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Orijinal Araştırma

Nurses' Knowledge, Attitudes and Practices regarding the Use of Physical Restraint on Patients with COVID-19

Hemşirelerin COVID-19 Hastalarında Fiziksel Tespit Uygulamalarına İlişkin Bilgi, Tutum ve Uygulamaları

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ABSTRACT

Background: COVID-19 infection increases the need for physical restraint in acute care settings.

Objective: This study aims to examine nurses' knowledge, attitudes and practices regarding the use of physical restraint in patients with COVID-19.

Methods: This descriptive study was conducted using online self-report questionnaires distributed to 285 intensive care nurses. In the data collection, "Nurses Information Form" and "Level of Knowledge, Attitude and Practices for Using Physical Restraint Scale for Nurses" were used.

Results: The mean score of the total scale of the nurses was 76.11±9.21, the mean knowledge score was 8.07±1.60, the mean attitude score was 32.67±7.08, the mean practice score was 35.36±3.66. It was found that physical restraint usage rates of nurses increased significantly compared to the pre-pandemic period ($p<0.05$). 59.3% of the nurses stated that they gave the semi-fowler position who would undergo physical restraint, and all of them did not use an alternative method.

Discussion: The knowledge of nurses about physical restraint is high, their attitudes and practices are positive toward patients with COVID-19. The nurses need training on alternatives to physical restraint. Future studies should focus on determining and developing alternatives to physical restraint and evaluating their effects on the rates of restraint in the patients.

Keywords: Physical restraint, COVID-19, intensive care, nurse, patient safety

ÖZET

Giriş: COVID-19 enfeksiyonu, akut bakım ortamlarında fiziksel tespit ihtiyacını artırmaktadır.

Amaç: Bu araştırma, hemşirelerin COVID-19 hastalarında fiziksel tespit kullanımına ilişkin bilgi, tutum ve uygulamalarını incelemeyi amaçlamaktadır.

Yöntem: Bu tanımlayıcı çalışma, 285 yoğun bakım hemşiresi ile çevrimiçi anket yöntemi kullanılarak yürütülmüştür. Verilerin toplanmasında "Hemşire Bilgi Formu" ve "Hemşirelerin Fiziksel Tespit Kullanma Bilgi, Tutum ve Uygulama Düzeyleri Ölçeği" kullanılmıştır.

Bulgular: Hemşirelerin toplam ölçek puan ortalaması 76.11±9.21, bilgi puanı ortalaması 8.07±1.60, tutum puanı ortalaması 32.67±7.08, uygulama puanı ortalaması 35.36±3.66 idi. Hemşirelerin fiziksel tespit kullanım oranlarının pandemi öncesine göre anlamlı olarak arttığı saptandı ($p<0,05$). Hemşirelerin %59,3'ü fiziksel tespiti için hastaya semi-fowler pozisyonu verdiğini ve hemşirelerin tamamı alternatif bir yöntem kullanmadığını belirtmişlerdir.

Sonuç: Hemşirelerin fiziksel tespit ile ilgili bilgi düzeyleri yüksek, COVID-19 hastalarına yönelik tutum ve uygulamaları olumludur. Hemşirelerin fiziksel kısıtlamaya alternatifler konusunda eğitime ihtiyaçları vardır. Gelecekteki çalışmalar, fiziksel tespite alternatifler belirlemeye, geliştirmeye ve bunların hastalarda tespit oranları üzerindeki etkilerini değerlendirmeye odaklanmalıdır.

Anahtar Kelimeler: Fiziksel tespit, COVID-19, yoğun bakım, hemşire, hasta güvenliği

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INTRODUCTION

The novel Coronavirus Disease (COVID-19), which is considered a widespread worldwide, has recently caused an increase in physical restraint (PR) practices (Font et al., 2021; Okuno et al., 2021). This situation is a consequence of the clinical manifestation that occurs in patients infected with COVID-19. Indeed, it has been reported that hypoxemia, pneumonia, and respiratory failure may occur in roughly 10% of COVID-19 cases. Thus, patients are followed up in ICUs (Acar et al., 2020). Besides, it has been well documented that the risk of delirium and agitation increases in patients with COVID-19 due to factors, such as hypoxia, social isolation, disruption of sleep patterns, and fear of death associated with acute respiratory distress syndrome (ARDS) (Kotfis et al., 2020; O'Hanlon & Inouye, 2020; Wong et al., 2020). In this situation, it may be necessary to apply PR to prevent the patient from harming his environment and himself. Indeed, Okuno et al. (2021) have reported that PR has increased in hospitals due to COVID-19. On the other hand, it has been recommended to place patients in the prone position for a long time as part of the treatment due to acute respiratory distress syndrome, which is common in patients with severe COVID-19 (Camporota et al., 2022; Ghelichkhani & Esmaili, 2020; Rollas & Senoglu, 2020; Alhazzani et al., 2020; Ozbilen & Altuncan, 2020). However, PR is not recommended in the prone position (Kose et al., 2020). Hence, it is not clear how to proceed with a COVID-19 patient who needs PR. This, in turn, may require nurses to perform specific restraint methods peculiar to patients with COVID-19, or inappropriate methods may increase the incidence of complications. Within this regard, it is crucial to know the practices of nurses, who have a key role in PR practices regarding patient safety, PR in patients with COVID-19. Although there are many studies on PR practices in the literature, to our knowledge, there is no study investigating nurses' PR practices specific to patients with COVID-19.

OBJECTIVE

This research aims to examine nurses' knowledge, attitudes and practices regarding the use of PR in patients with COVID-19.

Research Questions:

1. What is the level of knowledge of nurses regarding the use of PR on patients with COVID-19?
2. What are the attitudes of nurses towards the use of PR in patients with COVID-19?
3. How are nurses' use and practices of PR on patients with COVID-19?

METHOD

Research Design

This was a descriptive study employing self-report questionnaires.

Setting

This study was conducted the self-administered questionnaires between April and December 2021 with 285 intensive care nurses at an acute care hospital in Istanbul, Turkey. The acute care hospital was put into service as a COVID-19 pandemic hospital in 2020. In the hospital, only patients diagnosed with COVID-19 are served in all units, regardless of branch.

Research Population and Sample

The study population consisted of 300 nurses working in the ICUs of an acute care hospital in Istanbul, Turkey. In the present study, 285 nursing from COVID-19 adult intensive care units participated, where only patients with COVID-19. The confidence interval of the sample was 95%.

The inclusion criteria of nurses, who aged 20-55 years old and who gave consent to participate were included in the present study, working in intensive care for at least six months and practicing PR at least once.

Instruments

Data for the current study were collected utilizing the "Nurses Information Form" and "Level of Knowledge, Attitude and Practices for Using Physical Restraint Scale for Nurses." It took approximately 25 minutes for nurses to fill out the questionnaires.

Nurses Information Form: This form consisted of 22 questions, and it was developed by the researchers in line with the literature to determine demographic and working characteristics, PR experiences of nurses (Gul & Kavak, 2019; Goktas & Buldukoglu, 2018; Gurdogan et al., 2016).

Level of Knowledge, Attitude and Practices for Using Physical Restraint Scale for Nurses: The scale, which was developed by Suen (1999), was adapted into Turkish by Kaya et al. and its validity and reliability study was carried out by them as well (2008). The scale consists of three parts to assess "nurses' knowledge about PR," "nurses' attitudes towards PR use," and "nurses' practices for PR use." The scores that can be obtained from the first part of the scale range from 0 to 11. A high score indicates a "high level of knowledge." In the second part, the questions are of 4-point Likert type (strongly agree, agree, disagree, strongly disagree), and the scores can be obtained from the part range between 12–48. Here, a high score indicates a "positive attitude", and a low score indicates a "negative attitude". In the third part, the questions are in 3-point Likert type (never, sometimes, always), and the scores of the part range between 14–42. High scores indicate that nurses' practices are "excellent", while low scores indicate "inappropriate practice". The test-retest value of the scale is 0.88–0.90 and the Cronbach's α value for the whole scale is 0.69. (Kaya et al., 2008). In this study, Cronbach's alpha coefficient of the total scale was 0.75 and for the sub-dimensions of knowledge, attitude, and practices were 0.53, 0.73, and 0.74, respectively.

Data Collection

The nurses were recruited using the haphazard method following inclusion criteria. An online survey link (Google doc) was forwarded to the nurses' emails or network accounts, such as WhatsApp or Messenger, to facilitate the data collection.

Data Analysis

The statistical analysis utilized the SPSS 22.0 program. The descriptive statistics were presented in a number and percentage format, skewness and kurtosis coefficients were used for examining a normal distribution of variables. Between

-2 and +2 values were accepted as a normal distribution (George & Mallery, 2010). The nurses' profile and key variables of the study was analyzed using the Mann-Whitney U, t-test or Kruskal-Wallis and ANOVA test. Statistical significance was accepted at $p < 0.05$.

Ethical Consideration

We confirm that all procedures utilized in this study were conducted following the principles of the Helsinki Declaration. This study was approved by the Medicine Faculty of Ethics Committee (Approval Number: 21-4.1T/13). Written approval was obtained from hospital administrators and the Ministry of Health to conduct this study. The necessary permission to utilize the scales discussed previously in this study was received from the authors. All nurses were accepted voluntarily to participate in the present study, written consent was obtained from all of them, and they were informed about the aim and purpose of the present study. During the data collection process, the issue of protecting the confidentiality and privacy was addressed by preserving the anonymity of nurses to protect their privacy. Nurses could voluntarily withdraw their consent to participate in this study at any time wishes if they were not happy with the survey or for any reasons.

RESULTS

The mean age of the nurses was 27.16 ± 5.17 ; most of them (74.7%) were female and had a bachelor's degree (72.3%). More than half of the nurses (60%) were with 1- to 5-year work experience and had experience working in the intensive care unit (53.6%). The mean working length in the COVID-19 intensive care unit was 13.96 (SD=7.49) months. While nurses applied PR to patients diagnosed with COVID-19 at least once a week, the rate of nurses who did not use any PR in the pre-pandemic period was 19.3%. The findings showed that PR usage rates of nurses increased significantly compared to the pre-pandemic period ($p=0.000$, $X^2=79.074$).

More than half of the nurses (58%) reported that they received a course on PR. Nurses stated that the most frequent PR applied regions in patients with COVID-19 were the wrist (99.3%), ankle (56.1%), chest (7%), and waist (1.8%),

Table 1. Demographic and physical restraint practices characteristics of nurses (n=285)

Descriptive Features	n	%	Descriptive Features	n	%
Gender		Reason of physical restraint^a			
Female	213	74.7	Removing equipment	246	86.3
Male	72	25.3	Delirium	219	76.8
Education		Patient from falling			
Master degree	29	10.1	Physical harm	195	68.4
Bachelor degree	206	72.3	Order of physician	98	34.4
Associate degree	19	6.7	Shortage of healthcare professionals	46	16.1
Medical vocational high school ^b	31	10.9	Position in physical restraint^a		
Work experience		Semi-Fowler			
<1 year	36	12.6	Supine	169	59.3
1-5 years	171	60.0	Lateral	57	20.0
6-10 years	45	15.8	Fowler	39	13.7
≥11 years	33	11.6	Prone	35	12.3
Experience of intensive care unit		Prone			
<1 year	84	29.5	Sims	26	9.1
1-5 years	153	53.6	Physical restrained time		
6-10 years	33	11.6	Until sedation	79	27.7
>11 years	15	5.3	1-3 hours	22	7.7
Course on physical restraint		4-6 hours			
Yes	167	58.6	7-9 hours	12	4.2
No	118	41.4	10-12 hours	9	3.1
Physical restrained body part^a		10-12 hours			
Wrist	283	99.3	24 hours	10	3.5
Ankle	160	56.1	48 hours	62	21.8
Chest	20	7.0	72 hours	10	3.5
Waist	5	1.8	96 hours and above	24	8.4
Material of physical restraint^a		96 hours and above			
Gauze	136	47.7	Throughout hospitalized	23	8.1
Foam tie	133	46.7	Complication due to physical restraint		
Leather tie	21	7.4	Yes	77	27.0
Sheet	12	4.2	No	208	73.0
Mitt	7	2.5	Type of complication^a (n=77)		
Pre-pandemic weekly physical restraint use		Edema			
None	55	19.3	Deterioration of skin integrity	31	40.2
1-3 patients	147	51.6	Anger	29	37.6
4-6 patients	50	17.5	Echymosis	27	35.0
>7 patients	33	11.6	Fear	19	24.6
During pandemic weekly physical restraint use		Blockage of circulation			
1-3 patients	154	54.0	Pressure wound	14	18.1
4-6 patients	92	32.3	Loss of self-confidence	14	18.1
>7 patients	39	13.7	Humiliation	8	10.3
Mean Age: 27.16±5.17 years		Hypertension			
Mean working length of COVID-19 intensive care unit: 13.96±7.49 months		6			
		3			
		Intervention for complication^a (n=21)			
		Giving information the physician			
		10			
		Relaxation of restraint			
		9			
		Elevation of extremity			
		9			

^aMedical vocational high school: 4-year high school, after an 8-year primary school.
^bMore than one response was included.

respectively. Approximately half of them reported that they chose gauze (47.7%) and foam tie (46.7%) for PR. The findings showed that the most common underlying reasons reported by nurses for the application of restraint were maintenance of the placement of medical devices (86.3%), restless behavior (76.8%), protect the patients from falling (74.7%), prevent physical harm to the patient and their environment (68.4%). Almost one-fourth of the nurses stated that they applied PR until the patient diagnosed with COVID-19 was sedated (27.7%) or for 24 hours (21.8%). More than half of the nurses (59.3%) stated that they placed the patient in the semi-fowler position while applying PR, while 9.1% stated that they applied physical restraint to the patient in the prone position. All of the

nurses stated that they did not apply an alternative method to PR in patients diagnosed with COVID-19. A total of 27% of nurses reported complications after the application of physical restraint, and edema (62.3%), skin breakdown (40.2%) and anger (37.6%) were the most common complication. Reporting to the physician (12.9%), loosening the restraint and elevating the extremity (11.7%) were reported to be the most applied approaches when complications occurred (Table 1).

Table 2. Descriptive Statistics and Indicators Related to Scale

	Level of Knowledge, Attitude and Practices for Using Physical Restraint Scale for Nurses			
	Total	Knowledge	Attitude	Practices
n	285	285	285	285
Number of scale items	37	11	12	14
Minimum-maximum	51-106	2-11	17-59	22-41
Mean±SD	76.11±9.21	8.07±1.60	32.67±7.08	35.36±3.66
Skewness±SD	0.343±0.14	-0.779±0.14	0.692±0.21	-0.918±0.14
Kurtosis±SD	0.581±0.28	1.092±0.28	0.463±0.28	0.275±0.28

The mean score of the total scale was 76.11±9.21, the mean knowledge score was 8.07±1.60, the mean attitude score was 32.67±7.08 and the mean practice score was 35.36±3.66 (Table 2).

Table 3. Comparison of Level of Knowledge, Attitude and Practices for Using Physical Restraint of Nurses according to Descriptive Features

Descriptive Features (n=285)	Physical Restraint Scale	Physical Restraint Scale Sub-scales		
	Total Score Mean±SD	Knowledge Mean±SD	Attitude Mean±SD	Practices Mean±SD
Gender				
Female	76.63±9.14	8.12±1.54	32.98±7.20	35.52±3.39
Male	74.59±9.33	7.93±1.77	31.75±6.69	34.91±4.37
Test value ^a	1.625	0.896	1.281	1.069
p	0.105	0.371	0.201	0.288
Education				
Master degree	77.75±7.63	8.48±1.40	32.72±6.25	36.55±2.74
Bachelor degree	76.43±9.28	8.20±1.42	32.93±7.31	35.29±3.63
Associate degree	71.78±11.23	7.68±1.82	29.10±7.17	35.00±3.81
Medical vocational high school ^b	75.16±8.29	7.09±2.30	33.06±5.83	35.00±4.42
Test value ^{ab}	1.912	5.528	1.746	1.206
p	0.128	0.001	0.158	0.308
Work experience				
<1 year	77.66±10.05	7.94±1.56	33.97±7.75	35.75±3.64
1-5 years	76.32±9.01	8.04±1.66	33.07±6.82	35.20±3.70
6-10 years	75.17±10.71	8.00±1.63	32.66±8.05	34.51±4.04
≥11 years	74.66±6.89	8.48±1.25	29.21±5.31	36.96±2.36
Test value ^{ab}	0.794	0.845	3.282	3.231
p	0.498	0.470	0.021	0.023
Experience of intensive care unit				
<1 year	79.19±9.60	8.26±1.44	34.66±7.29	36.26±3.44
1-5 years	75.07±8.25	7.98±1.67	32.22±6.59	34.86±3.67
6-10 years	73.57±11.08	7.90±1.64	30.72±8.22	34.93±4.14
>11 years	75.20±8.33	8.40±1.59	30.40±6.00	36.40±2.79
Test value ^c	17.357	2.514	14.707	11.145
p	0.001	0.473	0.002	0.011
Course on physical restraint				
Yes	77.00±9.19	8.19±1.46	33.09±7.19	35.71±3.56
No	74.86±9.14	7.90±1.77	32.07±6.99	34.88±3.78
Test value ^a	1.941	1.509	1.197	1.892
p	0.053	0.132	0.232	0.060

^aIndependent-samples t test, ^bOne-way ANOVA test, ^cKruskal-Wallis
^dTukey test

The mean score of the total scale of the nurses was higher in nurses who had working experience of fewer than one year in intensive care. The mean knowledge score was significantly higher in nurses who had master's degree nurses. The mean attitude score was significantly higher in nurses with fewer than one year of work experience and working in the intensive care unit. The mean practices score was significantly higher in nurses with more than 11 years of work experience and working in the intensive care unit ($p < 0.05$) (Table 3).

DISCUSSION

Research in Turkey before the COVID-19 showed that the incidence of PR practices was between 69.6% and 96.1%, PR was widely used in intensive care units and the rate of PR application was similar to that of the worldwide figures (De Berardis et al., 2020; Ertugrul & Ozden, 2020; Soylemez et al., 2020; Gu et al., 2019; Estévez-Guerra et al., 2017). However, to our knowledge, no study was conducted on the prevalence of PR use among patients with COVID-19 in Turkey. Font et al. (2021), in their study during the COVID-19, reported that an increase in PR use was observed from 2% to 7% between the first period (February 2020) and the second period (May 2020) of the COVID-19. Likewise, Okuno et al. (2021) have reported that PR has increased in hospitals due to COVID-19. Similarly, in our study, almost half of the nurses stated that the frequency of PR practice increased during the COVID-19. Moreover, it is important to note that the rate of nurses who stated that they did not practice any PR in the pre-pandemic period was 19.3%, whereas there were no nurses who did not perform PR during the COVID-19. It is noticed that the frequency of PR application has increased significantly to when we compare the frequency to the pre-pandemic period. Our study results support the literature.

One of the most fundamental elements in using PR for the benefit of the patient and preventing the patient from being harmed is the attitude and level of knowledge of nurses about this issue (Kose et al., 2020). Based on the scores obtained from the scale in our study, nurses' knowledge about using PR is at a good level, their practice mean score is high, and their attitudes are positive. However, it is noteworthy that PR was applied to the patients for a long time, gauze was frequently

used as the PR material, complications occurred in 27% of the patients, and PR was not terminated even in case of complications, only PR is relaxed (11.7%). These results are consistent with the findings of studies conducted before the COVID-19 (Kose et al., 2020; Kasew et al, 2020; Via-Clavero et al., 2019; Gul & Kavak, 2019; Goktas & Buldukoglu, 2018; Balci & Arslan, 2018; Suliman et al., 2017; Azab & Negm, 2013; San Turgay et al., 2009) and show that the erroneous practices continued during the COVID-19. Furthermore, this result shows that nurses do not seek alternative methods for patients with COVID-19 and continue their usual practices. The American Nurses Association (2012) highlights that PR should be used only when the alternatives are not adequate and that organizations should develop strategies to provide a safety culture in which alternative practices are supported. Thus, the use of evidence-based non-sedation alternative methods, such as appropriate lighting, massage, music, and therapeutic touch, could reduce the need for PR by controlling the situations that stimulate agitation and delirium, such as hypoxia and fear, in patients with COVID-19. Indeed, studies have revealed that PR increases the incidence of delirium in patients, contrary to widespread belief (Pan et al., 2018; Rosa et al., 2016). However, studies conducted in Turkey revealed inadequate knowledge and use of alternatives among nurses and that PR was implemented without identifying the needs of each individual and that policies, including alternative methods, were not applied (Ertugrul & Ozden, 2020; Goktas & Buldukoglu, 2018). In our study, all of the nurses stated that they did not apply an alternative method to PR in patients diagnosed with COVID-19 and that they applied PR because the vast majority of the patients went into delirium. However, it is of great importance to reduce the incidence of delirium in patients diagnosed with COVID-19. In this respect, it is more important to use alternative methods in patients with COVID-19. These findings highlight the apparent need for training that can help ICU nurses think of alternatives to PR for patients with COVID-19. Additionally, in our study, the findings showed that the knowledge level of nurses with master's degrees was higher, and their attitudes were affected by their professional experience. These findings are consistent with the

studies in the literature (Kısacik et al., 2020; Eskandari et al., 2017).

Another noteworthy point regarding the PR practices used in patients with COVID-19 in our study is the position given to the patients during the practice. It is recommended that patients be kept in a prone position for a long time as part of treatment because ARDS occurs in patients with COVID-19 (Ghelichkhani et al., 2020; Rollas & Senoglu, 2020; Alhazzani et al., 2020; Ozbilen & Altuncan, 2020). However, PR is not recommended in the prone position (Kose et al., 2020). In our study, 9.1% of the nurses stated that they applied PR to the patient while in the prone position. Although this rate is remarkably low, it is a rate that cannot be ignored. On the other hand, more than half of the nurses stated that they applied PR to their patients when they were in the semi-fowler position. Given that most of the nurses prefer positions other than prone to restraint, the patient supports the lack of knowledge about alternative methods, although nurses have sufficient knowledge about the PR practice position. We should note that roughly one-fourth of the nurses (21.8%) use PR for their patients for 24 hours; it can be suggested that the treatment process may be adversely affected due to PR, the patients cannot be kept in the prone position for a sufficient time due to the prolonged restraint period, and the treatment for ARDS cannot be continued effectively. This situation reveals the necessity of using alternative methods to PR to maintain effective treatment in patients with COVID-19 and suggests that nurses need training on alternative methods.

Limitations

The limitations of the present study include that the nurses' knowledge, attitudes and practices regarding the use of PR were investigated using the questionnaire, given that the results of the present study were based on the nurses' self-reports and that no observational assessment was carried out. Because this current study was conducted at only one hospital and had a small sample size, we cannot generalize the findings obtained in this study.

CONCLUSION

Based on our research findings, it has been concluded that the COVID-19 has led to an increase in PR using in ICUs. We should note that the knowledge of nurses about PR is high, and their attitudes and practices are positive. However, ICU nurses experience incompetencies/challenges in using their knowledge on using PR in their care practice in patients with COVID-19. Intensive care nurses need training on alternatives to PR in patients with COVID-19. Within this regard, it is recommended to plan training programs on alternative methods to PR, notably for nurses working in pandemic clinics. Future studies should focus on determining and developing alternatives to PR and evaluating their effects on the rates of restraint in patients with COVID-19.

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