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Design and Validation of Behavioral Skills Promotion of Health Volunteers Questionnaire in Disasters

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Abstract

Background: Health volunteers are the main components of the health care system in dealing with critical situations.
Objectives: The purpose of this study was to design and validate the behavioral skills promotion of health volunteers questionnaire in disasters in Iran.
Methods: This study with descriptive and psychometric methods was conducted in 2022. Based on focus groups and extracted categories, a 50-item questionnaire was designed. A five-point Likert (totally agree 5, totally disagree 1) was used to score the questionnaire. The questionnaire's questions were reviewed by 14 experts, and after content validity with Lawshe's formula, four questions were removed and the number of questions was reduced to 43 questions. In this stage, 500 Red Crescent volunteers completed the questionnaire. Then, by examining the factor analysis, five questions did not factor loads and were discarded. Finally, 38 questions remained. Confirmatory factor analysis indicated that the behavioral skills promotion of health volunteer's questionnaire model was fitted.
Results: The findings of this study indicated that this questionnaire has good validity for the whole questionnaire and factors with Cronbach's alpha coefficient method. Moreover, the factor analysis results indicated that there were seven factors, which explained 60.52% of the total variance.
Conclusion: According to the obtained results, the questionnaire on behavioral skills promotion of health volunteers in disasters is a valid and reliable instrument in the case of critical situations in Iran.

Keywords: Behavioral skills of health volunteers, Disasters, Validation

1. Background

Defining disaster due to its comprehensive nature is not easy, and this term suffers from a semantic, technical, operational, and consensus vacuum. Indeed, disasters vary in type, magnitude, and intensity, and they all have consequences that can disrupt an organization's or system's function. Therefore, the implementation of successful operations and reduction of losses and casualties by responsible organizations only occur in the background of the organization's collective effort (1). Every year, numerous people engage in a variety of volunteer endeavors and render several services, including aiding those who have been hurt and offering medical, administrative, and sporting assistance. Health volunteers must be prepared before a disaster strikes so that they can assist the affected individuals in a disaster to prevent loss of life and the effects of disasters (2). To prevent loss of life and the impact of the disaster, health volunteers must be ready to cope with a disaster in order to help the affected people (3).

Due to scarcity of skilled professionals, the readiness of health volunteers in case of disasters are necessary (4). Additionally, if a tragedy strikes, grassroot volunteers must prepare themselves to provide services and respond to any need (5). Roads, bridges, ports, airports, and communication facilities may be destroyed in the initial hours to a few days after a disaster (6). Many people can be saved in the immediate aftermath of a disaster; therefore, health volunteers presence is crucial during the disaster phase (7). Evidence suggests that regular and professional health volunteers can significantly contribute to disaster management (8). Volunteering is a motivated, organized, and methodical act performed in an organizational environment without expectation of compensation. Today, volunteers are among the most important elements of the healthcare system and are essential to a society's healthcare system (9).

According to psychological approaches, experiential disaster reduction behavior is a process in which peoples' views of a risky event are transformed through experience, rethinking, and then generalization, which attracts attention to the environment (10). In light of this issue, it can be claimed that peoples' experiencing behavior in times of disaster is a collection of behaviors spanning a

wide range of activities, including feelings, dispositions, and unique preparations for behavior in disaster (11). In other words, volunteering in the health field can be influenced by traits, such as responsibility, social intelligence, and problem-solving skills (12). The confidence to commit acts of kindness is among the most crucial abilities in helping behavior. According to Bandura, with high self-efficacy, individuals can perform tasks in various contexts with similar talents in a weak, medium, or strong manner or under various conditions because high self-efficacy encourages people to use their abilities to overcome challenges (13).

Other related factors are emotion and problem-solving (14). The high capacity to comprehend, assess, and accurately express emotions, use emotions to decide, comprehend emotions and emotional knowledge, and manage emotions to foster both emotional and intellectual development is known as social intelligence. In difficult circumstances, social intelligence can enhance social problem-solving (15). When a person's capacity for social problem-solving is low, they are more susceptible to mental health issues such as anxiety and depression, and when it is high, it boosts self-efficacy, which in turn boosts their capacity for social problem-solving (16). Developing social problem-solving skills is a crucial coping mechanism that can help someone better manage the emotional effect of common challenging circumstances and avoid psychological stress (17). People who have a high capacity for social problem-solving think they can change issues such as social disorder and turmoil. A high capacity for resolving social issues might have an impact on the management and aid process because disarray is frequently encountered in stressful situations (e.g., natural disasters) (18). Because a person can accurately analyze crucial conditions, this ability can enhance a person's performance in critical situations (19). As a result, the issue of managing and monitoring behavior is less significant in common and conventional models, even though it is a critical component of the disaster management process. Lack of focus on disaster behavior is caused by the fact that disaster management is not designed with flexibility, intelligence, and high sensitivity in mind. Instead, it is built on rational and logical principles. It appears that the disaster control formations' inefficiency is due to structural and communicative flaws that have not yet been identified (20).

From another point of view, the training level of volunteers affects the role of health volunteers and how well they behave (21). Training sessions that go well provide participants with a greater sense of comfort and competence. Directly and indirectly, systematic knowledge and skill acquisition to establish the competencies required for successful performance in work environments can boost disaster readiness (12). Designing a thorough program and highlighting the positive aspects of training to boost productivity greatly benefits from considering training and its impacts from the perspective of the volunteers. According to studies, students who are positive about their training experience and believe that their training program is effective use what they have learned. It seems that there are no such studies regarding the behavioral aspect of the health of aid workers during natural crises. Due to the important role of these cases in training of these people. The present study aimed to design and validate behavioral skills promotion of health volunteers questionnaire in disasters in Iran.

2. Objectives

The purpose of this study was to design and validate the behavioral skills promotion of health volunteers questionnaire in disasters in Iran.

3. Methods

This collaborative study used a descriptive and psychometric method. It was conducted in 2022 using a sequential exploratory tool compilation technique. Based on the qualitative findings from focus groups, main categories were obtained, including mixed education, evaluation of the training effectiveness, skill-oriented training, public education, education organizing, and motivating health volunteers. According to these categories, a 50-item questionnaire was designed. The questionnaire scoring was based on a five-point Likert (totally agree=5, agree=4, no opinion=3, disagree=2, and totally disagree= 1). Eight health experts, two experts in assessment and measurement, and four experts in disaster management reviewed the questionnaire's questions. After performing content validity with Lawshe's formula, seven questions were removed from the questionnaire, and the number of the questions was reduced to 46. Then, five questions with no factor load were discarded by the factor analysis. Therefore, the minimum and the maximum scores obtained from the entire questionnaire were 41 and 205, respectively. After designing the questionnaire based on the categories obtained from the focus group and content validity, 500 at-reach Red Crescent volunteers who were verbally and cognitively healthy were asked to complete the questionnaire. The entry criteria included being a member of the Red Crescent Society for at least one year and aged between 20 and 45. The exclusion criteria consisted of non-cooperation and incomplete questionnaires. The SPSS software (version 25) was used to analyze the descriptive statistics (as frequency and average of the demographic characteristics) and exploratory factor analysis. Moreover, LISREL 8.8 software was used to

evaluate the overall fit of the confirmatory factor analysis model.

4. Results

Out of the 500 volunteers, 321 respondents were female, with an average age of 34.14, and 179 respondents were male, with an average age of 26.41. Regarding the level of education, 26.18% of the respondents had a diploma, 23.11% had a master's degree, and 51.9% had a bachelor's degree.

Content validity was used to obtain the validity of this questionnaire. The results related to the content validity index of the questions are reported in Table 1. According to the content validity index, 38 remaining questions had agreeable validity for behavioral skills promotion of health volunteers in disasters (Table 1).

Cronbach's alpha is one of the most common methods of measuring the validity of questionnaires. If Cronbach's alpha coefficient is 0.70 or more, the questionnaire has good reliability, and one can be sure about the internal correlation of the questions. Table 2 shows the adjusted means and standard deviations of the behavioral skills promotion questionnaire in confronting with disasters and its subscales, along with Cronbach's alpha coefficients (Table 2).

Table 1. Results of the ratio and content validity index of the questions

Q1	0.58	Q13	0.61	Q25	0.68	Q37	0.58
Q2	0.54	Q14	0.52	Q26	0.73	Q38	0.55
Q3	0.56	Q15	0.71	Q27	0.69		
Q4	0.52	Q16	0.61	Q28	0.71		
Q5	0.65	Q17	0.60	Q29	0.65		
Q6	0.58	Q18	0.51	Q30	0.61		
Q7	0.73	Q19	0.72	Q31	0.63		
Q8	0.54	Q20	0.58	Q32	0.53		
Q9	0.62	Q21	0.71	Q33	0.55		
Q10	0.53	Q22	0.59	Q34	0.71		
Q11	0.57	Q23	0.58	Q35	0.62		
Q12	0.56	Q24	0.57	Q36	0.63		

Table 2. Mean and standard deviation and Cronbach's alpha coefficients of the factors

Factors	Title	M	SD	Cronbach's alpha
1	Information about disaster preparedness	4.32	0.32	0.76
2	The functional skill of preparedness before risks	4.36	0.36	0.78
3	Participation of key people in the preparation	4.02	0.28	0.82
4	Decision-making skills and quick response to disasters	4.21	0.24	0.86
5	Basic scientific training and preparation	3.99	0.21	0.74
6	Improving behavioral skills and self-efficacy	4.40	0.41	0.76
7	Community-oriented and general education for preparation	4.61	0.34	0.82
Total		4.20	0.31	0.91

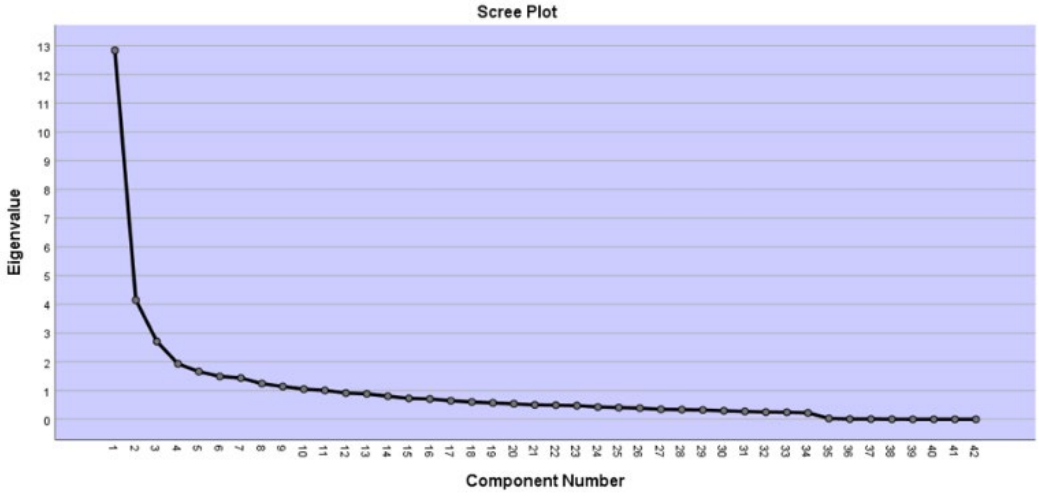

Figure 1. Scree plot of the behavioral skills promotion in confronting disasters questionnaire

To determine the factor structure of the behavioral skills promotion of health volunteers in the disaster questionnaire, the exploratory factor analysis method was used using the principal components method and varimax rotation. In the data analysis of this questionnaire, the value of the KMO coefficient (KMO=0.91) and the adequacy index of the correlation matrix (P<0.001) showed the existence of enough evidence to perform factor analysis. In other words, the sampling adequacy index was equal to 0.91, and the results of Bartlett's test indicated a significant correlation between the questions. Furthermore, a scree plot was used to determine the number of factors. In this way, according to the slope of the plot, the factors revealed in the steep slope of the plot were considered the main factors, and the acceptance of the factors that were placed parallel to the axis of the slope line was avoided. Therefore, this plot revealed seven factors with an eigenvalue greater than one in the questionnaire for behavioral skills promotion in confronting disasters. As a result, factor analysis can be used (Figure 1).

Table 3 presents the factors obtained from factor analysis, which shows that the questionnaire consists of seven factors that explain 60.52% of the total variance. The included factors are as follows: the first factor is updated information about disaster preparedness, the second factor is the functional skills of preparedness before risks, the third factor is the participation of key people in preparation, the fourth factor is decision-making skills and quick response to disasters, the fifth factor of basic scientific training in preparation, the sixth factor is improving behavioral skills and self-efficacy, and the seventh factor is community-oriented and general education for preparation. The first factor is 11.78%, the second factor is 10.49%, the third factor is 8.80%, the fourth factor is 7.62%, the fifth factor is 7.06%, the sixth factor is 6.68%, and the seventh factor is 15.6%. All of these percentages explain the total variance. Furthermore, there are loaded five questions on the first factor, seven questions on the second factor, six questions on the third factor, four questions on the fourth factor, five questions on the fifth factor, five questions on the sixth factor, and five questions on the seventh factor and the factor load is more than 0.30, and the eigenvalue is higher than one. Therefore, the questions with a factor loads of less than 0.30 were removed (1,6,7, 26, 43), and finally, a questionnaire for behavioral skills promotion in disasters with 41 questions was obtained by exploratory factor analysis. The index (KMO) changes from zero to one, which is 0.9 to 1 excellent, 0.8 to 0.9 good, 0.7 to 0.8 satisfactory, 0.6 to 0.7 average, and if between 5 If it is 0.0 to 0.6, the sample size is insufficient and less than 0.5 is considered unacceptable.

Table 3. Factors and factor loadings of the behavioral skills promotion in the confronting with disasters questionnaire

Factor 7		Factor 6		Factor 5		Factor 4		Factor 3		Factor 2		Factor 1		
factor load	Questions	factor load	Questions	factor load	Questions	factor load	Questions	factor load	Questions	factor load	Questions	factor load	Questions	Question
0.60	21	0.47	10	0.58	1	0.60	13	0.65	28	0.73	2	0.71	34	
0.55	22	0.63	11	0.81	7	0.55	14	0.63	29	0.55	3	0.68	35	
0.73	23	0.49	19	0.70	8	0.73	15	0.62	30	0.53	4	0.75	36	
0.69	25	0.59	24	0.65	12	0.69	18	0.72	31	0.55	5	0.73	37	
0.62	26	0.60	27	0.61	20	---	---	0.80	32	0.51	6	0.61	38	
---	---	---	---	---	---	---	---	0.54	33	0.68	9	---	---	
---	---	---	---	---	---	---	---	---	---	0.75	16	---	---0	
6.15		6.68		7.07		7.62		8.80		10.49		11.78		Percentage of variance

Table 4. Results of the fit indices of the confirmatory factor analysis model

Indices	X^2/df	RMSEA	GFI	NFI
Values	2.414	0.065	0.82	0.902

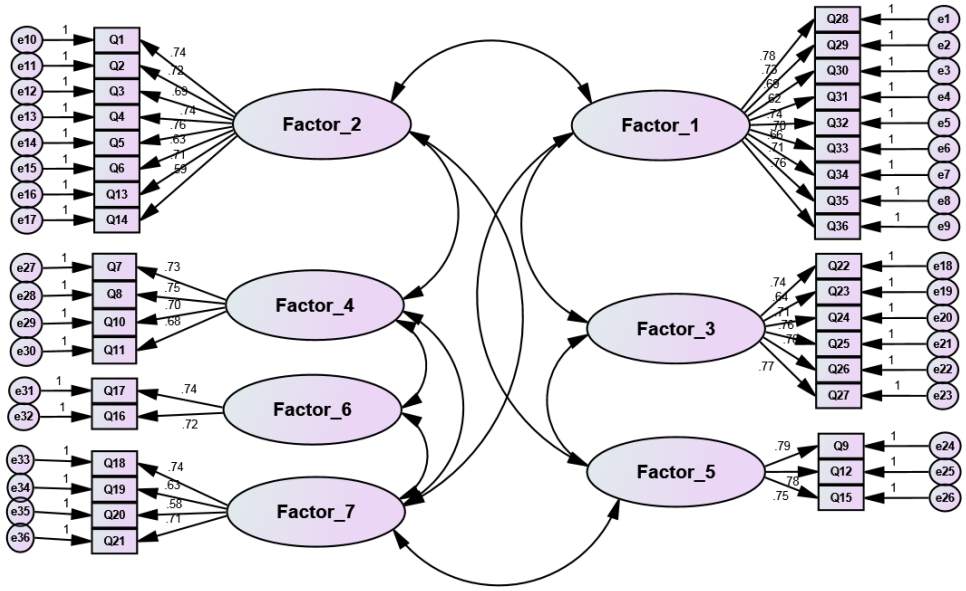

Figure 2. Confirmatory factor analysis model of the questionnaire

In the present study, the structural equation method (SEM) was used to fit the model. Figure 2 displays the confirmatory factor analysis model of the questionnaire for improving behavioral skills promotion questionnaire in confronting disasters. In this model, all the questions that were loaded on the factors had a factor load greater than 0.30, which was obtained by the confirmatory factor analysis method.

In Table 4, the fitness of all the fit indices of the confirmatory factor analysis model of the questionnaire for the behavioral skills promotion in confronting disasters by the method of structural equations is indicated. In other words, the results showed that the model is a good fit.

5. Discussion

The goal of this study was to design and validate behavioral skills promotion of health volunteers in disasters in Iran. Based on the findings, the first factor is updated information about disaster preparedness, the second factor is the functional skills of preparedness before risks, the third factor is the participation of key people in preparation, The fourth factor is decision-making skills and quick response to disasters, the fifth factor of basic scientific training and preparation, the sixth factor is improving behavioral skills and self-efficacy, and the seventh factor is community-oriented and general education for preparation. The said factors were identified as ways to enhance the behavioral skills of health volunteers.

It can be explained that quick response to catastrophes, strengthening behavioral skills and self-efficacy, and community-oriented and broad training were listed as preparedness-related training categories. The designed research questionnaire has strong internal consistency and reliability. Judges evaluated the survey questions based on how well they reflected the program's objectives and contents. This finding is in line with the results by Dunn Navarra et al. (22), Starks et al. (23), Al-Qbelat et al. (24), and Azizpour et al. (25). Some instruments measure various aspects of disaster situations cited in our findings; for example, Najafi et al. (26) designed and validated the Disaster Preparedness Index. Raneses et al. designed disaster preparedness measurement in Auckland (27).

Following the knowledge structure in the Information-Motivation-Behavioral Skills Model (IMB), motivation and training are interwoven in critical situations (28). It is important to have up-to-date information about disaster preparedness, basic scientific training in preparedness, and community-oriented and general education. Higher levels of practice and training are related to a greater understanding of disaster preparedness. According to related studies, those who are prepared for disasters react to situations more appropriately (29). According to our subscales and the importance of motivational stimuli, raising volunteer awareness and knowledge of the situation has impacts on enhancing volunteer motivation to participate (30). The establishment of physical training groups or enrollment in online courses will meet people's psychological demands for communication and

competence. These actions will also improve people's social interactions, which will encourage their desire to participate in disaster relief efforts. The motivation of health volunteers can be greatly increased by enhancing interpersonal communication skills, including fostering a nice environment and the trainers' and liaisons' interpersonal communication abilities. However, it is crucial to focus on the attractiveness of educational themes and packages in this regard to draw volunteers' attention and increase their enthusiasm for continuing their voluntary training. Based on this, it can be said that people's knowledge, awareness, and motivation for voluntary engagement interact in a two-way manner, with a rise in one increasing to the other (31).

The level of experience that individuals have with catastrophes may also be viewed as a barrier to disaster preparedness (32). As a result, the presence of individuals with expertise and recommendations in developing volunteers' enthusiasm for voluntary participation leads to a more desirable outcome. In addition, encouraging and boosting motivation, building self-confidence, and attempting to gain behavioral skills among health volunteers can be facilitated by material and spiritual motivators as well as obtaining suitable feedback from education (33). The promotion of behavioral skills and self-efficacy in the structure of motivation is related to an individual's assessment of his/her abilities to carry out a particular action, and the self-efficacy perceived by an individual is an important component in an individual's performance. Because it functions as an independent part of the candidates' fundamental skills, self-efficacy is a determinant of people's intention to engage in healthy behaviors and their capacity to accept various healthy behavioral patterns. Therefore, it is possible to increase a person's sense of empowerment and self-efficacy by designing an educational environment that will enable them to successfully acquire the necessary skills and knowledge. As a result, in this study, two questions as a measurement tool were provided to improve the candidates' behavioral skills and sense of self-efficacy (34). The IMB model's behavioral skill framework is congruent with the functional skill factor's eight questions on readiness for dangers and four questions on decision-making and quick response to disasters (35). Participation in training programs improves cohesion, work quality, functional skills, and decision-making. Functional skills, or a sense of self-efficacy to apply to healthy behavior, truly convey a person's conviction that has particular behavioral techniques or instruments to follow.

Strengths and limitations of this study

According to the results, the questionnaire on the behavioral skills of health volunteers in disasters is a valid and reliable instrument in case of critical situations in Iran. We did not score the areas in scoring the questions, which can alter the final score, because there hasn't been enough research in the field to determine the impact of training on enhancing the behavioral skills of health volunteers. It is suggested to do a quantitative and qualitative study on the factors that affect the ability to provide an acceptable solution in the area of enhancing disaster-handling behavior so that various factors can be given the proper weight. The questionnaire should be widely disseminated throughout society to identify and correct any additional flaws while standardizing and dividing the results into "favorable," "average," and "unfavorable" categories. It is feasible to increase confidence in the questionnaire's use by putting it into use on a larger scale.

6. Conclusion

To promote the abilities of volunteers, it is important to measure their opinions and needs to develop beneficial strategies in this area. According to this viewpoint, behavioral skills promotion of health volunteers in disasters in Iran was designed and validated. In other words, the factors obtained from the factor analysis showed that the questionnaire consists of seven factors that explain 60.52% of the total variance. The factors included: the first factor is updated information about disaster preparedness, the second factor is the functional skills of preparedness before risks, the third factor is the participation of key people in preparation, the fourth factor is decision-making skills and quick response to disasters, the fifth factor of basic scientific training and preparation, the sixth factor is improving behavioral skills and self-efficacy, and the seventh factor is community-oriented and general education for preparation. Confirmatory factor analysis indicated that the behavioral skills promotion of health volunteer's questionnaire model is fitted. According to the results, the questionnaire on behavioral skills promotion of health volunteers in disasters is a valid and reliable instrument in case of critical situations in Iran.

Behavioral Skills Promotion of Health Volunteers Questionnaire in Disasters

Numbers	Questions
1	Virtual training and online webinars play an effective role in improving the behavioral skills of health volunteers.
2	Confront-to-confront training and holding seminars have an effective role in improving the behavioral skills of health volunteers.
3	The production of educational content plays an effective role in improving the behavioral skills of health volunteers.
4	Practical training (internship in the field of disasters) has a great effect on improving the skills of health volunteers during disasters.

5	Considering people's level of awareness (disaster preparedness) has an important effect on the beneficial effect of training health volunteers.
6	It is necessary to evaluate the skills of candidates (through post-test) after completing each theoretical and practical training course.
7	Material-spiritual encouragement to increase volunteers' motivation plays an important role in raising the quality of health volunteers' services.
8	The use of simple and understandable training plays an effective role in improving the skills of health volunteers.
9	Virtual training at the right time is very important for candidates.
10	The use of media and virtual networks in education plays an important role in improving the quality of health volunteers' services.
11	It is necessary to use reliable scientific sources for effective education.
12	Knowledge of the primary prevention stage (preparation before disasters) has an important effect on improving the behavioral skills of health volunteers.
12	The use of experienced instructors is effective in training health volunteers.
14	Paying attention to the cultural-linguistic characteristics of volunteers during training is effective in improving their behavioral skills.
15	Improving the behavioral skills of volunteers plays an important role in strengthening their functional skills.
16	Improving the behavioral skills of volunteers has an effective role in strengthening their decision-making skills.
17	Specialized needs assessment (through interviews with volunteers) is necessary for prioritizing the specialized training of health volunteers.
18	Encouraging the cooperation of responsible institutions such as the Red Crescent plays a positive role in promoting the knowledge and awareness of health volunteers.
19	The preparation of skilled manpower is necessary before the time of disaster.
20	It is necessary to call for the skills of health volunteers before the time of disasters.
21	Conducting basic training for health volunteers is very important.
22	Decentralized public education is effective in attracting the participation of health volunteers.
23	Free training in first aid skills is necessary for society.
24	The cooperation of private and government organizations in community-oriented education is necessary for the preparation of the general public.
25	Paying attention to the facilities and equipment during a disaster is important for health volunteers.
26	Public education (for free) of health volunteers is effective in increasing their ability and skills before disasters.
27	Strengthening motivational skills (in the form of rewards) affects improving volunteers' services.
28	Creating interest and a sense of responsibility is effective in improving the services of health volunteers.
29	Highlighting the role of the neighborhood hall is effective in encouraging the public to participate in pre-disaster training.
30	Attracting the cooperation of popular people (such as the neighborhood officials) in training is effective for motivating health volunteers.
31	Using religious institutions as a training base is effective for gaining the trust of human forces.
32	Forming small volunteer training groups in the neighborhood hall is a useful and productive action.
33	It is necessary to promote the targeted education of self-care and other care based on the priority of the family's needs in improving the skills of health volunteers.
34	Description of duties and separation of roles of volunteers help to organize human forces in the field of disasters.
35	Gaining trust is necessary for the participation of government institutions in the training of human forces.
36	Organization of targeted education is more effective in practice by strengthening relations and division of work between public and private institutions.
37	Providing certificates of participation in webinars helps to encourage more human resources.
38	Organizing health volunteers before disaster situations plays an important role in promoting disaster management.

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Footnotes

Conflicts of Interest: There is no conflict of interest.

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