ORIGINAL ARTICLE **DOI: https://doi.org/10.18502/fem.v8i3.16330**

The challenges of children's safety in pre-hospital emergencies: a qualitative study

Hamidreza Aghababaeian[1,2], Asad Imani[3,4], Leila Masoudiyekta[5], Meysam Radmanmehr[6], Behnam Farahmandnia[6]*

1. Department of Health in Emergencies and Disaster, Dezful University of Medical Sciences, Dezful, Iran.
2. Center for Climate Change Health Research (CCCHR), Dezful University of Medical Sciences, Dezful, Iran.
3. Student Research Committee, Faculty of Nursing and midwifery, Ahvaz University of Medical science, Ahvaz, Iran.
4. Department of Nursing, Faculty of Nursing and Midwifery, Ilam University of Medical Sciences, Ilam, Iran.
5. Medical Ethics Research Center, Tehran University of Medical Sciences, Tehran, Iran.
6. School of Nursing and Midwifery, Dezful University of Medical Sciences, Dezful, Iran.

***Corresponding author:** Behnam Farahmandnia; **Email:** frahmandb@gmail.com, farahmandnia@dums.ac.ir

Published online: 2024-07-07

Abstract: **Objective:** Exploring the challenges experienced by the pre-hospital emergency personnel to prevent the secondary injuries and provide more effective services to children can be helpful. This study aims to explain the safety challenges of children in the pre-hospital emergencies.

Methods: This qualitative study, which was conducted with the content analysis approach, was a semi-structured, and in-depth data collection process with the field notes for pre-hospital emergency personnel in Dezful city in 2022. Sampling was done in a targeted and available manner. The sampling process continued until the data saturation was reached. The trustworthiness of data was improved by reviewing and revising the data, experience and expertise of the interviewer, review of research participants and researchers. The research data, including interview texts and field notes, were divided into the semantic units, and then summarized by compression, and then abstracted in the order of subclasses, main classes, and finally themes.

Results: Qualitative data analysis of interviews and notes led to the extraction of eight themes, which expressed the nature of children's safety challenges in the pre-hospital emergency: the lack of pre-hospital equipment for children, physical and mental characteristics of children, the lack of safety of vehicles for children, the lack of clinical skills of personnel for children, anxiety and non-cooperation of parents, operational and legal problems, the lack of attention to professional responsibility and high work pressure in children's missions .

Conclusion: This study's results showed that identifying children's safety challenges for pre-hospital emergency personnel can help better understand the care needs of this age group and help managers plan in order to reduce children's safety challenges in the pre-hospital missions.

Keywords: Challenge; Children; Emergencies; Emergency Medical Services; Safety

Cite this article as: Aghababaeian H, Imani A, Masoudiyekta L, et al. The challenges of children's safety in pre-hospital emergencies: a qualitative study. Front Emerg Med. 2024;8(3):e24.

1. Introduction

Pre-hospital emergency service responders can provide vital care for all vulnerable age groups, including children (1,2). Pediatric emergency medical dispatches account for about 10% of cases transferred by pre-hospital emergency services. According to past research, pediatric emergency medical dispatches have special constraints (3). Additionally, in this age group, the physical and mental needs differ from those of adults (4). Pre-hospital care for children requires more activity and decision-making during critical times and complex environmental interactions, which increases the likelihood of errors and risks (5). In summary, these factors endanger the safety and health of the child (6). Additionally, the lack of awareness among pre-hospital emergency personnel regarding emergencies leads to complex and stressful situations, such as inability to assist personnel and puts the patient's safety at risk (7). However, pre-hospital emergency service providers still have limited experience, information resources, and decision-making skills in clinical situations to care for sick children, leading to increased risks and threats (3,8). For example, poor communication between pre-hospital emergency personnel during service delivery is one of the factors of pre-risks, harm to the patient and reduction in the quality of care (9). Hence, to address safety and identify its challenges, the events experienced in pediatric care missions need to be described by pre-hospital emergency personnel.

2. Methods

2.1. Study design

The present study was conducted in 2022 as an experience data extraction using a qualitative research method and a qualitative content analysis approach. Content analysis is used as a systematic method to reach the depth and breadth of the description of the phenomenon, which is performed for revision and providing reliable conclusions from information and the providing knowledge and possibly new insights. The content analysis focuses on life experiences, interpretations and meanings that people have faced.

2.2. Data collection

The research population included pre-hospital emergency personnel in urban and road centers of Dezful city in 2022, who were included in the study based on the entry criteria (experience of at least 3 years of employment in pre-hospital emergency, work experience in children's mission). in addition, convenience sampling was used to collect data. Samples were collected during the research to the point of data saturation.

2.3. Information collection tool and interview process

The data collection tools in this study were audio recording and an open questionnaire (semi-structured and researcher-made). By performing face-to-face interviews, observation and recording of emergency medical personnel, the challenges of children's safety in pre-hospital emergencies were unfolded. The interview questions were built upon earlier responses to previous questions. After telephone or face-to-face conversations with the participants and determining the time and place of the interview according to the participants' convenience, in the next stage, the researcher explained the objectives of the study and the interview method for each participant. First, an open question was asked: "are there safety challenges in pediatric emergency medical services?" and then other questions were asked based on the objectives of the interview and the answers of the participants. Also, questions such as "can you explain more" were used as needed in each interview. At the end of each interview, the participant was asked to state if there was anything left to say. The interviews lasted between 65 and 90 minutes for each person. The participants were informed and convinced that the interviews were recorded with a tape recorder. In the shortest possible time, all interviews were carried out and transcribed by the first researcher by carefully cross-checking the audio and written forms.

In order to guide the interview, the researcher asked questions such as: (1) what are the biggest challenges of children's pre-hospital emergency? (2) how do you behave with child patients in emergency missions? (3) what special situations lead to safety risks and threats in children?

(4) what are the most common factors related to safe events?

The interviews lasted for two months and every week until the topics (themes) were completed. The participants shared their past and current experiences in the field of pre-hospital care challenges of children's age groups. In this study, three researchers (HA, BF and AI) accompanied pre-hospital emergency medicine technicians and clinical trainers of pre-hospital emergency medicine on ambulance missions. They documented their experiences during missions involving children. Additionally, they attempted to examine and evaluate pre-hospital emergency medical devices, equipment, and facilities for pre-hospital emergency medicine missions by interviewing other technicians participating in the study. Visible challenges were also noted.

The data was extracted from the transcripts of the recorded conversations and field notes, and qualitative content analysis was employed to analyze the data. In addition, the conversations were interpreted by coding and identifying concepts. At the end of the interview sessions, gifts were presented to the participants for their cooperation. Validity and reliability were based on Goba and Lincoln criteria (credibility, transferability, dependability, and confirmability).

Credibility: to increase the credibility of the study, participants were selected with maximum diversity from managers, officials and personnel of all urban and road bases and different technicians, drivers and operators. Interviewing and extracting codes and concepts lasted for about six months. At the beginning of the interviews, all participants were informed about the objectives of the study and familiarized with the interviewer.

The lead researcher in the team conducting the interviews had a background in the pre-hospital emergency medical services, with prior experience in emergency medicine and knowledge of emergency medical missions. Two other team members worked as emergency medical technicians (EMTs). A consistent observation technique was employed during the study to capture interview nuances. Apart from interviews, notes were made on ambulance facilities and equipment during observations of pre-hospital emergency medical services centers. The researchers also participated in children's missions and documented the challenges encountered.

All the stages of the study process, including theme extraction and coding, were supervised by an expert faculty member in the field of qualitative research. Transferability: in this study, transferability was ensured through a complete and detailed description of all study steps and presenting the complete set of data. In this way, findings can be generalized to other people, times, situations and settings. Dependability: in this study, two researchers who were not part of the research were asked for their opinions about the study process and study results.

Confirmability: to this aim, a clear description was provided from the beginning of the research project to the development and report of the findings in the text (bracketing) the transcripts of which remain with the researcher.

3. Results

Data saturation was reached through in-depth semi-structured interviews with 20 male pre-hospital emergency medical staff participants. The analysis of interviews and field notes produced a primary code and 17 categories, leading to the identification of 8 themes (Supplementary: table1). These themes include:

Theme 1- lack of pre-hospital equipment for children

This theme highlights the lack of suitable pre-hospital equipment for children, as indicated by the categories of lack of provision and equipment. The existing equipment in the pre-hospital system is often not tailored to the specific needs of pediatric emergencies and is typically designed for adults. This absence or inadequacy of pediatric equipment is identified as a key challenge in ensuring children's safety in pre-hospital emergencies. For example, one participant mentioned, "collar is not the right size for children, and it is difficult for children to tolerate disproportionate collar, and when collar is tied, the child gets scared and cries."

Theme 2- physical and psychological characteristics of children

This theme was extracted from four categories: physical characteristics, non-cooperation, psychological characteristics and fear. These categories indicate that the physical characteristics of children, despite their age and small size, as well as the lack of the development of verbal and communication skills and vulnerability, require special attention, and the child feels calm and safe when he is next to his parents, especially his mother.

In this regard, one of the participants stated, "since children are low weight, usually every person who is at the scene of the accident moves them easily."

Also, one participant expressed his experience in the field of child's psychological characteristics as follows: "3-5-years-old children get afraid and start crying when they enter the ambulance cabin." Another participant stated: "usually when a child is alert, he does not allow us to venipuncture because of fear; usually they start crying when they see a venous catheter; while the intravenous line is being established, the process of taking a vein is almost time-consuming and requires more skills."

Theme 3- inadequate safety of vehicles for children

This theme consists of one floor, low safety vehicles for children. Since a special seat for children is designed for placing children in the car, people do not use it due to various reasons such as lack of knowledge, high cost and negligence. A child is usually seated in the back, and this indicates the low safety of the vehicle for children. One of the participants said, "parents usually put the child in the back seat (without a child seat) and the child is thrown out of the car during an accident."

Theme 4- lack of clinical skills of personnel for pediatric missions

For this theme, two categories were extracted: lack of clinical experience, receiving incomplete information about the child and lack of skills and experience. Pediatric missions are challenging for emergency personnel. These problems are partly related to the lack of skills and experience working with children, as well as the incomplete and uncoordinated pre-hospital emergency information system, so these situations indicate a lack of clinical experience, receiving incomplete information about children lack of skills and experience working with children, and a mismatch between the practical educational needs and the topics presented in the courses related to children. In this regard, one of the participants stated: "one of our weaknesses is that we do not have the skills to communicate with children. In one accident, one of the passengers was a child who was constantly crying and anxious, and the child's mother was not present. We could not calm down the child."

With reference to gaining incomplete information about the child, one of the participants stated: "the emergency operator is usually a female nurse who does not have the experience of working in the pre-hospital emergency medical service and does not have a correct understanding of the accident conditions." Another participant expressed his experience as follows: "sometimes the information and description of the situation given to us by the companions are wrong and considered one of our challenges."

Theme 5- anxiety and non-cooperation of parents

This theme was extracted from three categories: parents' anxiety, lack of cooperation and work disorder, mother's emotional crisis and lack of understanding of emergency work. The emotional dependence of parents on the child, especially the mother, is of high priority in an emergency. When the child needs help and becomes anxious, in case of inappropriate interventions by the emergency personnel, the reaction of the parents disrupts the process of providing services. In this regard, one of the participants stated: "when the child has problems, the companions, especially the parents, are affected and become anxious."

Other participants stated: "most of the time, parents get angry with our repeated attempts to fix the peripheral venous catheter. In this situation, their stress affects us, and by arguing, they take away the opportunity to do the work on time." Establishing an intravenous line is time-consuming and requires sufficient skill and experience.

"Our biggest challenge is the patient's family; as soon as the baby cries, they get agitated for transferring the child quickly." In relation to the mother's emotional crisis, one of the participants said: "usually mothers are not able to help the child in emergency situations; they cannot even speak and are in a state of shock". In addition, people's lack of awareness of pre-hospital emergency services has made emergencies and the provision of pre-hospital emergency personnel services a challenge. In this regard, one of the participants said: "most family members think that the emergency medical service is only responsible for transportation and the ambulance always arrives late."

Theme 6- operational and legal problems

This theme was extracted from the category of a lack of access to medical resources and transparent laws. In principle, the cooperation between the doctor and the pre-hospital emergency personnel provides more comprehensive services to the patients, but in some areas, there is no access to a doctor, and the personnel perform the treatment based on the existing trauma guidelines. Therefore, one of the key challenges in children's safety in pre-hospital emergencies is the lack of access to medical resources and transparent laws. In this regard, one of the participants stated: "without a doctor's presence, the treatment procedure is performed according to the offline trauma protocol based on the patient's condition."

Theme 7- lack of attention to professional responsibility in pediatric care missions

Because of insufficient knowledge, inattention and negligence, this theme was extracted from the category of personnel negligence. Pre-hospital emergency personnel provide incomplete services. In this regard, one of the participants stated: "we do not check the diastolic blood pressure to control the vital signs due to the crowding of the accident scene or carelessness." Another participant expressed his experience as follows: "in the accident environment and open spaces with lower temperatures, we usually do not pay attention to the temperature control and maintaining the child's body temperature."

Theme 8- high work pressure

This theme was extracted from the two categories of the psychological pressure of working with children and work stress. There is a potential challenge and mental tension in pediatric care missions. The vulnerability of children and the sensitivity and reaction of parents in situations where a child needs help are unique characteristics of pediatric care missions. Therefore, the psychological pressure of working with children and work stress are relevant distinguishing characteristics. In this regard, one of the participants stated: "the stress of working with children is very high; when we face a dead child, the innocent image of the child stays in our mind for several days and causes us mental pressure, especially for the personnel who have children themselves."

Regarding work stress, one of the participants said: "fear of reactions of the patient's companions and those around us, and the lack of mental and physical security, usually prevent us from working effectively".

4. Discussion

The present study dealt with the challenges of children's safety in pre-hospital emergencies; considering the vulnerability of children, it is especially important to pay attention to the needs of this age group and provide services to them in emergencies.

Among the themes extracted from this study was the lack of pre-hospital equipment needed for children. Effective pre-hospital care requires equipment and immediate intervention in emergencies, and any equipment failure and delay in providing services is associated with a decrease in safety and the occurrence of risks threatening the health of patients (10). Jamshidi et al. showed that the lack of equipment is an important challenge when delivering traffic accident victims to the hospital, which can have negative effects on the cooperation between the medical system (11). Also, Mosca and Stein noted the lack of special equipment for children among the challenges of pediatric emergencies, which is in line with the results of our study (12). On the other hand, the availability of appropriate equipment and access to it saves time, provides better services, and reduces the workload of personnel when providing pre-hospital emergency medical services to patients (13). Therefore, it is important to have access to equipment suitable for children's care, so that pre-hospital emergency personnel have a better performance, reduced work tensions, and a greater sense of responsibility in pediatric care missions.

Another theme of the study of physical and psychological characteristics of children is that, basically, children have their own developmental and physical characteristics according to their age. When the events occur, the children are not able to talk about their medical history, occurrences and the part of the body which has been damaged .

Sied et al. showed the difference between the physical characteristics of children and adults, as well as the challenge of airway management skills and establishing an intravenous line in pediatric traumas (14). Also, the safety problems of vehicles for children were another theme of the study. Most of the cars do not have child seats, due to various reasons, especially the increase in cost; however, when using the car, children are often in the seat area without special child seats, which are thrown out when an accident occurs and the car overturns. Abdel Razig Ali and Elhassan studied the traffic safety applications and showed that 98% of cars did not have child seats, which is in line with the results of this study (15). The correct placement of the child safety seat in the back of the car along with suitable accessories, significantly reduces the risk of child injuries following an accident and prevents the disability and death of children (16). It is helpful to educate the public, highlight the importance of using child seats in the cars, and require people to comply with the laws applied in this regard.

Another theme extracted from this study was the lack of clinical skills of the personnel for pediatric care missions. The existence of different drug instructions, the size of the equipment and the unique characteristics of pediatric patients, which requires expertise and precision to provide services to them. An insecure work environment and poor communication skills are among the causes of human errors in the pre-hospital environment, which have negative effects on the safety of patients (17). Also, the low number of pediatric care missions and the treatments required by them affect the ability and skill of ambulance personnel. In such a situation, pediatric pre-hospital courses are held in Iran in the form of workshops.

Anxiety and non-cooperation of parents was the other theme of this study. Potentially life-threatening situations create a high level of anxiety for companions, especially parents. Anxiety and non-cooperation of parents hinder the initial assessment of the patient and the provision of support services by pre-hospital emergency personnel. In this regard, Jepsen et al. showed that the non-participation of parents causes mistrust and heightens their stress in emergencies. However, accepting parents and encouraging them to calm down by emergency personnel and involving parents during the provision of services helps them gain a positive experience and feeling and cooperate better in emergencies (18).

Also, operational and legal problems were another theme of the study. In Iran's pre-hospital emergency system, the doctor is not present with the ambulance and only provides the necessary guidance to the pre-hospital emergency personnel through telephone consultation. Even in some consultation areas, there is no doctor. However, pre-hospital emergency personnel's decision-making in complex situations is challenging due to the lack of legal authority. In this regard, Safi Kikale reported the uncertainty and lack of executive guarantee of the guidelines as well as the lack of sufficient authority in pharmaceutical measures for clients as a challenge, which is in line with the results of our study (19).

Nevertheless, the presence of medical and specialist personnel in the pre-hospital emergency system with continuous assessment of the patient and optimal provision of services leads to better control of critical conditions (20). In this regard, the formulation and implementation of pre-hospital care standards as well as the revision and updating of the pre-hospital emergency system organization becomes increasingly important.

In addition, another theme of this study was the lack of attention to professional responsibility in other pediatric care missions. Responsibility is defined as accepting an obligation with the consent to perform an action. Failure to fulfill responsibilities is regarded as an instance of negligence by pre-hospital emergency personnel, which occurs with malfunctioning at the scene of the accident and the transfer of the injured children by the personnel (21,22). In this connection, the findings of Hagiwara et al. reported adverse events such as non-recording and incomplete recording by emergency personnel as the most important factor in patient safety (23). Notably, errors are inevitable among care providers, including pre-hospital emergency personnel. Some cases may cause professional negligence, like the wrongful performance of a procedure, misdiagnosis, and incorrect prescription of medicine (22). To improve the provision of services and quality care, it is necessary to monitor the compliance of standards to identify and eliminate the factors that cause errors in the work environment by pre-hospital emergency personnel and managers.

Another theme of the study was high work pressure for pre-hospital emergency personnel. Encountering stressful factors is an integral part of the pre-hospital emergency. Twenty-four-hour work shifts and being on-call disrupts neuro-cognitive function and disturbances in the sleep cycle, in addition to chronic fatigue and burnout caused by the increased workload. The physical and mental health of pre-hospital emergency personnel is affected and in the long term, in the absence of support resources, lowers the physical and mental health and increases the risk of diseases. Abbaspour et al. showed that personnel who were married and had children were more exposed to post-traumatic stress disorder than other personnel, which was in line with the results of our study (24). Therefore, it is important to implement the program to adjust the workload of the personnel, rotate and diversify the place of service, pay attention to the welfare needs, and evaluate the physical and mental conditions of the pre-hospital emergency personnel.

5. Limitations

In some similar studies, the focus group method has been used to collect data, we could not use this method in this study in Iran due to the work schedule of pre-hospital emergency personnel and the lack of alternatives for personnel to form focus groups. Also, due to the absence of a female technician in the pre-hospital emergency under study, we could not add women's opinions in this study.

6. Conclusion

The present investigation demonstrated that, finding out the children's safety challenges for pre-hospital emergency personnel can help to better understand the care needs of this age group and help managers to reduce children's safety challenges in pre-hospital missions.

7. Declarations

7.1. Acknowledgement

Many thanks to honorable vice chancellor for research, Dezful University of Medical Sciences, for funding and supporting current study (Grant No:98078).

7.2. Authors' contribution

Study concept and design: HA and BF; Data gathering and interpretation of data: BF and HA; Drafting of the manuscript: BF, HA, AI, LM and MR. All authors reviewed and approved the final version of the manuscript.

7.3. Conflict of interest

There are no personal or organizational conflicts of interest.

7.4. Funding

The fund for this study was received from the credibility of the research plan approved by Dezful University of Medical Sciences (Ethical code; IR.DUMS.REC.2020.018).

References

1. Eriksson C, Schoonover A, Harrod T, Meckler G, Hansen M, Yanez D, et al. Retrospective chart review and survey to identify adverse safety events in the emergency medical services care of children with out-of-hospital cardiac arrest in the USA: a study protocol. BMJ Open. 2020;10(10):e039215.
2. Oulasvirta J, Harve-Rytsälä H, Lääperi M, Kuisma M, Salmi H. Why do infants need out-of-hospital emergency medical services? a retrospective, population-based study. Scand J Trauma Resusc Emerg Med. 2021;29(1):13.
3. Fidacaro GA, Jr., Jones CW, Drago LA. Pediatric transport practices among prehospital providers. Pediatr Emerg Care. 2020;36(11):e632-e5.
4. Ely M, Edgerton EA, Telford R, Page K, Hemingway C, Vernon D, et al. Assessing infrastructure to care for pediatric patients in the prehospital setting. Pediatr Emerg Care. 2020;36(6):e324-e31.
5. Guise JM, Meckler G, O'Brien K, Curry M, Engle P, Dickinson C, et al. Patient safety perceptions in pediatric out-of-hospital emergency care: children's safety initiative. J Pediatr. 2015;167(5):1143-8.e1.
6. Owusu-Ansah S, Moore B, Shah MI, Gross T, Brown K, Gausche-Hill M, et al. Pediatric readiness in emergency medical services systems. Pediatrics. 2020;145(1):e20193308.
7. Hewes HA, Genovesi AL, Codden R, Ely M, Ludwig L, Macias CG, et al. Ready for children part II: increasing pediatric care coordination and psychomotor skills evaluation in the prehospital setting. Prehosp Emerg Care. 2021:1-10.
8. Duby R, Hansen M, Meckler G, Skarica B, Lambert W, Guise JM. Safety events in high risk prehospital neonatal Calls. Prehosp Emerg Care. 2018;22(1):34-40.
9. Miorin JD, Dal Pai D, Ciconet RM, Lima MADS, Gerhardt LM, Indruczaki NS. Transfer of pre-hospital care and its potential risks for patient safety. Texto Contexto Enferm. 2020;29: e20190073. [Portuguese].
10. Swinton P, Corfield AR, Moultrie C, Percival D, Proctor J, Sinclair N, et al. Impact of drug and equipment preparation on pre-hospital emergency anaesthesia (PHEA) procedural time, error rate and cognitive load. Scand J Trauma Resusc Emerg Med. 2018;26(1):82.
11. Jamshidi H, Jazani RK, Alibabaei A, Alamdari S, Kalyani MN. Challenges of cooperation between the pre-hospital and in-hospital emergency services in the handover of victims of road traffic accidents: a qualitative study. Invest Educ Enferm. 2019;37(1).
12. Mosca CG, Stein C, Lawrence H. South African pre-hospital emergency care personnel's lived experiences of managing paediatric emergencies: a qualitative research design utilising one-on-one interviews. Health SA.. 2021;26:1558.
13. Dehghan-Nayeri N, Nouri-Sari H, Bahramnezhad F, Hajibabaee F, Senmar M. Barriers and facilitators to cardiopulmonary resuscitation within pre-hospital emergency medical services: a qualitative study. BMC Emerg Med. 2021;21(1):120.
14. Seid T, Ramaiah R, Grabinsky A. Pre-hospital care of pediatric patients with trauma. Int J Crit Illn Inj Sci. 2012;2(3):114-20.
15. Ali[1] AAHAR, Elhassan AA. A scientific study to determine the level of traffic safety application in Khartoum State-Sudan. American Journal of Sciences and Engineering Research. 2022; 5(1):123-36.
16. Elhalik M, El-Atawi K, Mahfouz R. Assessment of mother's knowledge on importance and need for child car afety seat in UAE. J Pediatr Neonatal Care. 2018;8:226-30.
17. Rowland M, Adefuye A. Factors that influence human error and patient safety in the pre-hospital emergency care setting: perspectives of South African emergency care practitioners. Health SA. 2022;27:1798.
18. Jepsen K, Rooth K, Lindström V. Parents' experiences of the caring encounter in the ambulance service-a qualitative study. J Clin Nurs. 2019;28(19-20):3660-8.
19. Safi-Keykaleh M, Khorasani-Zavareh D, Ghomian Z, Nateghinia S, Safarpour H, Mohammadi R. Barriers and requirements in the off-line emergency medical protocols implementation in Iranian pre-hospital system: a qualitative study. J Educ Health Promot. 2021;10:312.
20. Krüger AJ, Skogvoll E, Castrén M, Kurola J, Lossius HM. Scandinavian pre-hospital physician-manned emergency medical services–same concept across borders? Resuscitation. 2010;81(4):427-33.
21. McGrath SK, Whitty SJ. Accountability and responsibility defined. International Journal of Managing Projects in Business. 2018;11(3):687-707.
22. Dahlawi S, Menezes RG, Khan MA, Waris A, Saifullah, Naseer MM. Medical negligence in healthcare organizations and its impact on patient safety and public health: a bibliometric study. F1000Research. 2021;10:174.
23. Hagiwara MA, Magnusson C, Herlitz J, Seffel E, Axelsson C, Munters M, et al. Adverse events in prehospital emergency care: a trigger tool study. BMC Emerg Med. 2019;19(1):14.
24. Abbaspour S, Tajik R, Atif K, Eshghi H, Teimori G, Ghodrati-Torbati A, et al. Prevalence and correlates of mental health status among pre-hospital healthcare staff. Clin Pract Epidemiol Ment Health. 2020;16:17-23.

Supplementary

Table 1 The safety challenges of children in the pre-hospital emergencies

Lack of pre-hospital equipment needed for children	"Collar is not the right size for children, and it is difficult for children to tolerate disproportionate collar, and when collar is tied, the child gets scared and cries." "Equipment for transporting patients in an ambulance is designed for adults, and sometimes we don't have special equipment for children; for example, we don't have a special bed for children."
Physical and psychological characteristics of children	"Since children are low weight, usually every person who is at the scene of the accident moves them easily." "The anatomy of children is different from that of adults; for example, their venipuncture requires more skill." "Usually, children are playful and disrupt the treatment plan. In one case, a 5-year-old child, for whom I got an intravenous line after an accident, took the intravenous catheter during the transfer." "3-5-year-old children are afraid and start crying when they enter the ambulance cabin."
Inadequate safety of vehicles for children	"Parents usually put the child in the back seat (without a child seat) and the child is thrown out of the car during an accident."
Lack of clinical skills of personnel in pediatric care missions	"One of our weaknesses is that we do not have the skills to communicate with children. In one accident, one of the passengers was a child who was constantly crying and anxious, and the child's mother was not present. We could not calm down the child." "The emergency operator is usually a female nurse who does not have the experience of working in the pre-hospital emergency room and does not have a correct understanding of the accident conditions." "Sometimes the information and description of the situation given to us by the companions are wrong and considered one of our challenges".
Anxiety and non-cooperation of parents	"When the child has problems, the companions, especially the parents, are affected and become anxious." "most of the time, parents get angry with our repeated attempts to use the peripheral venous catheter: The peripheral venous catheter." "Our biggest challenge is the patient's family; as soon as the baby cries, they get agitated for transferring the child quickly."
Operational and legal problems	"Without a doctor's presence, the treatment procedure is performed according to the offline trauma protocol based on the patient's condition."
Lack of attention to professional responsibility in pediatric care missions	"In the accident environment and open spaces with lower temperature, we usually do not pay attention to the temperature control and maintaining the child's body temperature." "We do not check the diastolic blood pressure to control the vital signs due to the crowding of the accident scene or carelessness."
High workload pressure	"The stress of working with children is very high; when we face a dead child, the innocent image of the child stays in our mind for several days and causes us nervous pressure, especially for the personnel who have children themselves." "Fear of the reactions of the patient's companions and those around us and the lack of mental and physical security for us usually prevent us from working effectively."