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Original Article

Identifying Challenges of Providing Care for Trauma Patients; A Concurrent Mixed Methods Study

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Abstract

Background: Caregiving for trauma patients has many challenges. Inadequate knowledge of these challenges can affect the patients and worsen their conditions.

Objectives: We aimed to explore the caregivers' experiences about these challenges and problems of caring for patients with trauma emergencies.

Methods: The study adopted a concurrent triangulation mixed-method and was conducted in Shahid Rajaee Hospital, southern Iran, in 2019. Semi-structured interviews, focus groups, observation and ward document assessments were conducted with focusing on the challenges experienced by the caregivers. A checklist was used to assess the performance of caregivers and measure the indices related to the care process. Statistical results and qualitative data on the main categories were compared and integrated for data analysis.

Results: In total, 307 codes were extracted by analyzing the content of the interviews and available evidence. The codes were summarized in 20 subcategories, and six main categories were extracted as follows: lack of professional capability, uncoordinated team response, deficits in managerial commitments, inadequate work motivation, complex nature of trauma emergency, and lack of clinical communication. The quantitative results indicated that caregivers' performance was considerably far from the expected scores and also many indices indicated a waste of time in responding to the patient needs.

Conclusion: Various dimensions of trauma care challenges indicate that professional capability, team coordination and communication, managerial commitments and work motivation considering the complex nature of trauma emergency wards are crucial to enhance patients' access to optimum quality care. Caregivers' performance and quality of indices also affect the care process. Future studies are required for compiling strategies and protocols for the quality of care for trauma patients.

Keywords: Challenges, Emergency care, Trauma center, Mixed method design.

Introduction

The emergency state of trauma patients has always been a threatening health condition.[1,2] Trauma is the cause of more than 16% of disabilities and 5.8 million deaths [3] with an annual economic burden of 500 billion dollars worldwide,[4] making it the second leading cause of mortality [5] and the most prominent factor for disability.[6] Currently, suitable nursing care of these patients is a priority, due to the destructive effects of trauma on people's physical, emotional, behavioral, mental, and cognitive domains.[7] Several studies have emphasized the professional role of nurses in saving the trauma patients' lives, recognizing their problems, and preventing secondary complications.[1,8-11] However, the professional complexities related to healthcare processes under emergency conditions can also increase the rate of performance error and reduce care quality.[12] Previous studies have also indicated inadequate nursing knowledge and deficits in adhering to standard care guidelines in the management of traumatic patients.[13,14] Identification of related challenges in developed countries has led to providing professional care in line with rapid trauma diagnosis and complete patient assessment that has improved care quality.[15,16] Iranian studies showed that there are a variety of problems during caring for traumatic patients. These obstacles include the lack of clinical competence, motivation and reasoning, knowledge, and adherence to guidelines, and the use of evidence-based decision-making.[17,18] These studies demonstrated the problems of trauma emergency wards. However, until now, no research has been done to explore the complex challenges of caring for these patients in detail. We

used a mixed-methods design to collect, analyze, and integrate all data to resolve research problems based on a pragmatic epistemology.[19] This study aimed to investigate the caregivers' experiences using a mixed-method design regarding the challenges of caring for trauma patients and use the results of one method to support the findings of the other studies about a single phenomenon. We used a quantitative data collection approach to avoid missing factors that affect the challenges that caregivers face.

Objectives

In this regard, it is essential to investigate the challenges of caring for these patients using a mixed-method design that can improve the caregivers' knowledge and help planners to design and implement effective programs.

Materials and Methods

A Concurrent Triangulation Mixed Methods

The study adopted a triangulation mixed-methods design that emphasis on the qualitative research process in the Shahid Rajaee Hospital (A referral center for trauma injuries in Fars province and southern Iran) during 2019. Triangulation mixed methods design is one of the mixed methods designs in which quantitative and qualitative procedures are conducted separately from each other to maintain the independence of data analysis. In this study all data were collected concurrently and analyzed separately. Integration occurs during the interpretation.

Qualitative procedure

Research Objective: Phase I identified the challenges of providing care for trauma patients, which explored the caregivers' experiences about the challenges of caring.

Procedure: The inclusion criteria in this part were three years of work experience in the trauma emergency ward and having at least an undergraduate degree in nursing. In this part of the study, purposeful sampling and content analysis method was used. Data were collected using semi-structured interview, focus group, observation and ward document assessment.

In this study, nine semi-structured interviews were conducted with different participants. Interview guide, questions and methods for collecting trustworthy data were discussed by the research team before the interviews. The interviews began with general questions and then moved on to deeper questions and continued until data saturation. The duration of the interviews ranged from 47-75 minutes. The semi-structured interview focused on the following questions: Describe your experiences regarding caring for trauma patients? What challenges do you face while caring for these patients? What could be the causes of such challenges? Two heterogenous focused group sessions were used to integrate and consolidate data, comprising four nurses, a head nurse, two supervisors, a matron, two trauma surgeons, and one person from the anesthesiology team. The duration of the sessions was 98 minutes. Moreover, 18 observations were done to assess the interactions of the involved group and several care environment variables such as number of care providers, method of care, workplace accidents and incidents, and recording the features of the conversations. These observations were done directly on the care process in different patients, all weekdays and at different work hours, closely and with prior notice. Also, the documents and related evidence of different errors were evaluated during the past three months. The information of this section was also recorded with the consent of the participants using audio recording and in some cases only notes were taken. After recording the interviews and observations, the texts were reviewed several times.

To analyze qualitative data (the individual interviews, group discussions, and observations), we used the method described in Elo & Kyngas study (2008) through comprising three sections, including preparation phase, organizing phase and reporting the analysis process and results. The texts of interviews were reviewed several times after recording, and the codes were extracted and allocated to subcategories based on similarities and differences. Then, the subcategories were combined, and the main categories were extracted. For data analysis, MAXQDA 10 was used. The trustworthiness of the qualitative data was assessed using Lincoln and Guba's criteria [20] including member checking, prolonged engagement and persistent observation, audit, peer check, member check, correct interview and recording techniques, documentation, complete description of the research process, exact description of the participants' characteristics and stating their opinions. We also used Waterman's method for evaluating trustworthiness by holding various meetings, constant comparison, bracketing, and reflection.[21]

Quantitative procedure

Research Objective: The performance of trauma ward nurses and some indicators of the care process were assessed

in the Phase II of the study.

Procedure: The cross-sectional survey study involves all 25 nurses of the trauma emergency ward. Census method was used for sampling and descriptive data analysis was done. First, a checklist called "Assessing the performance of trauma ward nurses" was prepared based on the latest guidelines for essential trauma care complied by the World Health Organization [22] and the American College of Surgeons' resources for optimal care of injured patients.[23] The prepared checklist comprised of 35 items assessing four domains: assessment, nursing diagnosis, performance and evaluation. It was rated on a three-point Likert scale (acceptable, needs improvement, and unacceptable).

In the quantitative method, the reliability coefficients of the items were used for face validity. A checklist was provided for15 trauma emergency nurses to evaluate the items. For each of the 31 items, a 5-point Likert scale (from completely important to not important) was considered regarding the importance of the item: completely important (5), important (4), somewhat important (3), slightly important (2) and not important (1). After completing the checklist by the target group, the face validity was calculated using this formula (Impact Score = Frequency (%) × Importance). Items with a score ≥1.5 were retained and other items were removed.[24] Four items were omitted and 31 items with an item impact score of more than 1.5 remained. The content validity index (CVI) and content validity ratio (CVR) were assessed for evaluation content validity. The CVR was calculated using the Lawshe table.[25] The CVR score was estimated according to the following equation:

$$CVR = \frac{n_E - \frac{N}{2}}{\frac{N}{2}}$$

Where, NE indicates the number of experts who believed that the item is necessary and N represents the total number of panel members. The score obtained will be between -1 and +1. The minimum acceptable CVR amount in the table was 0.56, which was based on the opinion of the 12 experts.[25] According to this amount, 31 items remained.

The CVI was determined based on the content validity index of Waltz and Basel. CVI was assessed based on expert opinion according to relevance, simplicity, and clarity using a four-point Likert scale. A score of >0.79 is acceptable for CVI. Therefore, all items were more than 0.80 and were maintained. The average CVI was calculated based on the mean CVI of all the items in the checklist.

Polit and Beck recommended an amount of 0.9 or more,[26] and in this study, it was 1. The validity of known group was examined by determining significant differences in mean scores. Paired t-test results showed a significant difference in the dimensions of evaluation, performance and evaluation, and total score between two measurements in one group confirming the validity of the instrument construct (P<0.001). The reliability of the checklist was assessed using inter-rater or observer reliability and the correlation coefficient between the observer scores. The Kappa value was 86%. Ultimately nine indices were measured for better evaluation and measurement using the opinions of trauma emergency experts, literature review, and national trauma ward guidelines for 30 patients during different shifts. The results of the care performance checklist and indices were analyzed using SPSS software (version 20). We also enrolled the adequate number of participants in the quantitative part of the study to increase the data validity. Finally, qualitative and quantitative data were analyzed separately and their results were combined during their interpretation and explanation.

Ethical Considerations

The Ethics Committee of Tehran University of Social Welfare and Rehabilitation Sciences approved the protocol of the study (IR.USWR.REC.2019.169). Written informed consent was obtained from the participants and they were reassured that their information and identity would remain confidential and that they had the right to leave the study at any point they desired.

Results

Research findings from the qualitative phase

Participants

All participants (n=32) in the qualitative and quantitative study were comprised of 25 nurses, and other health care providers (n=7). The participants including 9 nurses (7 women and 2 men) participated in qualitative interviews and 11 caregivers (8 women and 3 men) participated in two heterogenous focused group sessions and all 25 nurses of the trauma emergency ward were enrolled in quantitative phase. There were 23 (71.8%) women and 9 (28.2%) men with a mean±SD age of 33±4.1 years old. Table-1 shows other demographic characteristics of the participants.

By reviewing the interviews and available evidence, 307 codes were extracted. The codes were summarized in 20 subcategories. After repeated analysis, six main categories were extracted representing the challenges related to caring for patients with trauma emergency (Table-2).

Table-1. Characteristics of participants (n = 32)

Variables		Mean ±SD
Age		33±4.1
Work experience (years)		8±4/3
Sex	**Men**	Frequency (%) 9 (28.2%)
	Women	23 (71.8%)
Education level	**Bachelor's degree**	28(87.5%)
	Master's degree	2(6/25%)
	Physician	2(6/25%)

Table-2. Categories and sub-categories of challenges related to caring for patients with trauma emergency

Main categories	Subcategories
Lack of professional competency	Lack of professional competence
	Unsuitable educational planning
	Deficits in team speed and accuracy
	Lack of responsibility and work ethics
Uncoordinated team response	Role ambiguity
	Problems related to team work
Deficits in managerial commitments	Not a priority for managers
	Ineffective management
	Inefficient and inadequate work force
	Inadequate and ineffective facilities
Inadequate work motivation	Motivational problems
	Having multiple responsibilities
	Inadequate work bonuses
	Work load
	Occupational tension
	Emotional fatigue
The complex nature of trauma emergency	Simultaneous complications in the patient
	The progressive nature of the trauma
Lack of clinical communication	Problems in inter-professional communication
	Unsuitable communication between colleagues

Lack of professional competencies

A lack of professional competencies means that an employee is not performing a job according to the standard required. This may be assessed by reference to an employee's performance, knowledge, technical skills, attitude, and ability for patient management. The participants believed that lack of professional competencies was one of the main challenges and included the following subcategories: lack of professional competence, unsuitable educational planning, deficits in team speed and accuracy, and lack of responsibility and work ethics. Regarding lack of professional competence, a nurse with 61 months of work experience stated: "Trauma emergency nurses should have extra competencies and abilities, but most of them don't have the required knowledge or skill". Another nurse with 73 months of work experience said: "They held an intubation class for us but few people went because the time was not suitable and they informed us only two days before the class. Couldn't they tell us one week earlier so we could plan our schedule?"

Uncoordinated team response

Team coordination is one of the main issues for planning and organization and it means clarifying the roles of all caregivers to achieve common goals. The second challenge was the healthcare team's uncoordinated response during caring for the patients and included the following subcategories: role ambiguity and problems related to teamwork. Concerning role ambiguity, one of the nurses with 81 months of work experience stated: "most of the time my role as a nurse and what I should be doing is not clear in

the ward. This leads to disorganization in the ward". Concerning problem related to teamwork, a nurse with 39 months of work experience said: "Many times, the doctors come here to treat the patients, but then they don't allow me to do what I should do as a nurse. They are not in line with us and it can increase patient waiting time".

Deficits in managerial commitments

A management commitment implies direct participation by the highest management level in all specific aspects such as providing facilities and resources for healthcare members. The third challenge was attributed to the commitments of managers in healthcare professions and included three subcategories. Concerning the subcategory of not being a priority for managers, a nurse with 86 months of work experience said: "Here, the routine has always been that staff problems are discussed constantly but nobody has done anything about them. Maybe they don't even care about us. Our service is important for them not us". Regarding the ineffective and inadequate human work force subcategory, a nurse with 88 months of work experience stated: "Some of the nurses who have come to this ward are not suitable or even effective. It's better they be used in other places, especially when we have deficits in human resources".

Inadequate work motivation

Participants believed that issues affecting motivation range from inadequate tools to occupational tension. These issues should be resolved to provide the best care quality. Some participants mentioned a lack of work motivation when providing care for patients with trauma. A participant pointed to motivational problems, having multiple responsibilities, inadequate work bonuses, work load, occupational tension, and emotional fatigue as subcategories. Regarding motivational difficulties, a nurse with 39 months of work experience said: "I like working at the trauma emergency ward, and besides my interest, nothing else motivates me to work here". Concerning the multiple tasks that nurses have and its role on their motivation, a nurse with 48 months of work experience said: "An emergency nurse should triage patients rapidly, sit at the station and record the patient's data herself. She has to follow the doctor's orders. We also have to complete the patient's record ourselves and even write the admission card. Well, all these things demotivate us".

The complex nature of trauma emergency

The studied participants indicated that the complex nature of trauma emergency was a challenge itself. This category includes the subcategories of simultaneous complications in the patient and the progressive nature of the trauma. Concerning simultaneous problems, a physician with 76 months of work experience stated: "The patient comes in and it looks like a mild bleeding, but it's not. There are many other complications to deal with which should be diagnosed and treated correctly". Regarding the subcategory of the progressive nature of the condition, a nurse with 55 months of work experience said: "The patients are different here compared with other wards in town. The condition of some of them is critical. One moment the patient's blood pressure is good but the next it suddenly drops. Well, these conditions should be considered while caring for patient".

Lack of clinical communication

Communication problems at the ward were among other challenges nurses faced. The subcategories of this category were problems in inter-professional communication and unsuitable communication between colleagues. One of the nurses with 78 months of work experience talked about problems in inter-professional communication: "Doctors don't respect us like before. Some of them confront us while it's not our problem the devices don't work. What I want to say is that they blame everything on us". Regarding the unsuitable communication between colleagues, a nurse with 55 months of work experience said: "The most important problem we have is related to our colleagues. Some of them don't behave correctly and mess everything up at the ward. They don't get along well and they want to ruin each other".

Research findings from the quantitative phase

By assessing the performance of nurses in each domain and comparing the scores with the total score, we found that their performance was considerably far from what was expected as following: patient assessment (M=11.78, SD=0.34 out of 21), diagnosis (M=2.78, SD=0.1 out of 6), performance (M=30, SD=0.7 out of 57), and evaluation (M=2.94, SD=0.2 out of 9). We also assessed the indices related to the care process. Although we found that the average waiting time for the first visit by a surgeon (4.1 minutes) and nursing care (1.3 minutes) was short, while the average waiting time for a neurologist visit (45.7 minutes) and receiving radiology

results (34 minutes) were long, which is not consistent with considering the golden time in trauma care (Table-3).

Analytic Integration

An analysis was conducted to identify the similarities and differences between main categories from qualitative data and the descriptive statistics from quantitative data. We used a joint display to facilitate integration at the analytic level (Table-3).[19].

Poor performance: "Lack of professional competencies"

Lack of professional competencies was the top priority for participants and qualitative interviews demonstrated that this category was the most important challenge. The quantitative result was complemented and verified by the main categories derived from the qualitative data by assessing the performance of trauma ward nurses.

Prolonged patient waiting time: "Uncoordinated team response"

According to the qualitative data, the second challenge was the healthcare team's uncoordinated response. Participants believed that the most important reason for this challenge was the waiting time for visiting by the clinical staff or using required health services. These findings were consistent with those obtained from the quantitative data as long delay for the first visit by a neurologist, radiology and laboratory results, and time duration of receiving nursing care. This finding implied that this challenge was related to the team response. Indeed, the findings of this study emphasize the importance of team coordination and patient waiting time to facilitate policy implementation. Table-3 also illustrates the average waiting time of patients in the emergency ward.

Table-3. Joint qualitative and quantitative data

Performance assessment	**Score (mean) (SD)**
Patient assessment	(11.78) (0.34) (out of 21)
Diagnosis	(2.78) (0.1) (out of 6)
Performance	(30) (2.7) (out of 57)
Evaluation	(2.94) (0.2) (out of 9)
Ratio of trained nurses to all the nurses at the ward	13.3%
Qualitative categories	**Quotations**
Lack of professional competence	"Most of the nurses don't have the required knowledge or skill"
Unsuitable educational planning	"They held an intubation class for us but few people went because the time was not suitable and they informed us only two days before the class"
Indices	**Mean (mins)(SD)**
Duration of waiting for the first visit by the surgeon	(4.1) (2.1)
Duration of waiting for the first visit by the neurosurgeon	(45.7) (3.1)
Access to radiology facilities	(14) (3.2)
Receiving radiology results	(34) (4.4)
Access to CT scan	(17.5) (5.8)
Receiving laboratory results	(11) (2.6)
Duration of receiving nursing care	(168) (27.3)
Qualitative categories	**Quotations**
Deficits in team speed and accuracy	"The pace of working with a patient with trauma is not at all comparable with patients admitted to other wards"
Problems related to team work	"Many times, other team members are not in line with us and it can increase patient waiting time"

Discussion

Considering the cultural variety and different opinions of the participants as well as the mixed method nature of the study, we could attain extensive and effective knowledge about the challenges of providing care for patients with trauma emergency. In general, the results showed that considering the importance of staff performance in trauma wards in response to the high rates of road traffic injuries (RTOs) in the country, there are various problems that interfere with providing the desired trauma care services.

In the qualitative section of the study, deficits in professional competencies were the main challenges during the care process, which was supported by quantitative results.

This indicated nurses' performance that was lower than the

standard level. Moreover, few nurses were trained to provide trauma care for patients. The combination of qualitative analysis with quantitative results brought out other challenges of providing care to trauma patients.

This study highlighted the value of a mixed-method research design by exploring the challenges of care and examining the caregivers' performance in trauma emergency wards. Based on the results, it was found that the participants expected their health care system to support the caregivers and increase their professional competency.

The evaluation of nurses' performance emphasizes their need to be knowledgeable and to upgrade their skills by disclosing all care process stages as a nursing diagnosis, nursing performance, and patient evaluation in the right way. Previous studies have also shown that the knowledge and skills of nurses were from moderate to weak during primary evaluation and care.[27-29] Dickason et al., showed an inadequate level of knowledge of nurses was the main reason that the provided care services were not operative.[30]

Uncoordinated team response was another challenge mentioned by the nurses and was consistent with those obtained from the quantitative data. The participants expressed that they tried to act accurately and quickly during care. However, sometimes it was difficult for nurses to access the doctors and paraclinical services, and hence, they face problems related to teamwork. In this regard, nurses and other health care givers felt helpless. Caregivers just wanted to have a certain protocol and know each member's responsibility to prevent role ambiguity. Considering the emergency nature of the trauma, waste of golden time in meeting the emergency needs of patients could lead to an increase in the mortality and morbidity rates and secondary injury.[4,31] The current study cannot be generalized to the effects of team discoordination via a mixed-methods design. It is assumed that these indices show the level of team coordination in this setting In a qualitative study, Horn et al., mentioned that teamwork and coordination in emergency environments was one of the main categories that prevented providing correct care, and some stated that the level of accepting responsibility and contradictory management, as well as team support, were among other reasons.[32] Another study showed that uncoordinated team response was a result of delays in preparing para-clinical wards, timely clinical visits, and workups.[30] Also, the design can be used in other contexts where the voices of trauma emergency caregivers have not yet been heard.

Management aspects were another challenge expressed by the participants, and we just used a qualitative approach to explore the challenges. The results showed that managerial problems, including organizing staff activities (correct role allocation), moderating staff workload, and the adequate number of personnel, are obstacles for optimal staff performance.[33] In another study, understanding work conditions and spending more time with staff improved tolerance at the workplace.[34] It was also found that nursing managers' and supervisors' support was the extensive organizational factor that offer many advantages in clinical decision-making among nurses.[35] This study demonstrated that resource and equipment management in trauma wards interfered with providing necessary care. Moreover, assigning non-professional matters to the nursing staff led to organizational chaos and lower control over workplace matters.[36] Therefore, reconstructing some managerial methods can solve many problems in relation to the care process in healthcare environments and increase staff productivity.

In the present study, the participants mentioned that work motivation was a challenge they faced during the care process. Motivation affects occupational performance among nurses and increases their satisfaction and creativity. Consequently, it encourages managers to identify factors influencing motivation.[37] The previous studies demonstrated that concepts such as financial bonuses, organizational justice, and occupational independence are sources of work motivation.[38] Increasing nurses' motivation as improving patient conditions can have positive effects on patient outcomes.

In our study, the results demonstrated that the complex nature of trauma emergencies was another challenge. Bergman reported that caring for patients with trauma requires higher skill levels in addition to accurate planning with respect to their complex physiological conditions.[39] The environment of health care sittings for traumatized patients is very complex, because these departments are multidisciplinary in nature and require strict adherence to the protocols. Moreover, due to the unpredictable nature of traumas, there is a high possibility of facing confounding factors in such environments.[40] Therefore, it is essential to focus on overcoming these complex challenges of health care and strengthening multidisciplinary approaches to care the

traumatized patients.

In this study, the last challenge that nurses faced was related to clinical communication during the care process. The managers' relationships with nurses has been distinguished as a crucial factor in increasing the general sense of job satisfaction.[41] Nurse-physician conflicts arise as a result of differences in the degree of authority, responsibilities, education and current culture between physicians and nurses.[42] One of the extensive aspects of clinical processes is the suitable interaction between healthcare providers.[43] The results of our study confirmed previous related studies that emphasize the need for creating an organizational environment rich in positive communication, respect, and mutual trust between managers and staff.

Conclusions

Various dimensions of trauma care issues can be related to these challenges, and hence, enhancing professional competency, team coordination and communication, managerial commitments, work motivation, and quality of indices considering the complex nature of trauma emergency wards are crucial to enhance patients' access to optimum quality care. The results of this study on identifying the challenges of providing care for trauma patients can increase the knowledge of government, society, and policymakers regarding the factors preventing correct and suitable caregiving in order to plan for better support of these patients. Future studies are required for compiling strategies and protocols to enhance the quality of caregiving in traumatic patients.

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Authors' Contribution

Study concept, design and supervision: Jamshidi, Norouzi Tabriziand, Khankeh; acquisition of data: Jamshidi; analysis and interpretation of data: Jamshidi, Norouzi Tabriziand, Khankeh, Fallahi Khoshknab, dalvandi, Vizeshfar; drafting of the manuscript; Jamshidi, critical revision of the manuscript for important intellectual content, statistical analysis, and administrative, technical, and material support: Norouzi Tabriziand, Khankeh.

Conflict of Interests

Non-declared.

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