



An Assessment of Physician Response to Provide Emergency Medical Assistance Outside of Routine Clinical Care: A Cross-sectional Study in a Tertiary Academic Hospital in Saudi Arabia

Sarah K AlSaif¹ and Saad M Alsaad^{2,*}

¹Resident, Department of Family and Community Medicine, College of Medicine, King Saud University, Riyadh, Kingdom of Saudi Arabia

²Assistant Professor, Geriatrics, and Public Health, Department of Family and Community Medicine, College of Medicine, King Saud University, Riyadh, Kingdom of Saudi Arabia

* **Corresponding author:** Saad M Alsaad, Geriatrics, and Public Health, Department of Family and Community Medicine, College of Medicine, King Saud University, Riyadh, Kingdom of Saudi Arabia. Tel: +966505493944; Email: salsaad@ksu.edu.sa

Received 2021 December 26; Revised 2022 January 23; Accepted 2022 July 05.

Abstract

Background: Medical emergencies are unpredictable situations that can occur outside of the health facilities and when doctors are off-duty. Limited studies, to the best of our knowledge, have explored factors that contribute to physicians' responses to such situations in Riyadh, Saudi Arabia.

Objectives: The present study aimed to investigate physicians working in a teaching hospital by responding to multiple hypothetical scenarios that can occur outside of routine clinical care and the contributing factors which lead to the physicians' responses.

Methods: The present cross-sectional study was conducted among physicians working in King Saud University Medical City (KSUMC) Riyadh, Saudi Arabia from February to October 2020. The Participants were selected using the convenience sampling method. The calculated sample was 384 individuals. An online survey tool was designed using a validated questionnaire to assess the opportunities for interventions, responses to hypothetical emergency scenarios, or willingness to provide different levels of care. In addition, the hindrances to providing care, including fear of legal ramifications were assessed.

Results: A total of 360 physicians completed the survey. Moreover, 57.2% of physicians reported having intervened at least once in the past. No significant difference was found between specialties. Gender, experience, and nationality significantly affect the willingness to intervene. Fear of potential litigation was the most common reason for hesitancy in dealing with an emergency.

Conclusion: Local physicians are less inclined to offer assistance in an emergency. Fear of litigation and perceived lack of training were among the most notable reasons for hesitancy in emergencies. Continuous education on local regulations may encourage physicians to intervene in an emergency.

Keywords: Cross-sectional studies, Emergencies, Physicians, Saudi Arabia

1. Background

Accidents, disasters, and medical emergencies are unpredictable situations that can occur at any time or place causing human loss. Healthcare professionals are best equipped to handle these situations as they have spent years acquiring the knowledge and skills needed to respond. Emergency medical services (EMS) personnel are key players in the response to such events. However, caring for the patients before the arrival of EMS will greatly affect their health outcomes (1). Healthcare professionals are expected to provide appropriate and efficient healthcare management to patients suffering from this unprecedented situation (2).

During this situation, off-duty healthcare providers particularly physicians may be called upon to provide care to emergencies outside the hospital (3). This act is called "Good Samaritan" from a biblical story of a Samaritan who aided an injured traveler on the roadside (4). Several countries such as the US, Canada, and European countries have enacted the Good Samaritan laws to protect those providing emergency assistance unless gross negligence is established (5,8). The intended outcome of these laws

is to encourage medical professionals, and the general public in some countries to assist with necessary impunity to comfortably provide as much care as possible to preserve human life when given the opportunity (9). In the Middle East, multiple anecdotes report medical professionals coming to the aid of those in need (10,11). In Saudi Arabia, the government has mandated physicians to aid the injured in an emergency, and failing to do so may result in fines of up to 100,000 Saudi Riyals and possible imprisonment, or both (12). However, literature is limited for assessing the experiences of off-duty physicians attending an emergency, leaving this area largely unexplored. Generally, the responses of local physicians and the factors which influence their decision are unclear.

The willingness of off-duty physicians to respond to accidents, disasters, and medical emergencies is an important factor in the response capacity of the health system in emergencies.

2. Objectives

The present study aims to determine the behavior of off-duty physicians in Saudi Arabia regarding the

way they respond to accidents, disasters, and medical emergencies and the factors associated with their willingness to participate in such cases. Therefore, providing the required evidence allows for more effective programs to teach physicians to attend to this type of situation.

3. Methods

3.1. Study design and study population

The present cross-sectional study was conducted among physicians at King Saud University Medical City in Riyadh, Saudi Arabia. The questionnaire used has been tested for validity and reliability and was sourced from an article published in 2016 by Garneau *et al.* (5). The authors were contacted and the use of the questionnaire was approved. Minor changes were made for relevance to the population and to answer important questions about the local culture. Then, the revised questionnaire was piloted on 50 medical students and interns. The questionnaire consisted of three parts. Part 1: demographic information (age and gender) and current practice information (setting, specialty, years of practice, previous certification), part 2: respondent's sense of moral obligation and response to lack of legal protection, and part 3: prior encounters with emergencies outside the workplace, comfort offering different levels of care (history, physical examination, suturing, dislocation reduction), and hypothetical scenarios designed to vary in severity, relationship with the victim, and the number of bystanders.

3.2. Sampling and data collection

The sample size was calculated at 384 using the following formula, $n = (z)^2 p (1 - p) / d^2$, with a 95% confidence level and a margin of error of 5%. The inclusion criteria were licensed physicians, consultants, senior registrars, registrars, fellows, and residents, currently practicing in clinical specialties at King Saud University Medical City (KSUMC) in Riyadh, Saudi Arabia. Doctors practicing non-clinical specialties, physicians not currently practicing, those not in residency programs, and interns were excluded from the study. Data were collected between February and October 2020. Convenience sampling was used in this study. First, all staff information was collected from each department in the hospital, and then an email was sent to each physician. The subjects were subsequently sent three reminders in two weeks to reach the calculated sample. Ethical approval was obtained from the Institutional Review Board of the College of Medicine at King Saud University (E-19-0615). All information was collected after obtaining informed consent from the participants.

3.3. Statistical Analysis

SPSS software (version 26.0) was used to analyze

the results. Descriptive statistics and frequency tables were created to summarize the responses. The Chi-square test was used in the statistical analyses of data to compare categorical variables and differences in distribution among the groups. A p-value less than 0.05 was considered statistically significant. Specialties were divided based on the departments in the analysis such as emergency medicine, family medicine, internal medicine, pediatrics, Ob/Gyn, and surgical specialties. Furthermore, responses were categorized into three groups (agree, neutral, and disagree). The agree and strongly agree responses were combined as agree, whereas the disagree and strongly disagree ones were combined as disagree.

4. Results

Of the 384 physicians in our calculated sample, 360 responses were complete and used in the analysis of the results (response rate: 93.8%). Family medicine, emergency medicine, internal medicine, and pediatrics were the departments with the highest number of responses. The majority of respondents were male (62.2%), and only 15.6% of them were non-Saudi. Moreover, 56.4% of respondents were residents, and 26.4% were consultants. Also, 99.4% of physicians have received certification for Basic Life Support (BLS) (Table 1).

Table 2 indicates the frequency distribution of patients who have encountered Good Samaritan events. Fifty-seven percent of physicians have intervened at least once in the past. When asked about their last opportunity to intervene outside the workplace, 77% reported that they had provided care, and the most frequently reported situation was on an airplane. The intervention was an examination in most cases (24.2%) (Table 2). Additionally, 77.2% of physicians felt it was their moral obligation to intervene in an emergency outside the workplace, and only 69.4% of them were confident in their ability to provide emergency care (Figure 1).

In the hypothetical scenarios (Table 3), the most intervening one (probably and definitely intervening) was a woman collapsing with an EpiPen in her bag (93.1%), followed closely by a scenario of a baby choking (92.5%). The scenario where the fewest number would intervene (probably not intervening and definitely not intervening) was of a man being placed on a stretcher with an ambulance parked outside (19.4%). However, the response to all scenarios was overwhelmingly to intervene.

The intervention that most physicians were most likely to provide (probably provide and definitely provide) outside the health care facility was chest compressions (94.4%), followed by taking history (90%) (Table 4).

Table 5 presents the reasons given by physicians for not intervening in Good Samaritan events. The intervention physicians reported they were least

Table 1. Characteristics of the respondents

Characteristics	Response	n	Percentage
Recently encountered the patient	Yes	360	100
Gender	Male	136	37.8
	Female	224	62.2
Age	<35	246	68.3
	>36	114	31.6
Specialty	Emergency medicine	48	13.4
	Family medicine	52	14.5
	Internal medicine	42	11.7
	Pediatrics	38	10.6
	OB-GYNE	14	3.91
	Surgical specialties	50	13.97
	Others	114	31.8
Current level	Resident	203	56.4
	Registrar	31	8.6
	Fellow	31	8.6
	Consultant	95	26.4
Previous life support certification	BLS	358	99.4
	ACLS	221	61.4
	PALS	99	27.5
	ATLS	137	38.1
	Other	33	9.2
Years of internship	<10 years	251	69.7
	>11 years	109	30.3

OB-GYNE: Obstetrics and Gynecology; BLS: Basic Life Support; ACLS: Advanced Cardiac Life Support; PALS: Pediatric Advanced Life Support; ATLS: Advanced Trauma Life Support

Table 2. Characteristics of respondents with previous opportunity to intervene

Experience	Response	n	Percentage
Previous opportunity to intervene	Yes	206.00	57.2
	No	154.00	42.8
Number of interventions in the past	1-2	119.00	33.1
	3-6	66.00	32.0
	7 or more	21.00	5.8
Help in the last encounter	Yes	160.00	77.7
	No	46.00	22.3
Place of the last encounter	Airplane	90.00	43.7
	Event	31.00	15.0
	Shopping center/store	24.00	11.7
	Other	61.00	29.6

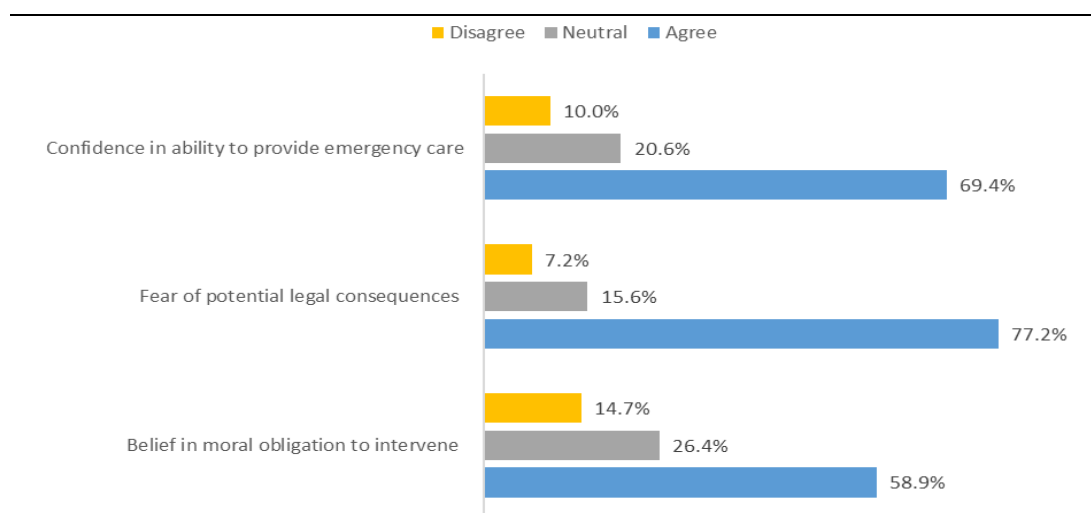


Figure 1. Opinions on intervention in an emergency

likely to provide was an emergency tracheostomy (55.8%). Moreover, 58.9% of respondents agreed that they fear the potential legal consequences of intervening in a medical emergency outside their workplace. Lack of emergency training was the

second most common reason that physicians may hesitate to intervene (23.9%). Furthermore, 2.2% of physicians reported the patient being of the opposite sex as the main reason they would not intervene.

No difference was observed between specialties in

Table 3. Physicians' responses to hypothetical scenarios

Scenarios	Definitely not intervene	Probably not intervene	Neutral	Probably intervene	Definitely intervene
Stranger collapses clutching chest (MI)	4 (1.1%)	17 (4.7%)	28 (7.8%)	143 (39.7%)	168 (46.7%)
A friend in distress and falls in a parking lot	2 (0.6%)	12 (3.3%)	30 (8.3%)	115 (31.9%)	201 (55.8%)
Women with difficulty breathing in the alley	6 (1.7%)	13 (3.6%)	41 (11.4%)	150 (41.7%)	150 (41.7%)
Unconscious man on the flight	4 (1.1%)	15 (4.2%)	32 (8.9%)	108 (30%)	201 (55.8%)
Neighbor falls in the mall parking lot	3 (0.8%)	8 (2.2%)	26 (7.2%)	126 (35%)	197 (54.7%)
Women collapse with EpiPen in bag	2 (0.6%)	4 (1.1%)	19 (5.3%)	87 (24.2%)	248 (68.9%)
Road traffic accident with an injured driver	24 (6.7%)	58 (16.1%)	83 (23.1%)	98 (27.2%)	97 (26.9%)
A man is placed on a stretcher to be taken by an ambulance	159 (44.3%)	77 (21.4%)	54 (15%)	39 (10.8%)	31 (8.6%)
Choking baby turns blue	4 (1.1%)	4 (1.1%)	19 (5.3%)	86 (23.9%)	247 (68.6%)
Man on bus collapses grasping chest	2 (0.6%)	13 (3.6%)	28 (7.8%)	153 (42.5%)	164 (45.6%)
A stranger in the parking lot collapses, and people call for help	2 (0.6%)	19 (5.3%)	41 (11.4%)	131 (36.4%)	167 (46.4%)
Man falls 5 meters and falls on his back	12 (3.33%)	40 (11.1%)	59 (16.4%)	112 (31.1%)	137 (38.1%)

Table 4. Willingness to provide different interventions

Interventions	Definitely not provide	Probably not provide	Neutral	Probably would provide	Definitely would provide
Obtain history	7 (1.9%)	7 (1.9%)	22 (6.1%)	118 (32.9%)	205 (57.1%)
Perform physical examination	3 (0.8%)	10 (2.8%)	33 (9.2%)	131 (36.4%)	183 (50.8%)
Provide mouth-to-mouth resuscitation	39 (10.8%)	33 (9.2%)	118 (32.8%)	88 (24.4%)	82 (22.8%)
Perform chest compressions	4 (1.1%)	3 (0.8%)	13 (3.6%)	91 (25.3%)	249 (69.3%)
Utilize AED if available	11 (3.1%)	8 (2.2%)	50 (13.9%)	94 (26.1%)	197 (54.7%)
Administer emergency medication	16 (4.45%)	25 (6.9%)	96 (26.7%)	119 (33.1%)	103 (28.7%)
Suture superficial wound	84 (23.3%)	53 (14.7%)	79 (21.9%)	58 (16.1%)	86 (23.9%)
Reduce dislocated elbow in a child	128 (35.56%)	65 (18.1%)	73 (20.3%)	49 (13.6%)	45 (12.5%)
Perform an emergency tracheostomy	147 (40.8%)	54 (15%)	82 (22.8%)	45 (12.5%)	32 (8.9%)
Insert the needle to treat pneumothorax	85 (23.6%)	44 (12.2%)	75 (20.8%)	95 (26.4%)	61 (16.9%)
Accompany patient with treatment	25 (6.9%)	31 (8.6%)	102 (28.3%)	125 (34.7%)	77 (21.4%)

Table 5. Reasons for doctors not to intervene

Reasons	Percentage (%)
Concern for legal consequences	30
Lack of emergency training	23.9
Another person took charge	23.6
Lack of medical equipment	12.8
Fear of infectious disease	4.7
Patients of the opposite gender	2.2
Other	2.8

the rate of intervention at the last opportunity ($p = 0.19$). A higher percentage of non-Saudis have performed interventions in the past compared with Saudi physicians (69.6% and 54.9%, respectively). Moreover, non-Saudi physicians intervened more frequently than their Saudi counterparts. The percentage of male physicians who have

performed interventions in the past was significantly higher than that of female ones ($p < 0.001$). Also, physicians with more experience performed more interventions compared to those with less experience, 71.3% of consultants versus 47.8% of residents ($p = 0.001$) (Table 6).

Table 6. Distribution of the number of encounters according to gender, nationality, and level of training

Epidemiology		No Encounter	1	2	3-6	≥7	P-value
Gender	Male	72 (52.9%)	25 (18.4%)	26 (19.1%)	11 (8.1%)	2 (1.5%)	0.001
	Female	82 (36.6%)	24 (10.7%)	44 (19.6%)	55 (24.6%)	19 (8.5%)	
Nationality	Saudi	137 (45.1%)	44 (14.5%)	60 (19.7%)	52 (17.1%)	11 (3.6%)	0.001
	Non-Saudi	17 (30.4%)	5 (8.9%)	10 (17.9%)	14 (25%)	10 (17.9%)	
Level of training	Resident	105 (51.7%)	35 (17.2%)	38 (18.7%)	22 (10.8%)	3 (1.5%)	0.001
	Registrar	14 (45.2%)	5 (16.1%)	3 (9.7%)	6 (19.4%)	3 (9.7%)	
	Fellow	10 (32.3%)	3 (9.7%)	8 (25.8%)	9 (29%)	1 (3.2%)	
	Consultant	25 (26.3%)	6 (6.3%)	21 (22.1%)	29 (30.5%)	14 (14.7%)	

5. Discussion

The present study indicated that more than half of the surveyed physicians have performed Good

Samaritan acts in the past. Furthermore, the study concluded that a vast majority of local physicians stated they had responded the last time they encountered an emergency outside their typical

clinical setting. The frequency of Good Samaritan acts is lower than those reported in the UK and US where over 70% of physicians reported having been called upon in the past (5,13). A possible explanation for this could be that the majority of respondents in the present study were residents and early in their careers as physicians. Despite a strong sense of moral obligation to intervene, physicians should be prepared and have reasonable confidence in their ability to act in an accident, disaster, or medical emergency.

The present study revealed that female physicians appeared less inclined to respond to emergencies. This finding is similar to those obtained in Yemen, Jordan, China, and the USA about male healthcare workers being more willing to participate in any type of disaster (14,18). The hesitancy of female physicians to intervene might be an effect of the local culture that encourages women to be more reserved. This finding in female physicians highlights the need for programs that will motivate them and other healthcare providers to do the Good Samaritan act or intervene in emergencies.

Another highlight of the present study was the findings in different hypothetical scenarios that were given to the participants. The percentage of respondents willing to help in an inflight emergency (86%) was higher compared to that reported in a recent study in Singapore (19). In the aforementioned study, 69% of physicians stated that they would introduce themselves and offer assistance in an inflight emergency (19). The results of the present study are more consistent with those of Garneau *et al.* which 98% of physicians assist the patients (5). Although respondents tended to intervene in most cases, those who stated they would definitely intervene were much fewer than physicians in North Carolina from which the scenarios were taken (5). The present study indicated that more than half of the respondents were willing to assist in traffic accidents; however, the number of subjects was less than those in the study conducted in the US (5). One strategy to improve the preparedness of physicians would be to encourage them to carry a first aid kit with common supplies and medications while in the place where accidents, disasters, and medical emergencies might occur. In this way, keeping a first aid kit within reach may maximize the time and improve the health outcomes of the patients.

Fear of legal ramifications was identified as a major determinant in the decision to help when the participants were asked about the barriers to participating in a Good Samaritan event which was in contrast to the US where legal concerns were the third most cited cause (5). The second most prominent reason for unwillingness was that physicians felt they failed to receive adequate training in emergency care. Therefore, focusing on training physicians in emergency care could improve

response rates among them. Saudi physicians, especially women, should be trained to build confidence in their abilities and improve their willingness to assist.

The present study has several important limitations. First, the small number of respondents from subspecialties may restrict the generalization of the findings to the attitudes of other specialties and factors affecting their choices. Second, the lack of comparable studies in the region complicated assessing the impact of culture on physicians' behavior. Finally, the study failed to assess physicians' knowledge of local laws, which could explain the reason for low response rates. Therefore, further studies should be recommended to assess physicians' perceptions of local laws.

6. Conclusion

The present study revealed that a limited number of local physicians were less willing to provide assistance in emergencies than their international counterparts. Fear of litigation and lack of adequate training were the most notable reasons for hesitation in an emergency. The lack of protective laws for physicians potentially reinforces a culture of negative defensive medicine. Continuous emergency training and education about local rules and regulations may help remedy this and encourage physicians to intervene in case of accidents, disasters, or medical emergencies.

Acknowledgments

The authors would like to express their sincere gratitude to the physicians who took the time to complete the survey and the College of Medicine Research Centre, Deanship of Scientific Research, King Saud University, Riyadh, Saudi Arabia, for their support.

Footnotes

Conflicts of Interest: The authors declare that there is no conflict of interest regarding authorship and publication of the present study.

Author Contributions: Both authors contributed equally to this manuscript in terms of conceptualization and methodology, data collection, data analysis, and interpretation, drafting and revising the article, and final approval of the manuscript.

Funding: The present study was supported by the College of Medicine Research Centre, Deanship of Scientific Research, King Saud University, Riyadh, Saudi Arabia

Ethical Statement: Ethical approval was obtained from the Institutional Review Board of the College of Medicine at King Saud University (E-19-0615).

Informed Consent: All information was collected after obtaining informed consent from the participants.

References

1. Alanazy ARM, Wark S, Fraser J, Nagle A. Factors impacting patient outcomes associated with use of emergency medical services operating in urban versus rural areas: a systematic review. *Int J Environ Res Public Health*. 2019;**16**(10):1-16. doi:10.3390/ijerph16101728. [PubMed: 31100851]
2. Shapira S, Friger M, Bar Dayan Y, Aharonson Daniel L. Healthcare workers' willingness to respond following a disaster: a novel statistical approach toward data analysis. *BMC Med Educ*. 2019;**19**(1):1-12. doi:10.1186/s12909-019-1561-7
3. Burkholder TW, King RA. Emergency physicians as good samaritans: survey of frequency, locations, supplies, and medications. *West J Emerg Med*. 2016;**17**(1):15-7. doi:10.5811/westjem.2015.11.28884. [PubMed: 26823924]
4. Adusumalli J, Benkhadra K, Murad MH. Good samaritan laws and graduate medical education: a tristate survey. *Mayo Clin Proc Innov Qual Outcomes*. 2018;**2**(4):336-341. doi:10.1016/j.mayocpiq.2018.07.002. [PubMed: 30560235]
5. Garneau WM, Harris DM, Viera AJ. Cross-sectional survey of good samaritan behavior by physicians in North Carolina. *BMJ Open*. 2016;**6**(3):1-8. doi:10.1136/bmjopen-2015-010720. [PubMed: 26966061]
6. Public Law 105-170 105th Congress An Act. pdf 2019. <https://www.govinfo.gov/content/pkg/PLAW-105publ170/pdf/PLAW-105publ170.pdf>
7. Good Samaritan Act, 2001, S.O. 2001, c.2. Weblog. 2001. <https://www.ontario.ca/laws/statute/01g02>.
8. Jaeck F, Cooke P, Verstrepren W. The Good Samaritan Law Across Europe. Parable Good Samarit. 1632-1633. Weblog.
9. Dachs RJ, Elias JM. What you need to know when called upon to be a Good Samaritan. *Fam Pract Manag*. 2008;**15**(4):37-40. [PubMed: 18444315]
10. How a Saudi Physician Saved Victims of Car Crash [Translated]. Al-Arabiya news. Weblog. 2019. <https://tinyurl.com/y78wc5fd>
11. Saudi Doctor Saves Passenger on Flight [translated]. Okaz news journal. Weblog. 2018. <https://www.okaz.com.sa/article/1652992>.
12. Ministry of Health- Saudi Arabia. Health Care Profession Law. Weblog. 2020. <https://www.moh.gov.sa/en/Ministry/Rules/Documents/Executive-Regulations-Health-Profession-Ar.pdf>.
13. Williams K. Doctors as good samaritans: some empirical evidence concerning emergency medical treatment in Britain. *J Law Soc*. 2003;**30**(2):258-82. doi:10.1111/1467-6478.00256
14. Al Hunaishi W, Hoe VC, Chinna K. Factors associated with healthcare workers willingness to participate in disasters: a cross-sectional study in Sana'a, Yemen. *BMJ Open*. 2019;**9**(10):1-9. doi:10.1136/bmjopen-2019-030547. [PubMed: 31628126]
15. Loke AY, Fung WMO, Liu X. Mainland china nurses' willingness to report to work in a disaster. *Am J Disaster Med*. 2013;**8**(4):273-82. doi:10.5055/ajdm.2013.0134. [PubMed: 24481892]
16. Al Khalailieh MA, Bond E, Alasad JA. Jordanian nurses' perceptions of their preparedness for disaster management. *Int Emerg Nurs*. 2012;**20**(1):14-23. doi:10.1016/j.ienj.2011.01.001. [PubMed: 22243713]
17. Burke RV, Goodhue CJ, Chokshi NK, Upperman JS. Factors associated with willingness to respond to a disaster: a study of healthcare workers in a tertiary setting. *Prehosp Disaster Med*. 2011;**26**(4):244-50. doi:10.1017/S1049023X11006492. [PubMed: 22008278]
18. Charney RL, Rebmann T, Flood RG. Hospital employee willingness to work during earthquakes versus pandemics. *J Emerg Med*. 2015;**49**(5):665-74. doi:10.1016/j.jemermed.2015.07.030
19. Ng WL, Abdullah N. Knowledge, confidence and attitude of primary care doctors in managing in-flight medical emergencies: a cross-sectional survey. *Singapore Med J*. 2020;**61**(2):81-5. doi:10.11622/smedj.2020016. [PubMed: 32152640]