



## A Questionnaire Study on the Attitudes and Previous Experience of Croatian Family Physicians toward their Preparedness for Disaster Management

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### ► ABSTRACT

**Objective:** To explore family physicians' attitudes, previous experience and self-assessed preparedness to respond or to assist in mass casualty incidents in Croatia.

**Methods:** The cross-sectional survey was carried out during January 2017. Study participants were recruited through a Facebook group that brings together family physicians from Croatia. They were asked to complete the questionnaire, which was distributed via google.docs. Knowledge and attitudes toward disaster preparedness were evaluated by 18 questions. Analysis of variance, Student t test and Kruskal-Wallis test t were used for statistical analysis.

**Results:** Risk awareness of disasters was high among respondents (M=4.89, SD=0.450). Only 16.4 of respondents have participated in the management of disaster at the scene. The majority (73.8%) of physicians have not been participating in any educational activity dealing with disaster over the past two years. Family physicians believed they are not well prepared to participate in national (M=3.02, SD=0.856) and local community emergency response system for disaster (M=3.16, SD=1.119). Male physicians scored higher preparedness to participate in national emergency response system for disaster ( $p=0.012$ ), to carry out accepted triage principles used in the disaster situation ( $p=0.003$ ) and recognize differences in health assessments indicating potential exposure to specific agents ( $p=0,001$ ) compared to their female colleagues.

**Conclusion:** Croatian primary healthcare system attracts many young physicians, who can be an important part of disaster and emergency management. However, the lack of experience despite a high motivation indicates a need for inclusion of disaster medicine training during undergraduate studies and annual educational activities.

**Keywords:** Family physicians; Disaster; Attitude; Mass casualty; Knowledge; Disaster response.

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## Introduction

Disaster preparedness is defined as promptness of one country to effectively respond to a disastrous event, keeping on the same time integrity and functioning of physical structures and systems, while reducing the negative consequences for safety and the health of the nation [1]. Disasters lead to the loss of lives and destruction of public infrastructures or premises which exceed the ability of affected community to handle it successfully within available resources [2]. Types of disasters are classified into three main groups: 1) natural -meteorological, geological, disease outbreak, 2) accidents-transportation, structural, nuclear, agricultural, industrial and 3) intentional acts of violence-bombing, shooting, biological agent, chemical agent [3]. While literature mostly focuses on providing care during mass incidents, there is very little data on providing care during mass incidents in rural areas. Rural areas may also be affected by a variety of natural disasters (floods, earthquakes). Traffic accidents on roads, railways, and airplane and helicopter accidents may also take place in rural areas. In these kinds of situations, it is rarely enough for the emergency medical service to intervene, as it is necessary to engage other medical staff, including family physicians [1].

As one of the key steps in disaster management is preparedness, all health care professionals need to be familiar with effective action in the case of disastrous events [4, 5], and, in turn, must receive proper disaster preparedness education [6], including continuing education courses in disaster management, regular drills within the communities that they serve as well as integration of disaster courses content in undergraduate curricula [7, 8]. However, previous studies found that physicians globally are unprepared to respond to disasters and coordinate that response with other organizations due to scarce training and lack of real disaster response experience [9-11]. Most of these studies have been done with other physicians than those in family practice, so limited data is available regarding knowledge, skills and attitudes of family physicians (FPs) toward disasters [12, 13]. In Croatia, FPs are the gate keepers of health care systems and providers of comprehensive care to the community [14], flexible in their ability to respond to various population health needs, thus playing an important role in the disaster management system and effective reduction of desolation from disasters [12, 15]. How prepared they are to respond to disaster has not been explored yet, as very little research has been done in this area. Although, there is no well-established model or etalon for rapid mobilization or maintaining readiness of FPs, an effective response to disaster could be facilitated by a virtual network of FPs and public health authorities [16], while improvement of the disaster response capacity of family medicine is expected to be a key element for handling disaster

incidents effectively [17]. The knowledge (theoretical issues), attitude (beliefs) and behavior (practice and experience) of FPs on disasters are the inseparable components of the health emergency response capacity and have a direct impact on national protocol for disaster management [12, 18].

According to the OECD, Croatia is predominantly a rural country [19]. Although Croatia is investing a great deal into good emergency medical service (EMS) organization, there are still towns over 20 kilometers away from the nearest hospital with just one emergency medical team. The number of active Croatian FPs during work hours is 2300, of which more than 400 FPs work >20 km and more 300 FPs >50 km away from the nearest hospital, respectively. In addition, some FPs may just have finished medical school without any certified training in family medicine. Therefore, the aims of this study were to explore family physicians' attitudes, previous experience and self-assessed preparedness to respond or to assist in mass casualty incidents in Croatia.

## Materials and Methods

### *Study Participants*

This cross-sectional survey was carried out in the period from 1<sup>st</sup> to 31<sup>st</sup> January 2017. Study participants were recruited through a Facebook group that brings together FPs from Croatia. They were asked to complete the questionnaire, which was distributed via google.docs. The participants were informed about the purpose of the study, the time involved in the completion of the questionnaire and how to submit the completed questionnaire.

### *Measurement*

Self-administered questionnaire was designed and developed according to International Association for Medical Education (AMEE) Guide. AMEE Guide presents a systematic, seven-step process for designing questionnaires, with particular emphasis on developing survey scales [20]. After the literature review, the interviews with prospective family physicians and emergency medicine specialists were performed to get valuable expert input during design process. Questionnaire items were written, but in order to improve the overall quality and representativeness of the questions, 3 methodology experts were asked to systematically review the questionnaire's content. They looked at various domains and each set of items. The quantitative data were combined with experts' opinion and the overall functioning of the questionnaire.

To identify any mistakes that need correcting, to analyze whether the questions, as they are worded, will yield relevant information, to test the level of comprehension, relevance to topic, to define possibly neglected area by designed questionnaire as well as degree to which the items are interpreted by different respondents, validation by pilot testing was carried

out. The respondents selected for the pilot survey were representatives of the family physicians to be interviewed in the main study. The results were analyzed and the three items misunderstood by the majority of participants in pilot testing were excluded from the final version.

The final version of the questionnaire consisted of 22 items, with first four involving demographic data. The questionnaire included: attitudes (risk awareness, response to disaster), self-assessed preparedness and previous experience. Fourteen items were rated according to a 5 point Likert-type scale, ranging from strongly disagree (1) to strongly agree (5). The remaining 4 items were dichotomous questions, asking for a Yes/No.

Reliability analysis was performed during pilot testing phase, by calculating a Cronbach's alpha coefficient. Cronbach's alpha is a measure of the internal consistency of the item scores. Its value of 0.780 was found to be acceptable. The questionnaire was in Croatian language, but to be included in the paper, the items were translated into English

### Procedure

All procedures followed were in accordance the Helsinki Declaration of 1975, as revised in 2008. The responses were anonymous; no participant identifiers were collected, so anonymity and confidentiality of the respondents was ensured throughout the study. Data was secured correctly, saved in the main researcher's personal computer. The reminders were sent out 4 times, 7 days apart. There were no risks involved in participating in the study and responding to questions regarding disasters. The participation in the study was voluntary, no incentives were provided.

### Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics Version 20 (Statistical Package for Social Science, Chicago, IL, USA). Means ( $\pm$ SD) for

continuous variables and numbers and percentage for categorical variables were used to describe attitudes and knowledge. The difference between groups means were analyzed using Student t test or Analysis of variance when appropriate. Categorical variables were tested using the Kruskal-Wallis test.  $p$  values less than 0.05 were considered significant.

### Results

Eighty physicians responded to the survey (response rate was 4%). Of those, 16 (20%) were men and 64 (80%) women. Most of physicians (66%) belonged to the age group of 25 to 30 years, 25% were between 31 and 40 years of age and 9% were older than 41. Forty-three (54%) respondents work in the places with the hospitals that are near their practices, while 36 (46%) practice medicine in rural location. Fifty-six FPs (70%) had private practice, and 24 (30%) were employed by public primary health care centers. Forty-three (54%) respondents worked close to a hospital, while 36 (46%) practice medicine in rural location.

First set of research items was related to physicians' attitudes toward disaster response.

There were 9 items analyzing the attitudes, with answers ranging from 1 to 5. Respondents strongly agreed that "Every medical institution should have a disaster/mass casualty incident protocol" ( $M=4.84$ ,  $SD=0.561$ ). The highest mean was linked to the item "Every medical institution should have strategy with organizational logistics in disaster response situations" ( $M=4.95$ ,  $SD=0.219$ ), and the lowest to the item "All health professionals should be familiar with institutional strategy regarding implementation of emergency plans" ( $M=4.55$ ,  $SD=0.870$ ). The need for overall and situational risk awareness of disasters was rated by respondents as high ( $M=4.89$ ,  $SD=0.450$ ). Family physicians strongly agreed that mass casualty drills should be carried out frequently ( $M=4.73$ ,  $SD=0.595$ ) (Table 1).

**Table 1.** The attitudes of family physicians towards response to health emergencies and risk awareness

No	Statement	Mean	SD <sup>a</sup>
1.	Every medical institution should have a disaster/mass casualty incident protocol	4.84	0.561
2.	Every medical institution should have strategy with organizational logistics and plans in disaster response situations	4.95	0.219
3.	Institutional strategies in disaster/mass casualty incident response situation need to be checked and updated periodically	4.77	0.451
4.	All health professionals should be familiar with institutional strategy regarding implementation of emergency plans and evacuation procedures	4.55	0.870
5.	All health professionals should be acquainted with the identification process of bioterrorism/ biological or chemical attacks and should have knowledge how to perform required procedures	4.76	0.582
6.	Trainings in emergency response and disaster preparedness should be mandatory for all health professionals	4.79	0.520
7.	Overall and situational risk awareness of mass casualty incident/disasters need to be high among health professionals	4.89	0.450
8.	Beside health professionals, the organizational logistics and roles in disaster response situations should include different local and national agencies	4.88	0.369
9.	Mass casualty drills should be carried out frequently in order to retain knowledge and skills in the event of a disaster/ mass casualty	4.73	0.595

<sup>a</sup>SD: Standard Deviation

Self-assessed preparedness to respond or to assist in mass casualty incidents is presented in Table 2. FPs moderately agreed that they are prepared to participate in national ( $M=3.02$ ,  $SD=0.856$ ) and local community emergency response system for disaster ( $M=3.16$ ,  $SD=1.119$ ). The highest mean related to preparedness to carry out triage in disaster incident ( $M=3.42$ ,  $SD=0.991$ ).

Majority (73.8%) of family physicians reported not to have been participating in any educational activity dealing with disaster over the past two years and previous mass casualty drills (82.5%). With respect to training needs, 50% reported that the educational activities dealing with disasters should be mandatory for license renewal, while 50% had opposite opinion. Regarding previous experience, only 16.4% of physicians reported to have been participating in management of disaster/mass casualty cases at the scene (Table 3).

Significant differences in the attitudes towards response to disasters and risk awareness were not found between female and male physicians ( $p>0.01$ ). However, male FPs' self-assessed preparedness to participate in national emergency response system for disaster ( $p=0.012$ ), to carry out accepted triage principles used in disaster incident ( $p=0.003$ ) and recognize differences in health assessments indicating potential exposure to specific agents ( $p=0.001$ ) were scored higher on Likert scale compared to their female colleagues' (Table 4). Significant differences in the attitudes and knowledge were not found according to age, length of practice, type of practice and practice environment.

## Discussion

Although FPs in Croatia have high risk awareness, their preparedness to provide disaster response and

optimal emergency management is not satisfactory, which encloses possible lack of skills to participate in the management of unpredictable disaster/mass casualty incidents in the future. Positive attitudes of FPs on the need for good preparation in case of mass incidents are identical to the attitude of Khorram-Manesh *et al.*, [21] who displayed in the New Global Program study. The current study corroborates international studies indicating that primary care physicians globally are not prepared to deal with the disasters or public health emergencies [10, 11, 12, 22], mainly due to the lack of training and experience [23, 24]. Disasters usually *come up rather unexpectedly and tend to become more intense* as the years go on, but as they are unpredictable, it is very hard to organize proper type of education on preparedness. As FPs are distributed more proportionally in health care infrastructure compared to other specialties, it is them who provide majority of care to population, especially in rural and underserved area. The role of the frontline physicians put higher requirements for FPs and primary health care institutions to prevent and control disastrous incidents [25].

Majority of family physicians involved in the study were young, with the time after graduation from medical school being less than 5 years at the time of survey. Sinha *et al.*, [26] found that medical students have very sparse theoretical and practical knowledge about disaster preparedness, while Hubloue and Debacker conclude that disaster incidents call for outstanding knowledge to provide health care within limited capability to systematize disaster response [27]. Although disaster training may advance the level of disaster preparedness and confidence of physicians to respond effectively in such events [26], the published evidence for improved outcomes for the majority of disaster preparedness and disaster response interventions is limited [28].

**Table 2.** Family physicians' self-assessment of disaster knowledge

No	Statement	Mean	SD <sup>a</sup>
1.	I feel prepared to participate in national emergency response system for disaster	3.02	0.856
2.	I feel prepared to participate in local community emergency response system for disaster	3.16	1.119
3.	I feel prepared to carry out accepted triage principles used in disaster incident	3.42	0.991
4.	In a case of disaster, I feel confident recognizing differences in health assessments indicating potential exposure to specific agents.	3.40	0.922
5.	In a case of disaster, I feel prepared to provide psychosocial support to the victims	3.03	1.031

<sup>a</sup>SD: Standard Deviation

**Table 3.** Previous experience of family physicians regarding training, mass casualty drills, and participation in real disaster management

Item	Yes N (%)	No N (%)
Over the past two years, have you been participating in any educational activity dealing with disaster/mass casualty preparedness or management?	21 (26.2)	59 (73.8)
Have you ever been actively involved in mass casualty drills?	14 (17.5)	66 (82.5)
Should educational activities dealing with disaster preparedness and management be mandatory for license renewal?	40 (50)	40 (50)
Have you ever participated in the management of disaster/mass casualty cases at the scene?	13 (16.3)	67 (83.7)

**Table 4.** Comparison of attitude and self-assessed knowledge between female and male family physicians.

Item		n	Mean	SD	p value <sup>a</sup>
Disaster incident protocol	Female	64	4.88	0.378	0.234
	Male	16	4.69	1.014	
Institutional strategy	Female	63	4.81	0.789	0.145
	Male	16	4.63	1.138	
Institutional strategy update	Female	64	4.79	0.481	0.304
	Male	16	4.63	0.885	
Knowledge of institutional strategy	Female	64	4.61	0.510	0.224
	Male	16	4.31	0.577	
Trainings in emergency response	Female	64	4.80	0.175	0.749
	Male	16	4.75	0.342	
Knowledge of identification process	Female	64	4.97	0.396	0.127
	Male	16	4.88	0.619	
Risk awareness	Female	64	4.91	0.344	0.459
	Male	16	4.81	0.750	
Other agencies inclusion	Female	64	4.88	0.333	1.000
	Male	16	4.88	0.500	
Mass casualty drills	Female	64	4.75	0.591	0.456
	Male	16	4.63	0.619	
National emergency response system	Female	64	2.91	0.849	0.012
	Male	16	3.50	0.730	
Local emergency response system	Female	64	3.08	1.131	0.179
	Male	16	3.50	1.033	
Triage principles	Female	64	3.27	0.963	0.003
	Male	16	4.06	0.854	
Health assessment in disaster	Female	64	3.23	0.904	0.001
	Male	16	4.06	0.680	
Psychosocial support to the victims	Female	64	2.97	0.992	0.332
	Male	16	3.25	1.183	

<sup>a</sup>Analysis of variance (ANOVA),  $p < 0.05$  is considered significant and bolded

Without relying on planning that ensures relevance of the content, effective teaching strategies and confirmation that learners acquired necessary skills, education cannot be effective. As found in current study, large majority of family physicians (83.7%) have never participated in the management of disaster at the scene, so being taught by experienced teachers is of utmost importance. Fifty percent of respondents thought that *disaster* preparedness should be included as a *mandatory* course for licence renewal, what is in line with other studies [29]. However, the opportunities for disaster training in Croatia are few and far in between, including undergraduate studies, residency programs as well as continuous professional development. Here we would like to emphasize the Medical According to previous research, family physicians are more willing to participate in practical training rather than just listen to the lecture [12, 30, 31]. Albeit published evidence of drills impact on disaster response over the long term is limited, recent scoping review study found that disaster preparedness drills could be effective at improving physicians' overall competence, perceptions of preparedness, confidence, understanding of individual roles, roles of partners and knowledge of emergency activities and procedures [30, 32]. Despite the fact that small percentage of family physicians has been actively

involved in mass casualty drills, they strongly agree that drills should be carried out frequently in order to retain knowledge and skills necessary in the event of a disaster/ mass casualty. These attitudes are in complete compliance with attitudes from Khorram-Manesh *et al.*, [33] review article which showed that courses with practical participation are most effective way for management of mass casualties. Future research needs to define what types of skills required to be drilled and analyze if simulated disaster drills could improve maintaining competence in this area.

Family physicians do not feel well prepared to carry out accepted triage principles used in the disaster situation. Disasters cause the emotional and physical stress, in a potentially dangerous environment with many injured people. Familiarity with the process helps efficiency and comfort in performing triage tasks as properly performed triage is a determinant of survival for injured people [34]. Learning proper triage algorithm is an important skill for FPs providing first-response care to people affected in the disastrous event, however, disaster triage is inconsistently performed, due to the lack of personnel who are familiar with triage protocols. The best triage model combines the physiological and anatomical parameters and signs and should be practiced in an environment which displays the

existing stress and interactivity among healthcare workers. Previous studies have found that virtual reality in disaster triage can be the feasible alternative for standardized patient drills [34, 35]. Virtual reality triage is a valuable training policy for rare contexts where high-level performance is of utmost importance, but difficult to rehearse [34]. Training participants wear eye-goggles showing experience in full-immersion virtual reality environment for disaster. Repeatability, feasibility, and consistency ensure the good platform for mastering skills and effective self-control when facing external stressors could cause inappropriate reaction or delayed response [36].

Public health response to disasters needs to include psychological as well as physical needs of an affected population because stress experienced in critical incidents [2]. Training in psychosocial support to the victims prepares responders to deal with own stress and to assist others, therefore it is essential to carry out targeted training to enhance capabilities and confidence of family physicians regarding psychological first aid [2]. Both disaster victims and care providers may benefit from training in different counseling techniques [37].

Differences in attitudes and knowledge toward disaster preparedness were not found between younger and older physician, or rural physicians and those practicing in urban settings. Yet, statistical analysis indicated that male physicians feel better prepared to participate in national emergency response system for disaster, carry out triage disaster incident and recognize differences in health assessments of exposed patients compared to their female colleagues. Studies investigating the factors contributing to specialty preference in career choice among medical students showed that women significantly preferred pediatrics, gynecology and psychiatry, and men emergency medicine or surgery [38, 39]. It has been indicated that medical students who prefer surgery are more motivated by

medical challenges and career possibilities, while those who chose family medicine as future career are basically stimulated by variety [40]. Women are more relationship-oriented, while men tend to be *more task or action-oriented* [41].

Notwithstanding it is critical that family physicians are able to effectively respond to disaster incidents, the current study identified gaps in their knowledge regarding disaster preparedness and management. The courses on disasters and disaster drills should be integrated into undergraduate curricula of medical schools and residency training in family medicine. National and local disaster plans with clearly specified steps to be undertaken need to be regularly updated, altogether with clinical guidelines to be followed in the event of an emergency [29]. Family physicians do not feel well prepared, but are willing to address disaster incidents. By mobilizing family physicians, the work force could be drawn out and significant resources provided [16].

Some limitations of the study need to be considered. Respondents were a self-selected sample of interested physicians, so the main limitation is small response rate and small participants' number. Attitudes were assessed at one point in time, while the study was based on the subjective, self-assessment. Although the results could be very important for policy makers, this was a pilot study, therefore the larger, longitudinal studies, with representative samples, are needed. The representativeness of the results is also limited and we cannot be sure of the generalizability of our results.

In conclusion, (unnecessary letter c) primary healthcare system attracts many young physicians, who can be an important part of disaster and emergency management. However, the lack of experience despite a high motivation indicates a need for inclusion of disaster medicine training during undergraduate studies and annual educational activities.

**Conflicts of Interest:** None declared.

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