for the use of Physical restraint, a study conducted in Spain showed that 94.1% of the use of Physical restraint was decided by the nurse. In France, the lack of a physician's instruction to start or stop of the use of physical restraint indicates that it is generally a decision to use physical restraint with the nurse [15]. Schirm et al found that despite the fact that 40% of nurses considered using physical restraint as part of the responsibility for care and treatment, they did not know the negative aspects of using physical restraint [13]. Considering that nurses are the main decision-makers of using physical restraint, but, without thinking and evaluating, it can cause errors. Therefore, it is necessary to identify effective factors for using physical restraint and preventing its complications [15]. The study of Azab and Negm done in 2013 also suggests that nurses' knowledge and attitude in the field of physical restraint can affect their performance in using physical restraint and patient safety assurance [4].

Since the conditions and facilities of intensive care units are different in different parts of the world, the knowledge and attitude of nurses have been different. Also, the Physical restraint validation program of hospitals has been considered and a policy of physical restraint is compiled for intensive care units [16]; on the other hand, the use of Physical restraint is seen as one of the criteria for the ratio of staff to patients in the Hospital standard validation of the intensive care unit [17]. Therefore, the purpose of this study was to determine the knowledge, attitude and performance of nurses in intensive care units regarding the application of physical restraint of patients and their related factors in 2016.

Procedure

This study is cross-sectional analytical. The research population in this study was nurses working in intensive care units of twelve educational and therapeutic centers affiliated to Guilan University of Medical Sciences. After receiving the license from the Moral Committee of the Department of Research and Technology of University and obtaining permission number IR.GUMS.REC.1395.263, The researcher referred to the University Treatment Deputy. The participation in the study was voluntarily and it was conducted with informed consent. To participate in the research, the questionnaires were delivered by direct referral. A census sampling was conducted on 204 nurses working in intensive care units to participate in the research; 11 of whom were not willing to cooperate or answered questions incompletely and thus excluded from the study. Finally, 193 subjects remained in the study. Data were collected using a four-part tool including a demographic characteristics questionnaire, measurement of knowledge, attitude and performance of nurses in the field of physical restraint. The questionnaire of measuring knowledge, attitude and performance was prepared based on Azab and Negm's research in 2013 [4] and that of Karagozoglu et al. [13] The demographic characteristics under study included questions about age, gender, marital status, level of education, position, experience in clinical departments (work experience), work experience in the intensive unit, employment status, records of the participation in retraining the standards of physical restraint, Have you used physical restraint for a patient so far, methods which are used to restrain the patient. The knowledge assessment questionnaire has 18 sentences; the answer to the sentences was correctly and incorrectly designed to give the correct answer the score 1 and to the wrong answer the score zero. The total score resulted was from 0 to 18. The attitude assessment questionnaire had 16 sentences. Responses to them were designed as I agree, I disagree and unanswered, and the answer I agree had the score 3, the option unanswered the score 2 and I disagree the score 1. The overall score resulted was from 16 to 48. The performance measurement questionnaire had 14 items. Responses to phrases were designed as always, sometimes and never, and always has the score 3, sometimes the score 2 and never got the score 1. The total score resulted was from 14 to 42, which was finally evaluated based on the mean. First, the questionnaires' validity and reliability were determined. Content validity is known as the judiciary method, where the tool is evaluated by judges [18]. Content validity was determined by conducting the survey of 14 faculty members using the Lavashe method. The content validity ratio for each

item of the questionnaire was evaluated and the ratio for each one was calculated to be higher than 0.42 for all sentences. The reliability of the questionnaire was measured by internal consistency and calculated as 20 by Cronbach's and Richardson's alpha. The confidence coefficient of the knowledge questionnaire was 0.72 and the calculated alpha for the attitude and performance questionnaire was 0.77 and 0.76. The results indicated that the knowledge, attitude and performance of nurses in relation to the physical restraint are of acceptable internal consistency.

The analysis of the collected data after encoding was done using SPSS software version 21 by descriptive and intuitive statistics. To evaluate the relationship between performance score and knowledge and attitude, Spearman correlation coefficient was used, because the distribution of knowledge, attitude and performance scores did not follow the KS (Normal Distribution) test ($P < 0.05$). Mann-Whitney and Kruskal-Wallis tests were used to compare the scores of performance, knowledge and attitude in terms of individual social variables. Also, in order to determine the relationship between performance on the one hand and knowledge and attitude on the other, by modulating individual and social variables, the logistic regression model was used through the Backward method. The significance level of the tests was considered to be $P < 0.05$.

Results

Research on 193 nurses working in the intensive care unit showed that 52.3% of participating nurses were in the age group of 31-40 years old. 92.7% of them were women and 70.5 were married. 94.3% had a BSc degree. 90.2% of them were unit nurses. In terms of work experience, 31.6% of the participants had a job experience of 10-6 years and 38.3% of the participants had a work experience in the intensive unit of 6-10 years. Also, 50.8% of the nurses were officially recruited (Table 1)

Table 1: Frequency distribution of individual-occupational variables of the units under study

individual-occupational variables	Frequency	Number	Percentage
Age	21-30 years	**65**	**7.33**
	31-40 years	**101**	**3.52**
	41-50 years	**27**	**14**
	Woman	**179**	**7.92**
Gender	Man	**14**	**3.7**
Marital status	Married	**136**	**5.70**
	Single	**57**	**5.29**
Education	MSc	**11**	**7.5**
	BSc	**182**	**3.94**
position	Head nurse	**11**	**7.5**
	Substitute nurse	**8**	**1.4**
	Nurse	**174**	**2.90**
	Under one year	**11**	**7.5**
	1-5 years	**34**	**61.17**
Work experience	6-10 years	**61**	**6.31**
	11-15 years	**52**	**95.26**
	16-20 years	**23**	**92.11**
	Over 20 years	**12**	**22.6**
Work experience in Intensive care unit	Under one year	**19**	**84.9**
	1-5 years	**60**	**1.31**
	6-10 years	**74**	**34.38**
	11-15 years	**26**	**5.13**
	16-20 years	**8**	**12.4**
	Over 20 years	**6**	**1.3**
Employed	Official	**98**	**8.50**
	For a limited period of time	**12**	**2.6**
	Contractual	**51**	**4.26**
	Project-based	**32**	**6.16**

Only 17.6% of nurses had undergone physical restraint courses, while 93.8% of them had experience of physical restraint for their patients. The most used method for physical restraint of patients by nurses was band and cotton with 78.3%.

The nurses' average response to the questions of knowledge domain in the field of physical restraint was 11.04 ± 1.85, with the lowest response rate of 6 and maximum of 15. (The score of the acquired score was from 0 to 18). The average response of nurses to the attitude questions in the field of physical restraint of patients was 36.49 ± 5.02, with the lowest response of 24 and highest of 48. (The range of acquired score was from 16 to 48). The average response of nurses to performance questions in the field of physical restraint of patients was 36.95 ± 3.55, with the lowest response 22 and the highest 42 (the range of acquired score was from the 42- 14). (Table 2)

Table 2: Mean, standard deviation, minimum and maximum score of the units under study, regarding to the knowledge, attitude and performance in the field of physical restraint of patients

Variables under study	mean	standard deviation	median	minimum	maximum
knowledge	04.11	85.1	11	6	15
attitude	49.36	02.5	36	24	48
performance	95.36	55.3	38	22	42

There is a significant positive correlation between attitude and performance scores ($P = 0.0001$). But there is no significant correlation between knowledge and attitude scores ($P = 0.66$) (Table 3 and 4). The mean score of knowledge is not associated significantly with any of the occupational individual variables. The mean score of attitude has a significant positive correlation with the level of education ($P = 0.01$). There is also a significant positive correlation between the mean score of performance and re-training course ($P = 0.04$)

Table 3: Relationship between the mean score of performance, knowledge and attitude of the units under study in the field of physical restraint

variable	Performance score		Knowledge score	
	Correlation coefficient (r)	P	Correlation coefficient (r)	P
Knowledge score	0.12	0.08	-	-
Attitude score	0.3	0.0001	0.13	0.06

Table 4: Regression coefficient and predictive relative odds ratio related to the mean score of knowledge and attitude with the performance associated with physical restraint based on the non-matched model

Variable		Regression coefficient (B)	Standard error (S.E.)	Significance level (Sig.)	Odds Ratio	Exp(B) 95% C.I. for	
						Upper	Lower
Initial model	Knowledge score	123.0	083.0	136.0	131.1	331.1	962.0
	Attitude score	108.0	032.0	001.0	114.1	187.1	045.1
	Constant value	097.-5	419.1	00.0	006.0		
Final model	Attitude score	114.0	032.0	00.0	12.1	193.1	052.1
	Constant value	948.-3	166.1	001.0	019.0		

Discussion

The use of physical restraint is a common practice in intensive care units [19], because in intensive care units a large number of invasive methods and mechanical ventilation are used [20]. Nurses' decision on Physical restraint is a complex pathway, and in this process, the nurse's focus is on patient safety, by which the patient, nurse and related factors are considered [21]. Nursing performance includes behavior, attitude, judgment and physical and emotional abilities in using knowledge, skills and abilities for the benefit of the patient [22]. Therefore, it is necessary to identify the knowledge, attitude and performance of nurses in physical restraint.

In our study, the most used method for physical restraint of patients by nurses was band and cotton (78.3%). Akansel (2007) [12], Azab and Negm (2013) [4], Shata et al. (2015) [23] were similar.

In response to the expressions of knowledge, the most correct answer belonged to the expression "physical restraint should be comfortable" with 96.4 percent, which was similar to the study conducted by Fatemeh Eskandari et al. (2017) [24] and Karagozoglu et al. (2013) [13]. This indicates the attention of nurses to the patient with special conditions in the intensive care unit.

94.3% of nurses participating in this research believe that "in each shift the condition of patient under physical restraint should be recorded", which is similar to the study of Azab and Negm (2013) [4]; it indicates the importance of recording from the nurses' point of view.

Also, the expression "when the patient is under physical restraint, the restraint cannot be connected to the fences next to the bed", has only 15% of the correct answer; it was similar to the study of Azab and Negm [4], but inconsistent with the study of Karagozoglu et al [13]. It seems that the reason for this difference can be the population under study; in the study of Karagozoglu, the population was senior nursing students, while in the present study, as well as the study of Azab and Negm, the nurses working in the intensive care unit with a different work record were respondents.

The expression "applying physical restraint requires the consent of family members", only 23.8% of the population under study required informed consent, which was similar to that of Karagozoglu et al. [13]. Also, in the study of Parisa Majd et al. [2], the written consent of the patient's family members was not observed, which could be due to the nurses' believing in non-invasiveness of the physical restraint. Nurses may also think that physical restraint is necessary to ensure patient safety and does not need to obtain family consent.

In investigating the attitude of nurses in the field of physical restraint of patients, the expression "I think it is very important for a patient under physical restraint to know that I am careful for him" had the most favorable agreement with 95.3% in this research. It was similar to the study of Azab and Negm [4]. The reason for this can be to provide a sense of security for patients under physical restraint.

The expression "If the patient becomes anxious and disturbed after using physical restraint, I do not feel well", received the agreement of 94.3 percent of the nurses in this study, which was similar to the study done by Saeidi et al. [15] in Hamadan, but it was inconsistent with The study of Fatemeh Eskandari et al. [24]; perhaps its reason is cultural difference in different countries.

Also, the expression "I think the main reason for the application of physical restraint is the shortage of personnel," received only 18.7% of agreement; it was similar to the study of Azab and Negm [4], Karagozoglu et al [13] and Condil et al [7], indicating that the physical restraint was unnecessary.

The expression If I was a patient, I think I had the right to accept the restraint, received 71% of the agreement of the research population; it was similar to the study of Karagozoglu et al [13] and Azab and Negm [4] but inconsistent with the study of Saidi et al. [15] that perhaps the reason for this is the response from the point of view of patient's rights. While 32.1% of surveyed nurses agreed with the expression "I think the family members of the patient have the right to not accept the physical restraint of the patient." It was similar to the study done by Azab and Negm [4], Fatemeh Eskandari et al. [24]. The reason for their response could be considering the patient's condition and the importance of maintaining patient safety regardless of patient's rights.

In assessing the performance of nurses in the field of physical restraint of patients in the intensive care unit, the expression I apply the physical restraint of the patient only by physicians' order, received 40.9% of the population under study. Therefore, in most cases the physical restraint is performed without a physician's order, which was similar to the study done by Akansel [12], Azab and Negm [4], Karagozoglu et al [13] and Saeidi et al. [15]. This is due to the fact that nurses are denied access to physical restraint as requiring a doctor's order. It is noteworthy that in China, the use of physical restraint is considered as a nursing intervention, and nurses are in using physical restraint the decision-maker and do not require the intervention of a physician. [14] On the other hand, in the study of Fatemeh Eskandari et al, 61.2% of nurses believe that they have not any right to use physical restraint for patients without a

physician's order [24]. Given the differences in different countries, there is a need for indigenous instructions in accordance with the laws of the country.

The expression "mostly the patient is under physical restraint, when there is a shortage of personnel, as long as the staff is enough," 43.5 percent of the population under study never use the restraint due to lack of manpower, which is similar to the study of Azab and Negm [4]. However, in the Hui Chong's study, the main reason for the physical restraint was the shortage of manpower [14]; it was contradictory with the result of our study. Also, the expression "I continuously evaluate and record the effects of physical restraint on the patient", 86.5 percent of the participating nurses always do the registration; the expression "if using physical restraint, type of restraint, reason for the use of restraint, I will register the time of the order of its implementation and the necessary nursing care related to it at Cardex filing system", they do always registration with 67.4%; it was similar to the study of Karagozoglu et al. [13] but inconsistent with the results of the study of Azab and Negm [4] and Saidi et al. [15]; perhaps the reason for this difference is the importance of registering physical restraint according to the method of physical restraint in the hospital third-generation validation which has been operating in the country.

In the study, the mean score of knowledge was not associated significantly with any of the individual and occupational variables. The mean score of attitude has a significant relation with the level of education ($P = 0.01$) but the performance has no significant relationship with the level of education. Azab and Negm [4], in their results, found that the degree did not affect knowledge, attitude and performance. In the research of Saeidi et al. [15], a positive correlation was found between knowledge and education and attitude and education. It was found that the person with a higher education has a better attitude to the physical restraint, but no significant difference was observed in the performance of the individual with the other participants, that should be discussed in future studies.

Also, the employment status is considered as a performance-related predictor in our study. So the people with official recruitment status had 2.4 times more chance of having a performance score higher than the average ($P = 0.043$); while in Saidi et al. [15], there was no significant relationship between knowledge, attitude and performance variable regarding the physical restraint with the variable of employment status ($P < 0.05$). It could be due to the assurance that the official employment status creates for the individual and could therefore affect the performance of the individual.

In our study, there is a meaningful relationship between the performance variable in the field of physical restraint of patients and the passing of the physical restraint re-training course ($P = 0.04$). This finding is similar to that of Saeedi et al. [15], but does not conform to Azab and Negm [4]. Further studies on the content of physical restraint training curricula for nurses are needed in order to obtain more accurate conclusions in this regard.

There is also no significant positive correlation between knowledge and attitude score ($P = 0.06$), but there is a statistic significant relationship between attitude and performance scores ($P = 0.0001$); so with an increase of one mean score the performance score increases by 1.12 times. This finding was not consistent with the study done by Saeidi et al. [15], Azab and Negm [4] and Karagozoglu et al. [13]. There was a significant positive relationship between knowledge, attitude and performance in the mentioned studies. Also, in the study conducted by Fatemeh Eskandari et al. [24], learning about physical restraint can affect the knowledge, attitude and performance of nurses, and the nurses with higher knowledge are of more positive attitudes and better performance about the physical restraint. Here, planning to increase the knowledge of nurses and its impact on their attitude and performance in the field of physical restraint should be considered in order to assess the direct and indirect impact of knowledge on attitude and performance.

Since the role of knowledge in promoting attitude and performance is inevitable, and on the other hand, the physical restraint of patients in the validation of hospitals is important, the development of training programs for nurses working in intensive care units and also in the nursing student curriculum need more attention.

Conclusion

Regarding the main important and professional responsibility of nurses' care, it is necessary, by increasing the level of knowledge and attitude of nurses and strengthening their performance, they are always looking for the most appropriate care measures with an emphasis on maintaining safety and not harming patients. In-service training courses are needed to enhance the knowledge of nurses of intensive care units in the field of physical restraint. Also, the allocation of hours from nursing students' curriculum plays a prominent role in patient safety issues and physical restraint and enhancement of their ability as future nurses.

Research Limitation

Due to the completion of the questionnaire in the intensive care unit, the location, time and environmental stress during response to the questionnaire can be effective on how to respond. Of course, the researcher has tried to prevent the effects of these variables as much as possible, by choosing the right time and place in work shifts. In this study, only nurses' self-report is considered. It is suggested that subsequent studies in the field of physical restraint deal with the observational study of Nurses' performance in the field of physical restraint of patients and their results are compared with the self-report done in this research. It is also necessary to investigate the complications of physical restraint in the intensive care unit.

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