

Effect of Relief Maneuvers on Staff Preparedness for Disasters

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Abstract

INTRODUCTION: Investigation of natural disasters (e.g., earthquakes and floods) has a long history due to the lack of knowledge of humans about the severity and strength of these accidents or the time and place of their occurrence. In this regard, it is necessary to develop national plans for the reduction of the vulnerability of people who are exposed to such disasters. Execution of maneuvers can effectively raise the awareness of staff and even the society which would result in the reduction of disaster damage. Therefore, the execution of maneuvers is an appropriate response to these needs and a solution to this problem.

METHODS: This applied survey study was performed on the staff of the Red Crescent Society of West Azerbaijan Province. The required data were collected using the library and field methods. Finally, the collected data were analyzed in SPSS software (version16).

FINDINGS: Based on the findings, relief maneuvers had a direct effect on various aspects of staff preparedness. Therefore, it can be said that all research hypotheses were confirmed.

CONCLUSION: It can be said that the design and execution of relief maneuvers can help to identify opportunities, eliminate threats, and increase the preparedness and capability of the staff. This increases the individual and organizational preparedness of the employees. Moreover, effective relationships between managers and employees can create strong morale in the employees and increase their preparedness for accidents and disasters.

Keywords: Accidents; Disasters; Effectiveness; Maneuver; Preparedness; Response.

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Introduction

Upward trend of the frequency and damage of the occurrence of natural disasters in the world has a great impact on human habitation. In most cases, natural disasters cause severe financial loss and bodily injury and also disrupt economic and social activities. Since it is not possible to prevent the occurrence of these phenomena due to their nature, the formation of a

capable and efficient management plan can greatly reduce the damage and restore the normal conditions as fast as possible (1).

Unexpected events have always limited human life and left a great impact on it throughout history. For this reason, how to deal with the crises caused by natural disasters has always been one of the anxieties of humans. According to the results of field studies

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conducted on the crises caused by such disasters, one of the most important factors that affect the reduction or increase of the amount of damage and the number of casualties during natural disasters is the presence or absence of an efficient crisis management system. Due to the specific characteristics of natural disasters, their identification and management are very sensitive and complex. Therefore, it is essential to recognize the proper principles and methods of natural disaster management to prevent the transformation of natural phenomena into social crises (2).

According to the previous experiences of disasters in Iran and the world, the non-governmental relief organizations and institutions are sufficiently prepared for timely performance in case of disasters. However, due to the lack of trained and aware managers in terms of the science of crisis management, they feel weak and helpless in the face of disasters (3).

Efficient crisis management is one of the effective factors in reducing the rate of financial losses and casualties caused by disasters. If the necessary preparations are made before the crisis and people receive enough training and use the experiences of previous disasters, there is a better chance of success in crisis management. Therefore, the necessary plans should be developed at the levels of the country, province, and city based on the crisis management cycle. Moreover, different plans should be prepared and implemented according to the frequency and probability of disasters in each region. In addition, necessary experiences of crisis management should be gained through regular and planned practice. In this case, it is possible to gain the necessary preparations for dealing with the potential crises based on the results of such practices and training (4).

Education is one of the most effective tools for dealing with natural disasters and guarantees the provision of appropriate relief and humanitarian services. If it is formulated and implemented systematically and purposefully in line with the real needs of disaster managers, training will help to improve their performance and efficiency (5).

Based on the previous scientific studies, training people through maneuvers of crisis management and disaster preparedness can save thousands of lives, reduce costs, preserve assets, and prevent consequent complications. Accordingly, training of

managers and people who are exposed to disasters is one of the essential parts of the disaster preparedness program. Such training should lead to a change in the knowledge, attitude, and skills of individuals since training is a strategy that is implemented over time with a specific purpose and direction (6).

Design, implementation, and execution of relief maneuvers in the Red Crescent Society of West Azerbaijan province will help identify opportunities, eliminate threats, and increase the readiness and capability of the staff. This will increase the organizational and individual readiness of employees. Moreover, effective relationships between managers and employees of the Red Crescent Society create strong morale in employees and increase their preparedness for possible disasters and crises, and as a result, make employees work more determination. This will increase the quality of services as well as the productivity and success of the Society (7).

Concept of effectiveness, which is qualitative, lies within the concept of efficiency, which is quantitative (8). Preparedness refers to the ability to perform daily tasks with sufficient energy and without feeling tired, possession of stored energy for recreation, and readiness to deal with unexpected events (9).

Effectiveness of relief maneuvers has many effects and consequences. The present study aimed to investigate the effectiveness of relief maneuvers on the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province.

In the present study, the effectiveness indicators of using relief equipment have been measured based on the provision of sufficient and appropriate information by relief workers, adequacy of the equipment used in the maneuver, knowledge of how to use and work with various relief equipment, and provision of necessary and sufficient information about relief equipment by trainers. Furthermore, the effectiveness of individual and organizational preparedness was evaluated based on the improvement of personal preparedness of employees, organizational readiness, manager-employee relationships, employee morale, employee commitment, service quality, knowledge, and skills of employees.

Disaster management steps

Prevention and mitigation of the effects:

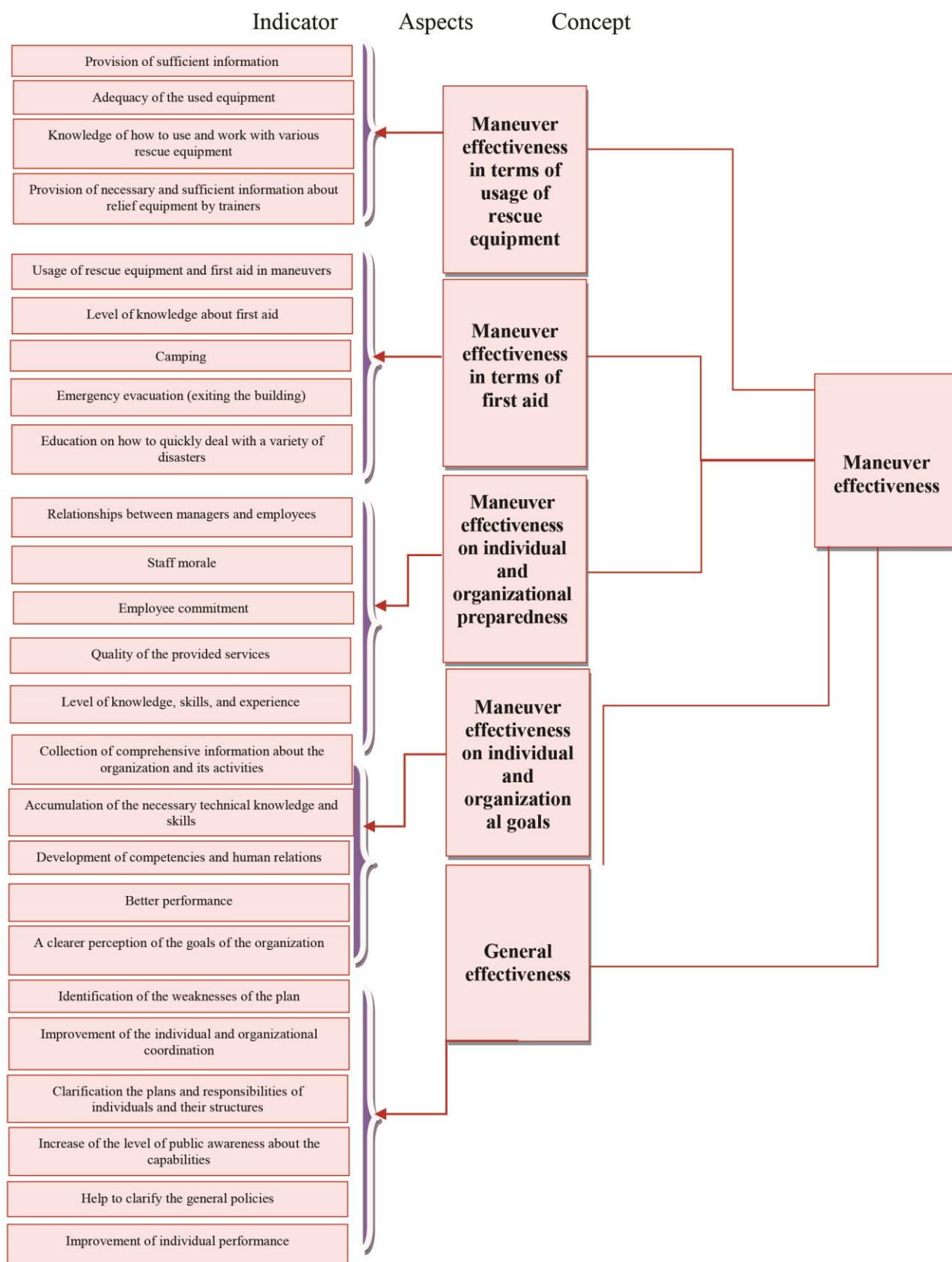


Figure 1. Model of the effectiveness of relief maneuvers (10)

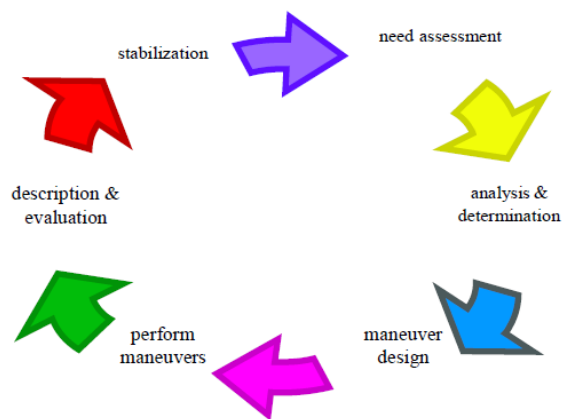


Figure 2. Maneuver management model

reduction of the likelihood of occurrence or effects of disasters

Preparedness: development of plans and research projects, education and execution of maneuvers

Response: provision of emergency services immediately after a disaster

Reconstruction: restoration of the normal conditions of the society and not only the pre-crisis state (11, 12).

Emergency preparedness process

This process consists of a series of methods for the preparation of a society, an organization, or an activity for an emergency (13, 14).

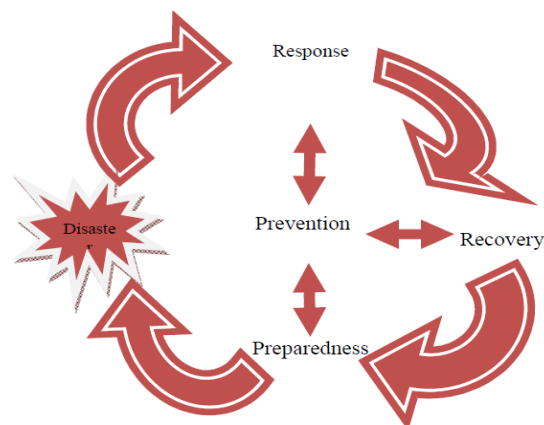


Figure 3. Comprehensive crisis management cycle

Methods

The present applied survey research was conducted based on a descriptive-correlational design since the purpose of the study was to

investigate the role of relief maneuvers on disaster preparedness. The required data were collected using a combination of field and library

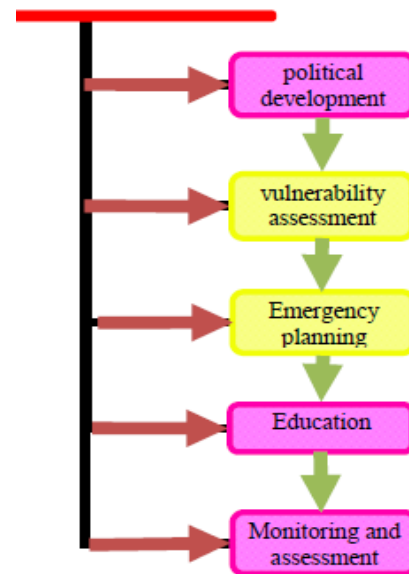


Figure 4. Preparedness process in emergencies

methods. Accordingly, the library method was used to collect the research literature and set the theoretical framework and the operational model of the study. In addition, the field method of data collection was used to answer the research questions and test the research hypotheses. Besides, the required data about the subjects was collected using the field method and through a questionnaire.

Moreover, the data were analyzed in SPSS software (version16) in two stages; in the first stage, which was descriptive analysis, the collected data were presented in the form of descriptive statistics tables and bar graphs. In the second stage, which was the inferential statistics, various methods and techniques were used, such as the Spearman correlation coefficient, Wilcoxon test, Friedman test, one-sample t-test, and regression. In other words, the research method was quantitative, survey, and extensive, and the used tool was a questionnaire (open and closed). According to their nature and purpose of the questions, they were designed in the form of multiple-choice questions at nominal, ordinal, and interval scales.

Data analysis methods and used statistical models

This research had a statistical aspect; therefore,

in addition to reliance on documents, intuition, perception, and rational analysis (qualitative analysis) for the data analysis, statistical methods (quantitative analysis) were used as well. Based on the research data and knowledge of statistical methods used in humanities research, various statistical methods were selected for the analysis of data, such as the one-sample t-test, Spearman correlation coefficient, Kendall's tau-b, gamma, and regression.

The statistical population of this study consisted of all employees of the Red Crescent Society of West Azerbaijan Province, which were 262 people according to statistics. The sample size was calculated at 159 subjects according to the Cochran formula and Morgan table, and the participants were selected using the quota sampling method. In the next step, a researcher-made questionnaire with 5 demographic questions and 51 specialized questions was used to examine the role of relief maneuvers on preparedness and response to natural disasters. Eventually, the collected data were analyzed in SPSS software (version16).

This questionnaire was designed to test the hypotheses according to the research variables and their operation. The items of the research questionnaire were divided into two sections. The first section consisted of questions about the demographic characteristics of the participants (e.g., gender, age, marital status, level of education, and work experience). The second

section included 51 items which were divided into eight categories that aimed to test the research hypotheses. The items were scored based on a five-point Likert scale ranging from very much to very little.

In the present study, an ordinal scale was used to rank the data. Table 2 summarizes the ordinal scale of the data of the staff preparedness items, effectiveness of relief maneuvers, and the numerical value of each scale.

Validity and reliability

In this study, the validity of variables was tested using construct validity through factor analysis which determines the measuring instruments that can be used together. It should be noted that factor analysis is a powerful and inevitable method for validation (Carlinger, 2003: 149 and 150). Based on the results, the validation of variables was calculated at 0.770. Moreover, the reliability of the questionnaire was measured using Cronbach's alpha in the SPSS software (version16). Based on this method, with a preliminary study on 30 subjects selected from the study population, the reliability of the relief maneuvers effectiveness and staff preparedness items were 0.938 and 0.755, respectively. According to the obtained values of these statistics, the items of the questionnaire have a high correlation with each other and the research questionnaire has high reliability.

Table 1. Number of items related to each component in the questionnaire

Categories	Total items	Item number
Maneuver effectiveness in terms of usage of relief equipment	4	1-4
Maneuver effectiveness in terms of first aid	5	5-9
Collection of information about the relief crisis	3	10-12
Relief equipment training	3	13-15
Maneuver effectiveness on individual and organizational preparedness	8	16-23
Usage of all of the items of the incident command system in the maneuver	11	24-34
Effectiveness of relief maneuvers separated by each of the factors of effectiveness	11	35-45
Maneuver effectiveness on individual and organizational goals	6	46-51

Table 2. Ordinal scale of the data obtained from staff preparedness and relief maneuvers effectiveness items

Numerical value of positive items	Options	Numerical value of negative items
1	Very much	5
2	Much	4
3	Moderate	3
4	Little	2
5	Very little	1

Findings

Based on the results, 73% of the statistical population were male; accordingly, the majority of the statistical population was male. In terms of marital status, most of the statistical population was married (87.4%). Regarding the education level of the Red Crescent staff, 4.4%, 21.4%, 15.7%, 50.3%, 5%, 3.1% had below high school education, high school education, associate degree, bachelor's degree, master's degree, and Ph.D. Moreover, 28.9%, 55.3%, 14.5%, and 1.3% of the total population were 25-35, 36-45, 46-55, and over 55 years old. Regarding work experience, 14.5%, 27.7%, 23.9%, 17%, and 3.8% had under 5 years, 5-10, 11-15, 20-25, and 26-30 years of work experience.

After the descriptive findings, the research hypotheses were analyzed and their results are provided below:

Hypothesis 1: First aid training is effective on the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province.

Based on Table 3, it can be said that the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province has a significant relationship with first aid training. According to the findings obtained from the statistical data, the significance level of the test is less than 0.05 (0.000); therefore, the above-mentioned hypothesis is confirmed.

Among the statistical tests, Kendall's tau-b test shows the relationship between two sequential variables. According to the results of this test, in the case of the two aforementioned variables, the null hypothesis was rejected, while the research hypothesis was confirmed. The research hypothesis declared that there is a

significant relationship between the two variables. The obtained statistics revealed a suitable coefficient for these two variables. Furthermore, since both variables of this hypothesis were measured at the ordinal scale, gamma is an appropriate correlation coefficient that tests the existence of the relationship as well as its intensity and direction.

The correlation coefficient of first aid training with the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province at the confidence level of 99% was calculated at 0.47. This value indicates a relationship in a positive direction with a moderate intensity which means that the increase of the first aid training leads to the increase of the staff preparedness.

Finally, the results of the Spearman correlation test of the two variables of first aid training and staff preparedness indicated that the relationship between these two variables is significant since the t-value and significance level were 0.40 and 0.000, respectively. Therefore, this hypothesis is confirmed which means that first aid training is effective on the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province.

Hypothesis 2: Usage of the incident command system (ICS) affects the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province.

According to Table 4, the findings indicate that the usage of ICS has a significant relationship with the preparedness of the participants since the significance level of the test for both gamma and Kendall's tau-b statistics was 0.000 which is less than 0.005. Moreover, the obtained value for

Table 3. Analytical and inferential statistics of first aid training and preparedness of the staff of Red Crescent Society of West Azerbaijan province

	Value	Asymptotic standard error ^a	Approximate T	Significance level
Kendall's tau-b	0.353	0.067	5.147	0.000
Gamma	0.472	0.086	5.147	0.000
Spearman correlation	0.404	0.076	5.527	0.000
Number of valid cases			159	

Table 4. Analytical and inferential statistics of the use of the incident command system and staff preparedness

	Value	Asymptotic standard error ^a	Approximate T	Significance level
Kendall's tau-b	0.387	0.061	5.968	0.000
Gamma	0.540	0.076	5.968	0.000
spearman correlation	0.437	0.067	6.093	0.000
Number of valid cases			159	

gamma was high (0.54) which indicates a strong positive relationship between the two above-mentioned variables. This means that using the ICS increases the preparedness of the Red Crescent staff. Therefore, it can be said that there is a significant relationship between the two variables which confirms the above-mentioned hypothesis.

To further confirm the accuracy of this hypothesis, it was tested with other statistics.

Table 5 tabulates the results of investigating the Spearman correlation coefficient of these two variables. The t-value and significance level were 0.43 and 0.000, respectively. Therefore, it can be said that the usage of the ICS affects the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province.

Hypothesis 3: Usage of relief equipment affects the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province.

Two-dimensional tables and chi-squared test were used to investigate the significant relationship between the relief equipment utilization and staff preparedness. Moreover, the direction and intensity of the correlation of the variables were examined using Kendall's tau and gamma tests. The values of chi-square and degree of freedom were 1.311 and 16, respectively, at a significance level of 0.000. Since the significance

level of type I error is less than 0.05 the aforementioned hypothesis is confirmed at a confidence level of 99%.

Based on Table 6, it can be said that the correlation between the two variables of usage of relief equipment and staff preparedness is 0.46 which is moderate. According to the obtained significance level of the test, the above-mentioned correlation is significant at a confidence level of 99%. Moreover, since the significance level was 0.000 and less than 0.05, the above-mentioned hypothesis is confirmed. This means that the usage of relief equipment affects the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province.

Hypothesis 4: Provision of the employee assistance program (EAP) risk map and disaster information in the implementation of operational maneuvers for the accurate assessment of the events affects the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province.

Based on Table 7, it can be said that the provision of EAP has a significant relationship with the staff preparedness. According to the findings obtained from the statistical analysis of the data, the significance level of the test was 0.000 and less than 0.05; therefore, the aforementioned hypothesis is confirmed.

Table 5. Correlation between the usage of relief equipment and the preparedness of the staff of Red Crescent Society of West Azerbaijan Province

	t-value	Degrees of freedom	Significance level
Chi-square value	1.311	16	0.000
Correlation	43.861	1	0.000
Number		56	
Kendall's tau-b=0.41 significance level=0.000 Gamma=0.58 significance level =0.000			

Table 6. Correlation between the usage of relief equipment and the preparedness of the staff of Red Crescent Society of West Azerbaijan Province

Variable	Spearman correlation	Significance level	Number of subjects
Staff preparedness and usage of relief equipment	0.46	0.000	159

Table 7. Analytical and inferential statistics of the effectiveness of employee assistance program risk map and disaster information in the implementation of relief maneuvers and preparedness of the staff of the Red Crescent Society of West Azerbaijan province

	Value	Asymptotic standard error ^a	Approximate T	Significance level
Kendall's tau-b	0.241	0.065	3.607	0.000
Gamma	0.327	0.086	3.607	0.000
Spearman correlation	0.281	0.076	3.663	0.000
Number of valid cases			159	

Table 8. Analytical and inferential statistics of the awareness of organizational strategies and goals and preparedness of the staff of the Red Crescent Society of West Azerbaijan province

	Value	Asymptotic standard error ^a	Approximate T	Significance level
Kendall's tau-b	0.502	0.056	8.356	0.000
Gamma	0.678	0.063	8.356	0.000
Spearman correlation	0.557	0.059	8.356	0.000
Number of valid cases			159	

Table 9. Correlation of awareness of strategies and organizational goals with the preparedness of Red Crescent staff of West Azerbaijan province

Variable	Spearman correlation	Significance level	Number of subjects
Staff preparedness			
Awareness of strategies and organizational goals	0.55	0.000	159

Kendall's tau-b test indicates the relationship between two sequential variables. Based on the results of this test, the null hypothesis was rejected for the two variables of the provision of EAP risk map and staff preparedness, while the research hypothesis, which indicated that there is a significant relationship between these two variables, was confirmed. The obtained statistics provide a suitable coefficient for these two variables.

Moreover, since both variables of this hypothesis were measured at the ordinal scale, gamma is an appropriate correlation coefficient that tests the existence of the relationship as well as its intensity and direction. This correlation coefficient between the existence of EAP risk map and staff preparedness at a confidence level of 99% is calculated at 0.32. This level of correlation indicates the existence of a direct and positive relationship with a moderate intensity which means that the provision of EAP risk map and disaster information in the implementation of relief and operational maneuvers for the accurate assessment of disasters increases the staff preparedness.

In addition, the Spearman correlation coefficient between these two variables was 0.28 and the significance level was obtained at 0.000 which indicated a significant relationship between these two variables; therefore, this hypothesis is also confirmed.

Hypothesis 5: Awareness of organizational strategies and goals affects the preparedness of the staff of the Red Crescent Society in West Azerbaijan province.

Based on the above tables, the majority of the participants declared that awareness of organizational strategies and goals affects the staff

preparedness “very much” and “much”. Based on Table 8, there is a significant relationship between these two variables. In addition, the calculated coefficients also indicated a desirable relationship between these two variables.

Since these two variables were calculated at the ordinal level, Kendall's tau-b was calculated at 0.50 and the gamma intensity was also obtained at 0.67 at a significance level of 0.000 which indicates a significant relationship between these two variables. Therefore, it can be said that awareness of organizational strategies and goals affects the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province. Furthermore, the Spearman correlation coefficient with a degree of 0.55 and a significance level of 0.000 indicated that the correlation between these two variables is at an appropriate and significant level. Therefore, this hypothesis is also confirmed.

In addition, as can be seen in the Table 9, the correlation of the awareness of strategies and organizational goals with staff preparedness is 0.55 which is very strong. According to the obtained significance level in the test, the above correlation is significant at a confidence level of 99% since the significance level was 0.000 and less than 0.05; therefore, the above-mentioned hypothesis is confirmed. This means that knowledge of organizational strategies and goals affects the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province.

Discussion and Conclusion

Life preservation has always been the priority of humans and has caused the continuity of the human race. Throughout history, people have acquired the skill of control and management of many deadly occurrences. Humans have pondered

in the best possible way about what needed reason and prudence to find and use the best solution to continue a healthy and prosperous life. However, natural disasters have always been present as an insoluble problem since the important features of natural disasters are their unpredictability and extraordinary speed of occurrence.

In this regard, it is necessary to develop national plans to reduce the vulnerability of the citizens who are exposed to disasters. Therefore, for sustainable development, citizens must first strive for a healthy life that requires their empowerment and preparedness for disasters through crisis management maneuvers. Therefore, the execution of preparedness maneuvers can effectively increase the level of awareness of people and prepare the different sections of society. Besides, its proper implementation plays an important role in creating the necessary preparations for the correct and rapid response to disasters which will result in the reduction of their damage.

Disaster preparedness maneuvers do not have a long history in Iran; however, they are important for several reasons. First, our country is the fifth most disaster-prone country in the world which requires all the possible effort to increase the level of knowledge and improve the quality of emergency services.

Secondly, the previous preparations among the staff and even different sections of the society have two reasons. First, due to the eight years of the Iran–Iraq War, the cities of Iran have become relatively familiar with emergencies and have practiced rescue and relief. Second, given the situation of the country and the occurrence of several disasters in recent years (Rudbar, Ardabil, north and south of Khorasan, Tabas, Bam, and East Azerbaijan), the relief workers and organizations have acquired successful experiences (15, 16).

Therefore, it is necessary to execute training maneuvers in order to regulate and improve the necessary coordination and evaluation of programs. This is of special importance since, in recent decades with the advancement of technology and increase in the population and expansion of cities, the type and quality of disasters have changed as well and technology-based accidents pose a new threat to human life. Moreover, according to the course of crisis management and its stages (prevention, preparedness, response, and reconstruction), the

performance of various maneuvers should include all of these four stages (17).

Investigation of the investment trends in educational activities and relief maneuvers around the world in recent years shows that the amount of dedicated resources to this important cause has increased, compared to previous years, and managers and officials in various industries pay considerable attention to this issue. However, there are still some concerns on the part of the officials and decision-makers of the organizations regarding the lack of effectiveness of educational activities. This lack of efficiency could be due to the lack of knowledge and skills in the decision-making cycle, along with other various reasons that can be raised in this regard. This study aimed to introduce each of the main steps of this cycle, and more precisely state how to measure the effectiveness of relief maneuvers (18).

Based on the results of the present study, relief maneuvers had a significant impact on various aspects of staff preparedness. Effectiveness of these maneuvers was due to the effectiveness of first aid training and the usage of ICS for command, control, and coordination of all resources in various disasters or as a type of management system that organizes people, facilities, equipment, and communications in disasters (19).

Moreover, the effectiveness of the usage of relief equipment and the EAP Risk Map and disaster information should not be overlooked. The EAP Risk Map and disaster information refer to the precise execution of maneuver operations based on the map and geographic systems (20).

According to the findings, in the implementation of relief and operational maneuvers, access to disaster information and awareness of organizational strategies and goals had direct impacts on the preparedness of the staff of the Red Crescent Society of West Azerbaijan Province. Therefore, it can be concluded that all research hypotheses were confirmed.

However, it should be noted that along with designing useful and needed maneuvers for learners, it is necessary to create and improve their internal motivations for participation in these maneuvers. In addition, the managers must provide the appropriate facilities, situations, and supportive atmosphere in the workplace so that the staff can use the knowledge and skills that they have learned in training courses.

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Conflict of Interests

Authors have no conflict of interests.

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