ORIGINAL ARTICLE / ORİJİNAL MAKALE

Determination of Knowledge, Attitudes and Practices of Nurses Working in Surgical Intensive Care Units on the Use of Physical Restraint: A Multicenter Cross-Sectional Study

Cerrahi Yoğun Bakım Ünitelerinde Çalışan Hemşirelerin Fiziksel Tespit Kullanımına İlişkin Bilgi, Tutum ve Uygulamalarının Belirlenmesi: Çok Merkezli Kesitsel Bir Çalışma

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Abstract

Background: Research on the knowledge, attitudes, and practices of nurses working in surgical intensive care units regarding the use of physical restraints is limited.

Objective: This study aimed to assess nurses' knowledge, attitudes, and practices regarding physical restraint use in surgical intensive care units (S-ICUs).

Method: The research, a descriptive cross-sectional study, involved nurses from three hospitals' surgical intensive care units between March 15th and June 15th, 2022, with a total of 73 voluntarily participating nurses (n=73). Data were gathered using the Physical Restraint Knowledge, Attitude, and Practice Scale via face-to-face surveys. In the analysis of the data, independent t tests and one-way ANOVA were used. The post hoc Tukey HSD test was utilized to determine the variables contributing to the differences. A p-value of <0.05 was considered statistically significant, and the study's reporting adhered to the STROBE checklist.

Results: The participating nurses had a mean age of 32.08±6.91 years, with 61.6% being female and 68.5% having undergraduate degrees. The total scale score was 76.86±6.58, with subdimension scores for knowledge, attitude, and practice at 7.09±1.49, 32.52±4.5, and 37.24±3.30, respectively. Nurses working ≤61 hours per week had lower scores in physical restraint attitude and practice (p=.001 for both), and there was a significant negative correlation between nurses' weekly working hours and their physical restraint attitude and practice scores (r=.746 and r=.734, respectively) (p<.05).

Conclusion: Nurses displayed shortcomings in knowledge, attitudes, and practices related to physical restraint use. It has been determined that nurses do not consistently document the physical restraint, do not always implement it solely based on physician directives, and do not always resort to alternative methods. Knowledge scores were linked to S-ICU work experience, while attitude and practice scores were influenced by weekly working hours.

Keywords: Intensive Care Unit, Physical Restraint, Surgical, Nursing

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Öz

Giriş: Cerrahi yoğun bakım ünitelerinde çalışan hemşirelerin fiziksel tespit kullanımına ilişkin bilgi, tutum ve uygulamalarını belirleyen araştırmalar sınırlıdır.

Amaç: Bu çalışma, cerrahi yoğun bakım ünitelerinde (C-YBÜ) çalışan hemşirelerin fiziksel tespit kullanımına ilişkin bilgi, tutum ve uygulamalarını belirlemek amacıyla yapıldı.

Yöntem: Araştırma, tanımlayıcı kesitsel bir çalışma olup, 15 Mart 2022 ile 15 Haziran 2022 tarihleri arasında üç hastanenin cerrahi yoğun bakım ünitelerinde görev yapan toplam 73 gönüllü hemşire (n=73) ile yürütüldü. Veriler, Fiziksel Kısıtlama Bilgi, Tutum ve Uygulama Ölçeği kullanılarak yüz yüze anketler aracılığıyla toplandı. Verilerin analizinde bağımsız gruplarda t testi ve tek yönlü ANOVA kullanıldı. Farklılıklara katkıda bulunan değişkenleri belirlemek için post hoc Tukey HSD testi kullanıldı. p-değeri <0.05 olan sonuçlar istatistiksel olarak anlamlı kabul edildi ve çalışmanın raporlaması STROBE kontrol listesine uygun olarak yapıldı.

Bulgular: Çalışmaya katılan hemşirelerin yaş ortalaması 32.08±6.91, %61.6'sı kadın, %68.5'i lisans mezunudur. Ölçeğin toplam puanı 76.86±6.58, bilgi, tutum ve uygulama alt boyut puanları (sırasıyla; 7.09±1.49, 32.52±4.5, 37.24±3.30) bulundu. Haftalık çalışma süresi ≤61 saat olan hemşirelerin fiziksel tespit tutum ve uygulama puan ortalamaları daha düşüktü (sırasıyla p=.001, p= .001, p=.001) (p<.05). Hemşirelerin haftalık çalışma saatleri ile fiziksel kısıtlama tutum ve uygulama puanları arasında negatif yönde yüksek bir korelasyon vardı (sırasıyla, r=.746 ve r=.734) (p<.05).

Sonuç: Hemşirelerin fiziksel tespit bilgi, tutum ve uygulamalarında eksikler olduğu belirlendi. Hemşirelerin fiziksel tespit uygulamasını her zaman kayıt etmediği, hekim direktifi ile uygulamadığı, alternatif yöntemlere başvurmadığı belirlendi. Bilgi puanları C-YBÜ çalışma deneyimlerinden, tutum ve uygulama puanları ise haftalık çalışma sürelerinden etkilenmektedir.

Anahtar Kelimeler: Yoğun Bakım Ünitesi, Fiziksel Tespit, Cerrahi, Hemşirelik

INTRODUCTION

Physical restraint (PR) is defined as the restriction of a patient's movements by manual means or with physical-mechanical devices that cannot be easily removed, especially in situations where the patient poses a risk of harming themselves or others (Lan et al., 2021). Surgical intensive care units (S-ICUs) are areas with high patient circulation. Due to anesthesia and sedation, patients in S-ICUs are at a higher risk of falls, leading to the frequent application of PR (Dolan et al., 2017). While PR can provide benefits in terms of patient safety, improper and ineffective application can pose potential harm. It is a controversial practice that can lead to ethical dilemmas, such as limiting the patient's autonomy over their own body (Kılıç et al., 2018). Patients admitted to S-ICUs may exhibit agitated behaviors due to reasons such as pain

and altered consciousness (Bilge et al., 2015). Postoperative agitated patients may remove intubation tubes, chest tubes, and catheters placed as part of surgical treatment, depending on indications (da Silvia et al., 2012).

The quality of nursing care is associated with problems related to the use of physical restraints (Lach et al., 2016). Although nurses, who are responsible for ensuring patient safety, may be reluctant to apply PR to prevent falls and injuries, it has been reported that they can still implement PR when necessary (Karaca et al., 2018). Studies conducted in Turkey have found that 84.7% of nurses working in intensive care units apply PR without a physician's directive, and 93.7% did not document PR applications (Turgay et al., 2009; Akansel, 2007). It is important for nurses to be able to identify high-risk patients for PR use, recognize the reasons for behaviors that may

threaten patient safety, and evaluate the benefits and risks of PR application to the patient (Lach et al., 2016). Therefore, nurses are expected to be informed about PR application, to know effective alternative methods to reduce its use, and to apply PR while considering existing laws and ethical principles (Paslı Gündoğan et al., 2016).

While there are several studies assessing the knowledge and attitudes of nurses working in intensive care units regarding the use of PR, (Suliman et al., 2017) there is a lack of research specifically evaluating nurses working in surgical intensive care units. Determining the knowledge, attitudes, and practices of nurses regarding PR use in surgical intensive care units can contribute to the development of policies, guidelines, and clinical protocols related to PR application. Knowledge deficiencies, incorrect attitudes, and practices of nurses in surgical intensive care units can be reduced through in-service training. Best clinical practices can be identified to protect patient safety, evaluate alternative methods to PR application, and reduce complications.

Aim

This study aims to determine the knowledge, attitudes, and practices of nurses working in surgical intensive care units regarding the use of PR.

METHOD

Type of the Research

This research is a descriptive and cross-sectional study conducted with nurses working in the surgical intensive care units of hospitals in one of the eastern provinces of Turkiye, between March 15 and June 15, 2022. The reporting of this study followed the STROBE checklist.

Place of the Research

The research was conducted with nurses working at the S-ICU (Surgical Intensive Care Unit) located in a province in the eastern part of Turkey.

Universe/Sample of the Research:

The sample size of the study was calculated using G*Power 3.1.9.7 software. The calculation was performed using Cohen's (d) effect size (Cohen, 1998). A one-tailed hypothesis with an effect size of 0.3 was determined, with an α error of 0.05, a β error of 0.20, and a power of 80%, resulting in a minimum sample size of 71 participants (n=71). The study population consisted of 92 nurses working in the surgical intensive care units of three hospitals in one of the eastern provinces of Turkey between March 15 and June 15, 2022. Five nurses who were not willing to participate, eight nurses who were on leave during this period, and six nurses who did not fill out the data collection form were excluded from the study. The study was completed with 73 nurses. The scope of the study reached 80% of the population.

Data Collection Instrument-Validity and Reliability Information

The data collection forms consist of two parts: an introductory information form and the Nurses' Physical Restraint Information, Attitude, and Practice Scale. The introductory information form was created by the researchers as a result of the literature review (Suen, 1999; Kaya et al., 2008). It includes 10 questions to determine the introductory characteristics of the nurses. The Physical Restraint Knowledge, Attitude, and Practice Scale was developed by Suen in 1999 to determine. the nurses' knowledge levels, attitudes, and practices regarding the use of physical restraints (Suen, 1999). The scale was adapted to Turkish by Kaya et al. in 2008. The original scale has a Cronbach's

alpha value of 0.85-0.99 (Suen, 1999). In the Turkish validity and reliability study, it was calculated as 0.69 (Kaya et al., 2008). In this study, the Cronbach's alpha value was calculated as 0.76. The knowledge dimension of the scale is scored between 0-11 points, the attitude sub-dimension is scored between 12-48 points, and the application sub-dimension, with the 10th item reversed, is scored between 14-42 points. A high score indicates excellent practice, while a low score indicates unsuitable practice.

Data Collection Process

A pilot study was conducted with 10 nurses to determine the appropriateness of the data collection forms. Based on the feedback received from the nurses, necessary adjustments were made, and changes were implemented in the data collection form. The pilot study data were not included in the final analysis. Prior to data collection, nurses working in surgical intensive care units were provided with information about the research, and those who volunteered to participate were asked to sign a voluntary consent form. The data for the study were collected through face-to-face survey method. Nurses who agreed to participate in the study were given the data collection form and asked to answer the questions on the form. It took the nurses approximately 10-15 minutes to complete the questions in both parts of the data collection form.

Evaluation of the Data

Statistical analysis of the data was conducted using SPSS 22.0 (IBM-USA) Windows package program. Descriptive statistics were used to represent categorical variables with number (n) and percentage (%), and numerical values were represented using mean ± standard deviation. The normal distribution suitability of the data was checked using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Since the data met the parametric conditions, independent sample t-tests and one-way ANOVA were used to compare dependent and independent variables. The post hoc Tukey HSD test was utilized to determine the variables that contributed to the differences. Pearson correlation analysis was employed to establish relationships between variables. A significance level of $p < 0.05$ was considered statistically significant.

Variables of the Research and Ethical Aspect of the Research

The knowledge, attitude, and practice scores of nurses working in surgical intensive care units constitute the dependent variables of the study, while the demographic characteristics of the nurses form the independent variables of the research. Ethical approval was obtained from a university's ethics committee before starting the study (Approval No: 2022-022). Nurses working in the S-ICUs who participated in the study were provided with information about the study, and their written consent was obtained if they volunteered to participate (Emanuel et al., 2004). The nurses' demographic information, attitude, and practice scale were adapted to Turkish, and the permission of the author who conducted the validity and reliability study was also obtained. Every stage of the research was conducted in accordance with international rules and the Helsinki (Declaration of Helsinki, 2008).

RESULTS

The average age of the nurses working in the S-ICUs who participated in the study was 32.08±6.91 years, with 46% of them being 30 years old or younger. Among the nurses, 61.6% were female, and 68% have a bachelor's degree. The average years of experience for the nurses was 9.08±6.66 years, and 38.4% of them have 5 years or more of experience. Considering

the experience duration of the nurses in the S-ICUs, it was found that the average duration was 4.89±5.16 years, and 76.7% of them have 5 years or more of experience. 50.7% of the nurses work in general surgical intensive care units, and 90.4% of them work on day and night shifts. The average weekly working hours for the nurses were 53.11±13.69 hours, with 41.1% of them working between 41-60 hours per week. 83.6% of the nurses have received training on physical restraint, and 93.2% have applied physical restraint (Table 1).

The study analyzed the data to investigate the differences in the knowledge, attitudes, and practices of nurses working in S-ICUs concerning the use of physical restraints based on age, gender, education level, nursing experience, S-ICU experience, working hours, and restraint usage. The findings revealed that there were no statistically significant differences (p>.05) in the average scores of the nurses based on these variables (Table 1).

However, a statistically significant difference (p=.016, p<.05) was found between the S-ICU experience and the knowledge score related to physical restraints. Post hoc Tukey test was applied to determine which groups were different. The comparison between groups '1-2' was not statistically significant (p>.05),

but the comparisons between '1-3' and '2-3' were statistically significant (p=.016, p=.013, respectively) (p<.05). This difference indicated that there was a variation in knowledge scores among nurses with S-ICU experience up to 11 years (Table 1).

When comparing nurses' intensive care units and work schedules with their knowledge, attitudes, practices, and average scores regarding physical restraints, no statistically significant differences were observed (p>.05). There was also no statistically significant difference (p>.05) between the nurses' weekly working hours and their knowledge scores related to physical restraints. However, there was a statistically significant difference (p=.001, p<.05) between the application of physical restraints and attitude and practice scores. Post hoc Tukey test showed that the comparisons between '1-2' were not statistically significant, while the comparisons between '1-3' and '2-3' were statistically significant (p=.001, p=.001, respectively) (p<.05). This indicated variations in attitude and practice scores among the nurses regarding physical restraint application (Table 1).

Regarding the nurses' physical restraint education and their actual application of restraints, no statistically significant differences were found (p>.05) (Table 1).

Table 1. Distribution of Descriptive Characteristics of Nurses Working in Surgical Intensive Care Units and Comparison of Descriptive Characteristics with Scale Dimensions (N=73)

Features	n	%	Information	Test p	Attitude	Test p	Implementation	Test p
Age (Mean ±SD*: 32.08±6.91, Youngest: 23- Oldest 55)								
0-30	34	46.6	6.82±1.48	F=1.095	32.92±5.03	F=.291	37.61±3.51	F=.484
31-40	30	41.1	7.36±1.29	p=.340	32.03±4.33	p=.748	36.80±3.15	p=.619
≥,41	9	12.3	7.22±2.04		33.00±4.33		37.33±3.16	
Gender								
Female	45	61.1	7.28±1.56	t=0.856	32.89±5.68	t=.548	37.22±3.79	t=.790
Male	28	38.4	6.97±1.45	p=.395	32.28±3.73	p=.585	37.22±3.00	p=.937
Educational Status								
Healthcare profession	14	19.2	7.12±1.95	F=.203	32.57±4.30	F=.160	37.35±3.07	F=.816
College Degree	50	68.5	6.66±1.03	p=.894	32.48±4.83	p=.997	37.42±3.41	P=.489
Postgraduate Degree	9	12.3	7.00±1.32		32.66±3.66		36.11±3.14	
Duration of Experience in Nursing (Mean ±SD*: 9.08±6.66, Minimum:1- Maximum:34 years)								
≤5	28	38.4	6.78±1.47	F=1.095	33.00±4.65	F=.455	37.32±3.50	F=.552
6-10	22	30.1	7.18±1.50	p=.340	29.42±5.29	p=.636	37.72±3.05	p=.578
≥11	23	31.5	7.39±1.49		32.65±3.67		36.69±3.34	
C-ICU Experience Duration (Mean ±SD*: 4.89±5.16, Minimum:1- Maximum 34 years)			**F=4.364**					
				p=.016				
≤5	56	76.7	7.05±1.49	**1-2****	32.87±4.57	F=1.199	37.30±3.45	F=.209
6-10	12	16.4	6.58±1.08	**p=,557**	30.66±4.05	p=.308	36.75±3.07	p=.812
≥11	5	6.8	8.80±1.30	**1-3****	33.00±5.24		37.80±2.28	
				p=.029				
				2-3**				
				p=.013				
Intensive Care Unit								
General Surgery	37	50.7	7.08±1.60		32.05±4.04		37.83±2.37	
Anesthesia	21	28.8	7.14±1.19	F=.017	33.14±4.88	F=.107	36.66±3.73	F=.384
KDC	8	11.0	7.00±2.26	p=.896	33.50±7.28	p=.744	37.75±4.49	p=.539
Emergency	7	9.6	7.14±0.69		32.00±2.16		35.28±4.38	
Your Work Layout								
Daytime	7	9.6	7.28±1.79	t=.352	33.14±1.34	t=.378	38.42±2.14	t=.994
Night and day	66	90.4	7.07±1.47	p=.726	32.45±4.76	p=.706	37.12±3.39	p=.323

Weekly Working Time (Mean ±SD*: 53.18±13.69, Minimum: 40- Maximum: 100 Hours)						**F=34.273**		**F=42.240**
						p=.001		**p=.001**
						1-2**		**1-2****
≤40	23	31.5	7.08±1.37	F=.560	33.08±5.35	**p=,064**	37.52±3.40	**p=.382**
41-60	30	41.1	7.16±1.41	p=.875	32.10±4.90	**1-3****	37.93±2.75	**1-3****
≥61	20	27.4	7.00±1.77		32.50±4.04	**p=.001**	35.90±3.69	**p=.001**
						2-3**		**2-3****
						p=.001		**p=.001**
Status of Receiving Training Related to Physical Detection								
Yes	61	83.6	7.14±1.52	t=.666	32.65±4.56	t=.136	37.36±3.21	t=.611
No	11	15.1	6.81±1.40	p=.507	32.45±4.29	p=.892	36.63±4.00	p=.511
Physical Detection Application Status								
Yes	68	93.2	7.28±1.47	t=1.570	32.42±3.98	t=.276	37.60±3.32	t=1.354
No	5	6.8	6.69±1.49	p=.121	32.73±5.69	p=.783	36.47±3.20	p=.180

*Mean ±Standard Deviation * *KDC: Cardiovascular Surgery Intensive Care, t: Independent-Samples T Test, F: One-Way ANOVA* * Post hoc Tukey HSD test.

The mean score of the Physical Restraint Knowledge, Attitude, and Practice Scale for the nurses was calculated as 76.86 ± 6.56. The nurses' overall average scores for knowledge, attitude, and practice related to physical restraint were determined to be at a moderate level. The middle score represents good practice. When examining the mean scores of the subscales of the scale, the knowledge dimension has a mean score of 7.09±1.49 (moderate level), the attitude dimension has a mean score of 32.52±4.5 (moderate level), and the practice dimension has a mean score of 37.24±3.30 (moderate level) (Table 2).

Table 2. Average Knowledge, Attitude and Practice Score of Nurses on Physical Restraint Use (N=73)

	Mean ±SD* (Minimum-Maximum)	Scale Score Limits
Information	7.09±1.49 (3-10)	0-11.
Attitude	32.52±4.5 (21-48)	12-48
Implementation	37.24±3.30 (14-42)	14-42
Total	76.86±6.58 (63-99)	0-101

*Mean ± standard deviation

In Table 3, the knowledge sub-dimension scores regarding the use of physical restraints by nurses working in S-ICUs were examined. According to the table, 30.1% of the nurses agreed with the statements 'Patients have the right to object to the use of restraints; the restraint used should be appropriate for the patient's condition' and 'Jacket-type restraints may lead to the patient's death' (Table 3).

Table 3. Distribution of Knowledge Scores of Nurses Working in Surgical Intensive Care Units Regarding Physical Detectors (N=73)

	Agree		Indecisive		Disagree	
	n	**%**	**n**	**%**	**n**	**%**
1- Since there will be no gap between the skin and the fixator, it should be applied comfortably and the type, time and reason for use should be recorded in the nursing note.	69	94.5	3	4.1	1	1.4
2- Since there may be a danger of suffocation, the patient should never be detected face down.	68	93.2	4	5.5	1	1.4
3-The anchor should be attached to the bed sides, not to the bed sheet or rails.	65	89.0	7	9.6	1	1.4
4-The retainer should be loosened every 2 hours. How many hours do you relax? (Mean ±SD*: 2.12±1.26, Minimum:1- Maximum 5 hours)	65	89.0	3	4.1	5	6.8
5-Detectors are vehicles prepared to prevent injury.	59	80.8	10	13.7	4	5.5
6- Informed consent should be obtained from a family member when the fixative is applied to the patient.	57	78.1	10	13.7	6	8.2
7- When the fixative is applied to the patient, the risk of deterioration in skin integrity increases.	57	78.1	9	12.3	7	9.6
8- Detectors are applied by professional people when the patient cannot be observed closely.	52	71.2	15	20.5	6	8.2
9- There is no determinant that we can call very good in every aspect.	46	63.0	20	27.4	7	9.6
10- The patient has the right to object to the identifier. Detector suitable for the patient's condition has to be determined.	22	30.1	26	35.6	25	34.2
11-Jacket type restraints may cause death of the patient.	22	30.1	43	58.9	8	11.0

In Table 4, the attitude sub-dimension scores regarding the use of physical restraints by nurses working in S-ICUs were examined. According to the table, 2.7% of the nurses strongly agreed with the statements 'I believe restraints increase the risk of choking for patients' and 'Applying restraints to patients leads to a decrease in their self-confidence.' Additionally, 8.2% of the nurses strongly agreed with the statements 'The main reason for restraint use in our institution is the insufficient number of nurses' and 'I feel guilty if I apply restraints to a patient.' Furthermore, 11% of the nurses strongly agreed that 'I feel guilty when the patient's orientation is disturbed after the application of restraints.' It was determined that 12.3% of the nurses strongly believe that 'The application of restraints reduces the duration of nursing care.' Moreover, 13.7% of the nurses strongly agreed with the statement 'I feel bad when the patient is worse/angry after being restrained.' Additionally, 16.4% of the nurses strongly agreed with the statement 'I feel bad when a family member enters the room of a patient who has been restrained.' Furthermore, 20.5% of the nurses strongly agreed with the statement 'I believe that family members have the right to oppose the application of restraints.' It was also found that 27.4% of the nurses strongly agreed with the statement 'If I were a patient, I would want the right to accept or refuse the use of restraints.' Lastly, 34.2% of the nurses strongly agreed with the statements 'Applying restraints legally is important for me and my institution' and 'I believe that the use of restraints reduces the fall rate for patients' (Table 4).

Table 4. Distribution of Attitude Scores of Nurses Regarding Physical Detectors (N=73)

	Absolutely. Agree		Agree		Disagree		Absolutely. Disagree	
	n	%	n	%	n	%	n	%
1- I think the rate of falling of the patients decreased with restraints.	25	34.2	46	63.0	2	2.7	-	
2-It is important for me and my institution to implement the restraints by taking legal measures.	25	34.2	47	64.4	1	1.4	-	
3-If I were sick, I would like to have the right to accept or reject this when the restraint is used.	20	27.4	34	46.6	18	24.7	1	1.4
4- I think that family members have the right to oppose the application of the restraint.	15	20.5	26	35.6	28	38.8	4	5.5
5- I feel bad when a family member enters the room of a patient who has a restraint applied.	12	16.4	25	34.2	32	43.8	4	5.5
6- I feel bad when the patient is worse/angrier after being identified.	10	13.7	39	53.4	21	28.8	3	4.1
7- I think that the fixative application reduces the duration of nursing care.	9	12.3	37	50.7	24	32.9	3	4.1
8- I feel bad when there is a deterioration in the patient's orientation after the fixator is applied.	8	11.0	46	63.0	17	23.3	2	2.7
9- I feel guilty if I apply a restraint to the patient.	6	8.2	16	21.9	43	58.9	8	11.0
10- The main reason for the use of restraints in our institution is the insufficient number of nurses.	6	8.2	12	16.4	41	56.2	14	19.2
11-There is a decrease in the self-confidence of the patient who is applied a restraint.	2	2.7	23	31.5	43	58.9	5	6.8
12- I think that the restraints increase the risk of suffocation of the patient.	2	2.7	10	13.7	58	79.5	3	4.1

In Table 5, the application sub-dimension scores regarding the use of physical restraints by nurses working in S-ICUs were examined. According to the table, 21.9 % of the nurses consistently responded 'As the number of my colleagues decreases, the number of restrained patients increases.' Additionally, it was determined that 45.2% of the nurses always respond 'In our institution, rather than applying restraints to patients, we try to find different ways to control the patient's movements' (Table 5).

Table 5. Distribution of Nurses' Application Scores Related to Physical Detectors (N=73)

	Always		Sometimes		Never	
	n	%	n	%	n	%
1- I check the skin of the patient who is applied a restraint for friction or irritation.	67	91.8	61	8.2	-	-
2- If the patient has been applied a restraint, I will answer his/her calls as soon as possible.	63	86.3	9	12.3	1	1.4
3- I tell the family members why the patient was detected.	62	84.9	11	15.1	-	-
4- I check the restraint every two hours to determine if it is in the right position.	60	82.2	13	17.8	-	-
5- When the restraint is applied, I record the type of restraint, the reason for use, the time of application and nursing interventions in the nursing note.	59	80.8	9	12.3	5	6.8
6- I tell the patient why the restraint is used.	59	80.8	14	19.2	-	-
7- I explain to the patient when the restraint will be removed.	57	78.1	16	21.9	-	-
8- When I think that the patient does not need to be identified, I inform the physician of this idea.	57	78.1	13	17.8	3	4.1
9- I frequently check the restraint to determine if it is turned on by itself.	57	78.1	16	21.9	-	-
10- I try different nursing interventions to prevent the patient from falling before applying the fixative to the patient.	43	58.9	30	41.1	-	-
11- When the restraint is applied, I frequently check, evaluate and record its effects.	41	56.2	28	38.4	41	5.5
12- I only apply the restraint with the directive of the physician.	37	50.07	33	45.2	3	4.1
13-In our institution, we try to find different ways of controlling the patient's movements rather than applying a restraint to the patient.	33	45.2	40	54.8	-	-
14- As the number of my colleagues decreases, the number of patients with detective application increases.	16	21.9	37	50.7	20	27.4

When the relationship between age, duration of experience in nursing, durauğn of experience in S-ICUs and the average scores of the knowledge, attitude and application scale related to the use of physical restraints of the nurses working in S-ICUs participating in the study was evaluated, it was determined that the relationship between them was not statistically significant (p>.05). There was no significant relationship between the weekly working hours of the nurses and the average knowledge dimension score of the scale (p>.05). However, it was determined that there was a high negative correlation between the mean score of the attitude and application subdimension of the scale and the weekly working time and that the relationship was statistically significant (p=.001, p=.001, respectively) (p<.05) (Table 6).

Table 6. The Relationship of Physical Detection Use of Nurses Working in Surgical Intensive Care Units with Some Continuous Variables (N=73)

Attribute	Information Test* /p	Attitude Test* /p	Implementation Test* /p
Age	r=.138 p=.122	r=.003 p=.429	r =-.019 p=.338
Duration of Experience in Nursing (Years)	r=.135 p=.255	r =-.169 p=.153	r=.027 p=0.822
Duration of Experience in C-ICUs (Years)	r=.160 p=.175	r =-.180 p=.127	r =-.010 p=.934
Weekly Working Time (Hour)	r=.084 p=.477	**r= -.746 p = .001**	**r =.734 p = .001**

Test r: Pearson Correlation*

DISCUSSION

This study conducted with S-ICU nurses working in three hospitals in the Eastern Anatolia region revealed significant deficiencies in their knowledge, attitudes, and practices related to physical restraints (PR). The total PR knowledge, attitude, and practice scale score of the nurses was found to be 76.86 ± 6.58. Comparing this with previous studies, Ertuğrul et al. reported a total score of 73.50 ± 10.08 for nurses working

in intensive care units, (Ertuğrul et al., 2020) and Cui et al. found a total score of 74.33 ± 9.55 for nurses in intensive care units (Cui et al., 2021). Although the subscale scores in this study were consistent with the literature, the higher total score may be attributed to the characteristics of the sample, consisting of S-ICU nurses.

The deficiencies in nurses' knowledge, attitudes, and practices regarding PR can lead to complications and ethical dilemmas and may diminish the effectiveness of beneficial treatments (Kirk et al., 2015). To address these deficiencies, administrative measures should be taken. The British Association of Critical Care Nurses and the American Nurses Association emphasize that PR should only be used when alternative methods are not available (Bray et al., 2004; ANA, 2012). Despite the potential harms of PR, its continued use is most commonly attributed to factors such as low nurse-patient ratios, excessive workload, working environment, inadequate staffing, and lack of legal regulations (de Casterle et al., 2015; Via Claveno et al., 2019).

According to the information sub-dimension score obtained from the scale in the study, the nurses' level of knowledge about PR usage was found to be at a moderate level (7.09 ± 1.49) and was reported by 64% of the nurses. While 63% of the nurses agreed with the statement "There is no good indicator in any way," 27.4% were undecided. Only 30.1% correctly answered the statement "Jacket-type restraints can cause patients' death," while 58.9% reported that they were unaware of it. These findings indicate that nurses working in S-ICUs have a lack of knowledge and are in need of training. Previous studies have also identified nurses' lack of knowledge and their application of PR without using alternative methods (Ertuğrul et al., 2020; Gürlek Kısacık et al., 2019).

In a randomized controlled trial conducted by Kavak et al., the impact of PR education provided to nurses was investigated. It was found that nurses who received PR training had a significant increase in their knowledge, attitude, and practice scores compared to the group that did not receive training (Kavak, et al., 2019). We recommend providing nurses with information about alternative methods to PR and developing clinical guidelines and in-service training programs.

In the study, 71.2% of nurses indicated that they utilize PR as a rationale when the patient is unable to be closely observed. This situation may arise due to a low nurse-to-patient ratio in the S-ICU, where nurses are unable to constantly observe patients and may prefer restraints as a measure to ensure patient safety. In the literature, it is recommended to place critically ill patients in a position where they can be closely observed, and to implement tighter monitoring and plan care interventions according to patient needs (Paslı Gündoğan et al., 2016; Suliman et al., 2017). Measures should be taken to ensure closer monitoring of critically ill patients in the intensive care unit.

In the study, 34.2% of nurses reported disagreement about the patient's right to object to PR, and 36.6% were undecided. 8.2% of nurses reported that they did not participate in the process of obtaining informed consent from the patient's family for physical restraint, and 13% were undecided. These findings indicate that nurses need more information about patient and family-centered care. The use of PR as a protective shield to prevent the patient from harming themselves and their surroundings in the management of agitation and delirium can inadvertently cause harm to the patient. Patient and family-centered approaches in the management of agitation and delirium can reduce the need for PR (Devlin et al., 2018). Nurses should be informed about the use of patient and family-centered approaches in the management of agitation and delirium.

The determination of the attitude sub-dimension score obtained from the scale in the study as moderate (32.52±4.5) indicates deficiencies in the positive attitudes of nurses working in S-ICUs. Nurses are divided in their views on the patient's and family's right to refuse restraint. This suggests that some nurses view restraint as a protective mechanism.

In the study, 16% of nurses strongly agreed, and 34.2% indicated that they "felt bad" when a family member entered the room of a patient who had been restrained. 11% strongly agreed, and 63% expressed that they "felt bad" in a situation where the patient felt bad/agitated. The findings of the study indicate that nurses, who are responsible for ensuring patient safety, experience a dilemma and thus resort to PR. Nurses may face a dilemma due to the risks of using PR and legal issues. When deciding to use PR, nurses often face ethical dilemmas. Ethical dilemmas in the decision-making process of nurses regarding the use of PR have been reported in three main categories: ethical dilemmas, not using PR and emotional issues, consequences of using PR, and patient safety, causing physical and psychological harm to patients (Salehi et al., 2020).

The moderate level of the application sub-dimension score obtained from the scale in the study (37.24±3.30) indicates deficiencies in the practices of nurses working in S-ICUs. In the study, 58% of nurses stated that they primarily applied physical restraint for patients at risk of falls. This shows that approximately half of the nurses view physical restraint as the first option for patients at risk of falls. The fall risks of patients admitted to the intensive care unit should be identified, and measures should be taken to prevent falls.

In the study, 56.2% of nurses stated that they

frequently monitor, assess, and record the effects of PR when applied. This finding indicates that approximately half of the nurses do not frequently monitor the effects of PR. Studies in the literature have reported that a decrease in care and monitoring frequency in patients undergoing PR is associated with the development of complications (Ertuğrul et al., 2020; Gürlek Kısacık et al., 2019). Ertuğrul et al. reported that PR caused various adverse effects in the immobilization area, such as redness, bruising, swelling, and edema, and increased the frequency of neurovascular complications (Kaya et al., 2008; Ertuğrul et al., 2020).

Particularly, changes related to circulation should be closely monitored and shared with the team in patients undergoing PR. In the study, 50.7% of nurses stated that they only apply PR with a directive from the physician. This finding reflects that approximately half of the nurses apply PR without a specific directive from the physician. In the study, 45.2% of nurses stated that they try to find different ways to assess the patient's movements before implementing PR in their institution. This finding indicates that more than half of the nurses do not seek alternative methods before applying PR.

A study by Chapman et al. recommended alternative methods before PR application (Cui et al., 2022). In the literature, alternative methods to PR are considered as chemical (pharmacological) methods, sedation (Devlin et al., 2018), and non-pharmacological methods (Rose et al., 2016). In a study by Rose et al., it was found that PR use increased the need for sedation, opioids, and benzodiazepines (Unoki et al., 2018). The increased need for sedation is a factor that prolongs the duration of patients' stay in the intensive care unit and hospital.

Reducing PR use requires multi-component

interventions, including non-pharmacological methods. These interventions include healthcare professional education, the presence of a family member in the intensive care unit, continuous family support, communication, early mobilization and rehabilitation, shortening mechanical ventilation duration, and planning care for delirium, agitation, pain, and sleep disturbances (Rose et al., 2016).

In the study, it was determined that the inadequate number of nurses in S-ICUs is also an important factor in the use of PR. 21.9% of the participants stated that as the number of their colleagues decreased, the number of PR applications increased. This finding demonstrates that the shortage of nurses is a determining factor in PR usage. The study also found a high negative correlation between nurses' weekly working hours and the average scores of the attitude and application sub-dimensions of the scale, and this correlation was statistically significant. Even if nurses have sufficient knowledge, this situation can lead to negative attitudes and inappropriate practices.

Studies examining the factors influencing PR use by nurses have identified inappropriate ICU environments, management attitudes, and nursing workload as reasons for PR use (Cui et al., 2021; Unoki et al., 2018). In the literature, PR use is considered as a compensatory tool for the shortage of healthcare workforce, leading to increased usage of restraints in the intensive care setting (Suliman et al., 2017; Unoki et al., 2019).

The findings of the study were consistent with previous research in the literature. Nurses' workload should be regularly measured using objective methods, and adequate nurse planning should be conducted. Measures should be taken to reduce overtime hours for nurses to ensure a balanced and safe working environment.

As a result, deficiencies were identified in the knowledge, attitudes, and practices of nurses working in S-ICUs regarding physical restraint (PR) use. Nurses were found not to consistently document the application of physical restraints, to not always implement it solely based on physician directives, and to not always resort to alternative methods. This study emphasizes the need for training programs and the development of clinical practice guidelines to address the educational needs of nurses. Further comprehensive research is required to evaluate the ethical dilemmas surrounding PR use and the utilization of alternative methods. Ensuring that nurses possess improved knowledge, attitudes, and practices regarding PR is of paramount importance in providing high-quality and safe healthcare services.

Limitations

The limitations of this research include the data being collected through subjective responses to the scale questions, which could lead to biases in the findings. The research reflects the findings of nurses working in the S-ICUs of three hospitals in Southeast Anatolia. The study's sample is limited to three hospitals, and due to the subjective data collection methods, the research findings cannot be generalized. However, being the first study conducted with nurses working in S-ICUs in Turkey makes the research findings valuable.

IMPLICATIONS FOR PRACTICE

Developing Education Programs

This study emphasizes the deficiencies in nurses' knowledge, attitudes, and practices regarding physical restraint (PR) use. Hospitals and healthcare institutions should create and regularly update education programs for nurses on PR usage. These education programs should emphasize the use of alternative methods to PR.

Utilizing Alternative Methods

Nurses should consider and implement alternative methods before resorting to PR use. These alternative methods include non-pharmacological approaches, involvement of the patient's family, communication, early mobilization, and rehabilitation. Nurses should create treatment plans tailored to individual patient needs.

Promoting Family-Centered Care

Nurses should involve patients' families in the treatment process and provide them with support. Family-centered care can contribute to better addressing patients' safety and needs.

Addressing Ethical Issues

Nurses should openly address ethical issues related to PR usage. Respect for patients' and families' opinions regarding PR use is essential. Nurses should act in accordance with ethical principles and respect patients' rights.

Increasing Nurse Staffing

To alleviate the workload of nurses, there should be an increase in nurse staffing, and regular methods for measuring nursing workload should be implemented. By providing a better working environment, more focus can be placed on alternative methods when PR use is not mandatory.

These recommendations can help nurses improve their knowledge, attitudes, and practices regarding PR usage, ultimately contributing to the safety and health of patients.

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REFERENCES

Akansel, N. (2007). Physical restraint practices among ICU nurses in one university hospital in Western Turkey. *Health Science Journal, 1*(1), 51-57.

American Nurses Association. (2024). Reduction of patient restraint and seclusion in healthcare settings. Available at: https://www.nursingworld.org/~4af287/globalassets/docs/ana/ethics/ps_reduction-of-patient-restraint-and-seclusion-in-health-care-settings.pdf (accessed April 16, 2024).

Bilge, E. Ü., Kaya, M., Şenel, G. Ö., & Ünver, S. (2015). The incidence of delirium at the postoperative intensive care unit in adult patients. *Turkish Journal of Anaesthesiology and Reanimation, 43*(4), 232-239. doi: 10.5152/TJAR.2015.61570.

Bray, K., Hill, K., Robson, W., Leaver, G., Walker, N., O'Leary, M., Delaney, T., Walsh, D., Gager, M., Waterhouse, C., & British Association of Critical Care Nurses. (2004). British Association of Critical Care Nurses position statement on the use of restraint in adult critical care units. *Nursing in Critical Care, 9*(5), 199-212.doi: 10.1111/j.1362-1017.2004.00074.x.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates. https://doi.org/10.4324/9780203771587

Cui, N., Qiu, R., Zhang, Y., et al. (2021). Why are physical restraints still in use? A qualitative descriptive study from Chinese critical care clinicians' perspectives. *BMJ Open, 11*(11), e055073. doi:10.1136/bmjopen-2021-055073.

Cui, N., Yan, X., Zhang, Y., Chen, D., Zhang, H., Zheng, Q., & Jin, J. (2022). Non-pharmacological interventions for minimizing physical restraints use in intensive care units: An umbrella review. *Frontiers in Medicine (Lausanne), 9*, 806945.doi:10.3389/fmed.2022.806945.

da Silva, P. S., & Fonseca, M. C. (2012). Unplanned endotracheal extubations in the intensive care unit: Systematic review, critical appraisal, and evidence-based recommendations. *Anesthesia & Analgesia, 114*(5), 1003-1014. doi:10.1213/ANE.0b013e31824c0b6d.

de Casterlé, B. D., Goethals, S., & Gastmans, C. (2015). Contextual influences on nurses' decision-making in cases of physical restraint. *Nursing Ethics, 22*(6), 642-651.doi:10.1177/0969733014557114.

Devlin, J. W., Skrobik, Y., Gélinas, C., Needham, D. M., Slooter, A. J. C., Pandharipande, P. P., et al. (2018). Clinical practice guidelines for the prevention and management of pain, agitation/sedation, delirium, immobility, and sleep disruption in adult patients in the ICU. *Critical Care Medicine, 46*(9), e825-e873.

Dolan, J., & Dolan Looby, S. E. (2017). Determinants of nurses' use of physical restraints in surgical intensive care unit patients. *American Journal of Critical Care, 26*(5), 373-379.doi:10.1097/CCM.0000000000003299.

Emanuel, E. J., Wendler, D., Killen, J., & Grady, C. (2004). What makes clinical research in developing countries ethical? The benchmarks of ethical research. *Journal of Infectious Diseases, 189*(5), 930-937.

Ertuğrul, B., & Özden, D. (2020). The effect of physical restraint on neurovascular complications in intensive care units. *Australian Critical Care, 33*(1), 30-38.doi:10.1016/j.aucc.2018.10.067.

Gürlek Kısacık, Ö., & Coşğun, T. (2019). Investigation of restriction applications and neurovascular effects in intensive care patients. *Journal of Intensive Care, 10*(2), 53-62.

Karaca, T., & Aydın Özkan, S. (2018). Investigation of responsible nurses' knowledge on detection practices by qualitative research method. *Journal of Health and Nursing Management, 5*(3), 172-178.

Kavak, F., Yılmaz, E., Okanlı, A., & Aslanoğlu, E. (2019). The effect of psychoeducation given to psychiatry nurses on level of knowledge, attitudes, and practices regarding physical restraint: A randomized controlled study. *Perspectives in Psychiatric Care, 55*(4), 743-751.doi:10.1111/ppc.12411.

Kaya, H., Aştı, T., Acaroğlu, R., Erol, S., & Savcı, C. (2008). Nurses' knowledge, attitudes and practices towards detective use. *Maltepe University Journal of Nursing Science and Art, 1*(2), 21-29.

Kılıç, G., Kutlutürkan, S., Çevik, B., & Erdoğan, B. (2018). Evaluation of nurses working in intensive care units on physical detection practice. *Van Medical Journal, 25*(1), 11-16.

Kirk, A. P., McGlinsey, A., Beckett, A., Rudd, P., & Arbour, R. (2015). Restraint reduction, restraint elimination, and best practice. *Clinical Nurse Specialist, 29*(6), 321-328.doi:10.1097/NUR.0000000000000157.

Lach, H. W., Leach, K. M., & Butcher, H. K. (2016). Evidence-based practice guideline: Changing the practice of physical restraint use in acute care. *Journal of Gerontological Nursing, 42*(2), 17-26.doi:10.3928/00989134-20160111-05.

Lan, S. H., Lu, L. C., Lan, S. J., Chen, J. C., Wu, W. J., Chang, S. P., & Lin, L. Y. (2017). Educational intervention on physical restraint use in long-term care facilities - Systematic review and meta-analysis. *Kaohsiung Journal of Medical Sciences, 33*(8), 411-421.doi:10.1016/j.kjms.2017.05.019.

Paslı Gürdoğan, E., Uğur, E., Kinici, E., & Aksoy, B. (2016). Knowledge, attitudes and practices of intensive care nurses on physical detection and affecting factors. *Journal of Internal and Surgical Sciences Intensive Care, 7*(3), 83-88.

Rose, L., Burry, L., Mallick, R., Luk, E., Cook, D., Fergusson, D., Dodek, P., Burns, K., Granton, J., Ferguson, N., Devlin, J. W., Steinberg, M., Keenan, S., Reynolds, S., Tanios, M., Fowler, R. A., Jacka, M., Olafson, K., Skrobik, Y., & Mehta, S. (2016). Prevalence, risk factors, and outcomes associated with physical restraint use in mechanically ventilated adults. *Journal of Critical Care, 31*(1), 31-35.

Salehi, Z., Najafi Ghezeljeh, T., Hajibabaee, F., & Joolaee, S. (2020). Factors behind ethical dilemmas regarding physical restraint for critical care nurses. *Nursing Ethics, 27*(2), 598-608.

Suen, L. K. P. (1999). Knowledge, attitude and practice of nursing home staff towards physical restraints in Hong Kong nursing homes. *Asian Journal of Nursing Studies, 5*(2), 73-86.

Suliman, M., Aloush, S., & Al-Awamreh, K. (2017). Knowledge, attitude and practice of intensive care unit nurses about physical restraint. *Nursing in Critical Care, 22*(5), 264-269.doi: 10.1111/nicc.12303

Turgay, A. S., Sari, D., & Genc, R. E. (2009). Physical restraint use in Turkish intensive care units. *Clinical Nurse Specialist, 23*(2), 68-72.

Unoki, T., Hamamoto, M., Sakuramoto, H., et al. (2019). Influence of mutual support and a culture of blame among staff in acute care units on the frequency of physical restraint use in patients undergoing mechanical ventilation. *Acute Medicine & Surgery, 7*(1), e479.

Unoki, T., Sakuramoto, H., Ouchi, A., & Fujitani, S. (2018). Physical restraints in intensive care units: A national questionnaire survey of physical restraint use for critically ill patients undergoing invasive mechanical ventilation in Japan. *Acute Medicine & Surgery, 6*(1), 68-72.

Via-Clavero, G., Sanjuán-Naváis, M., Romero-García, M., et al. (2019). Eliciting critical care nurses' beliefs regarding physical restraint use. *Nursing Ethics, 26*(5), 1458-1472.

World Medical Association. (2008). Declaration of Helsinki – Ethical principles for medical research involving human subjects. Available at: https://www.wma.net/what-we-do/medical-ethics/declaration-of-helsinki/doh-oct2008/ (accessed July 13, 2022).