**The challenges of using physical restraint in intensive care units in Iran: a qualitative study**

**Running title:** The challenges of using physical restraint

Abstract

Background: Physical restraint is widely used in intensive care units to ensure patient safety, manage agitated patients, and prevent the removal of medical equipment connected to them. However, physical restraint use is a major healthcare challenge worldwide.

Aim: This study aimed to explore nurses’ experiences of the challenges of physical restraint use in intensive care units.

Methods: This qualitative study was conducted in 2018–2019. Twenty critical care nurses were purposively recruited from the intensive care units of four hospitals in Tehran, Iran. Data were collected via in-depth semi-structured interviews, concurrently analyzed via Graneheim and Lundman’s conventional content analysis approach, and managed via MAXQDA software (v. 10.0).

Findings: Findings emerged as three main themes, namely organizational barriers to effective physical restraint use (with three categories), ignoring patients’ wholeness (with two categories), and distress over physical restraint use (with three categories). These categories were lack of quality educations for nurses about physical restraint use, lack of standard guidelines for physical restraint use, lack of standard physical restraint equipment, ignoring patients’ health, ignoring patient rights, emotional and mental distress, moral *conflict*, and inability to find an appropriate alternative for physical restraint.

Conclusion: Critical care nurses face different organizational, ethical, and emotional challenges in using physical restraint. Healthcare managers and authorities can reduce these challenges by developing standard evidence-based guidelines, equipping hospital wards with standard equipment, implementing in-service educational programs, supervising nurses’ practice, and empowering them for finding and using alternatives to physical restraint. Nurses can also reduce these challenges through careful patient assessment, using appropriate alternatives to physical restraint, and consulting with their expert colleagues.

Keywords: Physical restraint, Nurse, Intensive care unit

**Introduction**

Agitation and delirium are common problems among patients who are hospitalized in intensive care units (ICUs). One study reported that around 74% of patients experience these problems during their ICU stay ([1](#_ENREF_1)). Factors such as endotracheal intubation, mechanical ventilation, invasive procedures ([2](#_ENREF_2)), unwanted noises, abnormal lighting, sleep deprivation, fear, anxiety, and stress can contribute to agitation and delirium ([3](#_ENREF_3)). Agitation can cause serious life-threatening complications such as endotracheal extubation, removal of catheters and wires, and falling out of bed ([4](#_ENREF_4)). These complications can endanger a patient’s life, prolong ICU stay, and increase healthcare costs ([5](#_ENREF_5)).

Agitation and delirium may require ICU staff to use physical restraint (PR) to prevent physical injury to the patients, to themselves, and to others ([6](#_ENREF_6)). PR is the application of any physical method or device on a patient’s body, which cannot be easily removed, to restrict body movements ([7](#_ENREF_7), [8](#_ENREF_8)) . Currently, PR use is one of the most commonly used methods to ensure patient safety in ICU ([9](#_ENREF_9), [10](#_ENREF_10)). One recent study reported that the prevalence of PR use in ICU is 47% ([11](#_ENREF_11)).

PR use may cause different physical and mental complications for patients ([12](#_ENREF_12)). Physical complications include immobility-related problems ([12](#_ENREF_12), [13](#_ENREF_13)), skin lesions and edema due to poor padding, nerve damage and ischemia due to very tight PR, and shoulder dislocation due to fighting with PR A quantitative study also reported edema, bruising, pressure ulcer, aspiration, and death as the physical complications of PR use ([15](#_ENREF_15)). Emotional and mental complications for the patient include agitation, fear, depression dignity loss, unpleasant thoughts, sense of humiliation, and reduced self-confidence ([16](#_ENREF_16), [17](#_ENREF_17)).

Besides patients, nurses may also experience emotional, ethical, and mental problems ([18](#_ENREF_18)) and face negative feelings such as sadness, guilt, and pity due to PR use ([19](#_ENREF_19), [20](#_ENREF_20)) . One study reported that while using PR, nurses may feel stress, anxiety, and fear over inflicting harm to patients A review also reported anxiety as one of the main emotional challenges nurses face while using PR ([22](#_ENREF_22)). Nurses may decide on PR use based on the nonmaleficence principle of ethical practice and in order to ensure patient safety([23](#_ENREF_23)). However, PR use negatively affects patient independence and freedom and violates the ethical principle of patient autonomy([24](#_ENREF_24)) . Such preference of the nonmaleficence principle over the patient autonomy principle places nurses in a difficult ethical conflict ([25](#_ENREF_25)) and thereby, causes challenges for them([26](#_ENREF_26)). Lack of standard PR-related guidelines, equipment, and staff training is another factor which can cause challenges for nurses over PR use ([27](#_ENREF_27), [28](#_ENREF_28)) .

ICU nurses encounter moral distress Constant([29](#_ENREF_29)) exposure to PR-related challenges can gradually affect nurses’ physical health and emotional and mental stability([30](#_ENREF_30)) , cause them job burnout and absences from work and require them to eventually leave their profession([31](#_ENREF_31)). Physical, emotional, and mental problems among nurses can also affect the quality of their care services, increase the rate of nursing errors, and thereby, endanger patient’s life([4](#_ENREF_4), [32](#_ENREF_32)).

Despite the wide use of PR in ICU and its numerous consequences for patients and nurses, previous studies into PR use were mainly conducted in neurologic and psychiatric care wards. Moreover, because of their quantitative designs, most of those studies dealt mainly with some aspects of challenges in PR use ([18](#_ENREF_18), [22](#_ENREF_22)) . The present study was conducted to address these evidence gaps. This study aimed to explore nurses’ experiences of the challenges of using PR in intensive care units.

**Methods**

Design

This qualitative study was conducted from September 2018 to March 2019.

Participants

Participants were twenty critical care nurses who were purposively recruited from the ICUs of four hospitals in Tehran, Iran. Eligibility criteria were ICU work experience of more than three years and a bachelor’s degree in nursing.

Data collection

The first author conducted semi-structured interviews for data collection. Interviews were started with questions about participants’ sociodemographic and occupational characteristics. Then, broad questions about PR-related challenges were asked. Examples of these questions were “please explain about care delivery in ICU?” “How do you manage restless/agitated patients?” and “ please explain about your problems in care delivery to restless/agitated patients?” Also, follow-up questions were used to encourage participants to provide clearer explanations about their experiences. Examples of these questions were “Can explain more about this?” and “What do you mean by this?” Interviews were conducted at participants’ homes or workplaces depending on their preferences. On average, the length of the interviews was sixty minutes (in the range of 40–90). Interviews were recorded using a digital voice recorder. Data collection was continued up to data saturation, i.e., a point at which no new data were obtained from the interviews.

Data analysis

The conventional content analysis approach proposed by Graneheim and Lundman (40) was used for data analysis. After each interview, it was transcribed word for word and reviewed for several times to obtain a general understanding of its main ideas. Then, the transcript was read, and reviewed word for word and meaning units were identified and coded. Simultaneously, generated codes were reviewed, compared, and categorized according to their similarities and differences. Categories were also compared, developed, and further categorized into themes. Data were managed through MAXQDA software (v. 10.0).

Trustworthiness

Trustworthiness was determined through Guba and Lincoln’s criteria, namely credibility, dependability, confirmability, and transferability (41). The first author, who collected the data, worked for a whole year in the study setting before data collection to gain participants’ trust, better understand the study setting, and ensure credibility of the findings. Moreover, the generated codes were provided to four participants to confirm whether the study findings were congruent with their experiences. Another technique to ensure credibility was peer checking, through which two qualitative researchers and three Ph.D. students in nursing assessed the congruence of the findings with the data. Sampling from four different hospitals also helped ensure credibility. Close collaboration among the members of the research team helped ensure dependability. Confirmability was also maintained through carefully documenting all phases of the study. Also, clear description and word-for-word quotations of the interviews were provided to ensure transferability.

Ethical considerations

This study was approved by the Ethics Committee of Iran University of Medical Sciences, Tehran, Iran (IR.IUMS.REC.1397.495). At the beginning of the interviews, participants were informed about the aim of the study, the confidentiality of the study data, their freedom to unilaterally withdraw from the study, and their access to the study findings. Then, their informed consents were secured.

**Findings**

Study participants were thirteen female, and seven male critical care nurses with age mean of 35 years. The mean of their work experience was sixteen years in the range of 3–29. Table 1 shows the participants’ demographic characteristics.

Data analysis resulted in the development of three main themes, namely organizational barriers to effective PR use, ignoring patients’ wholeness, and distress over PR use (Table 2).

Organizational barriers to effective PR use

Most participants pointed to hospital managers’ and authorities’ inattentiveness to provide nurses with quality PR-related educations, standard PR-related guidelines, and standard PR equipment.

*Lack of quality educations for nurses about appropriate PR use*

Our participants’ experiences showed that despite the wide use of PR in ICU, critical care nurses received limited if any, educations about its appropriate use. Therefore, they resorted to non-standard and even inappropriate methods for PR which they had learned during their clinical practice. Such lack of quality education for appropriate PR use denotes that managers and authorities in the study setting did not value PR as a component of professional care and hence, did not plan for implementing PR-related educational programs.

*No education has yet been provided to us about PR. Thus, neither nurses nor physicians have accurate information about appropriate PR use, PR assessment, and PR removal. Nurses’ knowledge in this area comes mainly from their clinical self-learning (a male nurse with 21-year work experience).*

*Lack of standard guidelines for PR use*

Most participants noted the lack of standard context-based guidelines for PR use. PR guidelines in Iran are either ambiguous and non-practical or adapted from the guidelines developed in other countries and hence, cannot be used in the context of hospital settings in Iran. On the other hand, nurses have limited adherence to the available guidelines due to the lack of supervision.

*There is no clear guideline in our setting and each nurse resorts to his/her own methods for PR use. There are some guidelines which have not been developed based on the context of our setting. For instance, a guideline says that PR should be applied using standard equipment and with medical prescription. However, we have neither standard equipment nor medical residents in our ICU (a female nurse with sixteen-year work experience).*

*Lack of standard PR equipment*

Most participants referred to the lack of standard equipment for safe PR in their settings. They highlighted that despite the wide use of PR in ICUs, managers and authorities do not greatly value the provision of standard PR equipment.

*Sometimes, PR use can produce positive outcomes if standard equipment is available. For instance, beds with special hand restraint and flexible equipment can be used for PR. However, in most hospitals, PR is applied using stripes rolled by ICU staff, most of which inflict wound to patients’ limbs (a female nurse with eleven-year work experience).*

Ignoring patients’ wholeness

Participants noted that in some cases, they had no option but to ignore patients’ wholeness and use PR. The two categories of this theme included ignoring patients’ health and ignoring patient rights.

*Ignoring patients’ health*

Participants’ experiences showed that they sometimes ignored patients’ health and used PR due to their own interest such as heavy workload, staff shortage, and tiredness. Such use of PR helped them perform their other personal and clinical tasks more easily. Yet, inappropriate use of PR can endanger patients’ physical and mental health and cause complications such as a wound, edema, shoulder dislocation, blisters, depression, aggression, fear, and anxiety.

*Sometimes, the ward is too busy, and the nurse is tired and bored. Sometimes, the nurse-patient ratio is low. In these cases, the nurse may use PR even for patients who don’t really need it and fasten patients’ hands so tightly that they cannot unfasten PR. The nurse may forget to check PR and eventually, it may inflict wound to patients. Such inappropriate use of PR can cause patients discomfort, inflict pain on them, bring them joint stiffness, prevent them from changing their position, and thereby, upset them, affect their souls, and make them aggressive or depressive (a female nurse with fourteen-year work experience).*

*Ignoring patient rights*

Despite their awareness of patient rights, such as the rights of selection, freedom, and comfort, our participants sometimes ignored such rights and used PR for the peace of mind and to reduce their stress over patient safety. They referred to heavy workload and staff shortage as factors behind their decision to ignore patient rights and use PR.

*I admit that PR makes patients unhappy and causes them discomfort. However, it prevents fall and subsequent fall-related injuries. Most of the times, the ward is too busy, and there is a limited number of staff. In such situations, I experience high levels of stress over patient fall and its subsequent troubles for me; thus, I use PR for the peace of mind. In particular, at night shift I have to work alone with no colleague, and hence, I use PR even for conscious patients (a male nurse with eight-year work experience).*

Nurses’ distress over PR use

The third main theme captured from the participants’ experiences was related to nurses’ distress over PR use. This theme included three categories, namely emotional and mental distress, moral distress, and inability to find an appropriate alternative for PR.

*Emotional and mental distress*

Participants noted that while using PR, they experience negative feelings such as sadness, guilt, pity, sorrow, pain, suffering, and pangs of consciousness. These feelings reduced their self-confidence, undermined their morale, and gave them feelings of despair and disability.

*The patient was a ten-year-old conscious and awake girl with a tracheostomy. We had to fasten her hands to prevent her from touching the tubes. She continuously cried and appealed to us to unfasten her hands. Watching that scene was really torturing for me. I was very sad for her. When I looked at her, I remembered my own daughter. She finally died, but her image stayed in my mind for a long time. I was on the verge of depression for her (a female nurse with twelve-year work experience).*

*Moral conflict*

Participants highlighted that they experienced moral distress in difficult moral situations when they needed to decide on either maintaining patient safety or patient autonomy and freedom. Moreover, neglecting the ethical principles of autonomy and freedom to prevent patients from potential damages caused them ethical conflicts.

*Sometimes, we need to choose between the worse and the worst. I know that fastening patients’ hands and feet limits their activities and annoys them; but if I don’t use PR, they may remove their tubes which necessitates re-intubation. Re-intubation, in turn, can traumatize the airways. Sometimes, patients frequently appeal to me to remove PR. Such appeal causes concerns over the accuracy of my PR-related decisions and preoccupies me for a long time (a male nurse with seventeen-year work experience).*

*Inability to find an appropriate alternative for PR*

Participants highlighted that PR use is unpleasant to them; yet, they have no effective alternative for ensuring patient safety and managing agitation. Moreover, using PR alternatives is not always possible due to staff shortage, equipment shortage, nurses’ lack of knowledge, and their heavy workload.

*I really feel sad when I have to use PR, but there is no more option. For instance, the ward is too busy, and we have no staff to continuously monitor patients for possible harms. Moreover, we don’t have a walkman to play music for patients. We cannot trust any other method for ensuring patient safety, except for PR.*

**Discussion**

This study explored critical care nurses’ challenging experiences of using PR in ICUs. Findings came into the three main themes of organizational barriers to effective PR use, ignoring patients’ wholeness, and distress over PR use.

Our findings showed that although nurses are the main decision-makers for PR use, they have limited knowledge about it and its complications because they do not receive PR-related education during their university education or clinical practice. Similarly, a study reported that PR-related educations are not integrated into nurses’ academic curricula and in-service training programs([33](#_ENREF_33)).Lack of knowledge and skills about appropriate PR use may result in its extensive use which can cause serious physical and mental complications for patients([34](#_ENREF_34)). Several studies found that PR-related educational programs for critical care nurses significantly reduced PR use and its physical and mental complications([27](#_ENREF_27), [34](#_ENREF_34), [35](#_ENREF_35)). Staff training can improve nurses’ knowledge, skills, attitudes, and practice in the area of quality patient care([36](#_ENREF_36), [37](#_ENREF_37)) . Thus, healthcare managers and authorities need to provide nurses with quality in-service educational programs in order to improve their PR-related knowledge and skills and correct their PR-related misconceptions.

Study findings also revealed the shortage of standard and clear culturally-appropriate guidelines for PR use. Our participants noted that PR-related guidelines in Iran are mostly adopted from the guidelines developed in other countries and hence, are not necessarily applicable in healthcare settings of Iran. Guidelines have significant effects on using or not using PR; hence, their shortcomings may reduce their applicability and nurses’ adherence to them ([38](#_ENREF_38)). The first PR-related guideline was developed in 1980 by the Healthcare Financing Administration following the increasing rates of falls and physical and mental injuries caused by inappropriate PR use([39](#_ENREF_39)) . Currently, standard PR-related guidelines are used in ICUs in many countries. A study in Turkey reported that 71% of nurses in ICU had access to and used PR-related guidelines ([40](#_ENREF_40)). PR should always be used according to standard guidelines. Such guidelines can promote nurses’ PR practice and considerably reduce the rate, duration, and complications of PR use. Thus, managers and authorities are recommended to develop culturally-appropriate evidence-based guidelines for appropriate PR use in healthcare settings in Iran.

The findings of Henrich, Dodek, Alden, et al. in Canada indicated that inadequate resources, such as appropriate equipments can causes moral distress for ICU nurses, because of the impact on their ability to provide the best possible care([41](#_ENREF_41)). This supports another finding of the present study indicating the shortage of standard PR equipment which made participants use non-standard handmade devices for PR. Non-standard PR equipment can cause irreparable physical complications and even death([27](#_ENREF_27)) . A study in Turkey showed that the rate of physical complications associated with the use of non-standard PR equipment was 23% ([42](#_ENREF_42)). Another study in Egypt reported the lack of standard PR equipment in ICUs in that country which required nurses to use non-standard handmade devices for PR ([27](#_ENREF_27)). Different studies reported that standard PR equipment exists only in some ICUs([27](#_ENREF_27), [33](#_ENREF_33), [43](#_ENREF_43)) . Therefore, managers and authorities of healthcare organizations need to equip ICUs with standard PR equipment in order to promote nurses’ PR practice and reduce the risk of PR-related complications.

Study findings also showed that in case of fatigue, heavy workload, or staff shortage, nurses might ignore patients’ physical and mental health and freely use PR for self-interest reasons like reducing their workload. Although such use of PR may reduce nurses’ workload and stress in a specific time, it may cause different undue physical and mental complications for patients([44](#_ENREF_44), [45](#_ENREF_45)) . These complications may include arm fracture, thoracic wounds, nerve damage([33](#_ENREF_33), [34](#_ENREF_34)), pressure ulcer, ischemia, urinary incontinence, encopresis, nerve damage, and mental problems such as aggression, anger, agitation, and depression ([34](#_ENREF_34)). Moreover, PR does not necessarily ensure patient safety. Two studies reported that a large portion of patients removed their endotracheal tube despite having PR ([46-48](#_ENREF_46)). Hospital managers and authorities can reduce the risk of PR-related complications through both staff training and close supervision of nurses’ PR practice.

Our findings also indicated that despite being aware of patient rights and the principles of ethical practice (such as beneficence, respect for patient dignity, autonomy, and freedom), nurses sometimes were forced to ignore these principles and rights and freely use PR, particularly at during night shifts. Factors to with such use of PR were staff shortage, fatigue, peace of mind, as well as concerns over the removal of connections, fall from the bed, staff safety, and patient safety. Similarly, previous studies reported that in case of staff shortage or heavy workload at night shifts, nurses might ignore patient rights, ethical principles, and PR complications and resort to PR to ensure patient safety .([5](#_ENREF_5), [49](#_ENREF_49), [50](#_ENREF_50)) Another study also identified that around 55% of patients are under PR at night shifts([51](#_ENREF_51)) .In ICU settings, nurses may face situations which require them to make prompt decisions and take emergency measures. In these situations, they may prioritize patient safety over patient rights and hence, use PR to ensure patient safety. However, their frequent exposure to these situations may result in frequent or excessive use of PR which may gradually turn PR use in to routine practice. Thus, close managerial supervision of nurses’ PR practice is needed to minimize inappropriate use of PR.

We also found that while using PR, nurses may experience great emotional distress and negative feelings such as sadness, guilt, sorrow, and suffering([52](#_ENREF_52)). Similarly, two studies reported that 50% of nurses experienced sadness and 25% of them felt guilty at using PR([40](#_ENREF_40), [44](#_ENREF_44), [45](#_ENREF_45), [47](#_ENREF_47)) . Nurses in another study considered PR as a stressful, disturbing, and terrible experience which should be used as the last resort ([53](#_ENREF_53)). PR-related emotional distress can([29](#_ENREF_29)) negatively affect nurses’ emotional stability and health and gradually cause them mental problems such as sleeplessness, headache, anger, fear, anxiety, despair, disability, and fatigue, and ultimately result in long absences from work and job burnout .([22](#_ENREF_22), [32](#_ENREF_32))

Study findings also revealed that the compulsion to ignore patient rights and ethical principles for the sake of patient safety ouldcould cause nurses moral *conflict*. Protecting patients against injuries are among the most important professional roles of nurses([54](#_ENREF_54)) . On the other hand, PR use to ensure patient safety can negatively affect patients’ freedom, welfare, and well-being and violate the principles of ethical practice ([55](#_ENREF_55)). The necessity to balance between professional roles and ethical practice can cause moral distress for nurses. Similarly, a study showed that balancing between patient safety through PR use and patients’ freedom through not using PR can place nurses in difficult ethical situations ([41](#_ENREF_41), [56](#_ENREF_56)).

Moreover, our participants’ experiences showed that some of them were not sure about the accuracy of their PR-related decisions and hence, experienced moral distress([41](#_ENREF_41)). Moral distress may eventually cause nurses physical and mental complications. Thus, strategies such as careful patient assessment, considering and testing all possible alternatives, and consulting with experienced colleagues can help nurses minimize the emotional and moral distress associated with PR use.

The other finding of the present study was nurses’ inability to find an appropriate alternative for PR due to staff shortage, equipment shortage, and lack of knowledge. In line with this finding, the findings of a study indicated that nurses were unable to find appropriate alternatives for PR due to their lack of knowledge and were unable to use PR alternatives due to their heavy workload and staff shortage ([5](#_ENREF_5)). Another study reported that 52% of nurses were unaware of PR alternatives ([57](#_ENREF_57)). As PR use is unpleasant to nurses, they may feel guilty over their inability to find and use PR alternatives([56](#_ENREF_56)) . Nurses in one a study considerably used PR extensively despite knowing its disadvantages and the advantages of its alternatives([58](#_ENREF_58)). Other studies also showed that PR alternatives are not accessible to nurses and hence, they cannot use them to ensure patient safety ([35](#_ENREF_35), [56](#_ENREF_56)). Managers and authorities should provide nurses with adequate equipment and quality educations and reduce staff shortage in order to help them find and use more appropriate alternatives for PR. Nurses also need to develop their PR-related knowledge and carefully assess and monitor their patients and environments to find PR alternatives and identify the complications of their use.

Study limitations

Due to the sensitivity of PR use, our participants might have avoided sharing some aspects of their experiences. Of course, we attempted to manage this limitation by establishing a trustful relationship with them.

**Conclusion**

This study suggests that critical care nurses face different organizational, ethical, and emotional challenges in using PR. Healthcare managers and authorities can reduce these challenges through developing standard evidence-based guidelines for PR use, equipping hospital wards with standard PR equipment, implementing PR-related in-service continuing education programs, supervising nurses’ PR practice, and empowering them for finding and using PR alternatives. Nurses can also reduce these challenges through careful patient assessment, considering different PR alternatives, and consulting with colleagues.

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Table 1. Participants’ demographic characteristics (n = 20)

|  |  |  |
| --- | --- | --- |
| Characteristics | | N |
| Age (Year) | 25–34 | 5 |
| 35–45 | 9 |
| > 45 | 6 |
| Gender | Male | 7 |
| Female | 13 |
| Educational degree | Bachelor’s | 15 |
| Master’s | 5 |
| Work experience in ICU | 3–5 | 5 |
| 5–10 | 7 |
| > 10 | 8 |
| Work experience in nursing | 3–5 | 6 |
| 5–10 | 6 |
| > 10 | 8 |

Table 2. The main themes and their categories

|  |  |
| --- | --- |
| Categories | Themes |
| Lack of quality educations for nurses about appropriate PR use | Organizational barriers to effective PR use |
| Lack of standard guidelines for PR use |
| Lack of standard PR equipment |
| Ignoring patients’ health | Ignoring patients’ wholeness |
| Ignoring patient rights |
| Emotional and mental distress | Nurses’ distress over PR use |
| Moral *conflict* |
| Inability to find an appropriate alternative for PR |