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What structural factors influencing emergency and disaster medical response teams? A comparative review study

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Abstract:

INTRODUCTION: An important indicator increasing the survival chances of patients and injured people immediately after emergency and disaster is the rapid access to medical services. The establishment of Emergency and Disaster Medical Response Teams (EDMRTs) is one of the main strategies to improve response capacity and capability in the field of EDMRT. This study aimed to probe the structural factors influencing of EDMRTs.

METHODOLOGY: In this study, a comparative review method was used. The current study was conducted between March 2017 and September 2018. For this, articles, books, formal reports, and information concerning the available websites regarding the structure of EDMRTs were analyzed. To access relevant scientific articles, an extensive search was carried out in several steps using divergent keywords in the Scopus, ProQuest, PubMed, ScienceDirect, and Google Scholar databases. After accessing the resources and documents, the process of analyzing and comparing different team structures was carried out using content analysis.

RESULTS: Following the search of relevant databases and websites, the structure of EDMRTs in the United States, Australia, Japan, Turkey, New Zealand, Canada, and the World Health Organization were taken into consideration and compared. Two areas of "Organization and Management" as well as "Capacity and Capability Development" were explored along with multiple subsets.

CONCLUSION: The results of this study revealed that the model and structure of EDMRTs have direct relationship with such elements as the structure of the disaster risk management system, risk assessment, impact of the hazards and medical needs of the affected area, population distribution, level of team activity, and timing of the teams' presence after disasters. The research team recommends designing and conducting studies for determine the roles and responsibilities of the teams.

Keywords:

Comparative study, emergency and disaster, medical response teams, structural factors

Introduction

The World Health Organization (WHO) considers emergency and disasters a condition that local capacity has been destroyed to protect human life and lives due to natural or human-made hazards.^[1]

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Emergencies and disasters are classified into two natural and human-made groups,^[2] and in terms of the rate of occurrence, they are divided into two categories of sudden-onset disasters and slow-onset disasters.^[3] People are the most important element in the process of disaster risk management.^[4] Disaster risk reduction (DRR) strategies and the health sector are deeply interdependent.^[5]

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Between all, providing health services is one of the first priorities in the disaster risk management planning.^[6] Access to health-care services is considered one of the special indicators for increasing the survival rate of patients and injured people immediately after emergency and disaster.^[7] Conventionally, the major role of the health system in the disaster risk management life cycle is considered to be a response to disaster health consequences, which is vital in reducing mortality, disease, and postdisaster damages. However, multidimensional disaster risk management strategies enable the health system to play a more comprehensive and proactive role for achieving more resiliency in dealing with disasters.^[8] In both Hyogo and Sendai international documents, “increasing the readiness to provide efficient responses to the impacts of disasters at all local, regional and national levels” has been highlighted as one of the key priorities, emphasizing the provision of effective health services after a disaster.^[9] On the other hand, within the framework of the Sendai, the health system has been identified as a key component in strengthening DRR activities.^[10]

Due to the prompt increase of complex health needs and the loss of existing capacity caused by infrastructure degradation, the occurrence of a rapid-onset disaster may result in an imbalance between the increase of medical needs and capacity over a short period of time.^[11] This imbalance can eliminate the stability of the health services and cause crisis in the process of providing medical responses.^[12,13] According to the results of the previous studies and our knowledge, strengthening the response capacity at the local level, planning for preparation, training and education, increase resiliency, and ensure a better response.^[14]

In most countries, the National Disaster Medical System (NDMS), as a part of the National Disaster Risk Management System (NDRMS), plays an important role in protecting human lives, reducing illnesses and injuries though providing proper medical services.^[15] One of the subsets of this system is the Disaster Medical Response Teams (DMRTs), which are established at the local, regional, and national levels.^[16] Team-based care is an important and integral part of medical response to disasters. On the basis of the policies of countries and the goals and expertise of the individuals, these teams have different structures. Usually, the first responders to emergency and disaster are Emergency Medical System (EMS) staff at local and regional levels or local medical assistance teams.^[17] Considering different elements such as the structure of disaster risk management system, the results of risk assessment, the health impact of hazards and medical needs of the affected area, the level of activity of teams, and timing of the teams’ presence after the disaster, socioeconomic,

political, cultural, and population dispersion, most countries and international organizations have established emergency and DMRTs (EDMRTs).^[18] In 2005, Peter Aitken conducted a review study on the Disaster Medical Assistance Teams (DMATs), in which the structures of some of DMATs have been evaluated. In that study, factors such as: (a) the importance of DMATs, (b) model of the previous teams, (c) selection of members, (d) considerations for dispatching and deployment, (e) personal protective equipment and welfare requirements, (f) training and preparation, (g) technical equipment, (h) health before dispatching, and (i) the dispatching process have been extracted.^[19] Akira Fuse also compared DMATs of Japan and the United States and explained the reasons for the structural differences between the two teams.^[20] The present study was an attempt to provide a comprehensive research concerning a national model of EDMRTs. Considering the necessity of a deep knowledge about the international experiences of medical response teams, we conducted this research to investigate the structural elements of EDMRTs in different countries.

Methodology

This is a comparative review study according with narrative, which relevant articles, books, official reports, and information available on the websites in the field of EDMRTs were analyzed. The current study was conducted between March 2017 and September 2018. There were no time limits for reviewing the published articles, books, and official reports; therefore, all texts obtained in the search process were reviewed and analyzed using content analysis. The procedure of accessing the published scientific articles on the establishment and deployment of EDMRTs was based on an extensive search with several stages and keywords in different databases such as Scopus, ProQuest, PubMed, ScienceDirect, and Google Scholar, as shown in Table 1. Given that information on the establishment process of the teams in some countries was not published in official articles, this information was accessed and used according to the relevant official websites of those countries, which are listed in the resource list. It is worth mentioning that after the search, 40 articles, 4 books, and an operational guideline, which contained comprehensive information

Table 1: Searching strategy

Searching strategy

(("Emergency Medical Response Team" OR "Medical response Team" OR "Disaster medical team" OR "Disaster team" OR "Disaster Medical Response Team" OR "Emergency Medical Team" OR "Medical Assistance Team" OR "Disaster Response" OR "Disaster Assistance Team" OR "Disaster Medicine" OR "International Disaster Response" OR "International Disaster Response Team" OR "Foreign Disaster Medical Team")) AND (("Stablishing" OR "Implementation" OR "Structure" OR "Organization"))

on the teams established in the United States, Canada, Japan, Australia, New Zealand, Turkey, and the WHO emergency medical teams (EMTs), were selected by the research team. The reasons for choosing these countries to enter the study by the research team were to have access to the complete structure of the medical response teams and their structural variation. In the selected structures, a spectrum of the smallest to the largest team, in terms of the number of members, has a complete social structure and a completely military structure as well as different levels of accountability in the local, national, and international dimensions. Then, each of the team structures was carefully reviewed, and their structural elements were extracted based on the items mentioned in the above texts and compared with each other.

Inclusion and exclusion criteria

Given that the purpose of the study was to investigate the influencing elements that form the structure of EDMRTs, all texts that provide comprehensive information on the establishment, education and training, dispatching, and deployment of such teams was included in the study and other texts that did not have the above information were excluded from the study process.

Results

After the initial search in the databases and relevant websites, the countries or national and international organizations that had established EDMRTs were selected, and their team structures were analyzed. According to the information obtained from the published articles and texts, the structures of EDMRTs in the United States, Australia, Japan, Turkey, New Zealand, and Canada, along with the models of the WHO EMTs, were studied and compared. In the analysis of the abovementioned areas, the “organization and team management” with the subsets of (1) lead agency, (2) mode of membership, (3) composition and number of members, (4) activation, and (5) leadership and commanding of the team as well as the “capacity and capability development” with the subsets of (1) level of activity, (2) education and training, (3) logistic and resource supply, (4) access and dispatching, and (6) duration of attendance, were explored which are presented in details in Table 2.

Discussion

Following the search of relevant databases and websites, the structure of EDMRTs in the United States, Australia, Japan, Turkey, New Zealand, Canada, and the WHO were taken into consideration and compared. Two areas of “Organization and Management” and “Capacity and Capability Development” were explored along with multiple subsets. As defined in the literature, DMATs have self-sufficient structures, with the capability of

deploying and are comprised of professionals in the field of health such as general and specialized physicians, nurses, medical emergency technicians, pharmacists, paramedics, and logistic personnel. They can provide health care in different time periods of emergency and disaster. After disaster events, these teams are dispatched to participate in the health service delivery to the areas, where the health infrastructure is damaged and lack enough capacity to respond to ongoing needs.^[20] This study is in line with Peter Aitkin’s study published in 2005. In that study, factors such as: (a) the importance of DMATs, (b) model of the previous teams, (c) selection of members, (d) considerations for dispatching and deployment, (e) personal protective equipment and welfare requirements, (f) training and preparation, (g) technical equipment, (h) health before dispatching, and (i) the dispatching process have been extracted.^[19] In this study, the team structures of the United States, New Zealand, Australia, Japan, Turkey, Canada, and the WHO have been studied. It should be highlighted that the present study takes into account more factors, which have been proposed more recently, compared to the previous studies. The extracted subsets in each of the team structures are discussed in detail below.

Organization and team management

Lead agency

Previous studies indicate that in some countries, there is a disaster risk management mechanism under various headings such as Federal Emergency Management Agency in the United States,^[21] Coordinated Incident Management System in New Zealand,^[22] and National Incident Management System in Japan, which are lead agencies for disaster risk management. In the study, it was observed that in each country, an organization or institution is the lead agency for the establishment of EDMRTs. In most of these countries, the Ministry of Health is the lead agency for medical responses to the consequences of disasters. Hence, EDMRTs or DMATs are directly established by the Ministry of Health^[16,22] or other nongovernmental and military institutions under the direct supervision of the Ministry of Health.^[7,23] It is worth noting that in most of these countries, the Ministry of Health has established an office to organize and manage these teams. For example, in the United States, the NDMS^[24] and in New Zealand, Reference Group, the medical assistance team of New Zealand, provide counseling to establish and organize disaster management teams.^[25] The establishment of a department or office for the establishment, organization, and management of EDMRTs under the supervision of the Ministry of Health seems to be a logical and effective measure.

Membership

Each of the existing team structure, there are special requirements for the membership of the individuals in

Table 2: Compare subsets of organization/management and capacity/capability development

Areas	Subsets	Country						
		United States	New Zealand	Australia	Turkey	Japan	WHO	Canada
Organization and management	Lead agency	NDMS	Ministry of Health	NCCTRC	Ministry of Health	MHLW	Government and Nongovernmental organs	Canadian Armed Forces
	Mode of membership	A selection of professional and volunteer staff	Registration and selection based on certain criteria	Registration and selection based on certain criteria	Registration and selection based on certain criteria	Selection by health system	Registration and selection based on certain criteria	Canada's official military forces
	Members Composition	Medical and nonmedical staff Team members: 35-50 persons	Medical and Nonmedical staff Team members: 5-40 persons	Medical and nonmedical staff Team members: 15-40 persons	Medical staff and one logistician/driver Team members: 5-8 persons	Medical and logistic staff Team members: 4-5 persons	Medical and nonmedical members Depending on the type of team, the number of members is varies	Medical and nonmedical members Total members 200 persons
	Activation and dispatching	Request from Local authority Governance international organizations	Request from the affected area	Request from local authorities/ international organizations	Request from Affected region Ordered by the Ministry of Health	Request from the affected region	Declaration required by the state affected by the disaster	Request from Affected countries/ international organizations
	Leadership and commanding	Each team has a leader Commander -in-chief is the regional authorities	Team has an ICS	Each team has a leader Commander -in-chief is the regional authorities	Each team has a leader Commander -in-chief is the regional authorities	Each team has a leader Commander -in-chief is the regional authorities	Each team has a leader Commander -in-chief is the regional authorities	Each group has a commander and all are under a single command
Capacity and capability development	Level of activity	Three levels; local, national, and international	Three levels; local, national, and international	Two levels; national and international	Two levels; national and international	Two levels; local and national	Two levels; national and international	International level
	Education and training	Continuous training and annual exercises	Training courses	Training at the time of membership and annual repeat	Basic and advanced training courses Annual exercise	Training courses in disaster -based hospitals	Training courses based on standards	Regular and continuous exercises
	Logistic and resource supply	Quite self-sufficient	Quite self-sufficient	Self-sufficiency for 72 h	Quite self-sufficient	Self -sufficiency for 72 h	Self-sufficient except in certain circumstances	Quite self-sufficient
	Access for dispatching	Prepared for dispatch 6-24 h after recall	Team members are available 24 h in 7 days a week	National response: 6-24 h International response: 24-48 h	Teams are always ready and available	Prepared for dispatch 6-24 h after recall	National response: 12-24 h International response: 24-48 h	As soon as possible after confirmation of the request
	Duration of attendance	At least 14 days	7 days in local events and 14 days in regional events	14 days in domestic events and 1 month in international partnerships	24-72 h	48-72 h	2-3 weeks	Maximum 40 days

NDMS=National Disaster Medical System, NCCTRC=National Critical Care and Trauma Response Centre, MHLW=Ministry of Health, Labor and Welfare, ICS=Incident Command System

the teams. In most cases, health-care professionals join the teams voluntarily, then their conditions are assessed according to the standards set in each of the models.^[18,26,27] Factors such as having credentials and official certificates

in the field of expertise, providing citizenship certificates, having a valid passport for international missions (for models that have international levels), previous experience in the field of medical response to disasters,

availability at the time of call, adaptability and flexibility against events and difficult situations, ability to communicate correctly with colleagues and patients, and ability to work with specialized and communicative equipment, are conditions considered for the membership of individuals.^[25,27] In a study, Oldenburger *et al.* extracted the characteristics of EDMRTs, which are consistent with the findings mentioned above.^[28] As mentioned in these structures, it is not enough to have knowledge and skills to join the EDMRTs, but alongside these indicators, physical and mental health, personality traits such as motivation,^[19,29] the ability for teamwork, and the ability to successfully carry out fieldwork together with other team members should also be considered in this respect.^[30,31] It seems that for the selection of competent and eligible people in the response process, we need to evaluate the competency and characteristics required for the membership of volunteers or selected individuals in different EDMRTs in the form of a systematic investigation.

Members composition

One of the subsets that had a lot of diversity and contradiction is the composition and number of team members in each of the team structures. One of the factors affecting the composition and number of members of the expedition team is the time elapsed, since the occurrence of the disaster. In a study, Lind *et al.* divided postearthquake timeline into four stages,^[32] for each of which certain members composition and number of professionals are required to meet the relevant medical needs. Such factors as the location of the disaster, the type of the risk, the medical needs,^[20] and the level of the team (local, national, or international) have direct effects on the members composition.^[33] For example, the Japan DMAT, which is known for rapid response to geological hazards such as earthquakes at local and national levels, has the lowest number of members (about 4–5 people) at the time of deployment.^[34] However, the number of members of the Canadian Armed Forces Disaster Assistance Response Team (DART), aimed at contributing to international disaster response, is about 200.^[35] Some team structures, such as the Australian Medical Assistance Team, have identified a spectrum for the expedited teams rather than a fixed number of members, of 15 (at least) to 40 (at most).^[7] The composition and number of members of the EMTs, classified in the three types of EMT-1, EMT-2, and EMT-3, are determined based on the type of the needs and services to be provided in the affected area.^[18] Specifically, at local and national levels, agile and multidisciplinary response teams with appropriate training and management strategies would be the most effective option at the time of disasters.^[33] According to the results of the previous studies, lessons learned

and experiences, it is necessary to provide and dispatch small teams of agile and skilled members to respond to urgent medical services, which not only provide timely and effective response or logistics in the acute phase of disasters, but also empower local response forces such as EMSs, hospital staff, and (local) clinics, as the first responders of the health system.

Activation and dispatching

Based on the international experiences, one of the important principles in the activation process and the dispatching of EDMRTs is the announcement of demands and requests made by local, regional, and national authorities.^[27] To deploy DART, the Canadian government makes relevant decisions, in consultation with the Ministry of Foreign Affairs, and close cooperation with some organizations, including the Ministry of Defense and the Council of Experts.^[35] To activate the International EMT (I-EMT), the Virtual On-Site Operations Coordination Centre, following a disaster, declares its capabilities for the affected state(s), in order to offer assistance to the affected governments, and in most cases, the affected government makes a request to the WHO through the Ministry of Health or the NDRMS.^[36] The strengths of the above team structures encompass the dispatching of the teams based on the needs and requests of the local authorities affected by emergency and disaster. In this regard, it is important to note that, due to the possibility of damage and dysfunction of the decision-makers as well as rapid assessment teams right after major emergency and disaster, the consideration of exceptional cases for dispatching EDMRTs from higher levels seems to be useful. According to the laws of the Ministry of Health of Japan, when a large-scale incident or disaster occurs, due to the possibility of damage and disruption of functions, especially in the health area, the DMATs are allowed to participate in disasters without prior declaration of the needs of the affected area(s).^[37]

Leadership and commanding

Emergency response management is not a democratic process, and one should be the lead agency for the team and for the response process during an emergency. Moreover, everyone should be aware of the commanding chain.^[38] Incident Command System (ICS) has become an accepted standard for the successful disaster response in many countries.^[39] In almost all investigated models, teams carry out their activities under the commanding of the area's management team affected by the disaster.^[37] According to the notified instructions, the structure of DMATs of Japan is defined so: the team arriving at the site should be supervised and commanded by the operational team based in the area to provide services. Of course, if the team reaches the area faster than the local teams, it will take commanding of the operation until

the local team arrives.^[37] Considering the findings of the above-mentioned team structures, it can be concluded that the presence of leadership and commanding structures in EDMRTs is necessary and the presence of medical response teams in the ICS of the affected region directed by local or regional management is one of the basic principles for the participation and assistance of these teams in responding to the impacts of disasters.

Capacity and capability development

Level of activity

As far as team structures are taken into account, it was observed that, generally speaking, these teams were established to operate at two national or international levels, with the former being divided into three levels: local, regional, and national. The observed differences in the levels of team activity are influenced by such factors as the amount of capacity and capability at different levels of political divisions (city, county, province, and region), the goals of the establishment of the team, the types of hazards and their consequences, and the organization which is considered the lead agency for the team.^[36] For example, in Japan, given that the country's prevailing risk is earthquakes, the teams are established at the local level focusing on Disaster Base Hospital and are deployed immediately after declaring the need for the affected area.^[20] In a study conducted by Boyd *et al.*, it has been pointed out that disaster planning seeks to effectively and efficiently use resources on a local, regional, or national scale. Therefore, response capacity development at the local, planning, training, and learning from the experiences levels, increases the resiliency, and ensures a better response.^[14] Due to the late presence of EDMRTs outside the affected area, especially the international teams, providing an efficient response, based on the local capacity and capability is vital within the first 72 h after the occurrence of a disaster.^[15] According to Ian Norton, "only if the national capacities are not sufficient to respond to an emergency, the need to move international teams towards the affected country is felt."^[36] Therefore, it is necessary to develop capacity and ability at the local level, through strengthening the EMS and other sources of the health system distributed in the provinces and counties, to respond to medical emergencies in an effort to properly intervene in the golden time after the disaster, which can subsequently reduce the amount of deaths, patients, and injured people.^[40,41]

Education and training

The eligibility and competence of the individuals responding to the impacts of disasters are one of the main factors in the success of intervention programs. Creating and improving the capacity of the respondents before dispatching and deployment is, in some way, an investment of the founding organizations of the

response team.^[42,43] The adoption of a coherent education and training approach to improve the quality and professionalism of the expedition teams has been recognized as an important step in preparing the teams.^[44] Designing a proper educational program for the response teams requires awareness of the learning needs, appropriate educational patterns, effectiveness of the existing programs, and amount of experience in preparing team members for deployment.^[45] Different organizations and universities have developed customized disaster response training programs by making significant changes to curricula and content quality.^[46,47] Nonetheless, lack of common standards concerning the design and application of education and training programs for the members is an obvious shortcoming.^[48] Based on our reviews of seven-fold teams, we found that considering the type, area of responsibility, job description, and intervention levels of the teams, all countries and lead agencies have established a disaster response team along with education and training programs for the team members that are repeated at regular intervals throughout the year.^[24,36,49,50] One of the important points in the preparation of the teams is to conduct scenario-based exercises through workshops, panels, as well as functional and operational sessions. It is important to note that the discussion is not restricted to medical knowledge and skills alone, but based on the conditions of the disaster management teams, such issues as the ICS, safety principles, security, information management, communication and logistics in disasters,^[50] navigation and rescue in the mountains,^[49] and special courses for specialized and subspecialized medical teams^[7,18] are also included in the content and training courses.

Logistic and resource supply

Logistic and resource supply are the common elements of many international models in response to the consequences of disasters.^[51,52] Since the establishment of EDMRTs is one of the strategies to increase the capacity level for disaster risk management, it is important for the founders of these teams to pay attention to all aspects of equipping the team. According to the study conducted by Aitken *et al.*, when dispatched and deployed to the affected area, EDMRTs must rely entirely on their own for a period of at least 72 h, without needing to external resources.^[53] In a study performed on the WHO I-EMTs, Albina *et al.* point out that all teams should be self-reliant in terms of the provision of shelter, food, water, sewage systems, and all equipment and appliances. Accordingly, one of the components of the operational framework of these teams is the adequate support of technical and nontechnical capacities by taking into account several conditions such as constraint of the resources, emergency situation, and context.^[54] One of the common points for all the surveyed structures is that all teams are fully

self-reliant (at least for 72 h) and dispatched to the affected area, along with individual equipment. The medical response team members of the United States, Australia, Japan, and New Zealand carry personalized medical backpacks required for 72 h.^[7,21,37,55] As an exception of the model proposed by the WHO, it has been stated that if the dispatched team needs logistics and resource supply from local authorities, it should be announced in the form of a two-way memorandum of understanding in advance.^[18] To prevent the increased pressure on local authorities and provide appropriate medical services, it is imperative that teams maintain their full independence during their deployment and perform their duties without dependence on external resources.

Access for dispatching

According to Wong *et al.*, the comprehensive emergency medical rescue process during a disaster must be completed within <12 h.^[56] According to Peter Aitkin, the initial medical response begins immediately within few minutes after the incident by the local EMS or people in the affected area. It has been pointed out in this study that starting a response process at the state/regional level may take several days, as is the case for the federal response.^[40] In a study done by Arziman, it is noted that the dispatching process and the presence of DMATs are often delayed, so that they enter the area in the 3rd day after the occurrence of a hazard.^[57] The point observed in the access subset for deployment is a clear distinction between patterns from call time to team dispatching time, which is often related to the level of team activity. For example, the time period between recall and dispatching of local and national teams to respond to disasters is defined as 6–24 h.^[20,24,33] The time period for the participation in the international response to disasters is, on the other hand, between 24 and 48 h.^[18,33] In a study conducted by Abbasi and Salehnia, which proposes a structure for medical response teams concerning earthquake consequences, the time period between 6 and 12 h has been assigned for the first recall and dispatching first-level teams, respectively.^[58] Among the studied structures, only Japanese medical response teams, due to the presence of members in the hospital and the smallness of the teams, reach the disaster scene soon and provide required services in the affected area.^[20,34] In the best of situations, internal teams will participate in the medical response process of the affected area after more than 6 h, and higher level teams will usually appear in the region after the 1st or 2nd day of the incident. Often, at the time of arrival, patients or acute injuries have been decided upon.

Duration of attendance

Based on the results of the study of Aitken *et al.*, the members of the disaster-contributing team have

mentioned the appropriate timeframe for deployment in the affected area to be between 14 and 21 days.^[33] As far as existing structures are concerned, it was observed that different time frames are set for team deployment in the region. The minimum deployment period is set for the teams from Japan and Turkey, which is defined for 3 days or 72 h, which is due to the small number of Japanese teams and the participation of the National Medical Rescue Team of Turkey in the medical rescue process after an earthquake.^[27] Most team structures have set the deployment duration of 2 weeks to participate in responding to national disasters.^[7,22,24,59] For participation in the response to an international disaster, the WHO has set a 3-week start-up period and the Canadian military has assigned a time period of 40 days to help EDMRTs.^[18,35] As mentioned in the study performed by Redmond *et al.*, after the 5th day of deployment, the signs of physical and mental fatigue are evident in the team members and this issue is a factor, which reduces effectiveness and increases the rate of error in the care process.^[60] It seems that in relation to the duration of the deployment of response teams in the affected area, such factors as: (a) the level at which the team is designed to operate, (b) the timing of the incident, (c) the type and extent of medical needs in the area, (d) the equipment and resources associated, (e) the degree of readiness of the team, (f) the description of the duties and the role of the team, and (g) the instructions issued by the founding organizations of the team, must be taken into account to achieve the goals set.

Similar to other studies, there were some limitations for the research group. The most notable limitation in the study was the lack of access to documents, including scientific papers and official documents, on the complete structure of EDMRTs of some other countries. Moreover, this study was designed and implemented solely for the purpose of comparative evaluation of EDMRTs. Therefore, in the case of having access to relevant data and documents, it is recommended that studies be conducted to compare the other health-care teams such as HazMat teams, Public Health teams, Environmental Health teams, and Mental Health teams, as well.

Conclusion

The establishment of EDMRTs is one of the preparatory management functions, which aims to increase the capacity and capability of the health system. The results of this study showed that: (a) Many disaster risk management systems are organized with a scalable model at the local, regional, national, and international levels; (b) the model and structure of EDMRTs have a direct relationship with various elements such as the structure of the disaster risk management system, lead agencies responding to

disasters, results of the risk assessment, consequences of the hazards and medical needs of the affected area, population distribution, level of team activity, and timing of the team's presence after the incident, accordingly to which, each country/organization should consider the aforementioned factors to design and establish EDMRTs; and (c) in order to preserve the golden period, timely and appropriate response and decreased level of hazards, the lead agencies should focus on establishment/development of the capacity, empowerment, and resiliency of the local resources. To provide a timely and appropriate response, it seems necessary to have an independent structure in the body of the health management system to organize EDMRTs. At the end, considering the need to determine the roles and responsibilities of the teams, once they are present in the affected area, and to comply with some legal requirements in organizing and dispatching of the teams, the research team recommends designing and conducting studies for the comparative study of the above-existing structures.

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Conflicts of interest

There are no conflicts of interest.

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