

The Experience of Nurses with the Care Needs of the Children with Head Trauma Hospitalized in the Intensive Care Unit: A Qualitative Study

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ABSTRACT

Background: Children with head trauma need care in different dimensions. The identification of these needs is a key factor in providing high-quality nursing care. In this regard, nurse, as one of the main members of the healthcare team who is in a frequent and close contact with these children, has a good opportunity to identify and meet their care needs. This study aimed to explain the experiences of nurses with the care needs of the children under 18 years with head trauma hospitalized in the intensive care units.

Methods: The present study was conducted using qualitative content analysis method and through in-depth semi-structured individual interviews with 14 nurses working in the ICUs from August 2019 to January 2020. Purposive sampling method was used and the data were collected using an audio recorder until data saturation was reached. These data were analyzed through the use of conventional qualitative content analysis.

Results: Finally, two main categories of "supportive care needs" and "care needs for the prevention of secondary complications" were extracted. The former main categories included two sub-categories of "physical support" and "psychological support" and the latter included two sub-categories of "cares for the prevention of intracranial secondary complications" and "cares for the prevention of extracranial secondary complications".

Conclusion: Based on the results, children with head trauma have different care needs in different dimensions. Therefore, the healthcare team should have a need-based care plan to meet these needs and improve the health and well-being of this group of patients.

Keywords: Head trauma, children, ICU, nurse

INTRODUCTION

Trauma is the first cause of death and one of the leading causes of disability in developing countries^[1]. Among different traumas, head trauma with 39.7% frequency is the most prevalent anatomical site of injury in children^[2], that is the main and final cause of death and disability in 1 to 14 years old children^[3, 4]. Head trauma is a trauma that causes damage to various layers of the head, including the scalp, skull, and brain, and covers a broad scope of mild to severe injuries^[5].

Fifty seven million people with one or more head injuries are hospitalized all around the world^[6]. Every year in the United States, head trauma in under the 18-years-old children and adolescents leads to the admission of more than 600,000 children to the emergency department, 60,000 hospitalizations, and 7,400 deaths. In Tehran, the capital of Iran, with the largest population among Iranian cities, the rate of these injuries is estimated to be 295 cases per 100,000 people, 19% of them cause death^[7]. Fall, accident, mayhem, and trauma caused at home, school, workplace and during sport activities are among the prevalent types of traumas^[8]. Because of its secondary complications, head trauma may lead to adverse health, economic, and family consequences^[9]. Secondary complications of head trauma are among the major

complications which occur in 60 to 90% of casualties during the post-trauma hours or days in the patients hospitalized in neurology wards and ICUs^[10] which, finally, may lead to late deaths^[5].

Patients with head trauma experience also a number of neurological disorders. They may experience personality changes, anger, depression, and feelings of inadequacy, which can have a negative impact on the patient's family and social environment^[11]. These long-term disabilities will affect the lives of the injured children and their families^[12] and require long-term care, which may impose huge costs on the healthcare system^[13]. According to^[14] et al. (2015), dysfunction in the patients' performance and motor skills is the most important problem related to moderate and mild injuries in children^[14].

Therefore, given various individual, family, economic and social consequences of head trauma in children, a comprehensive and systematic care treatment process seems to be a necessity in order to eliminate or reduce these complications and problems. This treatment and care process is a dynamic, complicated and challenging process, especially in ICUs^[15]. As such, because of their frequent contact with the patient and having an ideal position for identifying different dimensions of care needs^[9], nurses need evidence-based skills and

knowledge to provide holistic care and make clinical decisions based on the needs of patients^[16].

In holistic care, human needs are considered in all physical, psychological, social and spiritual dimensions^[17]. Despite this advantage, however, studies show that nursing interventions for head trauma patients hospitalized in ICUs focus more on the physical aspects, and less attention is paid to other nursing interventions such as social support, spiritual support, and safety^[18-22]. According to these studies, patients' inability to give verbal answers, high workload in ICUs, limited knowledge about the needs of anesthetized patients, lack of understanding about reasoning and ways to communicate with them, together with the dominance of biomedical approach are the main reasons for the lack of attention of nurses to other care needs^[23, 24]. As a result, the quality of care in the psychological and communicational dimensions is moderate or poor in ICUs^[22, 25-27]. Therefore, increasing the knowledge and awareness of nurses about different dimensions of clinical care needs of these patients will provide the basis for identifying and responding to such needs that, in turn, will lead to the provision of a more appropriate care. As such, using the experiences of nurses, the aim of this qualitative study was to explain the care needs of the children under 18 years with head trauma hospitalized in ICUs.

METHODS

Study Design, Setting, and participant: The present qualitative study was conducted using conventional content analysis approach in order to discover the care needs of the children under 18 years with head trauma hospitalized in ICUs.

Setting: Considering the preferences and the workplace of the participants, the ICUs of the hospitals affiliated to Isfahan University of Medical Sciences were selected as the research setting.

Participants: The participants were randomly selected from the nurses working in the ICUs of three hospitals affiliated to Isfahan University of Medical Sciences who cared for the children with head trauma. The sampling continued considering the maximum variety in age, gender, educational level, Work experience in ICU. Inclusion criteria: the nurses with at least one year experience of caring for the children with head trauma hospitalized in ICUs, and nurses who were willing and able to participate in the study.

Data collection: Data were collected using in-depth and semi-structured interviews with 14 participants from August 2019 until January 2020. The interviews were conducted using guiding questions and audio recorder, and each interview lasted from 45 to 60 minutes. These questions were asked: What needs, issues, and problems do you have with regard to child care? What do you think is the

cause of these problems? Have the injured children had any need which has not been taken into account during the treatment process? It should be noted that the interviews continued separately until data saturation was reached and no new data was appeared. In the process of data saturation, an attempt was made to consider the maximum diversity of the participants in terms of their age, gender, level of education and work experience in ICU.

Data analysis: Data analysis was conducted using qualitative content analysis^[28, 29]. The interviews were transcribed verbatim by the corresponding author (ZK). Then, the narratives were frequently reviewed to present a general understanding of them. Afterward, sentences and phrases were coded, and similar codes were merged via an inductive approach. In this respect, codes with similar meanings were categorized in one group and sub-categories were created. With a comparison between sub-categories, groups with similar concepts were put in one category to create a main category.

Rigor and Trustworthiness: The findings were validated via different methods such as in-depth interviews in different times and a combination of data collection methods such field noting. In this study, transcripts were returned to participants for comments or corrections. Also, to approve the accuracy of the collected data, at different sessions, coded interviews were shared with three of the participants and their final opinions were achieved; so that member checking could be obtained. The opinions of two experts were also obtained to assure the consistency of the results. In the present study, to increase transferability of the data, results of the study were given to two individuals (nurses working in the ICUs) with similar characteristics to the participants who did not participate in the study to judge the similarity of the results to their own experiences.

RESULT

The majority of the study's participants (71.4%) were women. The age of the participants ranged from 28 to 52 with the mean age of 38.7. Interviews were conducted with participants with different work records. Moreover, the minimum and maximum work experience of the participants in ICUs was 11 and 20 years respectively, with the mean of 11 years (Table 1).

Following data analysis, 410 codes, four sub-categories, and two main categories including "supportive care needs", "care needs for the prevention of secondary complications" were obtained. The former main categories included two sub-categories of "physical support" and "psychological support" and the latter included two sub-categories of "cares for the prevention of intracranial secondary complications" and "cares for the prevention of extracranial secondary complications"(Table 2).

Table 1. The Demographic characteristics of the participants

Row	Participant No.	Participant	Age	Gender	Education level	Work experience in ICU
1	PN1	Nurse 1	28	Female	MSc in Nursing	4
2	PN2	Nurse 2	40	Female	PhD in Animal Biology	16
3	PN3	Nurse 3	36	Female	PhD in Psychology	13
4	PN4	Nurse 4	37	Female	BSc in Nursing	10
5	PN5	Nurse 5	45	Female	MSc in Nursing	18
6	PN6	Nurse 6	37	Female	BSc in Nursing	9

7	PN7	Nurse 7	45	Female	MSc in Nursing	15
8	PN8	Nurse 8	50	Female	BSc in Nursing	20
9	PN9	Nurse 9	52	Female	BSc in Nursing	15
10	PN10	Nurse 10	32	Male	MSc in Nursing	6
11	PN11	Nurse 11	31	Female	BSc in Nursing	7
12	PN12	Nurse 12	28	Male	BSc in Nursing	4
13	PN13	Nurse 13	34	Male	BSc in Nursing	9
14	PN14	Nurse 14	48	Male	BSc in Nursing	9

Table 2. Examples of codes, sub- categories, and main categories

Codes	Sub-category	Main category
healthcare support	Physical support	Supportive care needs
nutritional support		
rehabilitation care		
child safety		
calming children	Psychological support	Care needs for the prevention of secondary complications
calming parents		
management of intracranial pressure increase	Cares for the prevention of intracranial secondary complications	
control of convulsion		
maintenance of brain tissue perfusion		
prevent of infection	Cares for the prevention of extracranial secondary complications	Care needs for the prevention of secondary complications
prevent of hypoxia		
maintain optimal temperature		
prevent of bedsores		

Main category 1) Supportive care need

Physical support: The experiences of the participants showed that physical support, including healthcare support, nutritional support, rehabilitation care, and child safety, is one of the most important needs of children hospitalized in ICUs. According to the experiences of the participants, healthcare support was another important need of these children which included the ears, eyes, skin, mouth and tooth hygiene and bathing. The nurses believed that because of the patients' decreased level of consciousness, their inability to take care of themselves, and the long stay in ICUs, healthcare is considered to be one of their essential needs.

"In fact, oral healthcare, tooth brushing, and skin care are among our most important cares for patients who we know can't do anything on their own." (PN1)

All participants said that nutritional support in the children hospitalized in ICUs is one of the most important cares which should be considered in consultation with a nutritionist and based on the patient's condition. Based on the participants' experience, nutritional support measures include precise calculation of the child's weight, the insertion of catheter for gavage, high-calorie and low-carbohydrate diet for intubated patients, and consultation with a nutritionist.

"In patients whose condition is unstable, feeding is not recommended; but as soon as the condition becomes stable, we should start feeding, and the kind of nutrition and its method should be determined by a doctor or nutritionist." (PN10)

According to the participants, rehabilitation cares should never be neglected. According to these nurses, the prevention of deep vein thrombosis, use of bandages, splints for the prevention of organ deformity, limb physiotherapy, and speech therapy were considered as necessary interventions.

"Physiotherapy should be done for these children as soon as possible. Unfortunately, we have cases where the

patient has been intubated for a long time, has been tracheostomized and has not received physiotherapy. And after being conscious, the children have had deformed limbs, both their hands and feet. So, we ask the help of our physical medicine physician with regard to body's physiotherapy and the related things." (PN10).

The experiences of the participants showed that maintaining the safety of the child hospitalized in ICU is very important for the prevention of further injuries. To this end, they maintained that measures such as the use of identification wristbands for the children, raising the bedside and the use of appropriate bed to prevent them from falling, being careful about the separation of the children's connections, and the fixation of the neck and spine by using neck collar or backboard should be done.

"Falling is another important issue for these patients; our beds are not suitable for children. I've seen many times that my colleagues, for example, put a few pillows on the bed so that the child does not fall, but still falling is likely." (PN4)

Psychological support: The experience of the participants showed that psychological support includes calming children and their parents, which must be done to facilitate nursing care. According to the participants, teamwork for communication with the child, the use of a psychologist, and the presence of the parents beside the child are necessary to calm down the child.

"When a child is admitted to the ICU, he may be restless if he is conscious; there are different reasons for this restlessness, but whatever the reason, he must be calmed down and supported spiritually. For example, we can communicate with him, ask a psychologist to help us, entertain him, talk to him and, most importantly, let his family, especially his mother, come to his side." (PN10)

The experience of the participants showed that the families of these children, especially their parents, also have a lot of stress. This stress can be due to the lack of permission to be with their child, the lack of awareness

about the child's condition, uncertainty about the sufficiency of the care provided to their child, and fear and ignorance of the child's future. This stress, however, can be managed through communicating with the parents, asking the help of a psychologist, providing complete and clear information about the child's condition, providing post-discharge education to them, and providing them with the opportunity to accompany their child.

"Now, for example, parents often have questions; they would like to know about the treatment process of their child, and they will calm down when we explain it to them. We have to know that it is not just the patient who is important but the family of these children is also important. Doing so, we can increase their trust to the nursing system." (PN7)

Main category 2) Care needs for the prevention of secondary complications

Cares for the prevention of intracranial secondary complications: According to the most participants, one of the most important things which the nurses should consider and control in providing care for the children with head trauma hospitalized in ICUs was to prevent intracranial secondary complications. This prevention includes the cares related to the management of intracranial pressure increase, the control of convulsion, and the maintenance of brain tissue perfusion. Most participants stated that one of the most important neural parameters which should be carefully considered by nurses in providing care for the children with head trauma is intracranial pressure. They should be aware of the symptoms associated with increased intracranial pressure and monitor these symptoms carefully.

"Increased ICP occurs a lot. We only can notice from the changes in the vital signs that the ICP is maybe high. Then, CT scan is done for the patient to find out what is the main reason for the increase of intracranial pressure. Vital signs, the level of consciousness, and the pupils should be monitored precisely and closely. Respiratory support should be provided and hypoxia should be considered. The patient's blood pressure should also be monitored because it can exacerbate ischemia. If the patient does not have a neck trauma, it is better to put their head in about 30 to 35 degrees higher to reduce the pressure on the jugular vein and have a better circulation." (PN7)

The participants' experiences showed that the prevention of seizure was possible for patients prone to seizures by monitoring its symptoms and giving anticonvulsants.

"Of course, it is a little bit difficult to diagnose seizures in these patients. For example, some time ago, one of our neurosurgeons came and visited the patient and said that his neck was stiff as he was having seizures; so he prescribed a new anticonvulsant drug for him. Once again, we had a patient with immobile and staring eyes who also had seizures. It can be said that our nurses have little information about the symptoms of seizures in patients with low GCS." (PN2)

According to the participants, blood pressure monitoring and maintaining it above 90 mm Hg through fluid therapy, bleeding control, incoming and outgoing fluids control, electrolyte therapy, blood sugar control, and arterial

blood gases control were among the essential care needs of the patients for maintaining cerebral perfusion.

"It is very important to monitor the patient's vital signs. Any change in this regard is important for maintaining brain perfusion and should be reported immediately. The patient's blood pressure is also monitored. I believe that the cuff should be on the hands of the patients regularly and control their blood pressure so that if a change occurs, someone will finally notice. It's important to keep their blood pressure within normal limits." (PN7)

Cares for the prevention of extracranial secondary complications: Cares for the prevention of extracranial secondary complications, according to the participants, included measures to prevent infection and hypoxia, maintain optimal temperature, and prevent bedsores, and was one of the most important care needs. The participants maintained that antibiotics were prescribed prophylactically because of the possibility of infections such as meningitis in some cases. Based on their experiences, it is important for nurses to be vigilant about monitoring and identifying symptoms of infection. Doing so and in the case of observing these symptoms, they will be able to prevent further brain damage by providing timely information and taking the necessary treatment and care.

"... Head trauma itself can be a source of infection for the patient. Most of the time, if the brain is open or if there is an open fracture, doctors will give prophylactic antibiotics if they think it is needed." (PN5)

The participants stated that, depending on the cause of the temperature change, the necessary treatment and care measures have to be taken to maintain the optimal temperature.

"When the patient's temperature rises, we usually give him a feet washing and inject him an apotel with the doctor's prescription. We have also sometimes hypothermia, meaning that the body temperature goes below 36, which we have to keep it warm. We have warmer in the ward that adjust its degree on 30 to 32 degrees for them, or keep them warm using a blanket." (PN5)

The participants said that the patients sometimes experience hypoxia and timely treatment and care should be taken in this regard.

"The nurse needs to know the Pao2 standard and report the changes immediately. In the case of hypoxia, we must suction the patient, because the discharge or clot may have caused hypoxia. We wash the pipe or track route. We give him 100% oxygen or give a breath using ambu bag." (PN11)

The experience of the participants also showed that the children with head trauma hospitalized in ICUs are prone to bedsores for various reasons, which can be prevented by changing the position, massaging the areas under pressure, bathing, and using wavy mattress.

"These patients are prone to bedsores that is due to the loss of consciousness and limited movement. So, their position should be changed repeatedly; moreover, their skin should be massaged using oil, and physiotherapy should be done for them to maintain at least the integrity of their skin. It is better to use wavy mattress for some patients." (PN11)

DISCUSSION

Using content analysis method, the present qualitative study investigated the care needs of the Iranian children under 18 years with head trauma hospitalized in ICUs based on the experiences of the nurses. The findings of the study showed that the care needs of these children can be divided into two main categories of "supportive care needs" and "care needs for the prevention of secondary complications". Therefore, the identification of these needs can lead to the provision of full and comprehensive care and, hence, improve the quality of the provided healthcare.

The results of a study by Popernacket al. (2015), which aimed to investigate the problems of children with mild to moderate head trauma, showed that the first purpose in managing this acute injury is to maintain the nervous state and brain perfusion. They argued that the care of these children should focus on preventing increased intracranial pressure, maintaining systemic blood pressure, preventing hypoxemia, hypocarbia or hypercarbia and hypoglycemia, maintaining normal temperature, and preventing seizures[14]. In their study entitled "Impact of Implementing Nursing Care Protocol on Moderate Head Injured Patient's Outcome," Ghoneimet al. (2012) maintained that as primary injuries occur at the time of the accident and are unpreventable, the management of traumatic head injuries should focus on the prevention or reduction of secondary side effects. They concluded that appropriate and timely treatment and care is an essential factor in the prevention of secondary injuries in patients with severe traumatic injury inpatient on the neurology ward and ICUs, and nurses working in these wards play a key role in preventing these injuries[5]. The findings of the present study with regard to the experiences of nurses about the care needs for the prevention of secondary complications in the children with head trauma inpatient on ICUs are in line with the results of these studies. The primary objective in the management of the patients with traumatic head injury is to prevent secondary injuries by determining treatable space-occupying lesions such as intracranial hematomas, the maintenance of systolic blood pressure above 90 mm Hg, the control of intracranial pressure below 20 mm Hg, the control of cerebral blood flow pressure between 80-60 mm Hg, and the prevention of hypoxemia^[1].

Based on the experiences of patients, nurses and families, Cypress et al. (2010) concluded that the need for physical and psychological care is the greatest need of the trauma patients hospitalized in ICUs. According to Puggina et al. (2012), the most important aspects of the care for the patients with decreased level of consciousness include the treatment of pain, the control of nutritional status, the control of cardiovascular function, the control of respiratory function, the prevention of skin damage, and the prevention of deformation and muscle spasm.^[16] The results of the present study with regard to the needs for physical support are in line with the results of this study. Several studies have shown that nursing interventions for the patients with head trauma include mostly the physical aspects of care such as hygienic, nutrition, rehabilitation, and child safety cares^[18, 19].

Falk et al. (2008) noted that when a child is hospitalized for illness or injury, the whole family may experience stress or anxiety. According to the parents who

have been in such a situation, providing enough information is one of the most valuable things to help the family deal with such feelings. Their study identified two main supportive needs, namely, the need for information and the need for confidence and support in sharing and coping with emotional burdens. According to them, emotional support is what families need^[30]. The results of the present study with regard to the need of parents for psychological support are in line with these results. The most important needs of the family of the patients hospitalized in ICUs, including trauma patients, are the importance of receiving information, confidence, support and comfort, respectively, with the information needs for knowing the patient's condition and the treatments processes as the most important need^[31].

The results of the study conducted by Nelson et al. (2010) showed that patients, despite being unconscious, can feel the presence of the family by their bedside, which can improve the comfort and well-being of the patients^[32]. Falk et al. (2008) also noted that the most common needs of children with brain trauma are to be supported, receive continuous care and achieve independence^[30]. The results of the present study regarding the needs of children for psychological support are consistent with the results of these studies.

CONCLUSION

Based on the experiences of the nurses in the present study, children under 18 years with head trauma hospitalized in ICUs have different physical and psychological needs that should be considered and supported. Therefore, the health care team must identify and meet all the dimensions of these needs to improve the health and well-being of this group of patients and take a holistic and multifaceted approach in providing care for these children.

Implication for clinical practice

1. Based on the experiences of the nurses in the present study, children with head trauma have different care needs in different dimensions. The findings of the current study provide new insight into specific care needs of Iranian children with head trauma hospitalized in ICU in different dimensions.
2. The findings of the current study can help to increase the knowledge and awareness of nurses regarding the clinical care needs of children with head trauma hospitalized in the Intensive Care Unit.
3. Identifying care needs based on the experiences of the nurses can help to the development of clinical guidelines in Trauma centers in Iran to provide holistic care.
4. Nursing care based on this clinical guideline can help more effectively prevent, reduce, or manage the secondary complications of head trauma, reduce disability and mortality rates, improve nursing care quality, reduce healthcare costs, shorten hospital stay, and make wiser clinical decisions

Limitations: Given the small number of participants, the findings of this study cannot be generalized to all ICU settings in Iran or to all ICU staff. Additionally, given the fact that this study was a qualitative one, some participants

might have forgotten some aspects of their experiences or been unwilling to express their true feelings.

Ethics approval and consent to participate: Informed written consent was obtained from the participants and they were explained that they are free to leave the research at any stage of it. The Ethics Committee of Isfahan University of Medical Sciences approved the research stages in terms of ethical considerations (the code of Ethics: IR.MUI.RESEARCH.REC.1398.422).

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REFERENCE

- Escobedo LVS, Habboushe J, Kaafarani H, Velmahos G, Shah K, Lee J. Traumatic brain injury: A case-based review. *World journal of emergency medicine*. 2013;4(4):252.
- Osmond MH, Brennan-Barnes M, Shephard AL. A 4-year review of severe pediatric trauma in eastern Ontario: a descriptive analysis. *Journal of Trauma and Acute Care Surgery*. 2002;52(1):8-12.
- Forouzanfar MM, Safari S, Niazazari M, Baratloo A, Hashemi B, Hatamabadi HR, Rahmati F, Sanei Taheri M. Clinical decision rule to prevent unnecessary chest X-ray in patients with blunt multiple traumas. *Emergency Medicine Australasia*. 2014;26(6):561-566.
- Younesian S, Mahfoozpour S, Shad EG, Kariman H, Hatamabadi HR. Unintentional home injury prevention in preschool children; a study of contributing factors. *Emergency*. 2016;4(2):72.
- Ghoneim NI, Elden S, Okab ME, Elsaay O. Impact of implementing nursing care protocol on moderate head injured patient's outcome. *Rehabilitation*. 2012;9:10.
- Langlois JA, Rutland-Brown W, Thomas KE. Traumatic brain injury in the United States; emergency department visits, hospitalizations, and deaths. 2006.
- Rahimi-Movaghar V, Rasouli MR, Ghahramani M. The incidence of traumatic brain injury in Tehran, Iran: a population based study. *The American Surgeon*. 2011;77(6):E112.
- Woodward S, Mestecky A-M. *Neuroscience Nursing: evidence-based practice*. Nursing Older People. 2011;23(8).
- Haddad SH, Arabi YM. Critical care management of severe traumatic brain injury in adults. *Scandinavian journal of trauma, resuscitation and emergency medicine*. 2012;20(1):12.
- Kutzleb J. Evidence-Based Practice Nursing Interventions for Improved Functional and Cognitive Outcomes in the Traumatic Brain Injury Patient. *J Nursing Care*. 2012;1:110.
- Çelik S, Aksoy G, Akyolcu N. Nursing role on preventing secondary brain injury. *Accident and emergency nursing*. 2004;12(2):94-98.
- Barker E. *Neuroscience Nursing: A spectrum of care*. 3rd. New York: Mosby Company. 2008:602-603.
- Pakdaman H, Harandi AA, Hatamian H, Tabatabae M, Kasmaei HD, Ghassemi A, Gharagozli K, Ashrafi F, Naeini PE, Tavakolian M. Effectiveness and safety of MLC601 in the treatment of mild to moderate Alzheimer's disease: a multicenter, randomized controlled trial. *Dementia and geriatric cognitive disorders extra*. 2015;5(1):96-106.
- Popernack ML, Gray N, Reuter-Rice K. Moderate-to-severe traumatic brain injury in children: complications and rehabilitation strategies. *Journal of Pediatric Health Care*. 2015;29(3):e1-e7.
- Bond AE, Draeger CRL, Mandelco B, Donnelly M. Needs of family members of patients with severe traumatic brain injury: Implications for evidence-based practice. *Critical care nurse*. 2003;23(4):63-72.
- Puggina ACG, Da Silva MJP, Schnakers C, Laureys S. Nursing care of patients with disorders of consciousness. *Journal of Neuroscience Nursing*. 2012;44(5):260-270.
- Carter PJ, Goldschmidt WM. *Lippincott's Textbook for Long-term Care Nursing Assistants: A Humanistic Approach to Caregiving*. 2010.
- McNett M, Doheny M, Sedlak CA, Ludwick R. Judgments of critical care nurses about risk for secondary brain injury. *American Journal of critical care*. 2010;19(3):250-260.
- Price AM, Collins TJ, Gallagher A. Nursing care of the acute head injury: a review of the evidence. *Nursing in critical care*. 2003;8(3):126-133.
- Kashani P, Mirbaha S, Forouzanfar MM, Meschi F, Baratloo A. The Prevalence of Personality Disorders among Emergency Nurses Based on MMPI-2 Questionnaire; a Cross-sectional Study. *Emergency*. 2017;5(1).
- Manouchehrifar M, Lakestani M, Kashani P, Safari S. Sonographic diameter of optic nerve sheath in differentiation of ischemic and hemorrhagic strokes; a diagnostic accuracy study. *The American journal of emergency medicine*. 2018;36(11):2064-2067.
- Saberinia A, Vafaei A, Kashani P. A narrative review on the management of Acute Heart Failure in Emergency Medicine Department. *European Journal of Translational Myology*. 2020;30(1).
- Nikbakht Nasrabadi A, Emami A, Parsa Yekta Z. Nursing experience in Iran. *International Journal of Nursing Practice*. 2003;9(2):78-85.
- Jesus LMTd, Simões JFFL, Voegeli D. Comunicação verbal com pacientes inconscientes. *Acta Paulista de Enfermagem*. 2013;26(5):506-513.
- Neishabory M, Raeisdana N, Ghorbani R, Sadeghi T. Nurses' and patients' viewpoints regarding quality of nursing care in the teaching hospitals of Semnan University of Medical Sciences. *Koimesh*. 2011:134-143.
- Dabirian A, Zolfaghari H, Saidi ZA, Alavi-Majd H. Views of AIDS patients regarding nursing care quality in healthcare centers affiliated to Shaheed Beheshti and Tehran Universities of Medical Sciences. *Advances in Nursing & Midwifery*. 2008;18(61):39-45.
- Ebrahimi HK, Sohrabi S, Ashtiyani FZ, Hafize F, Esmaeilian S, Jafarnejad S. EFFECT OF SIMULATION-BASED CPR EDUCATION ON THE KNOWLEDGE AND PERFORMANCE OF NEONATAL INTENSIVE CARE UNIT NURSES. *Journal of Critical Reviews*. 2020;7(7):1135-1140.
- Creswell JW, Poth CN. *Qualitative inquiry and research design: Choosing among five approaches*: Sage publications; 2016.
- Jafarnejad S, Ebrahimi HK. Clinical guidelines on pediatric asthma exacerbation in emergency department, a narrative review. *European Journal of Translational Myology*. 2020;30(1).
- Falk A-C, von Wendt L, Klang B. Informational needs in families after their child's mild head injury. *Patient education and counseling*. 2008;70(2):251-255.
- Walsh A, Moore A, Barber A, Opsteen J. Educational role of nurse practitioners in a family practice centre: perspectives of learners and nurses. *Canadian Family Physician*. 2014;60(6):e316-e321.
- Nelson JE, Puntillo KA, Pronovost PJ, Walker AS, McAdam JL, Ilaa D, Penrod J. In their own words: patients and families define high quality palliative care in the Intensive Care Unit. *Critical Care Medicin* 2010;28(3):80.