

EXPLORING THE CHALLENGES OF PREHOSPITAL EMERGENCY PERSONNEL IN COVID-19 PANDEMIC: A QUALITATIVE STUDY

Zohreh Sarchahi¹, Hasan Ghodsi^{1*}, Rasool Iakziyan², Razieh Froutan^{3,4}

1. Department of Nursing, School of Nursing and Midwifery, Neyshabur University of Medical Sciences, Neyshabur, Iran
2. Department of Nursing, Sabzevar University of Medical Sciences, Sabzevar, Iran.
3. Nursing and Midwifery Care Research Center, Mashhad University of Medical Sciences, Mashhad, Iran
4. Department of Medical-Surgical Nursing, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran

Correspondence: Hasan Ghodsi; ghodsih1@nums.ac.ir

ABSTRACT

OBJECTIVES:

To explore the challenges and experiences of Prehospital Emergency Personnel in the context of the COVID-19 pandemic in Iran.

DESIGN:

Qualitative study

SETTING:

Prehospital Emergency Medical Services (EMS), Iran.

PARTICIPANTS:

15 Prehospital Emergency personnel were invited to participate. Semi-structured in-depth interviews were conducted between January to March 2021.

RESULTS:

Themes relating to challenges of Prehospital Emergency Personnel in COVID – 19 were: Lack of preparedness of EMS for the pandemic, shortage of Personal Protective Equipment (PPE), psychological distress and negative emotions, shortage of staff and challenges associated with delivering care for patients using PPE.

CONCLUSIONS:

The current study found that Health Care Workers (HCWs) in the prehospital emergency field had multiple challenges in caring for their patients during COVID-19. Therefore, they are vulnerable in this situation. These challenges must be addressed in order to protect them in pandemics.

KEYWORDS

Pandemics; COVID-19; Personal Protective Equipment; Emergency Medical Services; Psychological Distress.

INTRODUCTION

On 1 December 2019, the global outbreak of the novel Severe Acute Respiratory Corona Virus-2 (SARS-CoV-2), known as COVID-19, was reported by the World Health Organization. This was the first pandemic caused by the virus. [1] By December 14, 2021, more than 271 million confirmed cases and 5.3 million deaths of COVID-19 globally were reported. [2] In Iran, the number of confirmed cases has been recorded at more than 3 million with 82,217 deaths as of June 15, 2021. Due to exposure to patients with COVID-19, front-line Health Care Workers (HCWs) were at high risk of this infection which may contribute to death. In Iran, it has been registered that over 12,000 HCWs have been infected and 164 HCWs have died from COVID-19 so far. [3] The HCWs who are in contact with the pandemic COVID-19 may develop different psychological and mental disorders including symptoms of depression, insomnia, anxiety, posttraumatic stress disorder (PTSD), and burnout.

In a study conducted in Wuhan, China, it was found during the COVID-19 pandemic that a significant percentage of HCWs have been experiencing symptoms of depression (50.4%), anxiety (44.6%), insomnia (34%) and distress (71%). [4] Another study conducted on HCWs during COVID-19 showed that 39.1% of front-line HCWs during the fight against COVID-19 had been challenged with psychological problems. [5]

Prehospital Emergency Personnel are among the front-line HCWs who provide urgent care to people, are at a different risk of infections because they have close contact with both symptomatic and asymptomatic cases. Therefore, during the COVID-19 crisis, in providing essential care to patients, Emergency Medical Services (EMS) may encounter the factors associated with increased risk of anxiety, fear of infection, and burnout. [6]

Due to the fact that there is still not enough information available about this disease, and its form is getting changed every day, this intensifies the difficult decision-making for HCWs who have faced in these situations. [7] However, a number of studies have been conducted on previous challenges facing pre-hospital emergency care staff, [3-8] the challenges will be certainly different than before considering the different nature, spread rate and mortality of SARS-CoV-2.

The aim of this study was to investigate the challenges experiences with Prehospital Emergency Personnel in the context of the COVID-19 pandemic in Iran.

METHODS

DESIGN AND SETTING

This study adopted a conventional approach to qualitative content analysis. [9] Semi-structured interviews were conducted with Prehospital Emergency Personnel from the different provinces of Iran from 20 January to 30 March 2021. EMS Iran is an affiliate of Iran's Ministry of Health. There are 2,190 Emergency bases in 31 provinces of Iran.

PARTICIPANTS

The participants were chosen using a purposive sampling method with maximum diversity in education, age and gender. We selected the participants who had at least six-months experience in caring for patients with COVID-19 in the field through prehospital emergency medical services to obtain realistic perspectives from the challenges EMS faced. Sampling continued until a point of theoretical saturation was reached, i.e., when no new data were generated. The research participants were asked to sign a consent form in which the participants have a right to withdraw from the study at any time.

DATA COLLECTION

Semi-structured in-depth interviews were conducted with participants to explore the challenges EMS faced during the COVID-19 pandemic period. On average, the interviews lasted between 45 and 60 minutes and were conducted by the same interviewer H Gh (in Persian). The time and location of the interviews were arranged by agreement with the participants. The interview guide and questions were developed and modified after review of the related literature using opinions from experts and was tested in two pilot interviews. One major question and several minor ones were set.

An interview guide containing a list of general open-ended questions, such as "How do you describe your work experiences in EMS during the COVID-19?", "What challenges have you been facing during missions with patients who needed care for COVID-19?" and if needed, a probe question, "Could you describe in detail what you mean?" was used. The interviews continued until data saturation. To ensure data saturation, two additional participants were interviewed.

DATA ANALYSIS

The deployed analytical approach was a qualitative content analysis (Graneheim and Lundman approaches). [10] Audio-recorded interviews were transcribed verbatim and verified by participants. For immersion, the interviews were read several times and the data analysis was started line by line and the initial codes were extracted. Data were compared to find similarities and differences, then labeled and classified into categories and subcategories. Finally, the underlying meanings were interpreted as themes. Data from the interviews were initially coded by H Gh and codes were cross-checked with R F.

RIGOR

Trustworthiness of research was established through credibility, dependability, conformability and transferability. To fulfill this objective, prolonged engagement with data, constant comparison analysis, member checks, peer checks and maximum variation of sampling were accomplished. [11]

ETHICAL CONSIDERATIONS

The Ethical Committee of Neyshabur University of Medical Sciences, Iran approved this study (IR.NUMS.REC.1400.013). The principles of informed consent and confidentiality were observed carefully. All participants were assured about their anonymity and confidentiality of any information. Moreover, all of them were assured that they could quit the study at will.

RESULTS

15 participants consisting of six paramedics, three dispatchers, one anesthesiology assistant, two physicians and three nurses were studied. They were within the age range of 24-48 years, with an average age of 33.8 ± 8.29 years (66.7% male) and a mean working history of 9.67 ± 6.37 years (Table 1).

TABLE 1. PARTICIPANT CHARACTERISTICS

NO	AGE(YEARS)	POSITION	WORKING EXPERIENCE(YEARS)
1	25	Paramedic	3
2	45	Nurse	20
3	36	Dispatcher	5
4	43	Paramedic	15
5	24	Paramedic	5
6	32	Paramedic	8
7	24	Anesthesiology assistant	3
8	35	Nurse	12
9	48	Paramedic	22
10	43	Dispatcher	18
11	38	Physician	10
12	34	Nurse	8
13	25	Paramedic	5
14	25	Dispatcher	3
15	34	Physician	8

Challenges facing Prehospital EMS staff were classified under five main categories including: 1- lack of preparedness of EMS for pandemic 2- Shortage of personal protective equipment (PPE) 3- Psychological

distress and negative emotions in staffs 4- Shortage of staff 5-Challenges associated with delivering care for patients using PPE (Table 2).

TABLE 2. THEMES AND SUB-THEMES

N	THEME	SUB-THEMES
1	lack of preparedness of EMS for pandemic	- Education & training gap - Inconsistent Guidelines - Lack of operational plan
2	Shortage of Personal Protective Equipment	-Shortage of mask, hand rub, PPE - Barrier in access - Lack of alternative
3	Psychological distress and negative emotions in staffs	- Risk of disease - Transition disease to family members - Unknown nature of disease - Fear of death - Sympathy with family of patients
4	Shortage of staff	-Self isolation period - Positive test - Increased missions - Leave the job - Setting up new EMS centers
5	Challenges associated with delivering care for patients using PPE	- Providing care problem - Communication problem - Uncomfortable PPE - Hardness of eating & drinking with PPE

LACK OF PREPAREDNESS OF EMS FOR PANDEMIC

Most participants agreed that all pre-hospital emergency care staff were not sufficiently prepared for this pandemic. They also stated that at the start of the COVID-19 outbreak, the operational plan to respond to this pandemic was not clearly delineated.

“We were deeply surprised; it was difficult to believe that such a thing had happened. First few days, there were no special procedures and safety instructions for receiving and transporting a patient, ambulance cleaning and disinfection and so on. We felt as if we were drowning in the sea while we were not prepared to deal with that”. P8

“No one, even, had thought that we've faced such a global catastrophe, we were all stunned. We weren't adequately trained and qualified to deal with this disease. Even, in early days, we didn't know how to put the PPE on and take it out to avoid being contaminated. It was the first

time I had experienced dealing with an infectious disease”. P4

“Early on, there weren't any specific instructions, dispatch protocols and standard operating procedures for receiving the patients with COVID-19. We were limited by inadequate information, and every day we received a new circular that might be different from the last-day one and this can make a person confused. Everything seemed to be going wrong. It can be said that we weren't well-prepared to deal with such this unknown infectious disease”. P14

SHORTAGE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

All participants noted the shortage of personal protective equipment that was required for doing missions early in the pandemic. The biggest shortage was profound among personal protective equipment and N95 filtering masks.

They were really worried about being infected with COVID-19 due to the lack of equipment (especially those with underlying medical conditions or pregnant women).

"Early days, there were shortages of essential PPE for everyone such as respirators masks. We had to wear the same clothes for more than one mission without changing them. We don't have enough appropriate gloves and glasses". P11

Sometimes, there wasn't an appropriate size of personal protective clothing for us. You know, most of these clothes are equal in size and they weren't well-fit for me because I'm short. The masks were not correctly fixed and fitted on my face well. Some filtering respirators didn't meet the quality of standards and their filters got detached.

PSYCHOLOGICAL DISTRESS AND NEGATIVE EMOTIONS IN STAFFS

The participants were sharing their experiences including the fear of getting infected and seriously ill due to the coronavirus which would result in death. It being a horrible disease because of its unknown nature and of being a carrier and transmitting it to another person. Also, they were worried about returning home and infecting their family with the virus.

"Every day, on the way to go to work, I thought it was the last time that I would see my family. Because our mission was to give care to COVID-19 patients every day, I was afraid of becoming infected by the virus. I got nervous when I heard of the death of patients and my colleagues". P5

"There is no(sic) enough information about the disease including how to transmit, treat and bury the bodies. These patients were dying alone in hospital rooms. The hospital neither allows the patients to have visitors and nor delivers the dead patients' bodies to their families. Nobody is permitted to participate in their burial ceremonies. This is too deep anxiety that I feel like I'm going insane. I don't want to die like this (having a lump in his throat)". P15

SHORTAGE OF STAFF

All participants pointed out the severe shortage of staff, due to the 14-day self-isolation period when they tested positive for COVID-19, the increased number of EMS missions and the need to establish new bases at EMS centers during the COVID-19 pandemic.

"According to instruction, the staff had to self-isolate when they developed the early symptoms of the COVID-19. Also, the test results were given within 2 days. These compulsory leaves and subsequently 14-day sick leaves for a positive COVID-19 test result put a great deal of pressure on other staff who had to take mandatory overtime." P1

"First days, the people callings to EMS center was harassment. They called EMS center to ask their questions about Corona and the number of deaths and hospitalizations caused by COVID-19. We had to put more staff in the dispatch to answer the calls, while most of the staff went on sick leave and the shortage of staff was suffering." P3

"In the past one year, 80% of our pre-hospital emergency staff have tested positive. Therefore, these staff go on 14-day sick leave and it's necessary to find the replacement staff. On the other hand, since the number of missions was increasing, we had to establish some mobile bases that it caused the double shortage." P2

CHALLENGES ASSOCIATED WITH DELIVERING CARE FOR PATIENTS USING PPE

Most of the participants claimed that providing care for patients was difficult and tedious when wearing PPE. They also explain their other problems with PPE including profuse sweating, shortness of breath, local pain and damage to their ears and face with prolonged use of a mask.

"You know, working in this coverall is really difficult. It's hard to breathe during PPE use. You sweat profusely and they are cumbersome. Totally, it's better to say that you get sweltered when you use PPE and respirator for a long time. I'm not comfortable with them at all." P8

"When I have to intubate the patients, either I should be afraid of being infected intubating or we have to work in impermeable PPE that makes us feel someone ties our hands and then asks us to continue working. My face shield gets foggy and hard to see out. Providing care for patients is really hard in this clothing." P7

"We have to put on the PPE when the dispatch has announced a COVID-19 mission. This means a twofold increase in mission time. However, this wasted time is vital in prehospital care, but there is no choice. As a result, we have to speed up the ambulance to compensate for this wasted time." P12

DISCUSSION

This study found the challenges facing prehospital emergency personnel during COVID-19 pandemic included inadequate preparedness of EMS for the pandemic, shortage of personal protective equipment, psychological distress and negative emotions in staffs, shortage of staff and challenges associated with delivering care for patients using PPE. To our knowledge, this study is the first qualitative study explaining the challenges of prehospital emergency personnel during the COVID-19 pandemic in Iran.

The results of our study showed that the first category of challenges was inadequate pandemic preparedness levels of EMS. This theme was pointed out by other researchers. [7, 12] The preparedness of EMS is a key factor to control and manage any disaster such as natural, manmade or pandemics. If they aren't prepared for such a situation, they may be scared, confused, or can't do their jobs properly. According to the above, it is necessary that prehospital emergency medical managers have a preparedness plan to control and manage the pandemic. They must have ongoing policies to address the epidemic or pandemic.

Another category that is identified by this research was the shortage of personal protective equipment. PPE is one of the most important pieces of equipment to deal with a pandemic like COVID-19. [13, 14] Shortage of PPE has been reported due to the increasing worldwide demand (15). Nearly, all the participants reported a severe shortage of PPE in their workplaces. Shortage of PPE can lead to infection in the EMTs; hence, perceived shortages were a major source of stress for participants in this study, which is reported in different studies. [12, 16-18] The participants reported several adaptations in delivering care in prehospital emergency medical services in order to save PPE. Availability of PPE in the right quality and the right quantity at the right place and right time to reduce the stress of the staff is necessary. Adequate stock of PPE must be prepared by all healthcare organizations especially for frontline HCWs such as EMS staff.

When people encounter an unknown disease and pandemic, they become gripped by fear and anxiety. [19] This phenomenon is not new for COVID-19. [20] Almost all participants explained that fear and anxiety affected their work after this pandemic which is reported in different

Studies. [5, 7, 21-23] The reasons for fear and anxiety which were explained by participants included suspicion/confirmation for COVID-19, insufficient PPE, insufficient knowledge about disease, risk of infection transmission in the family. Health care managers have inevitably established psychological support systems to counter fear and anxiety in pandemics such as COVID-19 amongst their staff. Moreover, it is important for EMS staff to learn coping strategies to deal with fear and anxiety in various situations.

Another theme drawn from interviews was the shortage of staff which is explained in other studies. [7, 24, 25] The reasons for this shortage of staff are increased daily EMS calls and dispatches, staff absence, extremely vulnerable absence and 14-day self-isolation after a positive test. The average number of daily calls and dispatches in the post-outbreak periods was increased significantly. There was a substantially higher number of EMS phone calls during the post-outbreak period compared to the pre-outbreak period. [25]

Most participants described that using PPE is necessary to prevent infection, but it makes everything more difficult for health care workers. Face shields or glasses fog up whilst performing procedures on patients such as intubation. When using several layers of gloves, palpitations were less effective in physical examination. When you are wearing PPE communication with hearing-impaired older patients is difficult; so, some participants reported removing their masks when speaking about important issues with them. Also putting on the PPE can reduce the activity of EMTs while they drive an ambulance. These findings were reported in previous studies. [12, 26, 27] Comfortable PPE is an essential issue for health care providers such as EMS staff. Participants said PPE coverall could reduce their activity and focus at the scene. They noticed prolonged use of PPE had led to some complications such as headache, skin damage, and facial pain, difficulty in breathing and physical tiredness. Participants said that PPE use is not comfortable for a long time, it being time-consuming, hot, tiring and restrictive in delivery of care. Our findings showed that delay between a 115 call and EMS arrival, increased about 1.5 minutes.

STRENGTH AND LIMITATIONS

To our knowledge this is the first research study to explore challenges experiences with prehospital emergency personnel in the context of the COVID-19 pandemic in Iran.

This research has provided a comprehensive account of challenges associated with delivery cares to patients with COVID-19 in the prehospital field in Iran.

CONCLUSION

The results of this study regarding the challenges of prehospital emergency personnel in COVID-19 pandemic showed that they are not adequately equipped to an encounter with pandemics. Therefore, in preparation for further pandemics or public health emergencies, more efforts and coordination should be made to remove or reduce challenges for health care workers.

This qualitative study was conducted only utilizing interviews. In the future, research involving other methods may be needed to cover all aspects of this issue. Another limitation was the small number of participants. For this limitation, we chose our participants with maximum diversity and all of them were experienced in EMS. Supplemental employee assistant such as financial, emotional or other supports can reduce their pressure and useful for the staff in order to improve their psychological state.

ACKNOWLEDGEMENTS

The authors would like to thank all the participants for their contribution to the study.

AUTHOR CONTRIBUTIONS

The conception and design of the work was by HGH, RF and EM. Interviews conducted by HGH. Data from the interviews were coded by HGH and codes were cross-checked with RF. HGH, RF, ZS and MA were involved in the acquisition, analysis, or interpretation of data. All authors approved the submitted version and agree to be accountable for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the work will be answered.

FUNDING/SUPPORT

This study was funded by Neyshabur University of Medical Sciences, Grant/Award number: 99-01-218.

CONFLICT OF INTEREST

None declared.

DATA AVAILABILITY STATEMENT

Data are available in a public, open access repository. Data are available upon reasonable request. The data used for this study are qualitative, and the original transcripts can be made available from the first author upon reasonable request.

ETHICS APPROVAL

The Ethical Committee of Neyshabur University of Medical Sciences, Iran approved this study (IR.NUMS.REC.1400.013).

References

1. World Health Organization (WHO). Director-General's opening remarks at the media briefing on COVID-19-11 March 2020. [Available from: <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-COVID-19-11-march-2020>. Accessed 12 April 2021.
2. Johns Hopkins University. COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU). <https://coronavirus.jhu.edu/map.html>. Accessed 15 June 2021.
3. Erdem H, Lucey DR. Healthcare worker infections and deaths due to COVID-19: A survey from 37 nations and a call for WHO to post national data on their website. *Int J Infect Dis.* 2021;102:239-41. doi: 10.1016/j.ijid.2020.10.064
4. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Network Open.* 2020;3(3):e203976-e. doi: 10.1001/jamanetworkopen.2020.3976.
5. Dai Y, Hu G, Xiong H, Qiu H, Yuan XJM. Psychological impact of the coronavirus disease 2019 (COVID-19) outbreak on healthcare workers in China. 2020.03.03.20030874. doi: <https://doi.org/10.1101/2020.03.03.20030874>.
6. Anderson C, Pooley JA, Mills B, Anderson E, Smith EC. Do Paramedics Have a Professional Obligation to Work During a Pandemic? A Qualitative Exploration of Community Member Expectations. *Disaster medicine and public health preparedness.* 2020;14(3):406-12. DOI: 10.1017/dmp.2020.212.

7. Nyashanu M, Pfende F, Ekpenyong M. Exploring the challenges faced by frontline workers in health and social care amid the COVID-19 pandemic: experiences of frontline workers in the English Midlands region, UK. *Journal of interprofessional care*. 2020;34(5):655-61. <https://doi.org/10.1080/13561820.2020.1792425>
8. Sorani M, Tourani S, Khankeh HR, Panahi S. Prehospital Emergency Medical Services Challenges in Disaster; a Qualitative Study. *Emergency (Tehran, Iran)*. 2018;6(1):e26. PMID: PMC6036538
9. Strauss a cj. *Basics of qualitative research: Grounded theory procedures and techniques*. 4 ed. Losangeles: Sage publications; 2015.
10. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today*. 2004;24(2):105-12. DOI: 10.1016/j.nedt.2003.10.001
11. Boswell C CS. *Introduction to Nursing Research: Incorporating Evidence Based Practice*. Boston, MA: Jones & Bartlett Publishers; 2007.
12. Hoernke K, Djellouli N, Andrews L, Lewis-Jackson S, Manby L, Martin S, et al. Frontline healthcare workers' experiences with personal protective equipment during the COVID-19 pandemic in the UK: a rapid qualitative appraisal. *BMJ open*. 2021;11(1):e046199. DOI: 10.1136/bmjopen-2020-046199
13. Cook TM. Personal protective equipment during the coronavirus disease (COVID) 2019 pandemic – a narrative review. 2020;75(7):920-7. DOI: 10.1111/anae.15071
14. Sharma N, Hasan Z, Velayudhan A, M. A. E, Mangal DK, Gupta SD. Personal Protective Equipment: Challenges and Strategies to Combat COVID-19 in India: A Narrative Review. 2020;22(2):157-68. <https://doi.org/10.1177/0972063420935540>.
15. World Health Organization & United Nations Children's Fund (UNICEF). (2020). *Water, sanitation, hygiene, and waste management for the COVID-19 virus: interim guidance*, 19 March 2020. World Health Organization. <https://apps.who.int/iris/handle/10665/331499>. License: CC BY-NC-SA 3.0 IGO.
16. Liu Q, Luo D, Haase JE, Guo Q, Wang XQ, Liu S, et al. The experiences of health-care providers during the COVID-19 crisis in China: a qualitative study. *The Lancet Global health*. 2020;8(6):e790-e8 DOI: 10.1016/S2214-109X(20)30204-7.
17. Shanafelt T, Ripp J, Trockel M. Understanding and Addressing Sources of Anxiety Among Health Care Professionals During the COVID-19 Pandemic. *JAMA*. 2020;323(21):2133-4. doi:10.1001/jama.2020.5893
18. Gordon A, Lyons C, Rao S, Finoli L. Health Care Workers' Challenges in the Care of a COVID-19 Patient. *Critical care nursing quarterly*. 2020;43(4):400-6 DOI: 10.1097/CNQ.0000000000000325.
19. DeJean D, Giacomini M, Vanstone M, Brundisini F. Patient experiences of depression and anxiety with chronic disease: a systematic review and qualitative meta-synthesis. *Ontario health technology assessment series*. 2013;13(16):1-33. PMID: PMC3817854
20. Camara A, Sow MS, Touré A, Sako FB, Camara I, Soumaoro K, et al. Anxiety and depression among HIV patients of the infectious disease department of Conakry University Hospital in 2018. *Epidemiology and infection*. 2020;148:e8. doi:10.1017/S095026881900222X
21. Du J, Dong L, Wang T, Yuan C, Fu R, Zhang L, et al. psychological symptoms among frontline healthcare workers during COVID-19 outbreak in Wuhan. *Gen Hosp Psychiatry*. 2020; 67:144-5 doi: 10.1016/j.genhosppsy.2020.03.011.
22. Sanghera J, Pattani N, Hashmi Y, Varley KF, Cheruvu MS, Bradley A, et al. The impact of SARS-CoV-2 on the mental health of healthcare workers in a hospital setting-A Systematic Review. *Journal of occupational health*. 2020; 62(1):e12175 <https://doi.org/10.1002/1348-9585.12175>
23. Fathi E, Malekshahi Beiranvand F, Hatami Varzaneh A, Nobahari A. Health Care Workers Challenges during Coronavirus Outbreak: The Qualitative Study. *mui-jbs*. 2020;18(2):237-48. URL: <http://rbs.mui.ac.ir/article-1-745-en.html>
24. Xu H, Intrator O, Bowblis JR. Shortages of Staff in Nursing Homes During the COVID-19 Pandemic: What are the Driving Factors? *Journal of the American Medical Directors Association*. 2020;21(10):1371-7. doi: 10.1016/j.jamda.2020.08.002
25. Saberian P, Conovaloff JL, Vahidi E, Hasani-Sharamin P, Kolivand P-H. How the COVID-19 Epidemic Affected Prehospital Emergency Medical Services in Tehran, Iran. *West J Emerg Med*. 2020;21(6):110-6. DOI: 10.5811/westjem.2020.8.48679

26. Kim Y. Nurses' experiences of care for patients with Middle East respiratory syndrome-coronavirus in South Korea. *American journal of infection control.* 2018;46(7):781-7. DOI: 10.1016/j.ajic.2018.01.012
27. Lam KK, Hung SY. Perceptions of emergency nurses during the human swine influenza outbreak: a qualitative study. *International emergency nursing.* 2013;21(4):240-6. DOI: 10.1016/j.ienj.2012.08.008