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# The Preparedness of Primary Health Care Network in terms of Emergency Risk Communication: A Study in Iran

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## Original Research

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## Abstract

**Objective:** Emergency Risk Communication (ERC) is known as 1 of the important components of an effective response to public health emergencies. In this study, we aimed to investigate the preparedness of the Primary Health Care Network (PHCN) of Iran in terms of the ERC.

**Methods:** This study was conducted in 136 Primary Health Care Facilities (PHCFs) affiliated to Shahrekord University of Medical Sciences, Chaharmahal and Bakhtiari Province, Iran. Data in terms of ERC were collected using a checklist developed by the Center of Disease Control and Prevention (CDC).

**Results:** The findings of the study revealed that 65.9% of the PHCFs had low preparedness in terms of the ERC, 33.3% had a moderate level and 0.8% had high preparedness in this regard. There was a significant difference between the level of ERC and the history of crisis in the past year, PHCF type, and the education level of the responsible employees in the crisis unit in the PHCF.

**Conclusions:** The results showed that the PHCFs studied need to increase their capacity and capability in the field of ERC. Further efforts to provide ERC components may increase the preparedness of PHCN in Iran in terms of the ERC.

## Introduction

Emergency Risk Communication (ERC) or Crisis and Emergency Risk Communication (CERC) is a term introduced by the Centers for Disease Control and Prevention (CDC). The term explains the process of communicating regarding the risk with which various populations are faced during a public health emergency.[1] The term "emergency" encompasses crises and disasters, and also describes any event of public health or incident presenting risk to life, health, and infrastructure (e.g., natural, weather-related; and manmade destruction; infectious disease outbreaks; and exposure to harmful biological, radiological, and chemical agents).[2] According to the definition provided by World Health Organization (WHO), ERC "refers to the real-time exchange of information, advice, and opinions among experts, officials, and people who face a threat to their survival, health, or economic and social well-being. The ultimate purpose of ERC, is that everyone at risk is able to take informed decisions to mitigate the effects of the threat, such as a disease outbreak, and take protective and preventive actions." To increase the effectiveness of the developed efforts during a crisis, ERC applies various strategies and tactics, such as media communication, social media, and community engagement.[3] ERC was also recognized as 1 of the key elements of health emergency readiness.[1]

Although risk communication was introduced as 1 of the 8 main tasks which a WHO member emphasized to be performed as a part of international health regulations,[4] there are some challenges to meet the task. For example, Salvi, *et al.* in a review study showed that some factors such as coordination among response agencies, sustained human and financial resources, as well as a stronger engagement with communities, were the challenges for improving ERC.[5] In another study, Cope, *et al.* demonstrated that focusing more on monitoring, and evaluating risk communication is needed. In addition, they suggested that public health agencies should make more efforts to develop a plan in terms of risk communication, and train public health practitioners, and their partners about the risk communication principles.[6] In another study, Qiu, *et al.* demonstrated that during the SARS outbreak in Guangzhou, China, in 2003, the credibility of the government was affected by 2 factors which were: weak internal communications and external information blockades. Therefore, they suggested that building trust and facilitating multi-sector collaborations in dealing with a crisis, having an open and honest attitude, and actively engaging the stakeholders to meet their risk information needs are essential.[7] Tang, *et al.* reported that about 39.1% of the health emergency response employees in Chongqing, China, were not familiar with the ERC concept. Although 87.6% of them believed

that ERC was extremely effective, only 24.9% of them were extremely willing to adopt it in a practical situation.[8]

Given the importance of strengthening capacities regarding ERC to ensure more effective responses to public health emergencies in each country, and the necessity of identifying the current situation of health care agencies about ERC and also elements requiring further development,[9] the present study was performed. The objective of the present study was to determine the preparedness of Primary Health Care Facilities (PHCFs) affiliated to Shahrekord University of Medical Sciences, Chaharmahal and Bakhtiari Province, Iran, in terms of ERC in 2019.

To the best of our knowledge, a research exactly similar to the present study, on the assessment of the preparation of primary health care facilities of a geographical area in terms of components of ERC introduced by the CDC has not been done in other countries. In most of the research conducted, the best practices to increase the effectiveness of ERC have been reviewed.[10–14] Some studies have determined the strengths and weaknesses of risk communication conducted in response to public health crises, while some assessed knowledge, capacity and application of ERC principles among public health workers or health emergency response staff.[6,8,15] In addition, in the few published studies, the effectiveness of developed messages during a pandemic (e.g., COVID-19) has been investigated.[16,17]

### A brief overview of the Iranian primary health care system

The Primary Health Care (PHC) system was implemented in the Islamic Republic of Iran in the mid-1980s, to improve equal access to public health care in urban and rural areas in Iran. Correspondingly, PHC services are based on a health network, 1 per district, that stands on an extensive facility consisting of rural health centers, urban health centers, and health houses.[18,19] Given that a series of health reforms for increasing access to healthcare services can reduce the catastrophic out-of-pocket payments, promotion of the equity and improvement of the quality of healthcare services were done in Iran in 2014.[20]

## Method

### Design and Setting

This cross-sectional study (descriptive–analytical type) was conducted in 136 PHCFs affiliated to Shahrekord University of Medical Sciences, Chaharmahal and Bakhtiari Province, Iran from January to September 2019.

### Procedure

At first, the validity and reliability of the ERC checklist developed by CDC,[1] were assessed in the Persian language. All PHCFs (n = 136) were selected using census sampling method. The participants (the employee in charge of the crisis unit in the PHCF) were informed about the study objectives and then completed a written informed consent. Afterwards, the checklist was completed by them. Notably, 4 PHCFs had no willingness to participate in the study. Finally, data of 132 PHCFs were analyzed. The ethics committee of Iran University of Medical Sciences approved the protocol of this study (code: IR.IUMS.REC.1397.890).

### Data Collection

The ERC checklist was used for data collection in this study. This checklist was developed by CDC in 2011,[1] with 6 domains (16 items for planing, research, training, and evaluation domain; 39 items for message and audiences domain; 3 items for messanger domain; 21 items for the method of delivery and resources domain; 56 items for personnel domain; and 61 items for suggestions to be considered about resources). At first, the forward-backward procedure was used to translate the checklist. Then, the reliability and validity of the checklist were estimated. For assessing the qualitative and quantitative content validity of the checklist items, 10 experts in communication, crisis, and health education were asked to reflect their opinions on the simplicity, clarity, relevancy, and necessity of the items included. According to their comments, Content Validity Index (CVI) and Content Validity Ratio (CVR) were also assessed. Besides the items with CVR scores of 0.62 and above,[21] CVI scores of 0.79 and above,[22] were considered as satisfactory. At this stage, 8 ambiguous items were edited and the item "paper" was deleted from the suggestions for the resources domain. According to the expert panel opinion, 2 items of suggestions to be considered about resources domain as an item of "a contract with a media newswire," and an item of "a contract with a radio newswire" were merged. Also, 4 items of suggestions to be considered about resources domain (item pens, item marketer, item highlighter, and item erasable markers) were intergrated as the stationery. Next, the reliability of the checklist was estimated using the Cohen's kappa coefficient. In terms of the guidelines of the minimum sample size requirements for Cohen's kappa,[23] by assuming a kappa of at least 0.6 and a maximum of 0.17, alpha of 0.05, and power of 80%, 2 external trained researchers completed the checklist for 30 PHCFs. The finding showed that Cohen's kappa of the checklist was 0.87 ($P < 0.00001$). According to a suggestion by Cohen, the rate of agreement between 0.81–1.00 was considered as perfect agreement.[24] The final checklist had 6 domains (16 items for planning, research, training, and evaluation domain; 39 items for message and audiences domain; 3 items for messanger domain; 21 items for the method of delivery and resources domain; 56 items for personnel domain; and 56 items for suggestions to be considered about resources).

In the present study, the scores between 1 and 61 were considered as poor preparedness regarding the ERC, those between 62 and 122 as moderate preparedness, and the scores between 123 and 184 as good prepardeness. In addition, demographic characteristics including the number of population covered by PHCFs and their ethnicity, existence of independent crisis-related unit in the PHCFs, level of education of employees in charge of the unit of crisis-related communications in the PHCFs, and history of crisis in the last year were gathered using a researcher-made instrument.

### Data analysis

Finally, the obtained data were analyzed. The Chi square and Fisher`s exact tests were also used to examine the relationship between qualitative demographic variables and the level of preparedness of the PHCFs. The obtained data were reported as frequency, mean, and standard deviation. In this study, $P < 0.05$ was considered as statistically significant.

## Results

10 centers including district 1 health network, and district 9 health centers had independent units for crisis-related responsibilities. Demographic features of the PHCFs and their relationships with the level of ERC are shown in Table 1. In most of the PHCFs,

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**Table 1.** Demographic characteristics of the primary health care facilities ($n = 132$)

| Variables | Mean (*SD*) | *N* | % | *P*-value |
|---|---|---|---|---|
| **Geography of the health centers** | | | | <0.0001* |
| District health network | | 1 | 0.8 | |
| District health center | | 9 | 6.8 | |
| Urban health center | | 51 | 38.6 | |
| Rural health center | | 64 | 48.5 | |
| Urban-rural health center | | 7 | 5.3 | |
| **Town name** | | | | < 0.0001* |
| Shahrekord | | 29 | 22 | |
| Farsan | | 12 | 9.1 | |
| Koohrang | | 11 | 8.3 | |
| Lordegan | | 27 | 20.5 | |
| Ardal | | 12 | 9.1 | |
| Ben | | 8 | 6.1 | |
| Saman | | 7 | 5.3 | |
| Boroujen | | 15 | 11.4 | |
| Kiyar | | 11 | 8.3 | |
| **Education level of the employee responsible for crisis unit** | | | | < 0.0001* |
| Associate degree | | 8 | 6.1 | |
| Bachelor | | 117 | 88.6 | |
| Master | | 6 | 4.5 | |
| Ph.D | | 1 | 0.8 | |
| **The history of crisis in the past year** | | | | 0.005* |
| Yes | | 34 | 25.8 | |
| No | | 98 | 74.2 | |

The relationship between the demographic variables of the primary health care facility and the level of ERC (Chi Square):* $P < 0.05$.

the staff in charge of the crisis unit were experts in environmental health. In these PHCFs, the crisis team included a physician, an environmental health expert, and an expert in disease control. The findings showed that there was a statistically significant difference between the level of ERC and type of the PHCF (district health network, district health center, urban health center, rural health center, and urban-rural health center) ($P < 0.0001$), the level of education of the employees in charge of the unit of crisis-related communication in the PHCF ($P < 0.0001$), and the history of crisis in the past year in the covered region ($P = 0.005$).

The results showed that 65.9% of the PHCFs had low preparedness in terms of the ERC, 33.3% had moderate, and 0.8% had good preparedness. In Farsan town, 8.3% of the PHCFs had good preparedness regarding the ERC. The lowest preparedness was seen in the PHCFs of Lordegan town. In Table 3, the preparedness of the PHCFs of each town regarding the ERC is shown. In addition, the results showed that 73.5% of the PHCFs had crisis communication operational plan to inform the public, media, partners, and stakeholders. Notably, there was no structure called Joint Information Center (JIC) in the PHCFs. The Emergency Operation Center (EOC) had direct comunication only with the district health network and district health centers. Town hall meeting was the most important channel used by PHCFs for communcating with various populations during a crisis. There were inadequate expert employees in the crisis team or available in an emergency with skills in various areas including public affairs, health communication, communication officer, health education, training, writer/editor, technical writer/editor, audio/visual, and internet/web designs in the PHCFs. For example, there were public affair and health education specialists in the crisis team of 50.8% and 7.6% of the PHCFs, respectively (see Table 2). In the command and control sub-domain, 56.8% of the PHCFs activated a plan based on the careful assessment of the situation as well as the expected demands for information media, partners, and the public. Findings showed that 78.8% of the PHCFs identified specific populations and sub-populations of their region. To ensure that the messages were consistent and within the scope of the organization's responsibility, only 39.4% of the PHCFs were coordinated with horizontal communication partners. About 18.2% of the PHCFs reviewed and approved materials for regular release to the media, public, and partners, and 25% regularly cleared the materials released to media on policy or sensitive topic-related information which were not previously cleared. The results showed that 96.2% of the PHCFs had a plan for communication with the public, media, and partner organizations, regarding the prevalent waterborne and foodborne diseases, respectively. In Table 2, the frequency of responses regarding ERC items is shown.

## Discussion

The findings of the study showed that 65.9% of the PHCFs had low preparedness in terms of the ERC, 33.3% had moderate preparedness, and 0.8% had high preparedness. The PHCFs of Farsan and Lordegan towns had the highest and lowest prepareness levels regarding the ERC, respectively. Rural health centers had low preparedness compared with other health care facilities. To the best of our knowledge, the preparedness of PHCFs in terms of the ERC has not been widely studied yet. However, our findings are consistent with those of Malik, *et al.,* indicating that the score of risk communication, as 1 part of the pandemic preparedness plan, was 46% in the countries in the Eastern Mediterranean region.[25] In another study, Sambala, *et al.* evaluated pandemic influenza preparedness plans in 47 countries of the WHO African region. Accordingly, they reported that 22 studied plans had a communication strategy. The score of preparation and risk communication of the countries was 48%.[26] Given that the majority of the studied PHCFs were in a low preparedness level regarding the ERC, it is suggested that the health system in Iran should be further considered with respect to this field, and the gaps identified in this study should be addressed.

The findings of the present study showed that there was a significant difference between the level of ERC and history of crisis in the past year, PHCF type, and the education level of the employees in charge of the crisis unit in the PHCF. The facilities with crisis - unit employees, who had masters and PhD degrees were more prepared for ERC compared to other facilities. In the same line, Al-Hunaishi, *et al.* reported that the desire to participate in natural disasters management was higher among health care workers with bachelor and postgraduate degrees compared to those holding a diploma degree.[27] In recent years, some efforts were made in Iran to prepare the health professionals of PHCFs for disasters. However, more efforts are needed for employing employees who are experts in crisis, in all PHCFs, and preparing them in terms of communication in disasters while emphasizing the preparation of the local PHCFs workers such as health houses, and rural health centers about ERC.

The results showed that 78.8% of the PHCFs had identified specific populations and sub-populations of their region that need to be targeted with specific messages during a public health

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**Table 2.** The frequency of responses regarding emergency risk communication checklist items

| | Yes N (%) | No N (%) |
|---|---|---|
| **1. Planning, Research, Training, and Evaluation** | | |
| 1.1 Does your organization have an emergency response/crisis communication operational plan for public information and media, partner, and stakeholder relations? | 97 (73.5) | 35 (26.5) |
| **If yes, does the plan have the following elements:** | | |
| a. Designated line and staff responsibilities for the public information team? | 84 (63.6) | 48 (36.4) |
| b. Information verification and clearance approval procedures? | 65 (49.2) | 67 (50.8) |
| c. Agreements on information- release authorities (who releases what/when/how?) | 57 (43.2) | 75 (56.8) |
| d. Regional and local media contact list (including after-hours news desks)? | 45 (34.1) | 87 (65.9) |
| e. Procedures to coordinate with the public health organization response teams? | 63 (47.7) | 69 (52.3) |
| f. Designated spokespersons for public health issues in an emergency? | 66 (50) | 66 (50) |
| g. Public health organization emergency response team after-hours contact numbers? | 73 (55.3) | 59 (44.7) |
| h. Contact numbers for emergency information partners (e.g., governor's public affairs officer, local FBI public information special agent in charge, local or regional department of agriculture or veterinarian public information officers, Red Cross and other nongovernment organizations)? | 60 (45.5) | 72 (54.5) |
| i. Agreements/procedures to join the Joint Information Center (JIC) of the emergency operations center (if activated)? | 0 | 0 |
| j. Procedures to secure needed resources (space, equipment, people) to operate the public information operation during a public health emergency 24 hours a day 7 days a week, if needed? | 39 (29.5) | 93 (70.5) |
| k. Identified vehicles of information dissemination during a crisis to public, stakeholders, and partners (e.g., e-mail list servs, broadcast fax, door-to-door leaflets, and press releases)? | 65 (49.2) | 67 (50.8) |
| 1.2 Have you coordinated your planning with the community or state emergency operation center? | 9 (6.8) | 123 (93.2) |
| 1.3 Have you coordinated your planning with other response organizations or competitors? | 68 (51.5) | 64 (48.5) |
| 1.4 Have designated spokespersons received media training and risk communication training? | 53 (40.2) | 79 (59.8) |
| 1.5 Do the spokespersons understand emergency crisis/risk communication principles to build trust and credibility? | 45 (34.1) | 87 (65.9) |
| **2. Message and Audiences** | | |
| 2.1 Are any of the following types of incidents (disasters) likely to require intense public information, media, and partner communication responses by your organization: | | |
| a. Airborne infectious disease outbreak (e.g., pandemic influenza)? | 80 (60.6) | 52 (39.4) |
| b. Foodborne infectious disease outbreak (e.g., listeria)? | 127 (96.2) | 5 (3.8) |
| c. Waterborne (Cryptosporidiosis)? | 127 (96.2) | 5 (3.8) |
| d. Vector borne (West Nile virus)? | 108 (81.8) | 24 (18.2) |
| e. Outbreak with potential to spread outside your region or to your region? | 70 (53) | 62 (47) |
| f. Unknown infectious agent? | 31 (23.5) | 101 (76.5) |
| g. Chemical or toxic material disaster? | 40 (30.3) | 92 (69.7) |
| h. Natural disasters? | 96 (72.7) | 36 (27.3) |
| i. Unknown infectious agent (international) with potential to spread to the United States? | 25 (18.9) | 107 (87.1) |
| j. Known infectious agent (international) with potential to spread to the United States? | 97 (73.5) | 35 (26.5) |
| k. Large – scale environmental crises? | 71 (53.8) | 61 (46.2) |
| l. Radiological event? | 13 (9.8) | 119 (90.2) |
| m. Terrorist event | | |
| m. 1) Biological (suspected or declared)? | 25 (18.9) | 107 (81.1) |
| m. 2) Chemical? | 8 (6.1) | 124 (93.9) |
| m. 3) Radiological? | 7 (5.3) | 125 (94.7) |
| m. 4) Mass explosion? | 5 (3.8) | 127 (96.2) |
| n. Site-specific emergencies | | |
| n. 1) Laboratory incident with laboratory worker? | 34 (25.8) | 98 (74.2) |
| n. 2) Laboratory incident release of material in community? | 15 (11.4) | 117 (88.6) |
| n. 3) Death of employee contractor visitor while on campus premises? | 21 (15.9) | 111(84.1) |
| n. 4) Hostage event with by employee contractor on campus premises? | 3 (2.3) | 129 (97.7) |
| n. 5) Bomb threat? | 2 (1.5) | 130 (98.5) |
| n. 6) Explosion/fire—destruction of property? | 41 (31.1) | 91 (68.9) |
| n. 7) Violent death of an employee/contractor or visitor on campus/premises? | 11 (8.3) | 121 (91.7) |
| 2.2 Have you **identified special populations** (e.g., elderly, first language other than English, tribal communities, border populations)? List any specific sub-populations that need to be targeted with specific messages during a public health emergency related to your organization (e.g., tribal nations, persons with chronic respiratory illness, unvaccinated seniors). | 104 (78.8) | 28 (21.2) |

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**Table 2.** (*Continued*)

| | Yes<br>N (%) | No<br>N (%) |
|---|---|---|
| 2.3 Have you **identified your organization's partners who should receive direct information and updates** (not solely through the media) from your organization during a public health emergency? | 83 (62.9) | 49 (37.1) |
| 2.4 Have you **identified all stakeholder organizations** or populations (groups or organizations that your believes have an active interest in monitoring activities—to whom you are most directly organization accountable, other than official chain of command) who should receive direct communication during a public health–related emergency? | 69 (52.3) | 63 (47.7) |
| 2.5 Have you **planned ways to reach people according to their reactions** to the incident (fight or flight)? Are messages, messengers, and methods of delivery sensitive to all types of audiences in your area of responsibility? | 58 (43.9) | 74 (56.1) |
| 2.6 Are there **mechanisms/resources in place to create messages** for the media and public under severe time constraints, including methods to clear these messages within the emergency response operations of your organization (include cross clearance)? | 28 (21.2) | 104 (78.8) |
| 2.7 Have you identified how you will perform **media evaluation, content analysis, and public information call analysis in real time** during an emergency to ensure adequate audience feedback? | 4 (3) | 128 (97) |
| 2.8 Have you developed **topic-specific pre-crisis materials** for identified public health emergency issues, or identified sources of these materials if needed: | | |
| a. Topic fact sheet (e.g., description of the disease, public health threat, treatment, etc.)? | 78 (59.1) | 54 (40.9) |
| b. Public questions/answers (Q/As)? | 22 (16.7) | 110 (83.3) |
| c. Partner questions/answers? | 12 (9.1) | 120 (90.9) |
| d. Resource fact for media/public/partners to obtain additional information? | 35 (26.5) | 97 (73.5) |
| e. Web access and links to information on the topic? | 27 (20.5) | 105 (79.5) |
| f. Recommendations for affected populations? | 89 (67.4) | 43 (32.6) |
| g. Background beta video (B-roll) for media use on the topic? | 32 (24.2) | 100 (75.8) |
| h. List of subject matter experts outside your organization who would be effective validators to public/media regarding your activities during a public health emergency? | 31 (23.5) | 101 (76.5) |
| **3. Messenger** | | |
| 3.1 Have you identified public health spokespersons for media and public appearances during an emergency? | 76 (57.6) | 56 (42.2) |
| **If yes, have you:** | | |
| a. Identified persons by position to act as spokespersons for multiple audiences (e.g., media spokesperson, community meeting speaker, etc.) and formats about public health issues during an emergency? | 51 (38.6) | 81 (61.4) |
| b. Ensured that the spokespersons understand their communication roles and responsibilities and will incorporate them into their expected duties during the crisis? | 49 (37.1) | 83 (62.9) |
| **4. Methods of delivery (Information Dissemination) and resources** | | |
| 4.1 Does your organization have **go kits** for public information officers who may have to abandon their normal place of operation during a public health emergency or join a JIC? **If yes, does the kit include:** | | |
| a. A computer(s) capable of linking to the Internet/e-mail? | 62 (47) | 70 (53) |
| b. A CD–ROM or disks containing the elements of the crisis communication plan (including media, public health, and organization contact lists, partner contact lists; information materials, etc.)? | 16 (12.1) | 116 (87.9) |
| c. A cell phone or satellite phone, pager, wireless e-mail, etc.? | 25 (18.9) | 107 (81.1) |
| d. A funding mechanism (credit card, etc.) that can be used to purchase operational resources as needed? | 4 (3) | 128 (97) |
| e. Manuals and background information necessary to provide needed information to the public and media? | 77 (58.3) | 55 (41.7) |
| f. Care and comfort items for the public information operations staff? | 18 (13.6) | 114 (86.4) |
| 4.2 Have you identified the mechanisms that are or should be in place to ensure **multiple channels of communication to multiple audiences** during a public health emergency? **If yes, do they include:** | | |
| a. Media channels (print, TV, radio, Web)? | 31 (23.5) | 101 (76.5) |
| b. Websites? | 5 (3.8) | 127 (96.2) |
| c. Phone banks? | 6 (4.5) | 126 (95.5) |
| d. Town hall meetings? | 71 (53.8) | 61 (46.2) |
| e. Listserv e-mail? | 0 | 0 |
| f. Broadcast fax? | 0 | 0 |
| g. Letters by mail? | 12 (9.1) | 120 (90.9) |
| h. Subscription newsletters? | 6 (4.5) | 126 (95.5) |
| i. Submissions to partner newsletters? | 5 (3.8) | 127 (96.2) |
| j. Regular or special partner conference calls? | 43 (32.6) | 89 (67.4) |
| k. Door-to-door canvassing? | 32 (24.2) | 100 (75.8) |
| 4.3 Are **contracts agreements** in place to post information to broadcast fax or e-mail systems? | 2 (1.5) | 130 (98.5) |
| 4.4 Have **locations for press conferences** been designated and resourced? | 7 (5.3) | 125 (94.7) |

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**Table 2.** (*Continued*)

| | Yes N (%) | No N (%) |
|---|---|---|
| **5. Personnel** | | |
| 5.1 Have you identified employees, contractors, fellows, interns currently working for you or available to you in an emergency who have skills in the following areas: | | |
| a. Public affairs specialist? | 67 (50.8) | 65 (49.2) |
| b. Health communication specialist? | 19 (14.4) | 113 (85.6) |
| c. Communication officer? | 7 (5.3) | 125 (94.7) |
| d. Health education specialist? | 10 (7.6) | 122 (92.4) |
| e. Training specialist? | 10 (7.6) | 122 (92.4) |
| f. Writer/editor? | 2 (1.5) | 130 (98.5) |
| g. Technical writer/editor? | 1 (0.8) | 131 (99.2) |
| h. Audio/visual specialist? | 8 (6.1) | 124 (93.9) |
| i. Internet/Web design specialist? | 13 (9.8) | 119 (90.2) |
| j. Others who contribute to public/provider information? | 103 (78) | 29 (22) |
| 5.2 Have you identified who will provide the following expertise or execute these activities during a public health emergency (including backup): | | |
| **Command and control:** | | |
| a. Directs the work related to the release of information to the media, public, and partners? | 67 (50.8) | 65 (49.2) |
| b. Activates the plan, based on careful assessment of the situation and the expected demands for information media, partners, and the public? | 75 (56.8) | 57 (43.2) |
| c. Coordinates with horizontal communication partners, as outlined in the plan, to ensure that messages are consistent and within the scope of the organization's responsibility? | 52 (39.4) | 80 (60.6) |
| d. Provides updates to organization's director, Emergency Operations Center (EOC) command and higher headquarters, as determined in the plan? | 32 (24.4) | 100 (75.8) |
| e. Advises the director and chain of command regarding information to be released, based on the organization's role in the response? | 60 (45.5) | 72 (54.5) |
| f. Ensures that risk communication principles are employed in all contact with media, public, and partner information release efforts? | 32 (42.2) | 100 (75.8) |
| g. Advises incident-specific policy, science, and situation? | 43 (32.6) | 89 (67.4) |
| h. Reviews and approves materials for release to media, public, and partners? | 24 (18.2) | 108 (81.8) |
| i. Obtains required clearance of materials for release to media on policy or sensitive topic-related information not previously cleared? | 33 (25) | 99 (75) |
| j. Determines the operational hours/days, and reassesses throughout the emergency response? | 32 (24.4) | 100 (75.8) |
| k. Ensures resources are available (human, technical, and mechanical supplies)? | 31 (23.5) | 101 (76.5) |
| **Media:** | | |
| a. Assesses media needs and organizes mechanisms to fulfill media needs during the crisis (e.g., daily briefings in person, versus a Website update)? | 3 (2.3) | 129 (97.7) |
| b. Triages the response to media requests and inquiries? | 2 (1.5) | 130 (98.5) |
| c. Ensures that media inquiries are addressed as appropriate? | 2 (1.5) | 130 (98.5) |
| d. Supports spokespersons? | 3 (2.3) | 129 (97.7) |
| e. Develops and maintains media contact lists and call logs? | 3 (2.3) | 129 (97.7) |
| f. Produces and distributes media advisories and press releases? | 2 (1.5) | 130 (98.5) |
| g. Produces and distributes materials (e.g., fact sheets, B-roll)? | 3 (2.3) | 129 (97.7) |
| h. Oversees media monitoring systems and reports (e.g., analyzing environment and trends to determine needed messages; determining what misinformation needs to be corrected; identifying concerns, interests, and needs arising from the crisis and the response)? | 1 (0.8) | 131 (99.2) |
| i. Ensures that risk communication principles to build trust and credibility are incorporated into all public messages delivered through the media? | 1 (0.8) | 131(99.2) |
| j. Acts as member of the JIC of the field site team for media relations? | 0 | 0 |
| k. Serves as liaison from the organization to the JIC and back? | 0 | 0 |
| **Direct public information:** | | |
| a. Manages the mechanisms to respond to public requests for information directly from the organization by telephone, in writing, or by e-mail? | 44 (33.3) | 88 (66.7) |
| b. Oversees public information monitoring systems and reports (e.g., analyzing environment and trends to determine needed messages; determining what misinformation needs to be corrected; identifying concerns, interests, and needs arising from the crisis and the response)? | 43 (32.6) | 89 (67.4) |
| c. Activates or participates in the telephone information line? | 75 (56.8) | 57 (43.2) |
| d. Activates or participates in the public e-mail response system? | 8 (6.1) | 124 (93.9) |
| e. Activates or participates in the public correspondence response system? | 31 (23.5) | 101 (76.5) |

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**Table 2.** (*Continued*)

| | Yes N (%) | No N (%) |
|---|---|---|
| f. Organizes and manages emergency response Web sites and Web pages? | 6 (4.5) | 126 (95.5) |
| g. Establishes and maintains links to other emergency response Websites? | 8 (6.1) | 124 (93.9) |
| **Partner stakeholder information:** | | |
| a. Establishes communication protocols based on prearranged agreements with identified partners and stakeholders? | 29 (22) | 103 (78) |
| b. Arranges regular partner briefings and updates? | 75 (56.8) | 57 (43.2) |
| c. Solicits feedback and responds to partner information requests and inquiries? | 75 (56.8) | 57 (43.2) |
| d. Oversees partner/stakeholder monitoring systems and reports (e.g., analyzing environment and trends to determine needed messages; determining what misinformation needs to be corrected; identifying concerns, interests, and needs arising from the crisis and the response)? | 31 (23.5) | 101 (76.5) |
| e. Helps organize and facilitate official meetings to provide information and receive input from partners or stakeholders? | 51 (38.6) | 81 (61.4) |
| f. Develops and maintains lists and call logs of legislators and special interest groups? | 1 (0.8) | 131 (99.2) |
| g. Responds to legislator/special interest groups requests and inquiries? | 70 (53) | 62 (47) |
| **Content and material for public health emergencies:** | | |
| a. Develops and establishes mechanisms to rapidly receive information from the EOC regarding the public health emergency? | 12 (9.1) | 120 (90.9) |
| b. Translates EOC situation reports and meeting notes into information appropriate for public and partner needs? | 15 (11.4) | 117 (88.6) |
| c. Works with subject matter experts to create situation-specific fact sheets, Q/As, and updates? | 21 (15.9) | 111 (84.1) |
| d. Compiles information on possible public health emergency topics for release when needed? | 24 (18.2) | 108 (81.8) |
| e. Tests messages and materials for cultural and language requirements of special populations? | 9 (6.8) | 123 (93.2) |
| f. Receives input from other communication team members regarding content and message needs? | 13 (9.8) | 119 (90.2) |
| g. Uses analysis from media, public and partner monitoring systems, and reports (e.g., environmental and trend analysis to determine needed messages; what misinformation need to be corrected; and identify concerns, interests, and needs arising from the crisis and the response) to identify additional content requirements and materials development? | 7 (5.3) | 125 (94.7) |
| h. Lists contracts/cooperative agreements/consultants currently available to support emergency public/private information dissemination? | 8 (6.1) | 124 (93.9) |
| **6. Suggestions to consider about resources** | | |
| **Do you have space:** | | |
| a. To operate your communication teams outside the EOC? (You need a place to bring media on site, separate from the EOC.) | 30 (22.7) | 102 (77.3) |
| b. To quickly train spokespersons? | 76 (57.6) | 56 (42.4) |
| c. For team meetings? | 109 (82.6) | 23 (17.4) |
| d. For equipment, exclusive for your use? (You cannot stand in line for the copier when media deadlines loom.) | 42 (31.8) | 90(68.2) |
| **Have you considered the following contracts and memoranda of agreement:** | | |
| a. A contract with a (media, radio) newswire? | 1 (0.8) | 96 (99.2) |
| b. A contract for writers or public relations personnel who can augment your staff? | 0 | 0 |
| c. A contract for administrative support? | 0 | 0 |
| d. A phone system contractor to supply a phone menu that directs type of caller and level of information desired, including: | | |
| d. 1) General information about the threat? | 0 | 0 |
| d. 2) Tip line, listing particular actions people can take to protect themselves? | 0 | 0 |
| d.3) Reassurance/counseling? | 0 | 0 |
| d.4) Referral information for healthcare/medical facility workers? | 0 | 0 |
| d.5) Referral information for epidemiologists or others to report cases? | 0 | 0 |
| d.6) Lab/treatment protocols? | 0 | 0 |
| d.7) Managers looking for policy statements for employees? | 0 | 0 |
| **Do you have the following recommended equipment:** | | |
| a. Fax machine (with a number that's preprogrammed for broadcast fax releases to media and partners)? | 9 (6.8) | 123 (93.2) |
| b. Website capability 24/7? (You should attempt to have new information posted within 2 hours; some say within 10 minutes.) | 4 (3) | 128 (97) |
| c. Computers (on local area networks [LANs] with listserv e-mail designated for partners and media)? | 9 (6.8) | 123 (93.2) |
| d. Laptop computers? | 121 (91.7) | 11 (8.3) |
| e. Printers for every computer? | 5 (3.8) | 127 (96.2) |
| f. Copier (and backup)? | 8 (6.1) | 124 (93.9) |
| g. Tables? (You will need a large number of tables.) | 130 (98.5) | 2 (1.5) |
| h. Cell phones/pagers/personal digital devices and e-mail readers? | 28 (21.2) | 104 (78.8) |

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**Table 2.** (*Continued*)

| | Yes N (%) | No N (%) |
|---|---|---|
| i. Visible calendars, flow charts, bulletin boards, easels? | 116 (87.9) | 16 (12.1) |
| j. Designated personal message board? | 76 (57.6) | 56 (42.4) |
| k. Small refrigerator? | 119 (90.2) | 13 (9.8) |
| m. Color copier? | 5 (3.8) | 127 (96.2) |
| n. A/V equipment? | 15 (11.4) | 117 (88.6) |
| o. Portable microphones? | 13 (9.8) | 119 (90.2) |
| p. Podium? | 18 (13.6) | 114 (86.4) |
| q. TVs with cable hookup? | 105 (79.5) | 27 (20.5) |
| r. Video recording and playing capability? | 17 (12.9) | 115 (87.1) |
| s. CD–ROMs or flash drives? | 40 (30.3) | 92 (69.7) |
| t. Paper shredder? | 1 (0.8) | 131 (99.2) |
| **Do you have the following recommended supplies:** | | |
| a. Copier toner? | 43 (32.6) | 89 (67.4) |
| b. Printer ink? | 48 (36.4) | 84 (63.6) |
| c. Paper? | 118 (89.4) | 14 (10.6) |
| d. stationary? | 121 (91.7) | 11 (8.3) |
| h. Shipping and postal supplies? | 67 (50.8) | 65 (49.2) |
| i. Sticky note pads? | 30 (22.7) | 102 (77.3) |
| j. Tape? | 126 (95.5) | 6 (4.5) |
| k. Notebooks? | 98 (74.2) | 34 (25.8) |
| l. Poster board? | 106 (80.3) | 26 (19.7) |
| m. Standard press kit folders? | 67 (50.8) | 65 (49.2) |
| n. Organized B-roll in media ready format (keep VHS copies around for meetings)? | 22 (16.7) | 110 (83.3) |
| o. Formatted computer disks? | 9 (6.8) | 123 (93.2) |
| p. Color-coded items (folders, inks, etc.)? | 18 (13.6) | 114 (86.4) |
| q. Baskets (to contain items you're not ready to throw away)? | 42 (31.8) | 90 (68.2) |
| r. Organizers to support your clearance and release system? | 114 (86.4) | 18 (13.6) |
| s. Expandable folders (alphabetized or days of the month)? | 10 (7.6) | 118 (92.4) |
| t. Staplers? | 129 (97.7) | 3 (2.3) |
| u. Paper punch? | 129 (97.7) | 3 (2.3) |
| v. 3-ring binders? | 55 (41.7) | 77 (58.3) |
| w. Organization's press kit or its logo on a sticker? | 12 (9.1) | 120 (90.9) |
| x. Colored copier paper (for door-to-door flyers)? | 19 (14.4) | 113 (85.6) |
| y. Paper clips (all sizes)? | 103 (78) | 29 (22) |

emergency (Table 3). Likewise, Sambala, *et al.* surveyed pandemic influenza preparedness plans in 47 countries of the WHO African region plan. They reported that in 23 plans, key target groups have been defined for developing specific preventative messages about influenza.[26] Andrulis, *et al.* showed that integrating the factors related to race, culture, and language diverse communities into risk communication efforts of would be needed in the future.[28] Cole, *et al.* also demonstrated that for increasing the effectiveness of risk communication messages, several factors such as ethnicity, class, gender, and similar demographic characteristics of audiences should be adapted.[29] Since having a picture from vulnerable populations of a community may help to provide effective communication messages and interactions,[30] planning to identify the populations is essential in each region. In addition, the results of the present study showed that 52.3% of the PHCFs had suggested that stakeholder organizations or populations should have an active interest in monitoring those activities that should receive direct communication during a public health emergency. Also, 22% of the PHCFs have established their communication protocols based on the pre-arranged agreements with the identified partners and stakeholders (see Table 3). Toppenberg-Pejcic, *et al.* reported that improving the effectiveness of responses to a crisis, requires local communities to be involved with ERC processes before the occurrence of an emergency.[31] It is suggested that policy makers of Iran's health system should consider establishing the protocols to identify and involve the key stakeholders and groups in decision-making in terms of the ERC. In another study, Novak, *et al.* noted that developing strategies and tactics to foster participation among all stakeholders is important in ERC.[11]

The findings showed that town hall meetings were used more frequently than other communication channels such as websites during the emergencies by the PHCFs (Table 3). These findings are inconsistent with the results of Tam, *et al.*'s study. They showed that television (56%) and the Internet (16%) were more preferred than other communication channels across all age groups in public health emergencies in Hong Kong.[32] Also, the results of another study showed that most of the people in the United States received Zika-related information through television and radio (85%).[33] In

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**Table 3.** The level of prepareness of the primary health care facilities of each town regarding ERC

| Town name | Preparedness level | N | % | Mean | SD |
|---|---|---|---|---|---|
| **Shahrekord** | Low | 19 | 65.5 | 51.83 | 22.9 |
| | Moderate | 10 | 34.5 | | |
| **Farsan** | Low | 6 | 50 | 66.58 | 28.3 |
| | Moderate | 5 | 41.7 | | |
| | Good | 1 | 8.3 | | |
| **Koohrang** | Low | 8 | 72.7 | 46 | 17.8 |
| | Moderate | 3 | 27.3 | | |
| **Lordegan** | Low | 25 | 92.6 | 43.07 | 12.8 |
| | Moderate | 2 | 7.4 | | |
| **Ardal** | Moderate | 12 | 100 | 85.17 | 16.7 |
| **Ben** | Low | 5 | 62.5 | 59.75 | 11.5 |
| | Moderate | 3 | 37.5 | | |
| **Saman** | Low | 5 | 71.4 | 51.43 | 13.07 |
| | Moderate | 2 | 28.6 | | |
| **Boroujen** | Low | 9 | 60 | 58.27 | 8.8 |
| | Moderate | 6 | 40 | | |
| **Kiyar** | Low | 10 | 90.9 | 44.82 | 13.4 |
| | Moderate | 1 | 9.1 | | |

this regard, Edworthy, *et al.* showed that during the emergencies, when participants were not allowed to use the telephone, they primarily chose email communication followed by face-to-face communication. They also demonstrated that written communication generally facilitated more accurate transmission of information when compared to spoken communication.[34] Sambala, *et al.* revealed that among 47 WHO African region plans about pandemic influenza preparedness, 31 plans had materials published in multi-media such as newspapers, radio, television, and social networking sites on the Internet.[26] More efforts to train employees engaged in the public health emergencies in using various media and communication channels, instead of communication restricted to a method or channel, may help better transmit information and warning messages during an emergency.

In contracts and memoranda of sub-domain agreement, only 0.8% of the PHCFs had a contract with a (media, radio) newswire. None of them had any contract with writers, public relations personnel who can augment the staff or a contract, administrative support, and a phone system contractor to supply a phone menu that directs the type of caller and level of desired information. Sambala, *et al.* reported that in 13 pandemic influenza preparedness plans in 47 countries of the WHO African region, local distribution channels and telephone lines were used for dissemination of information.[26] Given the necessity of access to multiple resources during a public health emergency such as local distribution channels, contracting and memoranda of agreement with these resources before an emergency may increase the preparedness of the PHCFs regarding the ERC.

A major item of ERC checklist was selecting and training the spokespersons to ensure the rapid dissemination of consistent and core messages. Spokespersons present some information such as current activities and some special events.[35] They should be well aware of the ERC principles and be trained prior to the occurrence of an event.[2] In the present study, 57.6% of the PHCFs had selected public health spokespersons for media and public appearances during an emergency. Only 40.2% and 34.1% of the PHCFs had trained spokespersons about the media or risk communication and crisis/risk communication principles, respectively. Cope, *et al.* reported that 16 (out of 20) officials who were interviewed reported that their agency had a designated spokesperson.[6] Selecting credible spokespersons and training them prior to the occurrence of an event in the public health system in Iran are suggested.

The results of this study also showed that 96.2% of the PHCFs had a plan for communication with the public, media, and partner organizations regarding the prevalent waterborne, and foodborne diseases respectively. Notably, there were no specific plans to communicate with the public, media, and partner organizations regarding some other disasters. Cole, *et al.* demonstrated that preparing messages and assessing its credibility to their recipient audiences are essential responsibilities before the crisis.[29] Preparedness for the types of disasters with which health care agencies are likely to face is essential.[2]

## Limitations

This study had 2 limitations. First, the checklist was completed by the employees in charge of the crisis unit in the PHCF. Therefore, the responses in the checklist may be affected by the perceptions and interpretation of the respondent. However, for decreasing this bias, 1 of the researchers answered the respondents' questions about the checklist items. Second, another limitation of the present study was that the data collected from the PHCFs were related to Shahrekord University of Medical Sciences, Chaharmahal, and Bakhtiari Province, Iran; therefore, the findings could not be generalized to the other geographical regions in Iran. It is recommended that preparedness of PHCFs regarding the ERC should be assessed in the other geographic regions of Iran.

## Conclusion

The findings of this study showed that only 0.8% of the PHCFs had a good preparedness in terms of the ERC. Thus, the PHCFs need to increase their capacity and capability in the field of emergency preparedness. Moreover, the public health system in Iran should incorporate ERC in crisis management. Providing basic foundations of ERC and increasing the knowledge of the public health workforce regarding the ERC principles may also help the public response to crises, reduce the likelihood of rumors and misinformation, and present a good crisis leadership.

**Data availability statement.** The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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