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Assessing the Level of Trust in the Humanitarian Supply Chain (Case Study: the Fire-induced Collapse of Plasco Building, Shahran Gas Explosion, & Flash Flood in Tehran Subway)

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Original Article

Abstract

INTRODUCTION: The present study aimed to investigate communication, information exchange, cooperation, and trust networks in Iran's Humanitarian Supply Chain at both inter-organizational and interpersonal levels.

METHODS: This applied research was conducted based on a descriptive survey design. The statistical population of this research included the organizations and people involved in relief operations performed in three recent disasters: the fire-induced collapse of the Plasco building, Shahran gas explosion, and the flash flood in the Tehran subway. In order to analyze networks, a questionnaire containing network analysis questions was designed. Upon the completion of the questionnaires, the data of each network were entered systematically into a matrix on an excel spread sheet. Such indexes as degree centrality, betweenness centrality, intersection points, isolation points, and network density were calculated by Ucinet and Netdraw software packages; therefore, the networks were analyzed.

FINDINGS: Based on the results obtained from the analysis of communication, information exchange, and cooperation networks, the network density was 21%, indicating a low level of organizational relationship. At this level of communication, information exchange and cooperation were obtained at 11.5% and 16.5%, respectively. The analysis of the trust network also illustrated that the density of this network was 26.6%, suggesting that out of 21% of connections, there was about a quarter of possible trust. This is suggestive of low levels of inter-organizational trust.

CONCLUSION: Building trust in Iran's humanitarian service supply chain can be very effective in the acceleration of service supply, organization, and success of relief operations.

Keywords: Humanitarian services; Network analysis; Supply chain; Trust.

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Introduction

Humanitarian operations aim to preserve life and reduce the suffering of people in crises. These operations include the provision of material and technical aid, as well as the delivery of essential services, in response to crisis situations when the community's ability to cope is severely impeded. The management of humanitarian relief operations involves many actors and aid providers who differ vastly in terms of culture, goals, interests, commitments, capacity, and expertise (1). The main humanitarian relief actors can be classified into governmental and military forces, aid agencies, charities, NGOs, and private sector companies, among which logistics service companies have a special position (2).

The operational characteristics of relief supply chains vary depending on the type of disaster and the actors involved. Therefore, each type of disaster requires different management methods. The critical point here is paying assiduous attention to the relationships among these actors in a

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humanitarian supply chain (3). Trust is a key concept in supply chain management, specifically used in conjunction with supply chain collaboration (4&5). Apart from the great emphasis on information sharing, the most important cores of trust development in supply networks are cross-functional and inter-organizational teams (6).

Regarding a team, trust refers to trust that is collectively shared among team members (7). Trust is essential for the performance of chain teams since it positively affects team performance. Previous studies have demonstrated that trust is critical for team effectiveness and creativity (8&9). According to the commitment-trust theory of relationship marketing, trust is one of the key factors in relationship management (10).

According to Bal et al. (2004), trust has been logically and empirically assumed as a vital variable of communication (11). Martins and Basco (2013) have identified Trust as a prerequisite for building and maintaining long-term relationships. Mistrust results in relationship disruption, the failure of group formation, and a marked decrease in organizational effectiveness (10). The development of supply chain trust-based relationships is established based on the hypothesis that a company cannot succeed alone in a competitive environment unless it cooperates with others in a supply chain (12).

Cao and Zhang (2011) are of the belief that the development of a win-win situation is essential to benefit from established collaborations. In this situation, all the partners of the supply chain create synergistic effects that help them compete with other networks and increase their financial efficiency (13). Trust among supply chain members leads to the establishment of better relationships, as well as the reduction of uncertainty and risk (14). A high level of trust will accelerate decision-making and reduce costs. Therefore, organizational trust positively affects work productivity and improves the competitive position of supply chain companies in terms of both individual companies and the entire supply chain (15& 16).

Primary inter-organizational trust depends on the evaluation of credibility, assets, and competencies of companies, as well as their expected benefits from cooperation. Since building a good reputation is time-consuming and costly, it is easier to trust companies that enjoy a strong positive reputation and do not want to tarnish this reputation by making mistakes (17). However, a company's poor reputation and disregard for other people's perceptions of them reduce the chance of cooperation.

Experiences accumulated during a collaboration (collecting information from companies, confirming the knowledge and expectations they have from each other at the beginning of relationships) affect the development of trust-based relationships. Relationships assume critical importance when people adhere to their commitments, confirm their competencies, and exchange mutually beneficial information. According to Wood et al. (2002), trust-based collaboration has the following characteristics: Respect and free relationships, commitment to promises, honesty, and confrontation (willingness to cooperate in the obtainment of mutual benefits). In situations where companies have to face more uncertainty and risk, they need trust to be more versatile. When it comes to trust-based relationships, companies will react faster to new information and conditions (10& 11).

Considering the vital importance of trust, cooperative relationships can be defined as trust-based relationships. Mutual trust is an indicator of inter-organizational trust, and the level of trust affects the process of inter-organizational cooperation (18). Sarker et al. (2011) provided new insight into the functioning of social networks by presenting the concept of individual trust concentration. They defined trust concentration as "the extent to which an individual enjoys a central position in the trust network." They examined the relationship between two types of centrality (i.e., communication centrality and trust centrality) and individual performance in the global virtual teams based on the social network approach. They developed the hypothesis that a team member's communication centrality has a positive effect on his/her performance. That is to say, the people who are more actively involved in communication are the most positive members of the group (19).

Cognition-based trust and emotion-based trust are the principles of interpersonal trust. Cognition based trust refers to intellectual trust and the perceived competence of others, while affect-based trust refers to trust from the heart, a bond that depends on emotional relationships (20). This distinction is of great help in management studies.

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Each form of trust operates in a unique way with different antecedent and posterior variables (20, 21, & 22). In a disaster response situation, organizations come together with predetermined goals and policies (same goals). Nevertheless, the people who do not know each other do not belong to the same organization and have not received the same training.

The main feature of hastily formed networks (HFNs) is their rapid formation. Focusing on trust development becomes the primary interpersonal relationship. Therefore, building trust in HFNs should follow a different model of trust in long-term relationships. Meiren et al. pointed out that people within HFNs are connected to each other through "quick trust." On the other hand, an essential component of the trust-building process is its measurement. Due to the abstract and multidimensional nature of Trust, its assessment is a challenging task. A wide array of factors affects the trust level of companies; therefore, it cannot be directly observed and measured using just one index. Interorganizational Trust is a hidden variable that can be described using a number of observable variables (23).

In a related study, Choi (2022) used network analysis methods to evaluate the state of South Korea's partnership with important international organizations in the implementation of foreign aid projects in Korea from a humanitarian point of view (24). The results of a study by Copping et al. (2021) demonstrated that the shape of supply chain networks is strongly affected by the nature/cause of the initial movement, geographic location, local availability of materials, and the degree of support provided by aid agencies or governments. In addition, social network analysis can be used to show the strategies which may work in a particular context (25).

Based on the aforementioned issues, the present study aimed to evaluate the level of trust in the country's humanitarian service network and aid organizations at inter-organizational and interpersonal levels. It strives to identify the level of communication, information exchange, cooperation, and trust in the country's humanitarian services supply chain network.

Methods

In this research, the network analysis approach was used to analyze the data. Network analysis is one of the latest proposed methods that has been proved effective in problem-solving, relationship recognition, decision making, policy making, and management. It provides decision-makers, managers, or policy-makers with a golden opportunity to fully participate in this process and, finally, obtain satisfactory results based on their experiences and skills (26).

Social network analysis is an approach used to study social structures originating from social sciences, political sciences, anthropology, and graph theory (26). Network analysis is based on two theories, network and graph. From the perspective of computer science, network analysis is classified under the use of graphs. From the standpoint of social sciences, the theoretical framework of network analysis is "network theory." Graph theory is a structural aspect of the model, simulating the network in the form of mathematics (27).

The most important feature of this theory is that it analyzes the relationships among the independent actors in a system instead of partial interpretation and analysis of the characteristics of independent issues (27). It shifted the focus of attention from individuals and their characteristics to pairs of people and their relationships (27). That is to say, the between- and within-unit relationships should be initially investigated instead of the characteristics of the units themselves (28). Social network analysts use graphs and matrices to show information about communication patterns among social actors (28).

Matrices are the language of entering data into network analysis software; accordingly, rows are senders or selectors, while columns are receivers or the selected ones (29). In this method, in order to collect the data on structured relationships, nonparticipant observation and documents are used. The questionnaire is the most commonly used method of data collection in network analysis (30). In this research, Ucinet software was used for data analysis, while Netdraw software was applied to draw graphs and analyze networks at the same time.

Moreover, among the notable concepts in the network analysis approach, we can refer to the network, centrality, and power. Degree centrality and betweenness centrality are also among the major centrality measures. Centrality is a broad concept used to identify the most important actors or connections in a network. The points with higher degrees are more central and have a greater

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access to resources (30). The data of this research was collected through the distribution of questionnaires among the rescuers who were present in the three recent incidents: the fire-induced collapse of the Plasco building, the Shahran gas explosion, and the flash flood in Tehran subway.

Upon the completion of the questionnaires, in order to investigate the inter-organizational and interpersonal communication networks and their interactions, a matrix was made in Excel software (organizations in the columns and individuals in the rows). This research was conducted through the network of communication, information exchange, cooperation, and trust in the emergency management agency of Tehran province. The research community included all the chiefs, managers, personnel, and relief workers present in three major and recent incidents in Tehran province, and the sample size was calculated at 129 people.

Findings

The descriptive analysis of respondents' demographic information and the data on Iran's Humanitarian Supply Chain are presented in this section. The collected data were extracted in the form of a researcher-made questionnaire in Excel software. The Ucinet and Netdraw software were also used in the network analysis method. Moreover, the indicators of degree centrality, eigenvector centrality, betweenness centrality, and intersection points were emphasized in the analysis of cooperation and trust in the Humanitarian Supply Chain.

Descriptive analysis of the questionnaire

The analysis of the research questionnaire data by demographic characteristics and four primary questions are presented in the following tables. The result of assessing the frequency of organizational position of people participating in the survey is displayed in Table 1. Based on this table, 50% of the respondents had 10-25 years of work experience. In terms of education, the majority of them (57.8%) held a master's degree. The highest number of respondents (60%) was in the age group of 41 years and over.

Table 2 attends to the question, "How many incidents have you participated in?" The results displayed that out of a total of 128 respondents, the majority were present in more than five incidents.

Table 3 deals with the question, "How did you learn about the incident?" Out of a total of 128 respondents, 39.1% and 25.8% of cases were informed by their manager and colleagues, respectively. Among the respondents, some referred to more than one source of information.

Table 4 displays the result of the question, "When did you learn about the incident?" According to this table, about 24.2% and 33.6% of the respondents were informed about the incident during an emergency meeting in the organization and while doing work. It should be noted that some people mentioned more than one process.

Table 5 deals with the question, "After being informed about the incident, what was the first measure taken by your organization?"

Table 1. Frequency of respondents' organizational positions

Organizational position	Manager	Administrator	Deputy	Expert	Staff
n	7	33	26	31	31
Percentage	5.5%	25.8%	20.3%	24.2%	24.2%
Years of service	1>age≤5	5>age≤10	10>age≤15	15>age≤25	age>25
n	25	13	34	31	25
Percentage	19.5%	10.2%	26.6%	24.2%	19.5%
Level of Education	Associates degree	Bachelors degreed	Master's degree	PhD	Total
n	6	41	74	7	128
Percentage	4.7%	32%	57.8%	5.5%	100%
Age	25-30	31-40	41-50	51-60	Total
n	17	35	38	38	128
Percentage	13.3%	27.3%	29.7%	29.7%	100%

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Table 2. Frequency of presence in incidents

Participation in disaster management	One incident	5≥Incident>1	10≥Incident>5	20≥Incident>10	Incident>20
Number	14	14	38	44	18
percentage	10.9%	10.9%	29.7%	34.4%	14.1%

Table 3. Source of incident reporting

Source of Information	Manager	Expert	Friend	Colleague	Media	Social media	Presence at the scene
Number	50	30	17	33	22	26	5
Percentage	39.1%	23.4%	13.3%	25.8%	17.2%	20.3%	3.9%

It can be observed that 28.9% of organizations hold an emergency meeting immediately after the incident and 45.3% dispatched aid to the beneficiary region sent the relief workers to the scene.

Investigating the communication network, information exchange, cooperation, and organizational trust of Iran's humanitarian service supply chain

Communication, cooperation, trust, and information exchange networks were measured using a questionnaire comprising eight items. In the following, the analysis of these networks is discussed at two inter-organizational and interpersonal levels. The primary two-way network of inter-organizational and interpersonal communication in Figure 1 was extracted using Netdraw software. The red circles denote individuals, and the blue rectangles depict the organizations in Iran's Humanitarian Supply Chain.

Multidimensional Scaling of networks

The correlation coefficient (similarity among inter-organizational relationships) was calculated using this index, and the output of the abovementioned similarity was presented schematically in two-dimensional space using Multidimensional Scaling (MDS) analysis. The results of analyzing the similarity of inter-organizational communication indicate cooperation, trust, and information exchange based on the degree of correlation between the corresponding rows and columns related to relationships, as well as the distribution of points of network organizations.

According to Figure 2, almost the same correlation was observed throughout the inter-organizational communication network. In other words, these organizations have a similar position in the humanitarian services supply chain; that is to say, the selection of people in these organizations follows a very similar pattern. In a detailed analysis, it can be stated that in the communication network, firefighting command headquarters, the regional crisis management, Deputy of Transportation & Traffic, and Tehran Urban and Suburban Railway Company have higher communication than other organizations.
At the next level, Red Crescent Society, ABFA, Emergency, Police Force, Gas Company, Railway Company, Drilling Company, Tehran City Council, Regional Municipality, Governorate, Traffic Department, and Tehran Crisis Management Headquarters have a moderate correlation in this network and similar communications. Furthermore, the establishment of relationships among people in aid chain organizations follows a very similar

Table 4. Process of being informed about the incident

Process of being informed	Emergency meeting	Social media	Being informed while at work	Via phone	Via NGOs	wireless connection	Via SMS	Presence at the scene
Number	31	14	43	23	2	13	3	12
Percentage	24.2%	10.9%	33.6%	18%	1.6%	10.1%	2.3%	9.4%

Table 5. First measure taken by the service organization

First measure	Holding an emergency meeting	Arrangement of forces	Contacting related organizations	Dispatch of relief forces	Initial assessment of the situation
Number	37	16	9	58	8
Percentage	28.9%	12.4%	7.1%	45.3%	6.2%

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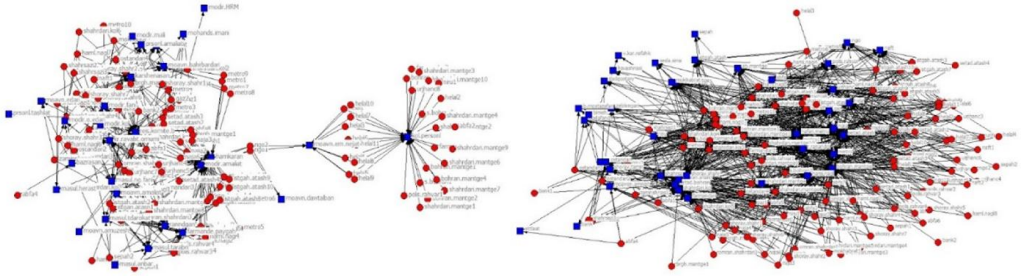


Figure 1. Basic two-way network of organizational (right) and personal (left) communication using Netdraw software

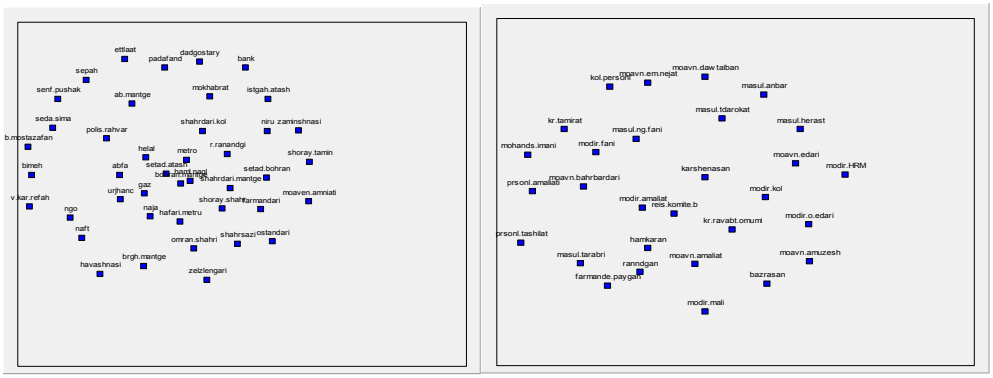


Figure 2. Unidirectional network of organizational (right) and personal (left) communication using Netdraw software

pattern. A closer examination revealed that the chair of the crisis committee, crisis operations manager, and experts had a higher level of communication.

According to MDS analysis, in the organizational information exchange network, Tehran Crisis Management Headquarters, Regional Crisis Management, Tehran Central Municipality, Regional Municipality, Traffic Police, and Tehran Urban and Suburban Railway Company have a higher correlation and information exchange than other organizations. At the next level, fire command headquarters, fire stations, Iranian Red Crescent Society, Police Department, Road, Housing & Urban Development Department, emergency department, Deputy of Urban Development, Tehran provincial government, Deputy of Transportation & Traffic, and the gas company had a moderate correlation and information exchange in this network.

Moreover, in the personal information exchange network, the chair of the crisis committee, the crisis operations manager, experts, the technical manager, and the CEO of the organizations had a higher correlation and information exchange compared to other people. Considering the high management levels in the organizational hierarchy, it seems obvious that these people have access to more information. In the inter-organizational cooperation network, Tehran crisis management headquarters, regional

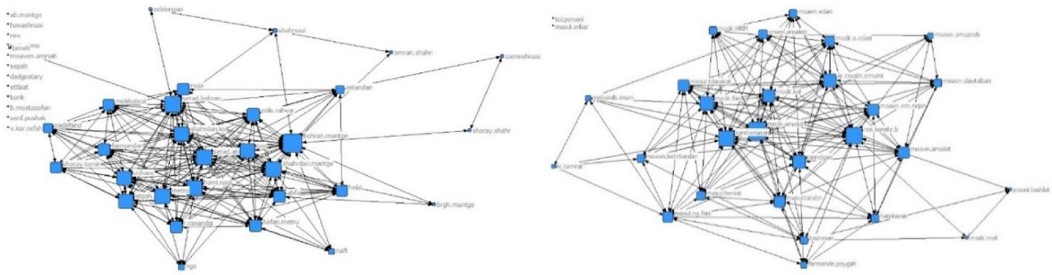


Figure 3. One-dimensional network of the centrality of organizational (right) and personal (left) trust using Netdraw software

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crisis management, Deputy of Transportation & Traffic, as well as Tehran Urban and Suburban Railway Company, had higher correlation and cooperation compared to other organizations.

In the personal cooperation network, the chair of the crisis committee, crisis operations manager, experts, and the CEO of organizations had a higher correlation and cooperation than other people. They perform a prominent managerial and advisory role in a time of crisis. In the organizational trust network, the firefighting command headquarters, fire stations, ABFA, regional crisis management, emergency, Gas Company, and Tehran Urban and Suburban Railway Company have a higher level of correlation and trust than other organizations.

At the next level, Tehran Crisis Headquarters, Tehran Central Municipality, Deputy of Transportation & Traffic, and the municipality of the affected area have a moderate correlation in this network and are similarly trusted by each other. It is evident that trust levels are higher among Tehran Central Municipality and its sub-groups due to their similar structures and responsibilities. Furthermore, in the personal trust network, the chair of the crisis committee, crisis operations manager, and experts had higher levels of correlation and Trust compared to other people. These people have gained great Trust due to the central role they play in the effective management of relief operations.

Degree centrality

Figure 3 shows the one-dimensional stoichiometric representation of the degree centrality of the inter-organizational and interpersonal communication network in the humanitarian services supply chain based on the three recent incidents in Tehran using the Netdraw software. In this network, squares signify people and organizations, while the lines between them illustrate the connection between them. The level of inter-organizational communication is presented by the size of the squares.

The organizations located in the center of the network have a high centrality compared to other organizations, while the ones situated in the outer layers of the network have less power and centrality. Accordingly, this greater centrality points to the more marked effect of these organizations on other organizations. It can be observed that in the communication network, the regional crisis management headquarters had the highest degree centrality, followed by the fire command headquarters, Deputy of Transportation & Traffic, Iranian Red Crescent Society, and Tehran Urban and Suburban Railway Company. This is suggestive of more effective communication among these organizations and one of the strengths of this network. That is to say, these organizations have more expertise and a higher number of links and, therefore, higher efficiency in the network. Accordingly, these organizations play the role of key actors in incident management.

In addition, Tehran Central Municipality, regional municipality, Emergency, Police Department, ABFA, Tehran City Council, Traffic Police, and Railway Drilling Company also had moderate centrality values, indicating more connections and a higher impact of these organizations. The Road and Urban Development Department, Traffic Police, the Ministry of Energy, and Telecommunication Company had a low level of centrality. It is one of the weaknesses of the communication network of relief supply chain organizations.

Iran Meteorological organization and the insurance company had the lowest degree centrality, as displayed in Table 6. The lack of strong communication and power in these organizations can be attributed to their involvement in a case incident and managers' failure to fulfill their responsibilities. The regional crisis management headquarters had more legal power due to high levels of strategic communication during a crisis. In addition, access to this headquarters in the terrible conditions of crisis and urgent needs for the exchange of information, facilities, and resources, increases communication and provides satisfactory coordination for other people and organizations. Therefore, the capability of the referred center assumes vital importance in this network.

Furthermore, the fire headquarters play a key role in an immediate response and the timely dispatch of aid workers to the affected area. The Red Crescent Society are involved in the initial search and rescue operations, reduction of casualties, facilitating the access of other organization to the depth of the incident by correct and timely debris removal. The deputy of transportation & traffic of Tehran municipality transfers equipment and consumables and assists in the collection of debris and damaged equipment

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in the region. The aforementioned issues, as well as the central role of Tehran Urban and Suburban Railway Company in two incidents, clearly show the extent of necessary communication during a successful operation.

Moreover, at the interpersonal, according to Table 7, it can be observed that the chair of the crisis committee and the crisis operations manager had the highest degree centrality in the communication network. All the colleagues, personnel, and experts of the respondent organization ranked next. This shows that these people have more expertise and a higher number of connections in the network compared to others. Therefore, these people play the role of key actors in incident management. In addition, the CEO, the vice president of operation, the public relations expert, the drivers, the transportation manager, and the base commander also have moderate centrality values.

Human resources manager, deputy of volunteer affairs, and bank facilities employee has the lowest degree centrality. In the organizational information exchange network, the regional crisis management headquarters had the highest degree centrality, followed by Tehran Central Municipality, Tehran Urban and Suburban Railway Company, fire stations, and the regional municipality. This indicates the higher level of information exchange in these organizations and is one of the strengths of this network. Therefore, these organizations play the role of key actors in incident management. Tehran crisis management headquarters, fire command headquarters, and Traffic Police also have moderate degree centrality, suggesting a relatively higher level of information exchange and influence of these organizations.

The Islamic Republic of Iran Broadcasting and insurance companies have zero-degree centrality, which is one of the weaknesses of the information exchange network of relief chain organizations (Table 6). The lack of information exchange among these organizations is due to their political power and influence, as well as the lack of fulfillment of obligations, sense of responsibility, and impartial judgment. Moreover, in the personal information exchange network, the head of the crisis committee and crisis operations manager had the highest degree centrality. The CEO and the experts of the organization had moderate centrality values.

The financial manager, the vice president of training, the warehouse manager, the bank facilities employee, the security manager, and the repair expert had the lowest degree centrality. The entire personnel of the organization have zero-degree centrality, demonstrating the non-horizontal structure of the organization and information access due to the limitations imposed by the organizational hierarchy. The low level of information exchange or the unavailability of the necessary information at all levels among personnel can be ascribed to case incidents and widespread distrust among the organizational staff (Table 7).

In the inter-organizational cooperation network, the crisis management headquarters of the region has the highest degree centrality, followed by the fire stations, Tehran Urban and Suburban railway company, Gas Company, The deputy of transportation & traffic of Tehran municipality, and District Municipality. This indicates that these organizations have a higher level of cooperation than others in the network, and it is one of the strengths of this network. Therefore, these organizations play the role of key actors in incident management. In addition, Railway Company Drilling Company, Tehran Central Municipality, Emergency Department, Police Department, ABFA, Tehran City Council, Traffic Department, Tehran Governorate, Red Crescent, Tehran Crisis Management Headquarters, and Fire Brigade Headquarters have moderate centrality values. This is suggestive of the relatively higher cooperation and influence of these organizations.

The Ministry of Intelligence, Khatam Al-Anbiya headquarters, Justice Organization, and Refah Bank have the lowest degree centrality (Table 6). The most important reason for the weak cooperation among these organizations is their political power and influence. Moreover, in the individual cooperation network, the head of the crisis committee and the manager of the crisis operations have the highest degree centrality. The CEO, Deputy Director of Operations, Technical Manager, Public Relations experts, drivers, Transportation Officer, and Base Commander also have moderate centrality values.

The financial manager, the vice president of education, the warehouse manager, and the bank facilities employee had the lowest degree centrality. The most important reason for the poor cooperation of these people in the network was

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Table 6. Values of degree centrality, betweenness, density, and intersection points of aid chain in organizational networks

Row	Network / Organization	Communication		Information exchange		Cooperation		Trust	
		Degree centrality	Betweennes s centrality	Degree centrality	Betweenness centrality	Degree centrality	Betweenness centrality	Degree centrality	Betweenness centrality
1	Central Municipality of Tehran	0.305	0.036	0.422	0.111	0.234	0.024	0.172	0.048
2	District municipality	0.375	0.050	0.328	0.070	0.305	0.051	0.234	0.090
3	Tehran crisis headquarters	0.266	0.026	0.227	0.041	0.242	0.038	0.156	0.081
4	Regional crisis management	0.711	0.186	0.641	0.256	0.641	0.235	0.313	0.185
5	Emergency medical services	0.328	0.025	0.117	0.011	0.250	0.026	0.211	0.037
6	Fire Department Headquarters	0.531	0.087	0.227	0.027	0.297	0.043	0.289	0.107
7	fire stations	0.117	0.003	0.324	0.070	0.414	0.088	0.430	0.197
8	Red Crescent Society	0.414	0.055	0.195	0.029	0.219	0.020	0.078	0.008
9	Tehran police department	0.352	0.033	0.148	0.041	0.289	0.033	0.023	0.001
10	Water organization of Tehran	0.320	0.026	0.117	0.020	0.266	0.034	0.203	0.050
11	Tehran Regional Water Organization	0.172	0.002	0.031	0.000	0.117	0.005	0.000	0.000
12	Deputy of transportation and traffic of Tehran Municipality	0.508	0.080	0.188	0.019	0.313	0.045	0.185	0.051
13	Civil deputy of municipality	0.250	0.022	0.078	0.002	0.156	0.013	0.008	0.000
14	Road, Housing & U rban Development Organization	0.211	0.013	0.133	0.010	0.156	0.014	0.016	0.001
15	Tehran City Council	0.344	0.043	0.063	0.002	0.227	0.040	0.016	0.011
16	Tehran urban and suburban railway company	0.430	0.053	0.438	0.114	0.398	0.074	0.289	0.087
17	Geological Research Center	0.117	0.005	0.047	0.001	0.078	0.005	0.016	0.001
18	Meteorological Organization	0.031	0.000	0.008	0.000	0.031	0.000	0.000	0.000
19	Ministry of Energy	0.164	0.005	0.055	0.008	0.102	0.003	0.000	0.000
20	Tehran Regional Electricity Compan y	0.133	0.004	0.016	0.000	0.102	0.003	0.016	0.000
21	Tehran Province Gas Company	0.406	0.057	0.156	0.017	0.320	0.079	0.320	0.124
22	The Islamic Republic of Iran Broadcasting	0.055	0.000	0.000	0.000	0.039	0.001	0.000	0.000
23	Tehran Provincial Government	0.156	0.013	0.141	0.014	0.133	0.022	0.031	0.022
24	Tehran Governorate	0.266	0.020	0.078	0.005	0.250	0.026	0.078	0.011
25	Iranian traffic police (Rahvar)	0.203	0.009	0.023	0.000	0.172	0.010	0.063	0.003
26	Provincial Supply Council	0.117	0.006	0.031	0.001	0.094	0.006	0.031	0.001
27	Political, security and social deputy of Tehran governorate	0.117	0.006	0.016	0.000	0.078	0.007	0.000	0.000
28	Non-governmental organizations	0.148	0.007	0.031	0.001	0.047	0.001	0.039	0.001
29	Telecommunication	0.117	0.002	0.023	0.000	0.094	0.003	0.031	0.001

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Table 6. Values of degree centrality, betweenness, density, and intersection points of aid chain in organizational networks

Row	Network / Organization	Communication		Information exchange		Cooperation		Trust	
		Degree centrality	Betweennes s centrality	Degree centrality	Betweenness centrality	Degree centrality	Betweenness centrality	Degree centrality	Betweenness centrality
30	company Khatam al-Anbiya Construction Headquarter	0.023	0.000	0.008	0.000	0.008	0.000	0.000	0.000
31	Justice department	0.039	0.000	0.000	0.000	0.016	0.000	0.000	0.000
32	Passive Defense	0.063	0.001	0.031	0.001	0.047	0.001	0.016	0.000
33	Ministry of Intelligence	0.016	0.000	0.000	0.000	0.016	0.000	0.008	0.000
34	National Iranian oil products Distribution Company	0.180	0.007	0.008	0.000	0.023	0.000	0.008	0.000
35	Refah Bank	0.023	0.000	0.008	0.000	0.008	0.000	0.000	0.000
36	Traffic Police	0.313	0.025	0.250	0.032	0.289	0.034	0.117	0.019
37	Railway company Drilling Company	0.328	0.028	0.023	0.000	0.258	0.038	0.070	0.003
38	Seismography Center	0.078	0.002	0.031	0.000	0.070	0.003	0.008	
39	Insurance Company	0.047	0.001	0.000	0.000	0.055	0.000	0.008	
40	Mostazafan Foundation of Islamic Revolution	0.031	0.000	0.031	0.000	0.086	0.005	0.000	
41	Clothing Manufacturers Association Tehran	0.023	0.000	0.055	0.001	0.031	0.000	0.000	
42	Ministry of Labor and Social Welfare	0.023	0.000	0.016	0.000	0.063	0.002	0.000	

Table 7. Values of degree centrality, betweenness, density, and intersection points of relief chain in personal networks

Row	Network / People within the organization	Communications		Information exchange		Cooperation		Trust	
		Degree centrality	Betweenness centrality	Degree centrality	Betweenness centrality	Degree centrality	Betweenness centrality	Degree centrality	Betweenness centrality
1	All personnel	0.242	0.254	0.000	0.000	0.000	0.000	0.000	0.000
2	Colleagues	0.266	0.215	0.148	0.081	0.281	0.122	0.281	0.135
3	CEO	0.133	0.030	0.188	0.074	0.188	0.059	0.117	0.056
4	Chair of the crisis committee	0.391	0.232	0.445	0.359	0.453	0.310	0.438	0.351
5	Vice president of operation	0.133	0.028	0.094	0.029	0.086	0.013	0.070	0.014
6	Manager of administrative affairs	0.070	0.010	0.078	0.020	0.078	0.008	0.055	0.006
7	Administrative deputy	0.063	0.002	0.008	0.000	0.023	0.000	۰/۰۲۳	0.001
8	Repair expert	0.063	0.004	0.016	0.000	0.016	0.000	0.016	0.000
9	Security guard	0.023	0.001	0.016	0.001	0.016	0.001	0.016	0.001
10	technical manager	0.109	0.018	0.156	0.061	0.156	0.048	0.156	0.065
11	Maintenance technician	0.102	0.020	0.063	0.022	0.063	0.012	0.063	0.013
12	public relations specialist	0.148	0.036	0.117	0.022	0.117	0.018	0.078	0.012
13	Drivers	0.180	0.035	0.078	0.018	0.180	0.055	0.117	0.037
14	Procurement Officer	0.063	0.007	0.094	0.017	0.094	0.014	0.063	0.013
15	base commander	0.133	0.016	0.141	0.038	0.141	0.024	0.141	0.032
16	Vice	0.016	0.000	0.008	0.000	0.008	0.000	0.008	0.000

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	Network	Communications		Information exchange		Cooperation		Trust	
	President for Education								
17	Deputy of rescue and relief	0.094	0.331	0.086	0.014	0.086	0.010	0.086	0.012
18	operation manager	0.328	0.0348	0.461	0.401	0.461	0.327	0.461	0.369
19	Vice President of Operations	0.141	0.033	0.109	0.044	0.172	0.055	0.109	0.034
20	Vice President of Volunteers	0.016	0.000	0.039	0.002	0.039	0.002	0.039	0.002
21	financial manager	0.039	0.002	0.008	0.000	0.008	0.000	0.016	0.000
22	experts	0.219	0.079	0.188	0.084	0.289	0.139	0.188	0.087
23	warehouse manager	0.023	0.001	0.008	0.000	0.008	0.000	0.008	0.000
24	Procurement manager	0.133	0.023	0.133	0.043	0.133	0.032	0.094	0.024
25	inspectors	0.055	0.016	0.123	0.013	0.047	0.016	0.039	0.106
26	Health and safety engineers	0.039	0.001	0.016	0.000	0.023	0.000	0.023	0.000
27	Human Resources Manager	0.008	0.000	0.031	0.001	0.031	0.001	0.031	0.002
28	Operational personnel	0.063	0.005	0.047	0.004	0.078	0.010	0.070	0.010
29	Facility personnel	0.008	0.000	0.008	0.000	0.008	0.000	0.008	0.000

the case incident, as well as the severity and extent of the incident (Table 7). In the inter-organizational trust network, the fire stations have the highest degree centrality, followed by the provincial gas company, the regional crisis management, the fire command headquarters, as well as Tehran Urban and Suburban Railway Company. This indicates that these organizations are more trusted and is one of the strengths of this network.

These organizations play the role of key actors in incident management. The regional municipality, emergency department, ABFA, and Deputy of Transport and Traffic of Tehran Municipality has moderate centrality values. This is indicative of the relatively greater trustworthiness and influence of these organizations. Moreover, the Ministry of Energy, Meteorological Organization, and the Islamic Republic of Iran Broadcasting have zero-degree centrality, which is among the weaknesses of the network of Trust among relief chain organizations (Table 6).

The lack of trust among these organizations can be attributed to the evasion of responsibility and their minor role in the incidents. Moreover, in an interpersonal trust network, the head of the crisis committee and crisis operations manager have the highest degree centrality. Colleagues and experts of the respondent organizations have moderate centrality values, indicating a relatively satisfactory level of trust and information exchange, as well as their influence in the network. The financial manager, the vice president of education, the warehouse manager, the bank facilities employee, the security manager, and the repair expert have the lowest degree centrality. The entire personnel of the organization have a zero degree of centrality (Table 7), pointing to widespread distrust in the humanitarian services supply chain.

Betweenness centrality

Figure 4 depicts the one-dimensional representation of the betweenness centrality of the organizational and interpersonal communication network of the humanitarian services supply chain in Netdraw software. In this network, people and organizations with more centrality are displayed bigger.

Organizations with high betweenness centrality (with larger forms) have high control power and social influence in the network. These organizations can play the role of key actors in crisis management. According to Figure 4, the regional crisis management organization has the

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highest betweenness centrality. Therefore, this organization has a mediating and determining role, as well as an ability to connect, increase, or limit communication. The fire command headquarters, the Iranian Red Crescent Society, the Deputy of Transport and Traffic of Tehran Municipality, the gas company, and the Tehran Urban and Suburban Railway Company have moderate betweenness centrality.

The meteorological organization and the Islamic Republic of Iran Broadcasting have zero betweenness centrality, which points to their indecisive role in the organizational communication network, as illustrated in Table 6. The results and reasons were discussed in the degree centrality section. Accordingly, people with high betweenness centrality (having bigger shapes) have high control power and social influence in the network. In the interpersonal communication network, the crisis operations manager, and the deputy of relief and rescue have the highest betweenness centrality. These people play a mediating role, increasing or limiting communication.

In this network, the chair of the emergency committee, all the personnel and colleagues of respondent organizations have moderate betweenness centrality. Moreover, the vice president of education, the vice president of volunteer affairs, the human resources manager, and the bank facilities employee have zero betweenness centrality. In the organizational information exchange network, the regional crisis management headquarters has the highest betweenness centrality and plays mediating role, increasing or limiting information exchange. In addition, the central municipality of Tehran has a moderate betweenness centrality. The Geological Organization, the Provincial Supply Council, the Governorate, and the Emergency Department have a low betweenness centrality (Table 6).

In the information exchange network, the crisis operations manager, and the chair of the emergency committee have the highest betweenness centrality and play a mediating role, increasing or limiting information exchange. In this network, the human resources manager, inspectors, volunteer affairs deputy, relief and rescue deputy, procurement officer, security officer, drivers, and operational personnel have a low betweenness centrality. Vice President of education, vice president of administration, financial manager, bank facilities officer, warehouse manager, safety engineer, repair expert, and all personnel have zero betweenness centrality.

In the inter-organizational cooperation network, the regional crisis management organization had the highest betweenness centrality and played a mediating role, increasing or limiting information exchange. The fire stations, the regional municipality, the gas company, and the Tehran Urban and Suburban Railway Company have moderate betweenness centrality. Meteorological organization and the insurance company have zero betweenness centrality, as discussed in the degree centrality section (Table 6). Moreover, in the interpersonal cooperation network, the crisis operations manager, and the chair of the emergency committee have the highest betweenness centrality.

The experts and colleagues in respondent organizations have moderate betweenness centrality. The vice president of administration, financial manager, bank facilities officer, warehouse manager, safety engineer, and repair

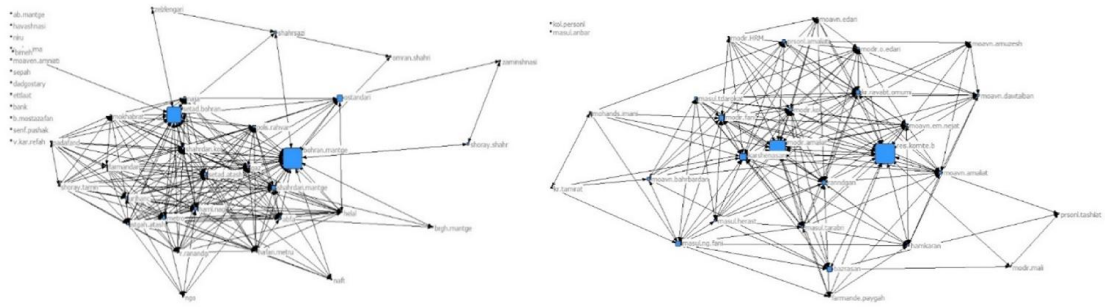


Figure 4. One-dimensional network of betweenness centrality of organizational (right) and personal (left) trust using Netdraw software

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expert have zero betweenness centrality. In the network of organizational trust, fire stations and regional crisis management headquarters have the highest betweenness centrality and play a mediating role, increasing or limiting trust. The headquarters of the fire department, the regional municipality, the Gas Company, as well as Tehran Urban and Suburban Railway Company, have a moderate betweenness centrality. Meteorological organization, regional water organization, civil deputy of the municipality, ministry of energy, regional electricity organization, Islamic Republic of Iran Broadcasting, seismography, and the insurance company have zero betweenness centrality (Table 6). In the interpersonal trust network, the crisis operations manager and the chair of the emergency committee have the highest betweenness centrality and the power to change the existing trust.

Networks Density

Density is one of the most used indicators, defined as the sum of the ties divided by the number of possible ties. This index demonstrates the degree of network correlation. In an interconnected network with high density, there are many direct relationships among members increasing the integrity, cohesion, and strengthening of network links. The density of the organizational communication network is calculated in two parts: the density of the whole network and the density among the sections, the density of the whole network was calculated at 21%, pointing to low and weak density. Therefore, direct relationships among organizations have a low correlation.

This has reduced the possibility of proper coordination and cooperation in the current situation. In order to increase synergy, measures can be taken to strengthen the existing relationships and make the most of the existing unused capacity. As illustrated in Table 8, the density among the sections was also divided into internal density (5% and 34%) and external density (23% and 7.5%). The internal density of 34% and external density of 23% are illustrative of better conditions in the inter-organizational network. Moreover, the density of the interpersonal communication network was calculated (the density of the whole network and the density among the sections), and the total density of the network was obtained at 11.5%.

The density among the sections was reported at two sections, the internal density (21% and 16.5%) and the external density (6% and 6%). The density of the whole network of inter-organizational information exchange was 11.5%, which indicates a very low and weak density. Therefore, the exchange of direct information among people has a low correlation. This has reduced the possibility of accurate and appropriate performance in the current situation. In order to increase synergy, measures can be taken to strengthen the existing information exchange and use the existing unused capacity in an attempt to reduce mistakes and achieve a better result.

The density among the sections was reported in two sections, the internal density (7% and 26%) and the external density (19% and 5%). The internal density of 40% and external density of 26% in organizations are suggestive of much better conditions and stronger potential influence. Moreover, the density of the whole network of interpersonal information exchange was 11.5%. Among the sections, the internal density values were 21.5% and 7%, while the external density scores were obtained at 3.5% and 14.5%. The density of the whole inter-organizational cooperation network was 16.5%, which indicates a low and weak density. Therefore, direct relationships among organizations have a low correlation. This has reduced the possibility of coordinating and accelerating rescue and relief operations in the current situation.

Table 8. Values of internal and external density of interorganizational and interpersonal networks

Network		1	2	Network		1	2
Organizational communication	1	0.049	0.233	Interpersonal communication	1	0.213	0.058
	2	0.075	0.339		2	0.062	0.165
Organizational cooperation	1	0.271	0.069	Personal information exchange	1	0.216	0.035
	2	0.155	0.100		2	0.145	0.069
Organizational Trust	1	0.227	0.015	Personal cooperation	1	0.107	0.259
	2	0.127	0.020		2	0.062	0.403
Exchange of information	1	0.073	0.188	Personal Trust	1	0.109	0.086
	2	0.050	0.258		2	0.048	0.214

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The density among the sections was reported in two sections, the internal density (27% and 10%) and the external density (7% and 15.5%). The internal density of 27% and the external density of 15.5% at the interorganizational level are suggestive of better conditions. The density of the whole interpersonal cooperation network was also 11.5%. Among the sections, the internal density values were 11% and 40%, while the external density scores were obtained at 26% and 6%. The density of the whole inter-organizational trust network is 8%, indicating a very low and weak density. Therefore, direct relationships among organizations have a low correlation. This has reduced the possibility of coordination, cooperation, and proper functioning in the current situation.

Regarding the density among the sections, the internal density values were 23% and 2%, while the external density scores were 1.5% and 12.5%. The internal density of 23% and the external density of 12.5% of organizations are indicative of much better conditions and stronger potential. The density of the whole personal trust network was reported as 9.5%. Among the sections, the internal density values were 11% and 21.5%, while the external density scores were 8.5% and 5%. The density scores of interpersonal communication, personal information exchange, personal cooperation, and personal trust were obtained at 0.114, 0.097, 0.113, and 0.097, indicating a very low and weak density.

Therefore, direct relationships among people have a low correlation. This has reduced the possibility of coordination and cooperation, necessary acceleration, as well as efficient, accurate, and appropriate performance in the current situation. In order to increase synergy, measures can be taken to strengthen the existing relationships and benefit from the unused capacities to reduce errors and achieve better results. The internal density of 21% of people shows much better conditions and stronger potential in the communication network. The internal density of 40% and the external density of 26% of people in the cooperation and trust network, as well as the internal density of 21.5% and the external density of 14.5% of people in the personal information exchange network, are suggestive of much better conditions and stronger potential of the networks.

The networks of inter-organizational communication and cooperation do not have isolation points. The inter-organizational information exchange network has eight isolation points. These points include Islamic Republic of Iran Broadcasting, Traffic Police, Khatam al-Anbiya headquarters, Justice Organization, Ministry of Intelligence, Oil Products Distribution Company, Refah Bank, and Insurance Company. The inter-organizational trust network has 11 isolated points, including regional water organization, meteorology, insurance company, Ministry of Energy, Ministry of Intelligence, Ministry of Welfare and Social Affairs, Khatam al-Anbiya headquarters, Justice Organization, Refah Bank, and Mostazafan Foundation of Islamic Revolution.

Moreover, interpersonal communication network does not have isolation points. The network of interpersonal information exchange and cooperation has an isolation point, which is "all personnel" of the organization. That is to say, none of the respondents had personal contact with all the personnel. The interpersonal trust network has two isolation points: "all personnel" and "warehouse manager." This is obvious since it is uncommon to trust all the personnel in an organization.

Intersection points in networks

Figure 5 displays the inter-organizational and interpersonal communication network of Iran's humanitarian services supply chain in the three recent incidents in Tehran based on the intersection point index using Netdraw software. These intersection points are shown in blue and mutual relationships are in red in the communication network of people and relief organizations.

Intersection points are communication bridges between different parts of a network, and their larger number indicates the greater divisibility of a network and the reduction of its integrity. In inter-organizational communication, information exchange, and cooperation networks, there is no intersection point. This shows the high correlation and integrity in these networks, being considered one of the strengths of the networks.

These organizations play a major role in communication, information exchange, and cooperation. In the working conditions prevailing in Iran, based on the available evidence, the output of expert interviews, and the results of crisis management operations in the last three

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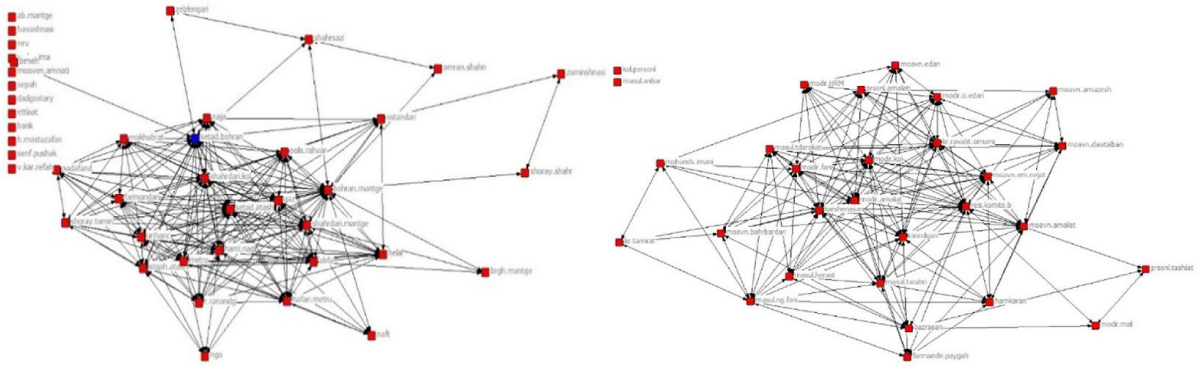


Figure 5. One-dimensional network of intersection points of organizational trust using Netdraw software

incidents, the integrity of these networks seems strange. This finding, which shows that the relief service supply chain organizations have high and complete communication without any problems, contradicts reality, operational records, as well as the obtained results, and attempts should be made to identify the root cause of this discrepancy.

It can be observed that there is only one intersection point in the organizational trust network. Tehran crisis management headquarters serves as a bridge for building trust among relief organizations. If this organization is removed, the entire trust network will break down, and the inter-organizational trust network will be brought to the brink of chaos. Moreover, there is only one intersection point in communication, information exchange, and interpersonal cooperation networks. It is considered one of the strengths of the networks since that person has a prominent role in the communication among the entire organizational personnel.

It was observed that in the communication network, the deputy of relief and rescue serves as a communication bridge, and his exclusion from this network will disrupt the communication among the personnel of the relevant organization. Therefore, this person is of critical importance to the network. In the interpersonal information exchange network, this person is the chair of the emergency committee who provides and receives information from other members in the network. The exclusion of this person will disrupt the information exchange network. In the interpersonal cooperation network, this person is the chair of the emergency committee.

Other people involved in the network receive more cooperation from the chair of the emergency committee, who is of critical importance to the network. In the network of interpersonal trust, there are no intersection points. These points to the high correlation and integration in the network, which is considered one of the strengths of the network. Based on the available evidence, the output of expert interviews, and the results of crisis management operations in the last three incidents, this level of integrity in the trust network seems strange.

Comparison of communication, information exchange, cooperation, and trust networks

Table 9 displays the result of the comparison of communication, cooperation, trust, and information exchange networks.

As displayed in Table 9, the comparison of the degree centrality of the communication, information exchange, cooperation, and organizational trust networks demonstrates that the regional crisis management headquarters have the highest degree centrality, pointing to the marked effect of this headquarters. In addition, this headquarters has more connections in the network. Only in the organizational trust network do fire stations have the highest degree centrality.

This headquarters plays a central role in all communications, cooperation, and information exchange. Moreover, the comparison of the degree centrality of the communication, information exchange, cooperation, and interpersonal trust network demonstrated that the head of the crisis committee and the crisis operation manager have the highest degree centrality in the communication network. Nonetheless, in information exchange, cooperation, and trust networks, the crisis operations manager has gained more power.

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Table 9. Comparison of communication, cooperation, Trust, and information exchange networks

Network	level	Degree centrality	Betweenness centrality	Density	Intersection points	Isolation points
connections	organizational	Regional Crisis Management Headquarters	Regional Crisis Management Headquarters	0.211	Non	Non
	Personal		Regional Crisis Management Headquarters Recue and relief deputy	0.114	Recue and relief deputy	Non
Cooperation	organizational	Regional Crisis Management Headquarters	Regional Crisis Management Headquarters	0.167	non	Non
	Personal	Chair of the crisis committee Crisis Operations Manager	Chair of the crisis committee Crisis Operations Manager	0.113	Chair of the crisis committee	1
Trust	organizational	Fire stations	Fire stations Regional Crisis Management Headquarters	0.083	Crisis Management Headquarters	11
	Personal	Chair of the crisis committee Crisis Operations Manager	Chair of the crisis committee Crisis Operations Manager	0.097	non	2
Information Exchange	organizational	Regional Crisis Management Headquarters	Regional Crisis Management Headquarters	0.113	non	8
	Personal	Chair of the crisis committee Crisis Operations Manager	Chair of the crisis committee Crisis Operations Manager	0.097	Chair of the crisis committee	1

In inter-organizational communication, information exchange, cooperation, and trust networks, the regional crisis management headquarters have the highest degree centrality. Therefore, this headquarters has strong social influence and control in the networks and can be regarded as a key and important organization in the network. However, in the trust network, it has given place to fire stations which have been able to gain the trust of other organizations. In interpersonal networks, the crisis operations manager has the highest centrality. In the second place, the chair of the crisis committee has replaced the relief and rescue deputy of the communication network.

The comparison of the MDS (similarity between individuals and organizations) analysis chart in the networks of communication, cooperation, trust, and information exchange is similar to the results of the comparison of degree centrality. There was a high correlation and integrity in the networks. In fact, there has been a belief that cooperation and trust exist at the level of relationships. It can be stated that changes have been observed in the cooperation and trust networks. The comparison of intersection points in the communication, information exchange, cooperation, and trust networks indicated that there were no intersection points in the interorganizational communication, cooperation, information exchange, as well as interpersonal trust networks.

There was one intersection point in interpersonal communication, information

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exchange, and cooperation, as well as inter-organizational trust networks. Therefore, the networks of interpersonal communication, cooperation, information exchange, as well as inter-organizational trust, have a higher probability of disruption due to the presence of intersection points. Based on this, the existence of social powers strengthens and develops the information exchange and trust among the stakeholders and, accordingly, disputes and conflicts are resolved in a short time. Finally, decision-making will be possible to solve the challenges posed to the achievement of crisis management. There were 1, 11, 2, 8, and 1 isolation points in interpersonal cooperation, inter-organizational trust, interpersonal trust, interorganizational information exchange, and interpersonal information exchange networks, respectively.

Discussion and Conclusion

The present study aimed to assess trust in Iran's humanitarian services network and evaluated three issues of communication, information exchange, and cooperation in the humanitarian services network at two inter-organizational and interpersonal levels using the criteria of degree centrality, betweenness centrality, density, and intersection points. The findings demonstrated that the regional crisis management headquarters had the highest degree centrality within the communication network. The network has a density of 21%, indicating a low level of inter-organizational relationships.

In fact, the organizations within the network act independently and perform their duties at the time of the incidents. About 80% of the communication capacity has remained unused, and 11.5% of information exchange takes place at this level of communication. Furthermore, the majority of organizations were reluctant to provide and exchange information which leads to acceleration, accuracy, and correction of organizational performance. This, in turn, results in mistakes and unnecessary expenses. It is worth noting that 16.5% of cooperation has taken place at the very low level of existing relationships among organizations.

The analysis of the trust network of humanitarian services supply chain illustrated that the regional crisis management headquarters has the highest centrality. The similarity between the results of the main network of trust and the networks of communication, information exchange, and cooperation confirms the connection of the mentioned networks and the integration of relational data in the entire chain. The density in the trust network was 26.6, indicating a quarter of the possible trust. In fact, according to the criteria of the trust model, the level of overall trust in the supply chain was one-fourth based on one-fifth of the possible relationships and one-sixth of the cooperation. This denotes the insignificance of Trust among organizations. Therefore, paying attention to the components of the trust model can be very effective in creating trust and accelerating the progress of affairs and achievement of goals.

Moreover, the results of the analysis of intersection points demonstrated that social power and the appointment of trusted people lead to the strengthening and development of trust and information exchange among the stakeholders, and as a result, disputes and conflicts are resolved in a short time. Finally, it will be possible to make wise decisions to tackle the challenges presented to crisis management. On the other hand, based on the literature review, today in advanced countries, the Red Cross is in charge of responding to disasters and crises. In these countries, when large-scale disasters strike, army forces are appealed for help due to their strong logistic capability. Accordingly, the army of that country is subordinated to the incident management and provides the necessary cooperation. While based on the evidence, crisis management headquarters was responsible for the management of the three mentioned incidents, which are considered successful examples of the country's relief operations.

Nonetheless, the Red Crescent Organization, which usually has the equipment and expertise needed for relief, has played a minor role. The crisis headquarters of the country failed to deliver a successful performance in this regard due to insufficient specialized and experimental knowledge resulting from continuous senior manager change under the influence of political and factional priorities. Furthermore, the interference of other organizations in these situations and the absence of a single command have caused inconsistency, parallel work, and waste of resources.

In Iran, non-governmental organizations and

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institutions have acted autonomously and caused confusion in service delivery. Moreover, the lack of legal support, strong logistic power, and modern facilities has marginalized the role of the Red Crescent organization. In a nutshell, there is no uniformity in the country's crisis management in the current situation. Organizations take measures based on their own conditions and preferences. The absence of a specific plan for dealing with various incidents does not guarantee success. The possible achievements depend on individual capabilities, and this issue is not acceptable.

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Conflict of Interests

The authors declare that there is no conflict of interest in this study.

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