Original Article

Journal of Iranian Medical Council, Volume 7, Issue no. 1
http://dx.doi.org/10.18502/jimc.v7i1.14198

Exploring Emergency Medical Technicians (EMTs) Challenges in Providing Pre-Hospital Care During COVID-19 Pandemic: A Qualitative Study

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Received: May 17 2023
Accepted: Jul 5 2023

Citation to this article:
Sadeghi M and Sohrabizadeh S. Exploring Emergency Medical Technicians (EMTs) Challenges in Providing Pre-Hospital Care During COVID-19 Pandemic: A Qualitative Study. *J Iran Med Counc*. 2024;7(1):28-39.

Abstract

Background: Emergency Medical Technicians (EMTs) face many challenges and problems as the front line of dealing with epidemics including COVID-19. Therefore, the present study was aimed at exploring the challenges of EMTs in providing pre-hospital care during the COVID-19 pandemic.

Methods: This qualitative research was conventional content analysis conducted between November and December 2021. The participants were 15 emergency medical technicians working in the emergency center 115 in Shahroud selected by purposeful sampling method. Data were collected through semi-structured in-depth interviews at the location of the participants. Then, the codes, subcategories and categories were extracted by inductive process.

Results: Challenges among EMTs in providing pre-hospital care during the COVID-19 pandemic were categorized under four themes including (1) work factors (high work pressure, non-cooperation of patients, difficulty working with protective equipment) (2) unprepared organization (lack of coordination between medical centers, (3) threatened health (psychological disorders, physical problems) and (4) restless social (challenges with family members, social isolation).

Conclusion: Health care managers, authorities and policy makers should use effective strategies to prevent and reduce the challenges of EMS workers in order to minimize their negative effects on EMTs and improve the quality of services provided.

Keywords: COVID-19, Emergency Medical Technicians, Humans, Pandemics

Introduction

The COVID-19 epidemic began in late 2019 in the city of Wuhan, China, and was declared a pandemic by the World Health Organization (1). The significant increase in the number of patients and their death rates have faced many problems for the medical staff (2). In different countries, this epidemic increased the exposure of medical workers to COVID-19, including pre-hospital emergency technicians (3). The impact of the COVID-19 pandemic has been shown on the behavior of healthcare workers, such as fear of infection, concern for family health, interpersonal isolation, distress and anxiety (4-6).

As an important part of health care and disaster management systems, pre-hospital emergency operations staff deal with patients in need of emergency services (7). Providing care in pre-hospital environments is worse than providing care in controllable environments such as hospital environments due to different problems and challenges such as the need to make quick decisions, overcrowding and the need for emergency measures without having sufficient information about the patients' situation (8). Significant negative effects of COVID-19 on the provision of pre-hospital emergency medical services have been demonstrated and epidemics can put them at high risk of infection, physical and psychological harm, and death (9).

As disasters increase worldwide, the need for Emergency Medical Services (EMS) also increases, as they are an essential part of any disaster management system (10). Examining the experiences of prehospital emergency technicians with the COVID-19 pandemic helps to identify challenges related to their daily work and develop strategies to deal with these challenges (11). The harsh, unsafe, and uncontrollable conditions of prehospital environments, including work at home, public places, and crime and accident scenes, put additional pressure on staff (12). Due to the increased demand for health care services during epidemics, the workload of emergency technicians increases significantly (13,14). Problems associated with ethical conflicts, such as obtaining informed consent, giving bad news, protecting patient privacy, and managing patient refusals for treatment or transfer, can also lead to ethical tension in prehospital emergency technicians (15). According to the results of previous studies during epidemics, health care providers experience high levels of occupational stress due to heavy workload, high risk of infection, inadequate personal protective equipment, understaffing, separation from family and response. Patients experience negative emotional distress and burnout in triage, medical decision-making, and urgent resource allocation during the COVID-19 pandemic (16,17). It has been shown that over 70% of healthcare professionals experienced psychological distress during the acute phase of the COVID-19 epidemic (18). These problems can cause physical and mental problems for EMTs, they create permanent physical and mental effects in these personnel (13,19-22). As a result, these challenges and problems can affect the ability of EMTs to provide quality care to patients with or suspected of having COVID-19 (13).

It should be noted that the developments of effective strategies for disaster management and the effective handling of the challenges during the COVID-19 pandemic depend on a deep understanding of this problem. On the other hand, to our knowledge, the literature mostly focused on the challenges of the emergency workers in normal conditions. In the current research, the researchers have focused on the deep identification of the EMTs challenges during COVID-19 pandemic. Thus, the present study is aimed to explore the challenges of EMT in providing pre-hospital care during the COVID-19 pandemic in northeastern Iran. Our findings can help with improving the quality of pre-hospital emergency care.

Materials and Methods

Study design

This qualitative research was conducted using conventional content analysis method from November to December, 2021. Then the codes, subcategories and categories were extracted by inductive process. The knowledge gained was based on the perspective of the participants (23).

Settings

The present study was conducted in a pre-hospital emergency center in the northeast of Iran. Participants' information was collected from the pre-hospital emergency center in Shahroud district. Shahroud district is located on the way of Tehran-Mashhad

highway in Iran and hence, it has a special location regarding the various levels of EMTs works (24). The participants were all operational emergency technicians working in one of the urban (8 technicians) or road (7 technicians) bases.

Participants

The participants included 15 EMTs working in Shahroud EMS Center. The participants were selected using purposeful sampling method. Inclusion criteria were EMTs working in emergency centers and having experience of providing care to patients with or suspected of COVID-19 for at least one year since the diagnosis of the first case in Iran on February 19, 2020. Exclusion criteria included not willing to participate in the study and not providing care for patients with COVID-19.

Data collection

Data were collected using semi-structured in-depth interviews at the participants' location. Before starting any interview, the researcher explained the purpose of the research and the process of conducting it to the participants. Face-to-face interviews were conducted in full compliance with health precautions. At the beginning of the interview, the researcher gave a brief description of his personal and educational information to create a friendly atmosphere, then explained the necessity of the research and how to conduct and report it. After obtaining written consent from the participants, the interview began with some demographic questions. The interview then continued using open-ended and in-depth questions about the challenges of providing care to patients with COVID-19. The main questions which were asked form the participants included "How is your experience of working during the COVID-19 pandemic?" and "What challenges and stressful situations did you face?". Probing was used in order to understand the depth of the participants' experiences. The duration of the interviews varied from 40 to 60 *min* and all the interviews were recorded with the permission of the participants and notes were taken during the interview if needed. Data collection continued until reaching data saturation, that is, when no new concept was obtained from the interviews. But for more certainty, 2 more interviews were conducted after data saturation.

Data analysis

Data collection and data analysis were done at the same time using inductive content analysis approach (25). Verbatim transcription was conducted immediately after each interview. Then the text was examined to understand its main concept, and each interview text was considered as a unit of analysis, and meaning units were identified and coded. The generated codes were grouped into sub-categories according to their similarities. Finally, subcategories were compared and grouped to develop larger categories and identify hidden content of the data.

Trustworthiness

To ensure the trustworthiness of the data, four strategies were followed (26). In order to gain credibility, things like selecting participants with maximum diversity and member check were conducted. For the purpose of verifiability, parts of the interview text along with all the codes, categories and subcategories were extracted by 1 observer outside the research team and familiar with the qualitative method.

To achieve reliability, the participation and using the opinions of all the authors were considered in the analysis and coding. To ensure the validity, detailed data on the age, gender, work experience, and education level of the participants as well as the characteristics of the study environment were provided, which helped the readers of the article to better understand the study context. Transferability was also ensured through sampling with maximum diversity in terms of age, education level, work experience and workplace. In order to obtain the criterion of transferability, items such as frequent use of direct quotes from the research participants, full description of the research steps and how they were carried out, and presentation of the research results for 3 EMTs from abroad were observed.

Results

In the current study, 15 emergency personnel including 8 from the road emergency department and 7 from the urban emergency department participated. The average age of the employees was 32.46±7.14 and their average work experience was 8.22±3.51

Table 1. Demographic information of the study participants

Variable	N	%
Age groups (years)		
24–34	7	46.67
35–45	5	33.33
≥46	3	20.00
Workplace (EMS station)		
Urban	7	46.67
Road	8	53.33
Work experience (Years)		
≤ 5	4	26.67
6-15	7	46.66
≥16	4	26.67
History of COVID-19 affliction		
Yes	6	40.00
No	9	60.00

EMS-Emergency Medical Station

(Table 1).

After analyzing the data, the selected codes were obtained from the interviews, which were classified into 11 subcategories and 4 categories (Table 2), which are listed along with quotes and explanations.

1. Work factors

a) Excessive workload

All the participants mentioned problems such as the increase in the number of missions and the difficulty of work. They also stated that these problems put them under a lot of work pressure and they are exhausted. Due to the high-stress and unpredictable nature of the pre-hospital environment, working in the COVID-19 pandemic conditions can increase the volume in long *hrs*. On the other hand, lack of human resources causes double work pressure on the pre-hospital emergency staff. One of the participants stated that:

"Due to the difficult conditions and heavy workload, we experienced difficult conditions as the result of the frequent infections of our colleagues and trying to follow the protocols, as well as worrying about our own infection and contamination" (P1).

b) Non-cooperation of the patients

Lack of cooperation and companionship of some patients or their family members caused problems in the work process. Non-cooperation in transporting people with symptoms, non-compliance with medical treatment, recommendations and recommended health instructions from patients, families and companions, such as refusing to wear a mask, were among the things that were reported in several cases. Despite the strict recommendation to transfer patients suspected of having COVID-19, the patients refused to do so or refused to go to medical centers" (P2).

c) Difficulty of work

The difficulty of repeatedly using protective personal equipment (gun, mask and gloves) and changing them frequently inside the ambulance cabin were among the issues reported. Due to the high contagiousness of the coronavirus and the necessity of frequent use of a mask during work, which was sometimes accompanied by the heat of the air, as well as the closed environment inside the ambulance cabin, made medical and care interventions more difficult in pre-hospital care.

"Working with the gun and mask in the hot weather inside the ambulance is really difficult, and we have never experienced anything like this before, and with those conditions, we had to provide treatment for the patient, which was very difficult, especially in the beginning" (P4).

2. Unprepared organization

a) Lack of coordination of medical centers

Lack of cooperation of medical centers in accepting suspected or infected patients and the occurrence of some inconsistencies were reported as other work problems, especially at the beginning of the epidemic.

Table 2. EMTs' challenges of prehospital care delivery during the COVID-19 pandemic

Selected codes	Subcategories	Categories
Increasing the number of missions	Excessive workload	Work factors
Job difficulty		
Decrease in number of personnel		
Non-cooperation in transferring the patient	Non-cooperation of the patients	
Failure to follow health recommendations		
Difficulty using protective equipment		
Frequent change of protective clothing	Difficulty working with protective equipment	
Work in hot weather with protective equipment		
Failure to accept patients	Lack of co-ordination medical centers	Unprepared organization
Lack of coordination between medical centers		
Lack of personal protective equipment	Resource limitations	
Lack of disinfectants		
Lack of sanitizers		
Lack of proper preparation of employees	Inadequate preparation of employees	
Lack of relevant training		
Lack of attention from the authorities		
Lack of proportional wage increase	Inadequate motivation of human resources	
Lack of employee motivation		
Anxiety, worry, fear	Mental disorders	Threatened health
The feeling of sadness caused by many people suffering		
Feeling guilty about being a carrier and the possibility of contagion to others		
Feeling depressed due to severe complications or death due to covid-19		
Pain	Physical problems	
Insomnia (lack of sleep)		
skin problems		
Tension with family members	Challenge with family members	Restless society
Being rejected from the family		
Family concerns		
Arguments with family members		
Willingness to withdraw from society	Social isolation	
Lack of presence in society		
Arguing with others due to job conditions		
Staying away from others due to the possibility of contamination		
Reduction of interpersonal relationships in society		

Non-admission of suspected or infected patients due to the lack of necessary infrastructure for their care and treatment was among the cases that were reported, especially at the beginning of the epidemic, which also caused confusion for the staff.

"Sometimes we were delayed and confused to deliver a patient to the hospital due to the lack of previous arrangements, which caused discomfort and increased work pressure" (P5).

b) Resource limitations

According to most of the participants, there was a lack of facilities and personal protective equipment, especially at the start of the COVID-19 pandemic, and staff were sometimes forced to wear masks multiple times. Also, some equipment that could prevent the spread of the disease to a large extent, especially in critical patients, did not exist.

"Due to the lack of masks at the beginning of the disease outbreak, masks were provided to us on a ration basis, and we had to use them several times, or sometimes we did not have enough disinfectants" (P11).

c) Inadequate preparation of employees

At the beginning of the epidemic, due to the unknown nature of the disease and the lack of preparation to work in the conditions of the COVID-19 outbreak, preparation of the employees was not at the optimal level. Although some training programs were provided by the training unit in the form of webinars or mass media before or during the outbreak of the COVID-19 disease, but due to the unknown nature of the disease, in many cases, the staff did not have enough knowledge and awareness.

"Due to the unknown nature of the disease and the lack of previous experience, we were not sufficiently prepared to work in such conditions, although over time, we gained better preparation with the training we received through the training unit or television and virtual networks" (P3).

d) Insufficient motivation of human resources

Most of the EMTs stated that their physical and mental needs were neglected by the organization and emphasized their need to receive more psychological support. They also believed that they should have been appreciated by the authorities much more and sometimes they have been treated with disrespect and neglect by the authorities. The participants complained that some of the benefits related to increased wages due to working in pandemic conditions were not only match ed with the hardships of their work, but also unfairly discriminated between them and other treatment groups.

"Unfortunately, we feel that our work and efforts are not noticed by the authorities, and we felt that all the looks and attentions are only towards some other treatment groups, and for example, the salaries and fees were not paid fairly between different groups" (P8).

3. Threatened health

a) Mental disorders

The participants stated that working during the COVID-19 pandemic caused them psychological problems, including anxiety, worry, fear, for various reasons. These problems continued not only in the workplace but also outside the workplace. The risk of contracting COVID-19, the possibility of transmitting the disease to the family members, the fear of asymptomatic patients and injured being infected, were the most important causes of fear and anxiety among Emergency Medical Technicians (EMTs). Also, there is a lot of stress when dealing with sick patients, which increases the possibility of disease transmission in these conditions.

"My mental fatigue and mental problems were mostly due to long-term involvement with work in these conditions, which sometimes caused me to be in a bad psychological condition, especially when I witnessed the death or severe complications of illness in others, and I often felt sad and depressed. He was giving hands" (P6).

b) Physical problems

Some participants reported some physical problems such as body aches, headaches, insomnia or lack of sleep, skin problems (itching and pain due to prolonged use of the mask), extreme heat caused by wearing protective clothing. They mentioned the skin problems caused by excessive sweating as well as disturbance in their rest and sleep schedule.

"Sometimes, due to the increased use of masks and gloves, I would experience itching and skin problems,

or I would constantly feel headaches or body aches during the day. Sometimes, due to stress and work pressure, I would not sleep properly or would not sleep at all" (P9).

4. Restless society

a) Tension with family members

Staying away from family members due to the possibility of being a carrier of the virus and the possibility of its spread to family members over time caused tension, worry, sometimes arguments and rejection from the family members, which can cause feelings of lack of support from family members and loneliness in the staff. The family's lack of empathy and dissatisfaction with working conditions and dealing with COVID-19 patients can complicate the challenges related to this issue.

"When I came home from work, I was constantly worried that I might not be a carrier of the virus and that it would spread to my family, and it made me distance myself from them, and over time, this situation caused my wife to be upset and dissatisfied with this situation. The case also led to our argument" (P6).

b) Social isolation

Some EMTs stated that they experienced fear and the risk of being rejected by others in the community. Lack of social support can lead to stigma and social isolation. Lack of understanding of the people of a society about the working conditions of the employees and the non-acceptance of the working conditions of the treatment staff and their behavior can cause them to withdraw from the society and cause future problems.

"I felt that some people avoided me because of my job, or in a few cases when they found out about my job, they treated me in a wrong way, which was not pleasant" (P7).

Discussion

The present study was conducted using a qualitative approach in order to explain the challenges of EMTs in providing pre-hospital care during the COVID-19 pandemic. The results of the study showed the problems faced by pre-hospital emergency workers in providing care to patients with COVID-19 with a qualitative approach so that these workers have experienced important challenges in physical, psychological, organizational and work dimensions. The results of other studies in this field have also expressed concerns of frontline workers while caring for patients during the coronavirus pandemic (27-29). One of the important challenges of the pre-hospital emergency workers was related to work issues, among which we can mention the high workload caused by the increase in the number of missions, the difficulty of the work and the decrease in the number of personnel. The increase in the number of calls to EMS centers is accompanied by the increase in the number of EMS missions, which is a great challenge for EMTs (11). The results of similar studies in this field have also shown that the increase in patients and concerns of the general public has significantly increased the number of calls to EMS, which in turn increases the workload of EMTs (21,30). Similar to our study, heavy workload has been shown to be among the main challenges in providing care for EMTs during the COVID-19 pandemic (11). In general, public health emergencies, such as disease epidemics such as influenza, impose a heavy burden on health care providers (31). A significant increase in the workload of EMTs during the H1N1 pandemic has already been demonstrated (32).

Non-cooperation of patients in transferring the patients with or suspected of COVID-19 disease, as well as non-compliance with health recommendations, were challenges of EMS employees. These findings highlight the necessity of providing quality and timely culturally appropriate training in epidemics in order to create a healthy level of emotional fear in society and thus promote people's adherence to training and protocols. It is important and necessary to reassess the approach to monitor testing and implementing changes that focus on regulatory adaptation and the development of the infrastructure needed to respond effectively during such crises (33).

The difficulty of working with protective equipment and factors such as the difficulty of using PPE, changing them frequently, and working in hot weather while using PPE were other challenges related to the work sector. Wearing and removing protective clothing and equipment repeatedly, in addition to creating psychological pressure, causes

harassment and fatigue of employees (34). Another study reported challenges associated with the use of protective equipment, including the occurrence of respiratory problems (35).

Organizational challenges such as lack of coordination between medical centers, limited resources, insufficient preparation of employees and inadequate motivation of human resources were among the other challenges raised during the COVID-19 pandemic. It would be important to implement changes that focus on developing the infrastructure needed to respond effectively during such crises (33). In a similar study, EMT employees experienced problems such as long mission duration, fatigue, conflict with hospital staff, and dissatisfaction of staff and patients (11). Also, most previous researches reported that in many countries of the world, employees faced a lack of protective equipment during the COVID-19 pandemic (36,37). In this regard, the result of a study also reported the lack of personal protective equipment as the main challenge in providing care for EMTs during the COVID-19 pandemic (11). Inadequate personal protective equipment can put health care providers at risk of health problems and thus negatively affect the overall performance of the health care system (36). In previous studies, the lack of personal protective equipment during epidemics and disasters has been reported (38,39). This problem has also been reported during outbreaks of diseases such as MERS, SARS, Ebola, and influenza (40-42). Proper training is critical to preparing a sustainable workforce for the outbreak of COVID-19 (33). It can be stated that due to the increase in the use of health products and the lack of preparation of countries during the outbreak of epidemics, access to these materials is difficult.

Health challenges including mental disorders and physical problems are also among the other challenges reported in this study. Due to the difficult conditions of the COVID-19 epidemic, problems such as anxiety, worry and fear due to the high involvement of employees, guilt about being a carrier and the possibility of contagion to others, and feelings of depression due to the severity of complications or death caused by COVID-19 cause tension. It is in EMTs. The results of several studies have presented similar findings regarding psychological problems among EMTS during outbreaks of epidemics (5,43,44). Depression, anxiety, and Post-Traumatic Stress Disorder (PTSD) are common psychological challenges that affect EMS providers. Studies have shown that EMS providers experience psychological challenges due to disaster response without receiving needed psychological support. In this regard, EMTs are at the forefront of providing care to patients with COVID-19 and are therefore at risk of contracting these diseases (10). Therefore, employees have a deep fear and anxiety of contracting the disease and spreading it to their families (5,11,45).

Physical problems such as pain, insomnia, lack of sleep, and skin problems were reported. a similar study showed that nurses did not drink water after wearing protective clothing in order not to go to the toilet to save this clothing. The occupational health of EMS personnel in the face of the corona virus depends on their access to adequate PPE (46). As a result, with longer working *hrs*, this leads to stress, physical and mental fatigue, and finally burnout (47) and during an epidemic, many physical problems such as fatigue, insomnia, headache and anorexia spread among employees (48). In the difficult conditions caused by the spread of the corona virus, EMS personnel are exposed to various types of psychological issues, including fear, emotional instability, lack of resilience, and post-traumatic stress disorder (46). Due to the nature of emergency duty, emergency workers are at increased risk for back pain and other physical problems.

This study is one of the few studies that investigated the challenges of pre-hospital emergency workers, which can provide useful information for future planning and policies to managers and officials. Prehospital emergency workers are vulnerable to multiple challenges in caring for their patients during COVID-19, which must be addressed to protect them in pandemics (49). The measures are taken to reduce their challenges so that these employees can work in better conditions. One of the main limitations of the study was the scheduling of the interview because the EMT staff had difficulty in determining the time of the interview due to long work shifts and insufficient rest, and the time of the interview changed many times. Also, following the hygiene rules for the interview, such as maintaining a safe distance and wearing a mask, in some cases, the voice of the respondents did

not rise during the recording of the interview, and the researchers asked the participants to speak louder. Furthermore, not generalizing the findings to other EMTs in different geographic-cultural contexts, due to the small sample size and the characteristics of the participants, is another limitation of this study.

Conclusion

The results demonstrated that EMT staff in caring for patients with COVID-19 face multifaceted challenges such as work factors, unprepared organization, threatened health and restless social. These challenges which are related to individuals and staff, EMTs and other health care providers, and health care organizations, can significantly affect the quality of prehospital care delivery by EMS. To cope with these emerging conditions and overcome challenges, the strategies such as performing religious activities and adding a spiritual dimension to work, trying to get family support, creating an empathetic atmosphere in the workplace and strengthening the sense of self-worth and responsibility can be used. In addition, the challenges can be reduced by providing adequate protective equipment, a suitable work environment and more social and financial support, appropriate management of work shifts, paying more attention to the physical and mental health of pre-hospital emergency workers and considering suitable mechanisms for communication. It is also possible to provide better conditions for these employees by reproducing and strengthening the strategies used for them. Future research is needed to investigate challenges and experiences of EMS workers in other disasters and critical situations.

Acknowledgements

The authors wish to acknowledge all the participants in the study. Ethical approval of the research was obtained from the Ethics Committee of Shahid Beheshti University of Medical Sciences, Tehran, Iran (Ethical code: IR.SBMU.PHNS.REC.1401.081).

Conflict of Interest

The authors declare they have no competing interests.

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