

PHYSICAL RESTRAINT KNOWLEDGE, ATTITUDES AND PRACTICES OF INTENSIVE CARE NURSES IN TURKEY: THE EFFECTIVENESS OF AN IN-SERVICE TRAINING PROGRAM

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ABSTRACT

Purpose: Intensive care nurses use physical restraints (PRs) to prevent critically ill patients from disrupting invasive medical equipment, but they may not recognize the negative or positive consequences. The study was conducted with a quasi-experimental, single-group pretest-posttest design to evaluate the impact of PRs in-service training on the knowledge, attitudes, and practices of intensive care nurses.

Material and Methods: The sample of the study consisted of 81 nurses. The data were obtained using a "The Individual Data Questionnaire" and the "Levels of Knowledge, Attitudes and Practices of Staff Regarding Physical Restraints Questionnaire." The level of knowledge, attitudes and practices of nurses towards PRs was evaluated one week before, immediately after and one and three months later PRs in service training program.

Results: The nurses' knowledge scores were significant decrease after three months following the PRs in service training ($p=.001$). The nurses' attitude and practice scores about the use of PRs in service training period and retest after one and three months increased significantly compared to the pre- service training period ($p=.001$).

Conclusion: This study showed that the PRs in-service training given to the nurses was effective. The findings recommended to carry out in-service training to increase the attitude and practice levels of nurses about PRs and its application, repeat this in service training periodically and evaluate its effectiveness.

Keywords: Attitudes, intensive care nursing, knowledge, physical restraint, training.

INTRODUCTION

Patients who are intubated in the intensive care unit, may have difficulty expressing themselves due to having a tracheostomy or a change in their level consciousness (1,2). This situation leads to occur anxious or agitated behavior in patients (3). Anxiety

and agitation lead deliberate or unintentional behaviors like removing or pulling devices with vital importance or accessories. Therefore, different methods are used to achieve intensive care patient safety and maintain the effectiveness of the treatment. Physical restraints (PRs) are commonly

used in intensive care units (ICUs) worldwide to prevent interference with treatment and safety (2,4). The use of PRs increases every day and shows variations based on different countries (5-10). In Turkey, the rate of applying PRs is high, while it varies based on clinics (11). Although the use of PRs is considered a method of protection for the patient, it is still associated with physical, psychological, ethical, and legal issues and could lead to death because of inappropriate PRs. Physical problems include restriction of movement, increase in the level of anxiety, bruising/redness at points of application, swelling, and peripheral circulation disruptions (12,13). In addition to psychologically patients, may feel angry, helpless, sad, and powerless, perceive this practice as a degrading treatment and experience psychological trauma (14,15). Ethical conditions that need to be considered while implementing PRs are that the physician has obtained informed consent for the practice of PRs, their practice is medically appropriate, and PRs are the least autonomy-restricting way of achieving the intended benefit (16). In intensive care units, nurses have an important role in using PRs. The priority of nurses is to ensure patient safety and comfort (17,19). Nurses should use alternative strategies to prevent or reduce PRs implementation and avoid negative outcomes that could be caused by PRs application by carrying out the restraining process appropriately and effectively (17). In the more effective performance of practices of PRs, nurses' knowledge and skills about this issue are important. Nurses need to be knowledgeable about problems that may arise because of the use of PRs (17,19, 20). Additionally, during PRs, nurses experience ethical dilemmas about the principles of autonomy, doing no harm, and providing benefit, which is among the significant ethical principles in the profession of nursing (16-18). While there are various studies conducted in Turkey to investigate the knowledge, attitudes, and practices of nurses regarding PRs use (11,18,21-23), no study was found to assess the effectiveness of in-service training about PRs. Furthermore, international studies have determined that the PRs related knowledge levels of nurses were insufficient or moderate, and they needed in service training (8, 24-26), whereas PRs in-service training programs increased the knowledge levels of nurses (8,27,28). Therefore, we aim to evaluate the effects of PRs in-service training on intensive care nurses' knowledge, attitudes, and practices.

MATERIAL AND METHODS

Design and setting

This quasi-experimental with one-group pretest-posttest design study was conducted in northwestern Anatolia part of Turkey between September 2019 and February 2020.

Study Population/ Sample

The population of the study consisted of 102 ICU nurses working at a in service training and research hospital in a province in the West Black Sea Region of Turkey. The inclusion criteria were: (a) being a graduate nurse actively working in ICU (b) having at least one year of work experience; (c) providing direct patient care and having previous experience with using PRs; (d) being volunteer to participate in this study. The criteria for exclusion were nurses' decision not to participate. G-power package version 3.1.9.2 was used for determining the sample size. Prior and post-hoc power analysis was both performed based on a fixed effect ANOVA test. Expected Cohens' f value for effect size was 0.4, which is considered a large effect size. For a 0.4 effect size with 0.05 types I error and 80% power minimum required, an estimated total sample size was 76. Twenty-one nurses withdrew from the study (three nurses in maternity leave, eleven on sick leave, seven were not willing to participate). For this reason, study was carried out with 81 nurses who met the inclusion criteria.

Instruments

The participants completed a survey that included an individual data questionnaire form and levels of knowledge, attitudes, and practices of staff regarding physical restraints scale.

The Individual Data Questionnaire: Individual data questionnaire form was created according to literature review. It consisted of the following two parts.

Part 1 (nine items) consisted of information on ICU nurses' socio-demographic data including age, gender, education status, work setting, duration of working as a nurse and ICU nurse, number of patients cared for day/ night shifts.

Part 2 (ten items) was related to the practices and thoughts on physical restraint such as frequency of using PRs, staff deciding to use PRs based on the relevant literature (2,9,17).

Levels of Knowledge, Attitudes and Practices of Staff Regarding Physical Restraints Scale

This scale was developed by Suen (29), which is a self-administered questionnaire. The questionnaire, which was adapted in Turkish by Kaya et al. (30), consists of three sections. The first section contained 11 items that evaluated nurses' knowledge about the use of PRs. The score range of this part is 0-11; a higher score indicates a high level of knowledge. The second section includes a 12-item four-point Likert scale to elicit nurses' attitudes towards the use of PRs. This section includes a 4-point Likert scale ranging from strongly agree=4 to strongly disagree=1. Higher scores demonstrate positive attitudes, with a total score ranging from 12 to 48. There are 14 items to evaluate nurses' practices in relation to the use of PRs in the third section. The 10th item is a negative item, and it is reversely scored. This section uses a 3-point Likert scale ranging from always=3 to never=1. Higher scores mean better practices, with the total score ranging from 14-42 (29,30). The scale's Cronbach's alpha was 0.69 (30). We found Cronbach's alpha value was 0.82 as to all items.

Data Collection

After obtaining written approval from the hospital, ICU nurses were contacted and informed about this study. A week before the in service training PRs, the individual data questionnaire form and levels of knowledge, attitudes and practices of staff regarding physical restraints scale were applied face to face in the intensive care meeting room at a time when the nurses were available. Then, nurses were invited to an in-service training program for four consecutive days (total 8 hrs-two hours per day). The program was conducted for a group of twenty nurses at a time. Total four groups completed in-service training. A structured teaching plan for in-service training was developed in line with institution policy, expert opinions, and literature regarding PRs use in ICU (2,9,17,27,31). The in-service training program focused on the concept of PRs, reasons to perform PRs, advantages, complications caused using PRs and prevention methods, PR methods, legal and ethical problems, PR decision-making process, and responsibilities of the nurse. The in-service training was done using the lecture method (Power Point presentation) group discussion and demonstrations. Video and case scenarios also were used for group discussion. The demonstration mainly focused on the application of PRs and safety. Right after the in-

service training and the demonstration, levels of knowledge, attitudes and practices of staff regarding physical restraints scale was applied again with the nurses. Additionally, a brochure prepared by the researcher was given to nurses at the end of the in-service training. Four and twelve weeks after the end of the educational sessions, ICU knowledge, attitude, and practice of nurses towards PRs were reevaluated face to face. To evaluate the pre-test and post-test, we wanted to write nicknames from nurses and test scores were compared with each other. The data collection period for this study comprised six months from September 2019 through February 2020.

Statistical Analysis

The IBM SPSS Statistics 23.0 [Statistical Package for Social Sciences IBM Corp., Armonk, NYC, USA] package program was used to analyze the data. Descriptive statistics on the continuous variables are presented as mean, standard deviation, median, minimum, and maximum values, while those for the discrete variables are given as frequency and percentage values. Shapiro Wilk test was used to evaluate the normality of the distribution of the data, and the data were found to be non-normally distributed. Friedman test was used in the comparisons of the PRs knowledge, attitude, and practice scores of the nurses for before- after the in-service training and after 1 and 3 months. $p < 0.05$ was accepted as statistically significant.

Ethical Consideration

Ethical approval for the study was obtained from the ethical review committee of State University (19/04/2019, No:5/17) and institutional permission was obtained from the administration of the hospital (No:903.07). Permission to use the scale was received via e-mail from the Turkish researcher. The ICU nurses were assured of anonymity and confidentiality, and they were informed that the completion of the questionnaire can be carried out in private and at the respondents' leisure. All data were stored in a secure, locked safe. The nurses were assured that their participation in the study was not obligatory. Also, they had the right to withdraw from the study at any time.

RESULTS

The sociodemographic characteristics of the nurses are presented in Table 1.

It was found that all nurses applied PRs on agitated and restless patients in the present study. 67.9% of nurses stated that they decided to apply PRs with a physician, 90.1% informed the patient and their family that PRs would be applied, and 33.3% obtained written consent from patient relatives (Table 2).

A comparison of the mean scores of nurses' knowledge, attitude, and practice regarding PRs before and after in-service training is shown in Table 3. While the nurses' mean scores before, immediately

after the in-service training and 1 month later was the same (8.38 ± 1.17), their mean score after 3 months was lower (8.35 ± 1.59). The nurses' knowledge scores were significant decrease after three months following the PRs in service training ($p=.001$). The mean score of nurses' attitudes before the in-service training was 30.16 ± 3.95 , the mean score immediately after in-service training was 31.33 ± 4.17 and the mean score after three months was 33.26 ± 5.75 . Statistical tests showed a significant difference between the

Table 1. Sociodemographic characteristics of nurses

Age (Mean\pmSD; Median Min-Max)	30.28 \pm 6.64; 27 (21-46)	
	n	%
Gender		
Female	64	79.0
Male	17	21.0
Educational Status		
High school	20	24.7
Bachelor's degree	58	71.6
Master's degree	3	3.7
Weekly working hours (Mean\pmSD; Median Min-Max)	49.32 \pm 8.18; 48 (40-60)	
Work experience in ICU (years)		
1-5	58	71.6
6-10	18	22.2
11-15	5	6.2
Working Type		
Regular daytime	12	14.8
Shifts	69	85.2
Number of patients cared for daytime		
1 patient	2	2.5
2 patients	49	60.5
3 patients	30	37.0
Number of patients cared for night shifts		
2 patients	63	77.8
3 patients	18	22.2

mean scores of attitudes before and after the in-service training ($p < .001$). The mean score of practice before the in-service training was 37.28 ± 2.65 , the mean score immediately after in-service training was 38.15 ± 2.71 and the mean score after three months was 38.83 ± 2.94 . A significant difference was observed between the mean scores of practices before and after the in-service training ($p < .001$).

DISCUSSION

This quasi-experiment with one-group pretest-posttest design study that aimed to determine the impact of in-service training on ICU nurses' knowledge, attitude, and practice regarding the use of PRs, which had a useful positive effect on improving their attitude and practice.

The findings of this study demonstrated all nurses had applied PRs. In previous studies, it was reported that the rate of nurses who applied PR in their practice ranged from 74.4% to 98.1% (7,21,22,32). Similarly, Kassew and colleagues (26) determined that 40.5% of nurses had applied PRs within 1 month, whereas Eskandari and colleagues (24) found a minority of nurses tried alternative approaches before PRs, and most of them believed there is no method better than PRs. In this study, the rate of the nurses who had applied PRs was identified to be higher in comparison to other studies. Because of the low number of nurses, increased workload, particularly one or two nurses working the night shift in ICU, low number of staff, and difficulties in caring, Turkish nurses may decide to use PRs in ICU patients.

Practices of ICU nurses on physical restraints

Table 2. Practices of ICU nurses on physical restraints

	n (%)
Physical restraints application status (Yes)	81 (100)
Reasons	
Agitated and restless patients	81 (100)
Patients with movement limitation	13 (16.1)
To prevent the patient from falling out of bed	62 (76.5)
To prevent the patient from removing equipment like intubation tubes and probes	73 (90.1)
To prevent the patient from harming themselves and others	66 (81.4)
Physician request	28 (34.6)
Lack of healthcare personnel	7 (8.8)
Frequency of applying physical restraints	
Frequently	25 (31.2)
Sometimes	56 (68.8)
Who decides on applying physical restraints?	
Physician	20 (24.7)
Nurse	6 (7.4)
Physician and nurse together	55 (67.9)
Informing patient and their family for application (Yes)	73 (90.1)
Taking written consent from patient and family for application (Yes)	27 (33.3)

Table 3. Comparison of the mean scores of nurse's knowledge, attitude, and practice before and after training

	Mean±SD (Min-Max)	Test Statistic	p-value
Knowledge			
Pre-intervention	8.38±1.17 (4-10) ^b	$\chi^2 = .326$.000
Post-intervention	8.38±1.17 (4-10) ^b		
Retest after 1 month	8.38±1.17 (4-10) ^b		
Retest after 3 months	8.35±1.59 (3-11) ^b		
Attitude			
Pre-intervention	30.16±3.95 (23-44) ^a	$\chi^2 = 13.883$.003
Post-intervention	31.33±4.17 (20-41) [*]		
Retest after 1 month	32.21±5.31 (20-48) ^b		
Retest after 3 months	33.26±5.75 (20-48) ^b		
Practice			
Pre-intervention	37.28±2.65 (30-42) ^a	$\chi^2 = 19.164$.000
Post-intervention	38.15±2.71 (28-42) [*]		
Retest after 1 month	38.51±2.30 (31-42) ^b		
Retest after 3 months	38.83±2.94 (26-42) ^b		

^{a,b}: The mean values in the same column are significantly different from each other ($p < .05$); ^{*}The mean values in the same column are not significantly different from each other ($p > 0.05$); Friedman multiple comparison test

We indicated that many Turkish nurses applied PRs on agitated and restless patients and use them to prevent the patient from removing medical equipment. In the study of Birgili and Izan (18) PRs were reported to be used for preventing patients from giving harm to the environment and themselves. The most common reasons were stated as preventing the patient from pulling and removing endotracheal tubes (9,22,25), preventing the patient from falling out of the bed (7). However, in another study performed by Rose and colleagues (12), it was indicated the use of PRs does not reduce the risk of the patient falling out of the bed or accidentally removing catheters, and alternative methods should be used instead of this practice. In this study, we did not investigate whether the nurses use alternative methods instead of PRs. On the other hand, for this study patients' removing mandatory equipment attached to them and their safety may be said to be the main purposes of PRs for nurses.

In the current study, many nurses indicated that the physician and the nurse together decided the use of PRs in ICU and they informed the patient and their family. Some nurses obtained written consent from the patient and their family for the practice. In Turkey, it was found that physicians decided on PRs (22), while in another study stated that physician and the nurse decided together to apply PRs (9,33). On the other hand, previous studies showed that most nurses did not ask for permission from the patient or their family for PR application like our study (21,22,25). According to the Ministry of Health in Turkey, physicians are responsible for applying PRs, and it requires a physician's decision. However, decision-making for applying PRs is a crucial issue for ICU nurses and considering the implication in terms of nursing doctrine like giving no harm, preventing complication, promoting safety and respect (34). It is important to decide to apply PRs collaboratively as a team in terms of the principles of doing no harm, autonomy, and respect. It was seen that the Turkish

nurses participated more actively in the decision-making process for the use of PRs. In addition, making the PRs decision together with physicians and nurses showed that there is strong coordination between the professional members who are responsible for care and treatment.

Effectiveness of training in nurse's knowledge for three months period

We found that 3 months after the in-service training program there were significant decrease in the mean ICUs nurses' knowledge scores compared to 1 month. While the knowledge score of nurses remained stable after one month, nurses' knowledge score about PRs was decreased after three months. However, studies have shown a significant improvement in the mean knowledge scores among nurses after in-service training programs (27,28,35-37). On the other hand, results of the previous studies performed by Suen and colleagues (29), Ahmadi et al. (27) have stated that nurses' knowledge level was undesirable. Furthermore, studies have highlighted that in service training for PRs is important to increase nurses' knowledge (27,28,35-37). The reason for the decrease in the level of knowledge of nurses about PR in the 3rd month might be due to the few working years in the ICU, (many nurses had 1 to 5 years of ICU experience), lack of awareness of Turkish Ministry of Health guidelines for PRs (34), lack of educational courses or poor formal education. Additionally, other environmental factors and nurses' professional characteristics may have influenced nurses' knowledge. Performing in-service training about PRs appears necessary to improve the level of knowledge and awareness in ICU nurses to quality of nursing care delivered to the patients. Furthermore, the results of our study recommend that there is a need to evaluate the long-term effects of the in-service training in the future.

Effectiveness of training in nurse's attitude for three months period

Taha & Ali (36) and Nasrate and colleagues (28) indicated that nurses had an undesired level of practice regarding the use of PRs. They also found that the reason for practice in nurses might be due to their lack of awareness and performing in service training programs had improved. In parallel with this, according to Eskandari and colleagues (8), there was a positive correlation between the attitude of nurses towards the use of PRs after a one-day and one

month. Similarly, Ali & Mohamed (38) determined that a scenario-based training program improved nurses' attitudes scores after ten days. In Turkey, one study was conducted by Kaya and colleagues (11). It was stated that the attitudes of nurses towards the use of PRs were positive because of reducing the nursing care period, but they experienced a dilemma regarding the psychological consequences of the use of PRs. On the other hand, the Turkish Ministry of Health recommends PRs should use alternative methods for preventing injuries and ensuring medical treatment (31,34). This in-service training may notice ICU nurses consider alternative methods before using PRs. However, Turkish nurses' positive attitudes about the use of PRs were found to be desirable due to reflection on the quality of nursing care practices.

Effectiveness of training in nurse's practice for three months period

We found that there were significant increase in the mean ICUs nurses' practice scores after one and three months following the in service training program. Training programs are simple ways to improve nurses' skills and practice (37). In parallel with this, one of the elements that play a significant role in turning information into practice is the individual's attitude (39). This finding of our study is parallel to the literature. Similar findings were reported by previous studies (27,28,36,37). Ali and Mohammed (38) found that a scenario-based educational program could improve nurses' practice of using PRs. In parallel with this, according to Younis & Ahmed (40) demonstrated that some factors such as no physician's order that the nurse can follow, lack of cooperation between nurse and physician, or lack of physicians' knowledge regarding their role in participating in the decision of restraining a patient lead low performance in PRs practice of critical care nurses.

Limitations

The following are some limitations of this present study: (1) the study used a convenience sample and quasi-experimental and single group at one hospital, although a larger sample with nurses from different geographical areas on Turkey could improve the generalizability of our results, (2) using a self-reporting method to assess nurses' practice of PRs could under-report the real picture in Turkish hospitals, (3) Unfortunately, due to COVID-19

pandemic, the study was completed in 3 months. The evaluation of the effectiveness of in-service training should not be limited to three months, but its effectiveness should be tested again after 6 and 12 months, (4) Some basic education technologies used in this study, reminder technology such as WhatsApp or text message could use in this study. Although this study may provide evidence of the effectiveness of an in-service training program on intensive care nurses' knowledge, attitudes, and practice towards the use of PRs, high-quality research is still required.

Implications of the Findings

To decrease the lack of knowledge, inadequate practice, and undesirable attitudes related to restraints, nurses need to be educated. The educational needs of nurses can be best understood by checking their knowledge and attitude toward restraints. The nurses should understand the reason and rationale behind the use of PRs, consideration of other measures, negative outcomes, and complications or ethical issues. Since nurses' knowledge, attitude, and practice toward PRs are directly related to their nursing care; it is important to explore nurses' knowledge and attitude regarding PRs to develop guidelines.

CONCLUSION

This study was an attempt to evaluate intensive care nurses' knowledge, attitude, and practice of PRs in Turkey. It was stated that performing the in-service training programs about the use of PRs would lead to a positive attitude and improved practice in nurses of the ICUs. However, while the nurses' mean scores immediately after the in-service training PRs and one month later were the same, their mean score after 3 months was lower. Therefore, it is needed to conduct in-service education and training programs towards increasing the knowledge levels of nurses on the issue of PRs application and their development of positive attitudes, periodically repeat these programs and evaluate the effectiveness of the provided education and training programs.

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Ethical approval: Ethical permission was obtained from Karabuk University Non-Clinical Research Ethics Committee of a State University (Date: 19.04.2019, Decision no: 5/17).

The research conforms to the provisions of the Declaration of Helsinki (as revised in Brazil 2013). All participants gave informed consent for the research, and that their anonymity was preserved.

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