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Preparedness Against Pandemic in Iran-Based on the Gronded Theory

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Abstract

Background: The COVID-19 pandemic has posed a major challenge for all countries. Iran is exposed to a wide range of natural and human-made hazards due to its geographical location. Therefore, preparedness is essential for a successful response to pandemics. In this study, the state of preparedness against COVID-19 in Iran was investigated.

Methods: This study is of an applied and analytical type. Qualitative data were collected using grounded theory. Semi-structured interviews were conducted with 23 individuals with a background in health management in accidents and disasters, infectious diseases, epidemiology, and passive defense. Participants were selected purposively. Qualitative data were analyzed using the continuous comparison method, and a conceptual model of national preparedness against epidemics in Iran was designed.

Results: Causal factors affecting preparedness were prerequisites, leadership, planning system, and promoters. Resilience, health system infrastructure, political situation, local situation, and nature of the disease were categorized as essential factors and adaptive and maladaptive strategies were categorized into action/interaction strategies. Consequences included social empathy, improved infrastructure, community dissatisfaction, increased psychosocial harms, reduced health system credibility, and environmental consequences.

Conclusion: The resulting framework showed that for preparedness, laws and structures need to be reformed and long-term planning should be carried out with a community-based, all-hazards and One Health approach. Information and communication management should be improved to promote community participation. Strengthening surveillance systems, establishing a single chain of command, using expert ideas and improving resilience are essential. In addition, it is possible to provide an appropriate response to future pandemics by preventing arbitrary and unscientific measures.

Keywords: COVID-19, Disasters, Empathy, Government, Grounded theory, Iran, Pandemics

Introduction

Disasters that cause ecological disorders, loss of human life, damage and deterioration of health, and require emergency response and provision of health services are considered health emergencies (1). The most important health emergencies are natural disasters and man-made accidents. Biological emergencies, epidemic threats, and severe epidemics are inherently catastrophic; Pandemics can have a more profound effect on the nature of the response in many countries (2). Preparedness against infectious diseases with an epidemic potential is a health priority and the focus of the work of the World Health Organization (WHO) (3).

Since 2019, COVID-19 treated public health worldwide and was added to the list of infectious diseases of previous epidemics (4). The outbreak of the 2019 coronavirus has challenged the existing health systems and national preparedness strategies regarding the spread of epidemic diseases around the world (5). In addition to the loss of life, epidemics cause numerous economic, social, and political losses at the regional, national, and international levels (6).

Preparedness is one of the important parts of reducing the risk of disasters and includes measures that are taken preventively to provide an effective response in the form of comprehensive planning (7). This preparedness should adequately deal with all kinds of emergencies and disasters (8). For the United Nations and WHO, preparedness is the ability (knowledge of organizational capacity and systems) of governments, specialist responsible organizations, communities, and individuals to anticipate, identify and effectively respond to and recover from potential, impending, or existing emergencies. That is, preparedness creates mechanisms that allow national authorities, multilateral organizations, and relief organizations to be aware of risks and quickly deploy staff and resources in crises (9).

The first international health regulations were published in 1969 to prevent, protect, control, and respond to the global spread of diseases. These international health regulations required states to notify each other of the existence of some specific diseases in their territory and to implement standard and appropriate measures to control the entry of disease into their borders (2).

In the revised version of these regulations, the responsibility of countries and the leadership role of the WHO with a systematic view of the care system, warning and rapid response systems, and vaccine production were specified, and technical cooperation and logistical support were promoted. Moreover, the way to facilitate the communication (10) between countries and sharing of services was defined and several suggestions were made for the management of epidemics (11). The WHO emphasizes that when an epidemic begins, it is too late to take the necessary measures to reduce its effects. Therefore, planning for preparation and deployment should be started before the start of the epidemic (12).

In 2020, the WHO developed a strategic program, following the COVID-19 outbreak, to prepare and respond to the epidemic in the Eastern Mediterranean region (13). In this plan, the main measures include participation and coordination, control of entry borders, international regulations and clinical guidelines, epidemiology and health information management, isolation and management of identified cases, infection control and prevention, rapid response teams, laboratory diagnostics, risk communication and interaction with the community (14), support and operation preparedness, program management and resource mobilization. Further, regional support and supporting other countries, and sharing experiences and resources are emphasized (15). The public health system and supporting procedures, programs, and functions should be adaptable for confronting the constantly evolving challenges. Continuous review of current information and implementation of public health practices and providing up-to-date instructions to public health organizations will facilitate the improvement of emergency preparedness and response planning (16).

Several studies, including the review of the preparedness programs of European countries and the member countries of the Eastern Mediterranean region, and the comparison of Iran's policies and strategies with the experiences of China and the WHO show that the countries of the world are not still preparing to deal with epidemic, especially emerging diseases (17-19).

Since it is very important to know the state of the country to prepare against epidemics, in this study,

the state of preparedness of Iran against covid-19 was investigated.

Materials and Methods

Study design

The present qualitative study was conducted after a review of the studies, through in-depth face-to-face interviews and the use of the grounded theory to discover the experiences of specialists and experts and finally to design a model of preparedness against COVID-19. Purposive sampling was used to select the interviewees.

Participants

The participants were policymakers, managers, and experts of health from the Ministry of Health and universities of medical sciences, and other organizations who have experience or theoretical knowledge in the field of crisis management. The criterion for entering the study was to have experience during COVID-19. The interview continued until data saturation. Table 1 shows the data of the participants.

Data collection

A semi-structured interview was used to collect the data. First, the interviewees were asked to express their recent experiences regarding the state of preparedness against COVID-19. Then, based on their answers, other questions such as: "What factors affect preparedness?" or "What actions and reactions are taken by policymakers and executives?" and other related questions were asked. Probing questions were also used to deeply understand people's experiences. To collect the data, devices such as audio recorders were used. The interviewer, after informing the objects of the interview, conducted the interviews face-to-face and individually. The trust and consent of the participants to participate in this research were gained before interviewing.

Data analysis

In this study, data collection and analysis were done simultaneously. After each interview, the audio recordings were implemented in Microsoft Word 2016. Then, following the grounded theory (Corbin and Strauss, 2015), a constant comparative analysis was performed based on three stages of open coding for primary data analysis, axial coding for classifying the extracted content, and finally selective coding for explaining the research theory. During the open coding, the research group focused on constructing the concepts. For this purpose, after studying the interviews frequently, the concepts of the extracted data were identified. Then, the extracted codes were placed in categories based on differences or similarities. The initial categories were then merged using constant comparisons to form new categories. In axial coding, the primary codes were compared

Table 1. Demographic data of the participants in the present study

Participants	Gender	Frequency	Percent
Gender	Male	19	82
	Female	4	18
Age	30-50	11	47
	50-70	12	53
Work experience	10-20	3	13
	20-30	16	69
	30-40	4	18
Level of interview	Staff managers (ministry and other organizations)	9	39
	University managers and professors	10	43
	Experts	4	18
Total		23	100

to find relationships between the categories and subcategories based on their similarities and differences. Then the related groups were placed in a cluster. Finally, the main categories were formed based on their conceptual relationship with each other. Concepts and categories based on the Strauss-Corbin paradigm model were placed in 5 categories of the main topic, causal and contextual factors, strategies, and consequences.

Trustworthiness

The authors tried to analyze the content of the findings of this study with the utmost honesty and trustworthiness and present the correct picture of the objectives of the study. Credibility, transferability, verifiability, integration, and reflectivity strategies were used to obtain valid and reliable data. Constant comparison, active listening, prolonged engagement with data, data immersion, and triangulation methods were employed for validation. The experiences and work experiences of the research team in the Ministry of Health, as well as their responsibilities during the COVID-19, were also effective in obtaining the credibility of the data. To ensure the confirmability of the study findings and also to improve the transferability of the findings, member review, peer review, and expert review techniques were used. In this research, the research team tried to describe the reflective notes for the interview and the content of the interviews while recording and taking notes.

Results

In this study, 23 interviews were conducted with experts, including policymakers in the Ministry of Health and other organizations, experts in the fields of health management in crisis and disasters, health care service management, and infectious disease specialists. The interviews were conducted for 7 months from December 2022 to September 2023 and the time of the interviews lasted from 30 to 90 (on average 60) *min*. In the first stage of the data analysis, 1392 open codes were extracted, which were reduced to 652 codes in the next stages by continuing the process of comparison, analysis, and integration of similar cases and removing the duplicate codes or unrelated codes to the research question.

The merging of these codes formed 36. By putting together and merging similar subcategories (based on dimensions and characteristics), 10 categories were formed and finally, 5 main themes including the status of national preparedness against COVID-19 as the main problem, causal factors, background factors, strategies, and outcomes were obtained as shown in Tables 2, 3 and 4.

The findings of this study demonstrated the lack of national preparedness against COVID-19. Although some participants mentioned that preparedness exists to some extent, however, it was found that the country

Table 2. Open coding

Subcategories	An example of initial concepts	Example of questions
Structure	Structure within the ministry of health-structure outside the ministry of health	- For example, the health deputy, medical deputy, nursing deputy, food and drug organization, and emergency administration of the country separately issued instructions without coordination, and holding meetings or coordination was done by one of these centers... (p01). - First, the responsibility of the National Headquarters was given to the Minister of Health, however, nobody followed the rules of the Ministry of Health. President became the head of the headquarters. However, don't we have an emergency management agency, don't we have a passive defense organization? (p18).
Rules	Amendment of rules-legal protection	We must have an acceptance at the legislative levels, it is mentioned in the national laws and specified in the law which organizations and which committees in the government are obliged to do it" (p01).

Contd. table 2.

Information	Supplying comprehensive information	Information is the basis of all measures... (p12).
Infrastructure	Energy-transportation infrastructure	In all parts of the country, attention must be paid to transportation and water supply conditions (p11).
Communication and information management	Provide timely information-Correct Informativeness-Comprehensive communication	- Unfortunately, there are many systems in the health system that coherence does not exist between them, MCMC has a series of information that it simply does not provide. - HIS has a series of information that does not provide the same information (p14). - We have many problems in communication, we don't know how to know the audience, how to communicate with them and how to talk to them to get their attention, at least we didn't do really well in this regard during Covid… (P15).
Knowledge and research management	Distribution of knowledge-development of technology-use of lessons learned-training and empowerment of society and medical staff	- PPE is one of the training and empowerment preparation items that our staff does not know. How to use PPE in everything is necessary; this should be part of the annual pre-service and in-service training, part of the preparation program... (P15). - Research development is one of the essential factors for preparation, and strengthening knowledge-based companies for research on drugs, vaccines and even manufacturing medical equipment... (p16).
Command	Chain of command-hierarchy	One of our problems was that the command of our unit was formed very late, and the interesting thing is that the incident command system is formed to remove the bureaucracy, which means it will reduce the complications and twists of the bureaucracy...(P03).
Risk management	Risk communication-risk perception-risk assessment	You do risk and vulnerability analysis and you know the capacities, what do you do in the end? You estimate your risk, you estimate it, then, what do you do? You do elevation risk, you say, well, I give an example, these risks exist and their number is so.... you transfer risk...(p11).
Surveillance systems	Syndromic care system-early warning system	The care system must be strengthened, we must have a care system following this disease in the laboratory, non-health consequences of Covid and non-hospital health...(p01).
Stakeholder analysis	Knowing the beneficiaries-knowing the companions	An analysis of the beneficiaries should be done, who is accompanying, who is hindering, who is effective and who are unaware, and should be called....(p01).
Compilation of job descriptions	Determining the duties of organizations	Every organization will affect the outcome of the pandemic, intentionally or unintentionally. Organizations must know their responsibility. They should know where they are related to other organizations... (p01).
Logistics and support	Supply of human resources-supply of equipment	It is necessary to evaluate human resources, equipment, and the required budget and provide strategic storage warehouses, especially for personal protective equipment, resource mobilization, and getting help from organizations outside the Ministry of Health, such as police and industry sector... (p17).

Contd. table 2.

Comprehensive and community-oriented approach and One Health	The approaches of the whole community-whole government and one health	- In the same way, the program should be written in a multidisciplinary, coordinated, cooperative manner. It should have a comprehensive approach and be holistic. The level of pandemic programs is high, if the community and its role are not seen in the program, the program is doomed to failure. OneHealth, one strategy, and one response, everything should be seen as this policy, if it is not shared, there will be many programs that waste resources...(p01).
Inter-sectoral cooperation and coordination	Coordinating all the organizations-getting the cooperation of different parts of the government	- If proper coordination, coherence, and cooperation between those collaborating and supporting organizations and the responsible organization which is the Ministry of Health do not happen and did not happen, we could not and will not be able to act properly against this event... (p03).
Advocacy	Support of the private sector-support of international institutions	An important point that must be clarified in planning is who and what organizations we can get help from, where they support us and we can get their support. This need for support should be taken into consideration both at the time of writing the program and after that... (p12).
Evaluation	Definition of indicators of performance evaluation	One of the issues that we neglect is the evaluation of the preparation program. Whether the program we design is implemented correctly or not, so evaluation is important in planning... (p22).
Social mobilization	Attracting social support	Leadership has a key role; the leader can create cohesion... (p23).
National commitment	The determination of the highest institutions	For preparation, we must have a high-level political and national commitment that a leader can play this role and can create national cohesion, alignment, companionship, and synergy… (p11).
Disease nature	Multifaceted-unknown-rapid mutations	We didn't know this disease, or how the disease spread and infected. We did not know at all what facilities we have to diagnose and inform and prevent the spread of the disease, which means we were not prepared at all... (P16).
Health system infrastructure	Equipping hospitals - providing experienced and trained personnel	Our hospitals were not prepared for such a situation at all, establishing negative isolation rooms, isolations, how to hospitalize this number of critically ill patients was a strange experience… (p23).
Political situation	People's obedience to the government-people's relationship with the government - accountability of the government	The type of government and its relationship with the people, how it interacts with the people, its accountability, and transparency play a very important role in preparation... (p16).
Native status	Economic-social-cultural-climatic situation	- Culturally, our people adhere to a series of etiquettes and traditions, for example, participation in celebrations and mourning ceremonies, festivities, and mourning, and wakes, which are more prominent in some ethnic groups and societies, so in such a context, dealing with diseases is difficult... (p23). - In my opinion, the countries that had suitable economic strategic reserves and favorable in terms of the related infrastructures, dealt successfully with this disease and naturally showed less failure of themselves… (p04).

Contd. table 2.

Resilience	Community literacy-community education-increasing community tolerance	A well-informed and well-trained society can adapt itself to limitations and changes in a crisis, so constant education of the people is very necessary. Society must be mentally prepared in advance to deal with such situations; thus, education can play an important role in such conditions... (P17).
Community-oriented associationism	Attracting associationism to carry out and extent measures	The most important measure that was done was the use of associationism, one of the most important symbols of which was the plan of Martyr Soleimani. In this plan, the whole society, mobilization, social and religious bases, and even mosques were used to better deal with the disease... (p21).
Localization of knowledge and technology	Increasing the activity of knowledge-based companies-trust in domestic experts	Knowledge-based companies were successful experiences, if they weren't there, the country would have faced serious problems. This successful experience shows that these companies should be strengthened, and increased as much as possible... (p02).
Experience-oriented measures	Using the country's experiences-using the experiences of other countries	The heads of universities who used the experiences of previous epidemics or the experiences of other countries were more successful, and even those who used the experiences of crisis managers were more successful in preparing hospitals.... (p03).
Use of the opinion of experts	Preference of experts' opinions to political opinions-use of all expertise	The use of experienced experts who are aware of the scientific news of the world in the management of the center of infectious diseases, the presence of crisis and disaster experts in disaster-prone areas, and terms of the outbreak and spread of diseases play an important role... (p22).
Measures without evidence	Arbitrarily measures and measures without scientific basis	The plan of night restrictions was implemented and the scientific evidence behind it was not evident and how much successful it was. It raised many objections even from the scientific community of the country… (p03).
Conflicting measures	Multiple measures-different actions of policymakers	For the funeral ceremony of the officials, we saw that the conditions of social distance were not observed, while ordinary people had to endure difficult conditions… (p03).
Inequality distribution of resources	Not using the comprehensive system of equipment-distribution of equipment without prioritizing	It was not at all clear how resources would be allocated because there was such a shortage in some places that we had to refer patients while we heard that other hospitals had enough patients' beds (p16).
Increase social empathy	The empathy of the government and people-empathy of people with each other-empathy of people with the medical staff	Well, we witnessed the pure moments after these bitter events and the social empathy that arose, the gathering of people next to the hospitals to appreciate the medical staff, providing free social services to the medical, *etc*. (p21).
Improvement of infrastructures	Preparing hospitals-increasing specialized equipment fleet	In addition to all the bitter events that happened, the expansion of many electronic infrastructures, distance education and equipment and hospital spaces and negative isolation rooms is a positive outcome (p16).
Reduction of the credibility of the health system	People's lack of trust in the health system-lack of dominance and openness of the Ministry of Health	Lack of equipment in hospitals and news that patients were dying due to lack of oxygen were effective factors in reducing the credibility of the health system (p17).

Contd. table 2.

Society dissatisfaction	Improper responsiveness of the government-lack of equipment	People are regularly exposed to conflicting news, the behavior of the officials, the way of informing, and arbitrary, unacceptable, and illogical decisions without any explanation causing dissatisfaction in society (p03).
Environmental impacts	Increasing environmental pollution-infectious waste of hospitals-improper disinfection	Look at how many masks were left in nature, which damaged the environment. Some pictures were published of these masks that involved animals, and some others were published about how disinfectants were used irregularly, especially at the beginning of the disease. These should be considered negative outcomes (p22).
Psychosocial traumas	Increasing psychological stress-increasing physical diseases	Government officials must have a coherent plan regarding mental complications. Only after that, you should look for people who have mental disorders caused by this disease and see how to work on them (p7).

Table 3. Axial coding

Categories	Subcategories
Prerequisite	- Structure - Rules - Information - Infrastructures
Leadership	- National commitment - Social solidarity
Planning system	- Stakeholder analysis - Compilation of job descriptions - Logistics and support - Comprehensive and community-oriented approach and OneHealth - Inter-sectoral cooperation and coordination - Advocacy
Promoters	- Information and communication management - Knowledge and research management - Command - Risk management - Surveillance systems
Exogenous factors	Disease nature
Endogenous factors	- Health system infrastructure - Political situation - Native status - Resilience
Compatible strategies	- Community-oriented associationism - Localization of knowledge and technology - Experience-oriented measures - Use of the opinion of experts
Non-compatible strategies	- Measures without evidence - Conflicting measures - Inequality distribution of resources
Positive outcomes	- Increase social empathy - Improvement of infrastructures
Negative outcomes	- Reduction of the credibility of the health system - Society dissatisfaction - Environmental impacts - Psychic-physical traumas

Table 4. Selective coding

Main themes	Categories
Causal factors	- Prerequisite - Leadership - Planning system - Promoters
Contextual factors	- Endogenous factors - Exogenous factors
Action/interaction strategies	- Compatible strategies - Non-compatible strategies
Consequnces	- Positive outcomes - Negative outcomes

as a whole is not ready for such epidemics.

As shown in Table 3, causal factors as factors affecting

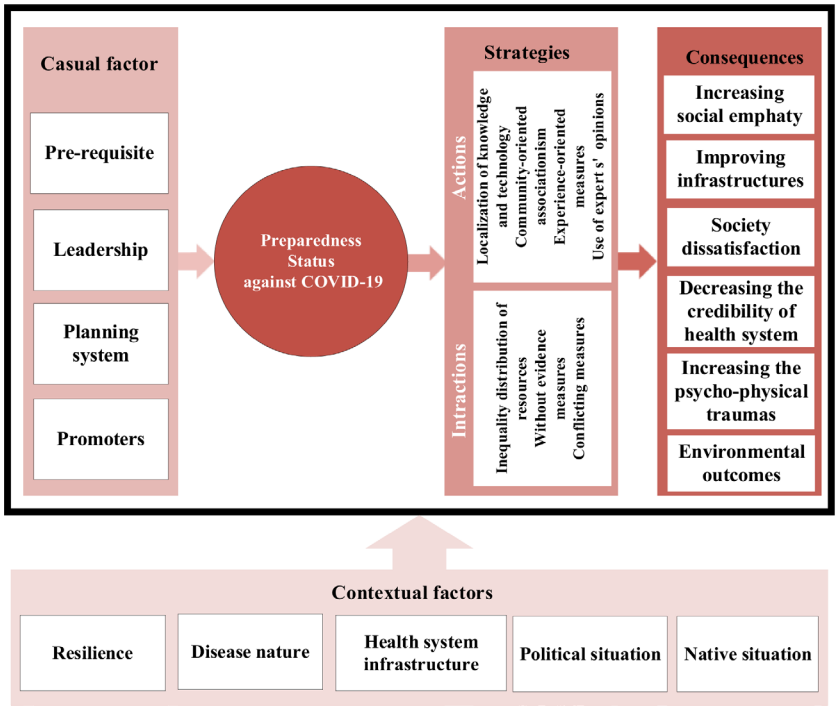

Figure 1. Conceptual model of preparedness against epidemics: with a focus on COVID-19.

preparedness include 4 subcategories of prerequisites, leadership, planning system, and promoters

Contextual factors are the basis of national preparedness which are divided into two categories of endogenous and exogenous, as shown in Table 3.

Strategies are measures that are taken to solve the main problem, which includes compatible and non-compatible measures. Finally, the consequnces as the final main theme represent the results of the measures, which include two categories of positive and negative outcomes.

Discussion

Grounded theory analysis led to the design of a preparedness status against COVID-19 in Iran. Causal factors included: prerequisites, leadership, the planning system, and promoters. The contextual factors as a preparedness base included 5 subcategories of resilience, health system infrastructure, political situation, local situation, and the nature of the disease. The action/interaction strategies included two compatible and non-compatible categories. The aligned category consisted of community-oriented participation, localization of knowledge and technology, and use of experts and experience-oriented measures. The non-compatible category included subcategories of measures without evidence, conflicting measures, and inequality distribution of resources. Finally, the outcomes included the subcategories of social empathy, infrastructure improvement, community dissatisfaction, increasing psycho-physical traumas, reducing the credibility of the health system, and environmental outcomes.

The law in the country and their performance bond were emphasized by the interviewees as one of the effective factors for preparing (14). Unfortunately, at the time of the official announcement of the outbreak of the disease in Iran, the National Headquarters for the fight against Corona was formed without paying attention to the existing laws and structures (20). This was observed despite the law of the country's crisis management organization, the international IHR regulations that the country is committed to implementing, the programs of the country's passive defense organization, and numerous related guidelines. This finding is in line with the studies of Zodpei (21) regarding the need for a law for national emergencies and its amendment and legal protection, the need for extended powers at the highest levels of government for decision-making and planning, the existence of a strong national institution, considering the epidemic as a matter of national security and the

formation of a national health protection committee with the membership of all health authorities and the common understanding of leaders, policymakers and scientists (21,22).

In this study, it was emphasized that the surveillance systems, including the early warning system and the syndromic care system in Iran, need to be strongly strengthened to be able to adapt to conditions such as emerging diseases. Accordingly, it is one of the promoters in the casual factors affecting preparedness included in the model. The rapid outbreak of the COVID-19 disease has shown that woefully local, national, and international warning systems for epidemic diseases are underdeveloped. This study is consistent with Fernley's (13,23) which focused on the successful experience of reducing the risk of COVID-19 in countries that used the experience of Ebola, MERS, and SARS epidemics and used early warning systems based on the Sendai (24)

In their study, Baru (25), and Scales (26) stated that China and Taiwan had a significant influence on the centralized command system in the effective mobilization of government budgets, military personnel, and medical resources for disease control measures (27). Further, the findings of this study demonstrated that the chain of command is one of the most important factors in preparing for crises. Daskalo emphasized in his study that sociocultural factors affect the management and control of COVID-19 (28). Both Wang and Wang (29) pointed out in their study that the traditional culture to follow social rules and observe moral standards led people to help the government to prepare and respond to the COVID-19 pandemic and actively and spontaneously join the emergency management against the pandemic (30). These findings are in line with the model designed in this research since the interviewees considered the role of cultural factors to be very effective in preparedness. Iranians have been subject to certain cultures and customs for a long time, many of which are important factors in the spread of the virus.

Resilience, from the perspective of the health system and society, is another important background factor that plays an important role in preparing for crises and epidemics, however, it has been neglected in the country. Paying attention to the dimensions that increase resilience is an issue that must be considered in the preparation program. The flexibility of equipment supply policies, supply chain, and service integration fundamentally increase the resilience of the health system. Maziar (31) suggested that the resilience of society is rooted in the level of education, culture, trust, and confidence in the government (32). The other most important background factor according to the interviewees was the infrastructure of the country's health system during the COVID-19 epidemic. In the early months of the disease outbreak in Iran, there was very little medical equipment, especially ventilators, oxygen generators, negative isolation rooms, laboratory kits, prepared treatment centers, and personal protective equipment.

Wang stated that although WHO required all member states to strengthen core capacities to respond to public health emergencies under the International Health Regulations (2005), the measures of most countries to fight the COVID-19 outbreak show that they are not well prepared (30)

The political situation and the way the government and the people interact and how to be responsive, transparent, and accepting criticism affect the formation of preparation in this study. Studies also reveal that the leading countries against the COVID-19 epidemic have been more prepared and given a more appropriate response (32).

The negative environmental outcomes caused by COVID-19 are also a factor that is emphasized in Iran and is consistent with the study of Mansour (33). Of course, some believe that Covid-19 has had positive effects due to the decrease in travel, noise pollution, and greenhouse gases (34), and this was not mentioned by the participants in the current study. Along with all the negative effects and outcomes of COVID-19, this disease created empathy between different sections of society. Social mobilization to help needy and vulnerable patients, empathy with the medical staff and material and spiritual support to them, donations from donors to hospitals to provide medical equipment, providing personal protective equipment and sewing masks and clothes, creating virtual groups for creating positive energy and enduring the quarantine period are examples that we have not witnessed before the COVID-19 disease. Research confirms the importance of empathy to deal with the spread of the virus and at the same time

preventing economic collapse (35).

Conclusion

The COVID-19 epidemic is a cross-border crisis that requires different programs with a base of requirements to prepare for it in different countries with different background conditions, therefore, a comprehensive and national preparedness plan in the countries is essential.

Reforming the existing structures in the country and preparedness laws against biological and natural crises, strengthening the information (36), health and non-health infrastructures are necessary to be reviewed and given serious attention. A planning system with a comprehensive approach, all risks, government, all society, One Health approach, close cooperation with crisis management and health management, and understanding the epidemic as a crisis form the basis for the preparedness plan. These requirements should be developed according to the existing context including the local situation, political situation, infrastructure of the health system, and resilience.

Considering the local conditions and the vast differences in cultural, social, and economic conditions of the society, the political situation of the country, and the existence of sanctions, the preparation in the country requires extensive inter-sectoral cooperation and coordination within the country and trans-sectoral with other countries. Learning from past experiences, global cooperation, and the creation of strong supply chain networks for the equitable distribution of resources in the required areas, the importance of long-term budgeting to support public health preparedness in critical situations, and promoting resilience are other requirements that should be given serious attention.

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Conflict of Interest

There are no conflicts of interest.

References

1. Chang J. Public health disasters and the evolution of pandemic response structures: a case study of MERS in Korea. J Polic Stud 2017;32(1):27-52.

2. Bjørkdahl K, Carlsen B. Pandemics, publics, and politics: Palgrave; 2019. 96 p.

3. Organization WH. Pandemic influenza preparedness framework: biennial progress report: 1 January 2018-31 December 2019. JSTOR; 2020. Report No.: 9240008683.

4. Khanna RC, Cicinelli MV, Gilbert SS, Honavar SG, Murthy GV. COVID-19 pandemic: Lessons learned and future directions. Indian J Ophthalmol 2020;68(5):703.

5. Biswas RK, Huq S, Afiaz A, Khan HT. A systematic assessment on COVID-19 preparedness and transition strategy in Bangladesh. J Eval Clin Pract 2020;26(6):1599-611.

6. Vearncombe M, Astrakianakis G. Canadian pandemic influenza preparedness: planning guidance for the health sector. https://www.canada.ca/content/dam/phac-aspc/migration/phac-aspc/cpip-pclcpi/assets/pdf/report-rapport-02-2018-eng.pdf

7. Verheul ML, Dückers ML. Defining and operationalizing disaster preparedness in hospitals: a systematic literature review. Prehosp Disaster Med 2020;35(1):61-8.

8. Cristian B. Hospital resilience: a recent concept in disaster preparedness. J Crit Care Med (Targu Mures) 2018;4(3):81-2.

9. Kandel N, Chungong S, Omaar A, Xing J. Health security capacities in the context of COVID-19 outbreak: an

analysis of International Health Regulations annual report data from 182 countries. Lancet 2020;395(10229):1047-53.

10. Dehghani A, Ghomian Z, Rakhshanderou S, Khankeh H, Kavousi A. Components of health system preparedness in disaster risk communication in Iran: a qualitative study. Int J Disast Risk Reduct 2023;84:103462.

11. Fineberg HV. Pandemic preparedness and response—lessons from the H1N1 influenza of 2009. N Engl J Med 2014 Apr 3;370(14):1335-42.

12. Mounier-Jack S, Coker RJ. How prepared is Europe for pandemic influenza? Analysis of national plans. Lancet 2006 Apr 29;367(9520):1405-11.

13. Organization WH. A strategic framework for emergency preparedness. 2017.

14. Dehghani A, Ghomian Z, Rakhshanderou S, Khankeh H, Kavousi A. National documents analysis of risk communication in Iran: based on disaster risk management cycle. Shiraz E-Med J 2022;23(12).

15. Organization WH. Coronavirus disease 2019 (COVID-19) strategic preparedness and response plan: Accelerating readiness in the Eastern Mediterranean Region: February 2020. World Health Organization. Regional Office for the Eastern Mediterranean; 2020.

16. Martinez D, Talbert T, Romero-Steiner S, Kosmos C, Redd S. Evolution of the public health preparedness and response capability standards to support public health emergency management practices and processes. Health Secur 2019;17(6):430-8.

17. Droogers M, Ciotti M, Kreidl P, Melidou A, Penttinen P, Sellwood C, et al. European pandemic influenza preparedness planning: a review of national plans, July 2016. Disaster Med Public Health Prep 2019;13(3):582-92.

18. Raoofi A, Takian A, Sari AA, Olyaeemanesh A, Haghighi H, Aarabi M. COVID-19 pandemic and comparative health policy learning in Iran. Arch Iran Med 2020;23(4):220-34.

19. Malik MR, Haq ZU, Saeed Q, Riley R, Khan WM. Distressed setting and profound challenges: Pandemic influenza preparedness plans in the Eastern Mediterranean Region. J Infect Public Health 2018;11(3):352-6.

20. Dehghani A, Ghomian Z, Rakhshanderou S, Khankeh H, Kavousi A. Process and components of disaster risk communication in health systems: a thematic analysis. Jamba 2022;14(1):1-11.

21. Zodpey S, Negandhi H, Dua A, Vasudevan A, Raja M. Our fight against the rapidly evolving COVID-19 pandemic: a review of India's actions and proposed way forward. Indian J Community Med 2020;45(2):117.

22. Group GCS. Combating the COVID-19 pandemic in a resource-constrained setting: insights from initial response in India. BMJ Glob Health 2020;5(11):e003416.

23. Shao S, Zhou Z, Li Y, Liu S, Lu L, Hou S, et al. Experiences and practices in the current prevention and control of the novel coronavirus pneumonia in China. Disaster Medicine Public Health Prep 2021;15(5):e7-e16.

24. Fearnley CJ, Dixon D. Early warning systems for pandemics: lessons learned from natural hazards. Int J Disaster Risk Reduct 2020;49:101674.

25. Baru RV. Health systems preparedness during COVID-19 pandemic: China and India. Indian J Public Health 2020;64(6):96-8.

26. Scales SE, Fouladi R, Horney JA. Description of the Use of the Incident Command System Among Public Health Agencies Responding to COVID-19. J Disast Res 2021;16(5):874-81.

27. Yeh MJ, Cheng Y. Policies tackling the COVID-19 pandemic: a sociopolitical perspective from Taiwan. Health Secur 2020;18(6):427-34.

28. Dascalu S. The successes and failures of the initial COVID-19 pandemic response in Romania. Front Public Health 2020;8:344.

29. Wang L, Yan B, Boasson V. A national fight against COVID-19: lessons and experiences from China. Aust N Z J Public Health 2020;44(6):502-7.

30. Wang Z, Duan Y, Jin Y, Zheng ZJ. Coronavirus disease 2019 (COVID-19) pandemic: how countries should build more resilient health systems for preparedness and response. Glob Health J 2020;4(4):139-45.

31. Maziar P, Maher A, Alimohammadzadeh K, Jafari M, Hosseini SM. Identifying the preparedness components in COVID-19: systematic literature review. J Educ Health Promot 2022 Nov 26:11:385.

32. Aslam F. Controlling pandemics: solutions to prevent the next pandemic. 2020;14(2):23-31.

33. Mansoor M. Citizens' trust in government as a function of good governance and government agency's provision of quality information on social media during COVID-19. Gov Inf Q 2021;38(4):10197.

34. Somani M, Srivastava AN, Gummadivalli SK, Sharma A. Indirect implications of COVID-19 towards sustainable environment: an investigation in Indian context. Bioresour Technol Rep 2020; 11:100491.

35. Franke VC, Elliott CN. Optimism and social resilience: social isolation, meaninglessness, trust, and empathy in times of COVID-19. Societies 2021;11(2):35.

36. Dehghani A, Zarei F. Design and psychometric properties of a tool to assess the knowledge, attitude and practice of health care workers for infodemic management (KAPIM-Tool). BMC Health Serv Res 2023;23(1):839.