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Physical restraint use in intensive care units

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ABSTRACT

Aims: Most patients hospitalized in intensive care units suffer from restlessness, confusion, and delirium. Physical restraint seems to be the only acceptable measure for ensuring patients' own and others' safety in certain cases in which other interventions are not applicable or useful,. The aim of this study was "to evaluate the application of physical restraint standards in intensive care units".

Methods: This was a cross-sectional descriptive study. A convenient sample of 120 physically restrained patients was recruited from the intensive care units of selected hospitals of Tehran University of Medical Sciences, Tehran, Iran. The data collection tool was an observational checklist for physical restraint standards. The SPSS16 was used for calculating the measures of descriptive statistics and conducting statistical tests.

Results: Most of the participating patients were male (65.8%), aged 50–60 years (62.5%), and had a Glasgow Coma Scale score of less than 8. The Fisher's exact test revealed a significant difference among the studied intensive care units and also among the three phases of using restraint (i.e. before, during, and after restraint use) regarding the rate of applying restraint standards ($p \leq 0.001$). Moreover, restraint standards were minimally applied in the study setting.

Conclusions: Educating nurses—as the first decision makers for restraint use—and familiarizing them with restraint-related clinical guidelines are crucial.

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1. Introduction

One of the responsibilities assumed for nurses is to protect patients from any kind of injuries. This can be challenging for critical care nurses who need to create a safe environment for patients with restlessness and delirium [1]. Most patients hospitalized in intensive care units (ICU) may suffer from varying degrees of restlessness, confusion, and delirium due to undergoing mechanical ventilation or suffering from pain, underlying conditions, sleep

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deprivation, hypoxia, myocardial ischemia, alcohol or drug withdrawal, and altered cellular metabolism [2].

Restless patients may be constantly restless and show behaviors such as increased mobility, pushing bed rails, removing catheters, attempting to get out of bed, throwing things around, and hitting others [1]. Accordingly, in certain cases in which other interventions are not applicable or useful, physical restraint seems to be the only acceptable measure for ensuring patients' own and others' safety [3–4].

In most cases, physical restraint is used as a safety measure to prevent patients from falling [5–8]. The rate of physical restraint use in ICUs is 24%–40% times more than general hospital wards [1]. Despite great tendency toward its use for ensuring patient safety, physical restraint has been reported to be associated with negative and harmful effects [9] such as pressure ulcer, depression, severe life-threatening injuries, and death [3].

Physical restraint use in ICUs has a long history. While countries such as England and France reacted to physical restraint in the nineteenth century, it was widely used as an ethical and appropriate therapeutic measure in the United States [10].

Moreover, it was used in 1980 in ICUs and medical-surgical wards. Historically, restraint was invented for ensuring patient safety. It was primarily used in nursing homes and psychiatric hospitals for preventing confused and restless patients from falling or self-harming [11].

Previously, nurses widely used their clinical judgment skills for deciding upon physical restraint use.

Although there are acceptable standards for its use, physical restraint is still associated with physical, psychological, ethical, and legal issues and complications [11].

Davis (2008) noted that in spite of numerous reports on the complications of restraint, only a few healthcare researchers and professionals pay attention to its appropriate use [12].

Given its wide use in ICUs [13–15] and the importance of employing appropriate and standard measures for preventing its complications and negative effects, this study was conducted to evaluate the application of physical restraint standards in ICUs.

2. Methods

This was a cross-sectional descriptive study. The study population encompassed all patients hospitalized in the ICUs of selected hospitals of Tehran University of Medical Sciences, Tehran, Iran, in 2012–2013. Patients were considered eligible if they aged greater than eighteen years and had been restrained by using physical restraint.

As no studies had been conducted in this area in Iran, we calculated the sample size with a P0 of 0.05, a P1 of 0.03, an alpha of 0.05 (i.e. a confidence level of 0.95), and a beta of 0.20 (i.e. a power of 0.80). P0 and P1 were respectively the proportion of patients who had been restrained and the estimated decrease in this proportion. Accordingly, the sample size was determined to be equal to 120. Participants were recruited conveniently from emergency, medical, surgical, and neurosurgical ICUs.

A checklist was used for data collection which had been developed through reviewing the existing literature. The content validity of the checklist was assessed and confirmed by ten faculty members. A pilot study was also done on 30 physically restrained hospitalized patients for assessing the applicability of the checklist. Moreover, the reliability of the checklist was evaluated through the split-half technique which resulted in a Spearman-Brown correlation coefficient of 0.84, denoting an acceptable reliability.

The checklist comprised two parts including a demographic and clinical characteristics questionnaire and a Physical Restraint Standards Scale (PRSS). The PRSS contained 20 items from which, items 1–8, 9–13, and 14–20 respectively related to before, during, and after implementing the restraint technique. The possible three answers to the items were 'Is applied', 'Not applied', 'and is not applicable'. The minimum and the maximum values of the

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total score of the PRSS were 0 and 20, respectively. The score of each phase of restraint use was calculated separately on a 0–100 scale.

After obtaining permissions and introduction letter from the Ethics Committee of Tehran University of Medical Sciences, we referred to the study setting, explained the aim of the study to the eligible participants, and gained informed consent from them or their guardians. Then, we attended the ICUs, observed the technique used for restraining each patient, and completed the checklist. The SPSS16 was used for calculating the measures of descriptive statistics and conducting statistical tests.

3. Results

One hundred and twenty patients were studied from which 65.8% were male and 34.2% were female. Most patients had an age of 50–60 years. The mean of participants' ages was 48.08 years. The Glasgow Coma Scale

Table 1: The rate of applying physical restraint standards in different phases of using restraint and in different ICUs and the results of the Fisher's exact test ($p \leq 0.001$)

Phase	Application of standards (%)	Medical ICU		Surgical ICU		Neurosurgical ICU		Emergency ICU	
		N	%	N	%	N	%	N	%
Before restraint use	< 25	4	12.5	3	6.8	0	0	1	3.1
	25–50	26	81.2	32	72.7	5	41.7	8	25
	50–70	2	6.2	9	20.5	7	58.3	23	71.9
	> 75	0	0	0	0	0	0	0	0
	Total	32	100	44	100	12	100	32	100
During restraint use	< 25	0	0	0	0	0	0	0	0
	25–50	5	15.6	0	0	0		0	
	50–70	27	84.4	1	2.3	12	100	31	96.9
	> 75	0	0	43	97.7	0	0	1	3.1
	Total	32	100	44	100	12	100	32	100
After restraint use	< 25	25	78.1	2	4.5	1	8.3	3	9.4
	25–50	5	15.6	3	6.8	5	41.7	24	75
	50–70	1	3.1	39	88.4	6	50	4	12.5
	> 75	1	3.1	0	0	0	0	1	3.1
	Total	32	100	44	100	12	100	32	100

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(GCS) scores of respectively 40%, 32.5%, and 27.5% of the participants were less than 8, 9–12, and 13–15. Moreover, the number of patients hospitalized in each of the studied ICUs was as follows: surgical ICU: 44 patients (36.7%); medical ICU: 32 patients (26.7%); emergency ICU: 32 patients (26.7%); and neurosurgical ICU: twelve patients (10%).

The mean of applying restraint standards was 47.60±10.97. The rates of applying the standards before, during, and after implementing the restraint technique in different ICUs are shown in Table 1. The before-, during-, and after-restraining PRSS scores were mainly 25–50 (59.2%), 50–70 (59.2%), and 50–70 (41.7%), respectively (Table 1).

4. Discussion

Study findings revealed that the mean of applying restraint standards was 47.60±10.97, denoting that restraint standards were applied in the ICUs minimally.

Before using restraint, only a small percentage of standards were followed. One of the restraint standards is physician's prescription for restraint [4] which was applied in none of the studied ICUs. In other words, nurses were the only decision makers for using restraint.

Another restraint standard which was not followed in the studied ICUs was obtaining written consent from patients' family members. Physical restraint is a widely-used technique in critical clinical situations. Although it has been well known in recent years, nurses need to obtain written consent from patients before implementing each procedure.

Probably, avoiding from obtaining informed consent may be due to nurses' concern over patients or their family members' refusal of restraint. Paterson et al. (2003) also found that the relationship among patients, family members, and healthcare professionals was not poor. They noted that interdisciplinary collaboration affects decisions about restraint use [4].

Several items of the pre- and during-restraining phases were related to the type of restraint device as well as the reasons for, length of, and clinical manifestations of restraint use. Hine (2007) reported that physical restraint use is rarely documented in patients' medical records, denoting that restraint is not considered as an important procedure. While one of the restraint use standards is its documentation, we found that only in one of the studied ICUs, the type of restraint and the restrained limb were reported to unit manager.

Mandatory documentation of the procedure can enhance the quality of restraint-related decisions and care services. The basic principles of restraint use (according to the 'Patient care standards' textbook) were applied in all of the ICUs. However, using a pad around patient's limb and placing restraint device on it were practiced only in one of the ICUs.

Several items of the during-restraining part of the checklist dealt with care services such as monitoring pulse rate and limb color every 30 minutes and removing restraint and performing passive range-of-motion exercises every two hours. Our findings regarding these items widely varied in that some nurses performed these procedures while others barely paid attention to restraint-related care services. This finding can be attributed to nurses' limited knowledge about restraint care, nursing staff shortage, and low nurse-patient ratio.

Nurses' attitude and knowledge are the determining factors in choosing the method of restraining. Accordingly, revising restraint-related strategies and principles and enhancing nurses' knowledge about restraint use are of paramount importance [18 and 19]. Previous studies have shown that education had positive effects on nurses' restraint-related knowledge, attitude, and practice [15 and 20].

The challenging restraint technique is still widely used in ICUs [16] while its safety and effectiveness are dubious [17]. The application of standards while implementing the restraint technique can prevent the accompanying complications [23 and 24].

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5. Conclusions

Factors which may contribute to the failure to implement restraint standards may be nurses' unfamiliarity with the standards, lack of documentation sheets, and managers' low sensitivity to restraint use and documentation. Therefore, educating nurses—as the first decision makers for restraint use—and familiarizing them with restraint-related clinical guidelines are crucial. Conducting further studies for assessing the effects of education on physicians and nurses' restraint use is recommended.

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