Article

Obstacles to complying with health protocols in coronavirus disease 2019 patient care among emergency medical staff of Zanjan province in 2022

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Abstract

Background: As a capable arm of the healthcare system, emergency medical staff play a major role in the evolution and growth of healthcare services and the improvement and promotion of society's health. One of the problems in providing ideal care during the coronavirus disease 2019 (COVID-19) pandemic across the world, including Iran, was complying with health protocols.
Objectives: The current study aimed to investigate the obstacles to complying with health protocols in COVID-19 patient care from the emergency medical staff's perspectives.
Methods: This cross-sectional study was conducted on 197 emergency medical staff in Zanjan province in 2022. Sampling was done by cluster random method. Data were collected using a researcher-made questionnaire in 4 parts, including demographic characteristics, organizational obstacles, social obstacles, and individual obstacles. Data were analyzed using descriptive and inferential statistics in SPSS 16 software.
Results: All participants were male, with a mean (SD) age of 33.15 (5.09) years. The mean (SD) score of the obstacles to complying with health protocols questionnaire from the participants' perspectives for organizational, individual, and social factors were 3.92 (0.49), 3.47 (1.06), and 3.32 (1.12), respectively. According to the participants' perspectives, shortage of equipment 4.53 (0.79), long-term use of personal protective equipment (PPE) 4.46 (0.66), and insufficient specialized training for COVID-19 4.18 (1.11) were the most important obstacles in complying with the COVID-19 health protocols.
Conclusion: It is suggested that managers and policymakers pay attention to the obstacles identified in the present study and take these obstacles into account in the emergence of newfound future diseases.

Implications of this paper in nursing and midwifery preventive care:
- Health protocols are a beneficial strategy in preventive care to promote health. Identifying the obstacles to complying with health protocols in COVID-19 patient care will play a crucial role in promoting preventive care.

Introduction

As a pandemic, coronavirus disease 2019 (COVID-19) has infected more than 700 million confirmed cases and led to the death of about 6.8 million people all around the world. The high prevalence of this disease has imposed heavy pressure on healthcare systems, particularly in developing countries, such as Iran, and has turned its management into a worriment challenge for governments [1]. Healthcare systems encountered major challenges in ensuring the safety of healthcare workers (HCWs) who strived tirelessly for patient treatment and care. One of the risks threatening healthcare providers, including emergency medical staff, was their susceptibility to infection because of exposure to direct contact with COVID-19 patients or virus-contaminated surfaces. Therefore, prioritizing HCWs' health and safety was essential to provide high-quality patient care. Nevertheless, the implementation of safety and health during the COVID-19 pandemic encountered several challenges, such as insufficient resources, healthcare systems being under pressure, and HCWs experiencing fatigue and job burnout [2,3]. Care provision in pre-hospital environments is worse than care provision in controllable settings like hospital environments due to various problems and challenges, such as the need for quick decision-making, overcrowding, and the need for emergency measures without having enough information about patient status. Among the

significant negative impacts of COVID-19 on providing emergency medical services were exposure to high risk of infection, physical and mental harm, and death [4]. One of the strategies to diminish the COVID-19 outbreak was to formulate and implement health protocols. However, there was non-compliance with health protocols among HCWs [5,6]. Non-compliance with health protocols could potentially culminate in the spread of COVID-19 in the community and the failure of pandemic control programs [7]. Considering the extensive dimensions of the disease, heavy work pressure was imposed on the emergency medical staff, preventing them from having enough time and energy to protect themselves against this disease per se. On the other hand, shortage of emergency medical staff, shortage of medical facilities and equipment, diagnosis and treatment at the beginning of the epidemic, low applicability of personal protective equipment (PPE), lack of training for new staff, inefficient rest time, the hospital's physical environment, and even extra-organizational factors, including sanctions, were among other obstacles faced by emergency medical staff in complying with COVID-19 proposed protocols [8].

In order to review and eliminate deficiencies, promote health protocols proposed by the Ministry of Health of Iran for emergency medical staff during the COVID-19 pandemic, and use these experiences in the emergence of newfound future diseases, it is essential to identify the challenges and obstacles to complying with the existing health protocols. In the existing literature and according to our knowledge, there was a limited number of studies in this regard. Therefore, the present research was conducted to investigate the obstacles to complying with health protocols in COVID-19 patient care among the emergency medical staff of Zanjan province.

Methods

This cross-sectional study was conducted on emergency medical staff in Zanjan province from May to October 2022. The statistical population consisted of 400 people, including 128 road technicians and 272 urban technicians. In the present study, Cochran's formula was used to determine the sample size with the defined population and the values of p=q=0.5, Z^2=3.84, a=0.05, and d=0.05 were used and the sample size was calculated to be 197 people.

The participants were selected using the random cluster sampling method from road and urban bases in the counties of Zanjan province. The staff working in 115 emergency centers who directly engaged in patient care and treatment and had at least 1 year of clinical work experience were included in the study. Incomplete questionnaires were not included in the analysis process.

The demographic and occupational information questionnaire, including age, marital status, education level, field of study, work experience, service base, number of missions per week, and a history of COVID-19 infection, was completed for the study participants.

A researcher-made questionnaire was used to assess the obstacles to complying with the COVID-19 proposed protocols among emergency medical staff. This questionnaire was designed based on a library review of theoretical foundations and literature review using books, articles, theses, and proposed protocols notified by the Ministry of Health of Iran [9-12]. This questionnaire encompasses 18 questions in three domains, including organizational domain (questions 1-10), individual domain (questions 13-18), and social domain (questions 11-12) with a five-point Likert scale ranging from 1 (completely disagree) to 2 (completely agree). The score ranges were 10-50 for organizational obstacles, 6-30 for individual obstacles, and 2-10 for social obstacles. After designing the questionnaire, face validity, content validity, and construct validity were used to assess the questionnaire's validity. In order to determine face validity, the questionnaire was provided to 10 emergency medical staff to read and respond to the questions. In addition, items such as the level of difficulty in comprehending phrases and words, the level of appropriateness and desirable relationship between the phrases and the questionnaire's dimensions, and ambiguity about misinterpretations regarding the raised phrases were investigated. The questionnaire's content validity was evaluated using two qualitative and quantitative methods. In the qualitative method, the prepared pilot questionnaire was provided to 10 faculty members of nursing. In the quantitative assessment of content validity, two indices of content validity ratio (CVR) and content validity

index (CVI) were calculated. Content validity was confirmed with S-CVI=0.90 and CVR>0.60. The questionnaire's reliability was also approved using the internal consistency method and calculating Cronbach's alpha coefficient (a=0.89).
After designing the questionnaire and assessing its validity and reliability, the researcher went to the research environment to collect the data. After introducing himself, explaining the study objectives, and obtaining written consent, the researcher provided the questionnaire to the participants. The participants were asked to complete the questionnaire if they desired, and two days later, the questionnaires were gathered collectively. Relevant data were entered and analyzed in SPSS 16 software. Descriptive statistics (mean, standard deviation, frequency, and percentage) and the independent t-test and analysis of variance (ANOVA) statistical tests were employed for data analysis. A significance level of less than 0.05 was considered.

Results

All participants were male, with a mean (standard deviation [SD]) age of 33.15 (5.09) years and a mean (SD) of work experience of 5.52 (3.17) years. Most of the participants were married (70%) and held a bachelor's degree (72%) in emergency medicine (53%). Also, the majority of them (68%) worked in urban bases. The participants' demographic characteristics are provided in Table 1.
The mean (SD) score of the obstacles to complying with health protocols questionnaire from the participants' perspectives for organizational, individual, and social factors were 3.92 (0.49), 3.47 (1.06), and 3.32 (1.12), respectively.

Table 1: Demographic and occupational characteristics of emergency medical staff in Zanjan province (N=197)

Qualitative Variable		Frequency	Percentage
Marital status	Single	60	30
	Married	137	70
Education level	Associate	54	27
	Bachelor	141	72
	Master and above	2	1
Field of study	Emergency medicine	104	53
	Nursing	77	39
	Anesthesiology	14	7
	Other	2	1
Service base	Road	64	68
	Urban	133	17
Number of missions per week	Less than 15	34	17
	15-30	18	9
	31-45	22	11
	45 and above	123	63
A history of COVID-19 infection	Yes	188	95
	No	9	5
Quantitative Variable		**Mean**	**SD**
Age (year)		33.15	5.09
Work experience (year)		51.52	3.17

COVID-19: Corona virus disease 2019; SD: Standard deviation

According to Table 2, from the participants' perspectives, shortage of equipment for the prevention and diagnosis of COVID-19 in patients [4.53 (0.79)], long-term use of PPE and the incidence of problems such as headache [4.46 (0.66)], and insufficient specialized training for COVID-19 [4.18 (1.11)] were the most significant obstacles in not complying with COVID-19 proposed protocols. Moreover, non-compliance with PPE by staff in the field [2.74 (1.60)], lack of daily control of the PPE list [2.79 (1.57)], and dissemination of invalid information in society [3.09 (1.26)] were the least significant obstacles.

Table 2: Frequency distribution, mean, and standard deviation of responses to the questionnaire's questions

Row	Questions	Completely Agree	Agree	No Idea	Disagree	Completely Disagree	Mean (SD)
1	**Shortage of equipment for the prevention and diagnosis of COVID-19 in patients**	0 (0)	5 (2.5)	22 (11.2)	33 (16.8)	137 (69.5)	4.53 (0.79)
2	**Long-term use of PPE and the incidence of problems**	0 (0)	0 (0)	19 (9.6)	67 (34)	111 (56.3)	4.46 (0.66)
3	**Non-standard equipment/tools**	0 (0)	21 (10.7)	46 (23.4)	43 (21.8)	87 (44.2)	3.99 (1.05)
4	**Shortage of experienced and expert technicians in hospitals**	10 (5.1)	58 (29.4)	21 (10.7)	34 (17.3)	74 (37.6)	3.52 (1.37)
5	**Insufficient organizational support**	0 (0)	10 (5.1)	30 (15.2)	92 (46.7)	65 (33)	4.07 (0.82)
6	**The presence of contradictory laws and information to comply with the proposed protocols**	0 (0)	46 (23.4)	49 (24.9)	12 (6.1)	90 (45.7)	3.74 (1.25)
7	**Insufficient specialized training for COVID-19**	0 (0)	26 (13.2)	29 (14.7)	24 (12.2)	118 (59.9)	4.18 (1.11)
8	**Not defining a specific process for patient delivery and transfer**	0 (0)	41 (20.8)	27 (13.7)	35 (17.8)	94 (47.7)	3.92 (1.20)
9	**Not allocating a specific place for the removal of PPE**	0 (0)	10 (5.1)	44 (22.3)	72 (36.5)	71 (36)	4.03 (0.88)
10	**Not taking necessary measures to prepare and equip staff before deployment**	10 (5.1)	49 (24.9)	14 (7.1)	0 (0)	124 (62.9)	3.90 (1.46)
11	**Dissemination of invalid information**	5 (2.5)	96 (48.7)	9 (4.6)	49 (24.9)	38 (19.3)	3.09 (1.26)
12	**Overcrowding and gathering of patients' companions during service**	9 (4.6)	10 (5.1)	0 (0)	117 (59.4)	61 (31)	4.07 (0.96)
13	**Lack of necessary precautions to prevent the spread of infection**	0 (0)	40 (20.3)	28 (14.2)	18 (9.1)	111 (56.3)	4.01 (1.23)
14	**Not having proper bags for disposal of sanitary items**	28 (14.2)	49 (24.9)	5 (2.5)	59 (29.9)	56 (28.4)	3.33 (1.46)
15	**Lack of daily control of the PPE list**	48 (24.4)	68 (34.5)	11 (5.6)	16 (8.1)	54 (27.4)	2.79 (1.57)
16	**Not caring about wearing PPE correctly**	28 (14.2)	47 (23.9)	37 (18.8)	34 (17.3)	51 (25.9)	3.16 (1.41)
17	**Inattention to the use of devices such as face masks and specialized nasal oxygen**	35 (17.8)	45 (22.8)	27 (13.7)	0 (0)	90 945.7)	3.32 (1.63)
18	**Non-compliance with PPE by staff in the field**	48 (24.4)	81 (41.1)	0 (0)	9 (4.6)	59 (29.9)	2.74 (1.60)

SD: Standard deviation; COVID-19: Corona virus disease 2019; PPE: Personal protective equipment

The results of Table 3 demonstrated that the comparison of the mean (SD) score of the obstacles to complying with the COVID-19 health protocols questionnaire for the participants showed no statistically significant difference in the three domains of organizational, social, and individual obstacles in terms of age, marital status, and education level (P>0.05). Similarly, no significant statistical difference was observed in other demographic and occupational characteristics, including field of study, work experience, service base, number of missions per week, and a history of COVID-19 infection (P>0.05).

Table 3: Comparison of the mean (SD) of the score of the obstacles to complying with the COVID-19 health protocols questionnaire for the participants in the study in the three domains of organizational, social, and individual obstacles according to demographic characteristics

Demographic Variable		Organizational Obstacles	Social Obstacles	Individual Obstacles
		Mean (SD)	Mean (SD)	Mean (SD)
Marital status	Single	3.24 (1.49)	3.64 (0.93)	3.26 (1.08)
	Married	3.23 (1.48)	3.55 (0.96)	3.21 (1.16)
	*Between-group comparison	P=0.960 T=0.050	P=0.573 T=0.565	P=0.813 T=0.237
Education level	Associate	3.28 (1.49)	3.60 (0.93)	3.22 (1.10)
	Bachelor	3.20 (1.49)	3.57 (0.95)	3.22 (1.15)
	Master and above	4.15 (0.49)	4 (1.41)	3.50 (1.17)
	*Between-group comparison	P=0.649 T=0.433	P=0.808 T=0.213	P=0.946 T=0.056
Age groups (year)	25 >	4.15 (0.21)	4 (0.70)	2.75 (0.85)
	25-30	3.20 (1.51)	3.55 (0.95)	3.19 (1.12)
	31-35	3.25 (1.52)	3.68 (0.95)	3.35 (1.15)
	36-40	3.25 (1.48)	3.60 (0.94)	3.28 (1.20)
	40=<	3.14 (1.42)	3.18 (0.91)	2.85 (0.84)
	*Between-group comparison	P=0.931 T=0.213	P=0.421 T=0.978	P=0.575 T=0.727

SD: Standard deviation
***Independent sample T-Test**
****ANOVA**

Discussion

The present research highlights the obstacles to complying with health protocols in COVID-19 patient care from the perspectives of emergency medical staff in Zanjan province.

The present study results revealed that the obstacles to complying with health protocols in COVID-19 patient care from the perspectives of emergency medical staff in the three organizational, individual, and social domains, including shortage of equipment, long-term use of PPE, and insufficient specialized training for COVID-19 were the most significant obstacles, and factors such as non-compliance with PPE by staff in the field, lack of daily control of the PPE list, and dissemination of invalid information in society were the least significant obstacles.

Consistent with the findings of the current research, in Nejad Dadgar et al.'s (2022) study in Ardabil, social obstacles and lack of awareness and training were identified as obstacles to complying with health guidelines during the COVID-19 period (10). According to the results of Evenstad et al.'s (2020) study, insufficient professional training on COVID-19 was an obstacle to non-compliance with the guidelines in HCWs [13], which was in line with the present study results. In the studies conducted by Abed Alah et al. (2021), Houghton et al. (2020), Cheng et al. (2023), and Brooks et al. (2021), lack of human force, shortage of PEE, and discomfort in long-term use of equipment, such as face shields and face masks, have been reported as obstacles to the use of preventive measures and infection control among HCWs during the COVID-19 pandemic [14-17], which was in line with the present study results. In a qualitative study in Iran, Hadiyan et al. (2022) identified factors such as inexperienced and inexpert human force, insufficient training of staff, shortage of medical supplies and equipment, and process and structural challenges as pre-hospital emergency challenges in facing the COVID-19 pandemic [18]. The findings of the current study confirm the results of the mentioned study. According to Ahmadipour et al.'s (2022) study, individual factors (lack of knowledge) and organizational factors (shortage of equipment) were obstacles to complying with hand hygiene in the intensive care unit (ICU) ward during the COVID-19 pandemic [19]. This finding was consistent with the results of the present study. In a qualitative study in Indonesia, shortage of human force, shortage of PPE, and the problems with using PPE, including face masks and face shields (fatigue, increased workload, difficulty in communicating) were

identified as the challenges of HCWs in COVID-19 patient care [20]. The findings of the present research confirm the results of the mentioned study. The obstacles and challenges identified in the COVID-19 pandemic have also been reported in other epidemics, such as severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), Ebola, and influenza [4,20].

Identifying and deeply understanding the obstacles to complying with health protocols in COVID-19 patient care by emergency medical staff are necessary to review the existing health protocols and design and formulate future targeted interventions [21].

One of the limitations of the present study is its cross-sectional nature. Thus, the results of the present study should be generalized cautiously.

Conclusion

Obstacles to complying with health protocols in COVID-19 patient care in the three organizational, individual, and social domains, including shortage of equipment, long-term use of PPE, and insufficient specialized training for COVID-19, were the most significant obstacles from the perspectives of emergence medical staff. It is suggested that managers and policymakers pay attention to the obstacles identified in the present study and take these obstacles into account in the emergency of newfound future diseases in order to review the existing protocols and formulate targeted interventions in this field.

Ethical Consideration

This study has been approved by the Ethics Committee of Zanjan University of Medical Sciences (IR.ZUMS.REC.1401.040).

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Conflict of interest

The authors declare no conflict of interest.

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Authors' contributions:

The authors equally contributed to this study.

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