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COPING STRATEGIES OF THE VICTIMS RELATED TO THE 2011 VAN EARTHQUAKE

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Abstract

Introduction: In 2011, two earthquakes occurred in Van, Turkey. The first of them happened on October 23 the second on November 9.
Purpose: The purpose of this study is to examine the damages suffered and the adaptive strategies applied in time against these damages by the victims of the first earthquake.
Method: The questionnaire method was used in this study. The questionnaire was applied to a total of 303 individuals, who were aged 18 and above and survived the earthquake.
Results: Seven-point nine percent of the disaster victims continued living in their houses as affected by the earthquake in the first week. Twenty-eight-point eight percent of the participants received aid from relatives in the three years following the disasters while 25.1% of them received aid from public institutions. Whereas 64% of the participants experienced income loss, the rates of the participants receiving aid from the relatives and state in the first week were 10.7% and 10.2%, respectively. In disaster recovery, victims of disasters receive the highest level of support from their families (72%).
Conclusion and Recommendations: It has been concluded in the present study that a strong institutional structure is of great importance for effective and efficient disaster management and the awareness of the public concerning disasters should be raised.

Key words: Adaptive Strategies, Damage, Disaster, Earthquake, Van

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Introduction

Disasters have affected the history of humanity with incidents such as epidemics, earthquakes, meteor hits or wars, migration movements and big industrial accidents. Such incidents even led to the collapse of civilizations (Cappola, 2007). Disasters can be induced by the nature, humans or technological dangers; affect humans and human societies; make the society affected by disasters dependent on outside help and can cause much more serious losses of life and property as well as environmental damages in the society affected in case that they are not managed correctly (Ergünay & Özmen, 2013).

Turkey is located on the Alpine-Himalayan seismic belt, which is one of the most important seismic belts of the world, and 42% of its surface lies on the 1st degree seismic zone (Ünal, Çelebioğlu, & Özmen, 2014). Also, 92% of its lands are located on the seismic zone and 95% of its population is under threat of earthquake (TMMOB, 2010). Turkey ranks third in the world in terms of loss of lives due to earthquakes and eighth in terms of the number of people affected (AFAD, 2008). As devastating and fatal disasters, two earthquakes hit the Van province of Turkey and its towns on October 23 (Mw:7.2) and the second (Mw:5.6) on November 9 in 2011.

There are a large amount of research on survivors' coping strategies and resilience (see Daramola, Oni, Ogundele, & Adesanya, 2016; Doğulu, Karanci, & Ikizer, 2016). In the present study, however, we researched which coping strategies were applied in time by the survivors of the October 23, 2011 Van earthquake. Thus, the main focus of this study is time factor which is very important in terms of reaching relief materials and basic necessities since victims may not use tap water, electricity, telephones etc. (FEMA, 2007) immediately after a disaster. Therefore, these critical needs must be assisted by family, neighbours or private institutions etc.

Literature and Theoretical Framework

In this part, basic concepts of the study, adaptive strategies applied by the disaster-stricken societies, disaster response works, main problems encountered by the societies in disasters and resilience against disasters are addressed together with conclusions reached by numerous researchers.

Earthquake

Movements within the earth's crust create pressure at weak points and lead to deformation in the rocks. Energy accumulates at these points. The pressure eventually surpasses the power of the rock and creates a fault generally along the weak point within the rock. This sudden energy release shows up as an earth tremor. Intense tremors or seismic waves spread from the starting point of the rupture like the waves in a lake. These waves shake the earth's surface and can reach distant points in all directions. In the areas close to the starting point, big waves can occur and result in destruction (British Geological Survey, 2018) When this natural event affects a society, it can turn into a disaster arising from earth movements.

2011 Van Earthquakes

The province of Van is located in the Eastern Anatolia region of Turkey and is a very important province which hosted many civilizations including the Urartian as its capital (Alaeddinoğlu, Sargın, & Okudum, 2016). It is located in the border with Iran. It suffered from many disasters in the past due to high seismic activity in the region.

Eastern Anatolia is the most underdeveloped region of Turkey in socioeconomic aspects (Başıbüyük, 2005). As for the province of Van, it ranks 75th among 81 provinces of Turkey in terms of development (Karancı et al, 2011). According to the statistics of the Turkish Statistical Institute (TÜİK), while the population of Van in 2011 was 1,022,532 it was 1,035,418 in 2010 and 1,051,975 in 2012. The population of the province was announced as 1,106,891 in 2018 and it is the most populous one of 14 provinces in the region (TÜİK, 2018). When figures are considered, it is seen that although Van earthquakes resulted in migration movements to the other provinces, it reached the same level and even surpassed it in the ensuing years.

According to the 2011 Van earthquake report prepared by the Disaster and Emergency Management Administration (AFAD), these earthquakes claimed the lives of 644 people and left 1966 people injured (AFAD, 2014). The highest number of deaths occurred in the district of Erciş. Two hundred fifty-two people were rescued from the wreckage alive thanks to the search and rescue efforts. After the earthquakes, more than 160 thousand people had to move to the other cities of Tukey temporarily.

Seventy six percent of houses, 79% of workplaces and 82% of barns examined were damaged at varying degrees. The rate of the undamaged buildings was determined to be 23%. Seventeen thousand four hundred eighty-nine permanent houses including 12,384 in central district, 4,880 in Erciş and 225 country houses and also 309 social reinforcements were constructed.

Since the earthquake occurred during the academic year, ¼ of the students receiving education throughout the province had to temporarily move to other provinces to sustain their education (AFAD, 2014).

Adaptive Capacity, Strategies and Resilience against Disasters

In the literature review, many studies examining the adaptive strategies towards disasters were encountered. Although concepts of resilience and adaptive strategy have been used interchangeably in most of these studies, there are slight differences between them. Resilience is the mutual interaction of humans and natural systems or other subsystems. Resilience is a more comprehensive concept. Adaptive capacity focuses on mechanisms and special skills, which are the contribution of human systems to resilience, from a narrower perspective (SERC, 2018). Therefore, when resilience is in question, it means resisting against disasters with an interaction of both human and natural resources. However, adaptive capacity refers to the contribution of human factors to resilience.

Y. Daramola et al. (2016) conducted a field study in Nigeria and studied on the factors affecting the adaptive strategies of the individuals and households against natural disasters as well as their preparation levels. It was determined that weak roof construction, disposal of solid wastes in ill-suited areas and settlements in rural areas negatively affect the adaptive capacities of the individuals and societies living in Nigeria and increase the impacts of natural disasters on them. It was also concluded that those who do not have savings, live on a single income and are engaged in agricultural activities for living are more likely to be affected by natural disasters. Also, since problems were experienced in relation to houses, health, education, energy and potable water supply, restriction of transport means, displacement and migration, adaptive strategies developed against these problems and effectiveness of these strategies were examined.

Laçiner and Yavuz (2013) examined the aids provided after the Van earthquakes and the legal framework of these aids. It was emphasized that disasters cause severe technical and infrastructure problems such as schools, hospitals, roads and industry along with losses of life and property. According to them, one of the biggest problems after the Van earthquake was the preference of the households in tents next to their houses although tent cities were established. This resulted in an unnecessary demand for tents and also led to problems in the delivery of the aids. In terms of the integration of the voluntary organisations into the work of AFAD in disaster recovery, sending of aids without determining the needs and problems such as looting during the distribution of the aids were listed among the problems experienced. Aid materials sent without being classified increased the work load of those distributing the aids.

The report of AFAD (2014) on the Van earthquakes states that 150 thousand hot meals were distributed on a daily basis through 11 food kitchens; 6 field hospitals were established in addition to the undamaged 4 hospitals; 49 National Medical Rescue Team (UMKE), 14 mobile health and 4 mobile dental clinic vehicles as well as 2 mobile pharmacy trucks were commissioned in the region; and environmental health and disease control program was initiated in order to prevent epidemics. It is also reported that aids were provided to the disaster victims by the public and private banks in the form of extension of credit period and extension of premium debts.

Platt and Drinkwater (2016) conducted a field study in Van in 2012 to examine the response and recovery stages of the Van earthquakes and evaluated their findings in comparison to a possible disaster scenario in İzmir. It was stated that while AFAD was highly successful in providing new houses to the disaster victims after the Van earthquakes, it failed in disaster management due to lack of adequate planning before the disaster, lack of coordination after the disaster and loss of time, energy and resources because of the involvement of many actors in disaster management.

A similar study that was conducted by Adeagbo et al. (2016) examined how the households in Nigeria were affected by disasters and addressed the problems experienced by the households under various titles mainly with a focus on female/male and urban/rural differentiation. In the population wherein the most common disaster that the participants suffered from was flood, it was determined that generally women, children and those living in rural areas were more negatively affected. In the study, the areas in which the disaster victims were affected negatively and had to develop adaptive strategies were listed as follows:

- Income and productivity
- House and household goods
- Health and education
- Electricity and water supply
- Transport, access, displacement
- Death, injury and displacement

Smit and Wandel (2006) stated in their study that adaptation is a response to environmental hazards and vulnerability of the human or risks associated with adaptive capacity. Therefore, the interaction between environmental hazards and human beings naturally results in the necessity for the development of strategies towards adaptive capacity. Despite various forecasts, disasters cannot be exactly forecasted in terms of the time and place of occurrence. Thus, when a disaster occurs in a society, all parts of this society will need certain adaptation strategies in order to cope with the disaster. The impact of the disaster can increase or decrease due to certain factors. Poverty, nondurable buildings, insufficient knowledge about disaster risks, weak

telecommunication and insufficient infrastructure are counted among the factors increasing the impact of the disaster. Therefore, these factors can be referred to as weak adaptive capacity.
The secretariat of the United Nations Office for Disaster Risk Reduction (UNDRR) (2018) defines coping capacity as the capacity of the human beings, institutions/organizations and systems to manage negative conditions, risks or disasters by using appropriate skills and resources.

In their project work, Moench and Dixit (2004) defined adaptive strategy towards floods, drought and long-term water management problems as the approach of working with and responding to the process coming after the change with the aim of achieving the targets in social terms. They gave prominence to the human factor, which lacks in most of the other studies, in the implementation of these strategies. They reported on this issue as follows: unlike many natural system components, people can make the elements of change strategical and act proactively. Thanks to their capability of assessing the events and acting strategically, people gain the ability of directing the adaptation patterns in a manner to increase the resilience of the means of livelihood. Therefore, beyond accepting human beings as part of the natural world, they emphasized that human factor is dominant in terms of adaptation and human beings are capable of developing their own adaptive capacities. They also reported that adaptation to the local problems to be experienced in the future depends on the structures that can connect at regional and global levels.

In the study conducted by Norris et al. (2008) to address strategy, capacity, theory and resilience factor for disaster preparedness as a metaphor, it was determined that societies have the potential of functioning in an effective and successful manner after disasters. They concluded that social resilience is a process, which ensures the transformation of adaptive capacity into adaptation in the face of problems, and social adaptation manifests itself as well-being, which is defined as high level of moral and behavioural health of the society, functioning and life quality of the society. They reported that resources having dynamic features or robust, abundant and rapidly accessible dynamic features constitute adaptive capacity. They also stated that social resilience consists of four main adaptive capacities and they altogether result in a strategy for disaster preparedness. They are listed as follows:

- Economic development
- Social capital
- Information and communication
- Community competence

Saja et al. (2018) examined the factors constituting social resilience against disasters through systematic literature review and modelled five resilience factors in total, and their findings included adaptive capacity findings similar to and different from those found by Norris et al. These

factors were listed as social structure, social capital, social mechanism/competences, social justice and diversity, social beliefs and culture.

Cutter et al. (2010) addressed resilience factors and their subcomponents in a more comprehensive manner and assessed the resilience differences among the societies by comparing sample settlement areas. These factors are social resilience, economic resilience, institutional resilience, infrastructure resilience and social capital factors.

Objective of the Study

Objective of the study is to determine adaptive strategies implemented by the victims of the 2011 Van Earthquakes over time and the damages they suffered the most.

Material And Method

This part includes information of the method of the study, how the measurement tool used in the research was developed and applied, sample selection and data analysis methods.

Research Tool and Data Collection

The present study was carried out by using a quantitative research method. Survey method was used as measurement tool. The survey used to collect data was developed by the researchers with inspiration from a scale that Daramola et al. (2016)[3] developed.

The biggest challenge experienced in data collection was the refusal of participation in the study for various reasons (suspicion, fear, anxiety etc. with respect to the purpose of the study). To overcome this challenge the participants were selected through convenience sampling.

Survey was applied on the victims aged 18 and higher after their consents were obtained. Data were collected between 18.01.-15.03.2017. Sample consisted of 303 people in total, 103 of whom live in central district of Erciş, 165 of whom live in central districts of Van and 24 of whom live in the countryside (11 participants did not report place of residence). The number of participants from urban areas is higher since the most of the deaths (538 people) occurred in these areas. The ethical principles of The Declaration of Helsinki were followed in all stages of the research.

[3] Daramola, A. Y., Oni, O., Ogundele, O., & Adesanya, A. (2016). Adaptive capacity and coping response strategies to natural disasters: A study in Nigeria. *International Journal of Disaster Risk Reduction*, 132-147. doi: http://dx.doi.org/10.1016/j.ijdrr.2016.01.007

Data Type

Survey applied in the study questions demographic features of the participants, financial losses including income, property, house etc. after the disaster and the strategies applied by the disaster victims in the first week, first month, three months, one year and three years after the disaster in struggling with these problems. Also, participants are asked about their biggest material and moral losses in a semi-structured question and several options are provided.

Data Analysis

In the analysis of the data, descriptive statistics were used in the identification of demographic features of the participants while 5-point Likert type scale and its ratios were employed to determine the damages caused by the earthquake and the degrees of these damages. Ratio analysis was used to detect the strategies applied in each period of time. SPSS 23 package program was used in the analysis of the data. In the study, to what extent the participants were affected by the disaster and which adaptive strategy they applied in time were researched in general.

Findings

In this part, findings concerning the demographic and socioeconomic characteristics of the participants, material damage after the disaster (5-point Likert) and breakdown of the adaptive strategies applied in disaster recovery by periods of time are presented under separate titles with tables and graphs.

Socioeconomic and Demographic Features

Socioeconomic and demographic features of the disaster victims participating in the study are given in the Table 1. Fifty-eight-point eight percent of the participants are aged between 26 and 35. The distribution of male (160-52.8%) and female (130-42.9%) participants is close to one another. The number of participants from the centre of the province of Van is 165 (54.5%) while the number of the participants from the centre of Erciş is 103 (34%) (see Table 1).

Table 1. Demographic Findings

Age	N	(%)	Gender	N	(%)
≤25	102	33,7	Men	160	52,8
26-35	76	25,1	Women	130	42,9
36-45	54	17,8	Missing	13	4,3
46+	68	22,4	Total	303	100,0
Missing	3	1,0			
Total	303	100,0			
Living place			Household size		
Erciş city center	103	34,0	2 persons	27	8,9
Van city center	165	54,5	3 persons	38	12,5
Village	24	7,9	4 persons	91	30,0
Missing	11	3,6	5+	146	48,2
Total	303	100,0	Missing	1	0,3
			Total	303	100,0

Damages Arising from the Earthquakes

Disaster victims were asked to grade the damages they suffered from the earthquakes in a five-point Likert scale from "I suffered no damage" to "I lost all". In Figure 1, data obtained from the answers of the participants are presented in a graph.

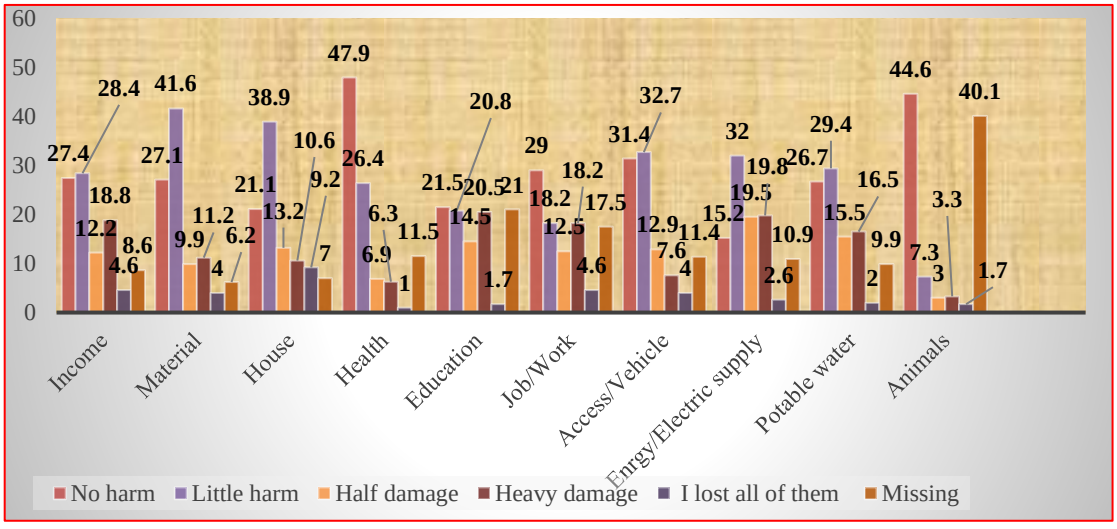

Figure 1

Percentage distribution of the damage suffered by the participants

Source: Field survey, 2017

Damages suffered by the participants included income, properties, house, health, education, work, transport, energy, potable water and livestock. According to the answers, 4.6% of the disaster victims completely lost their income, 4% property, 9.2% house, 1% health, 1.7% education, 4.6% vehicle, 2.6% energy source, 2% potable water and 1.7% animals.

Disaster victims participating in the study ranging from 52% to 79% stated that they suffered damage at varying degrees. It was determined that education, house, property, income and work came to prominence among the areas where the disaster victims suffered the most.

Adaptive strategies of the survivors in time against these sufferings, which stated figure 1, were in the following sections.

Strategies Applied in Time in Coping with the Problems of Meeting Basic Life Needs

When the material damages are considered, basic life needs such as house, household goods, potable water and food are without doubt included. In this part, the adaptive strategies applied by the disaster victims in coping with these problems and periods of time when these strategies were applied were examined. The available findings are visualised with graphs, as well.

Strategies Applied in Coping with the House Problems

When figure 2 is examined, it is seen that 7.9% of the participants continued living in the houses affected by the earthquakes during the first week. The rate of those living without changing their houses within the three years following the earthquakes is 71.6%.

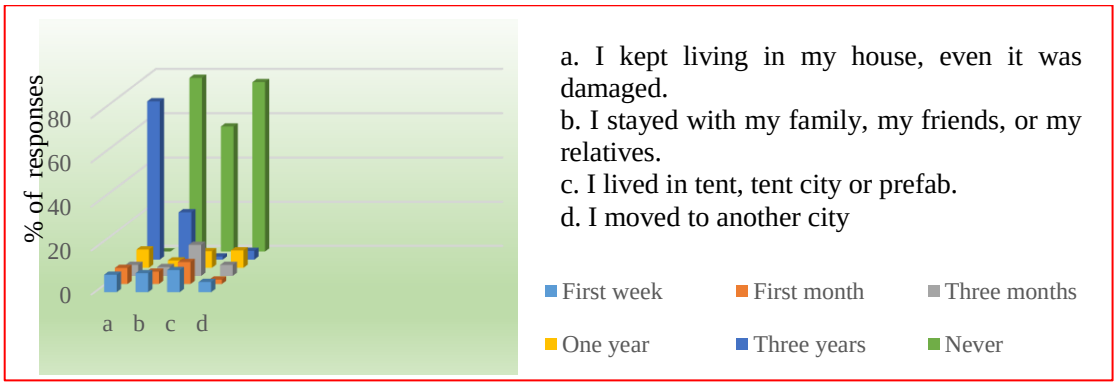

Figure 2

Strategies applied in coping with the house problems in time.

Source: Field survey, 2017

While the rate of the disaster victims staying with their families, relatives or friends in the first week is 8.6%, this rate drops to 5.6% in the first month and to 4% in the first three months. The rate of those who did not apply this adaptive strategy at all is 78.5%. Another adaptive strategy is the use of temporary houses (tent, tent city or prefabricated structures), and 10% of the participants used these houses in the first week and month. After three years, this rate drops to 1.4%. Fifty-six-point six percent of the participants did not use this strategy at all. While the rate of the people who chose to move to another city with the aim of solving the housing problem is 4.6%, it falls in the first month and three months. However, it rises to 7.9% in the first year.

Strategies Applied in Coping with the Damages to Household Goods

Of the participants who lost their goods in the earthquake, 10.2% handled with the remaining goods in the first week and 11.2% handled with the remaining goods in the first month. The rate of those who used the goods they possessed prior to the disaster for three years is 51.5%. While the rate of the people who received the support of relatives in the first week is 10.2% and gradually drops in the other periods of time, the rate of those who did not receive support from relatives is 71.06%. The rate of the people who received support from the public institutions as another adaptive strategy for coping with this problem is 8.9% in the first week, 6.6% in the first month, 5.3% in the first three months, 4.3% in the first year while it falls to 0% in the first three years. The rate of those who did not receive support from public institutions is 74.09%.

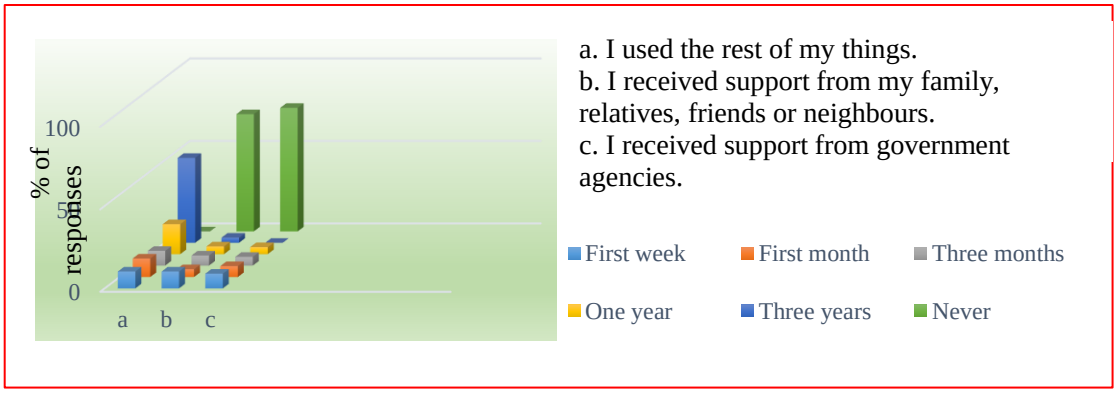

Figure 3

Strategies applied in coping with the damages to household goods in time

Source: Field survey, 2017

Strategies Applied in Coping with the Clothing Problem

For various reasons, clothes of the disaster victims get damaged and even they lose all of their clothes.

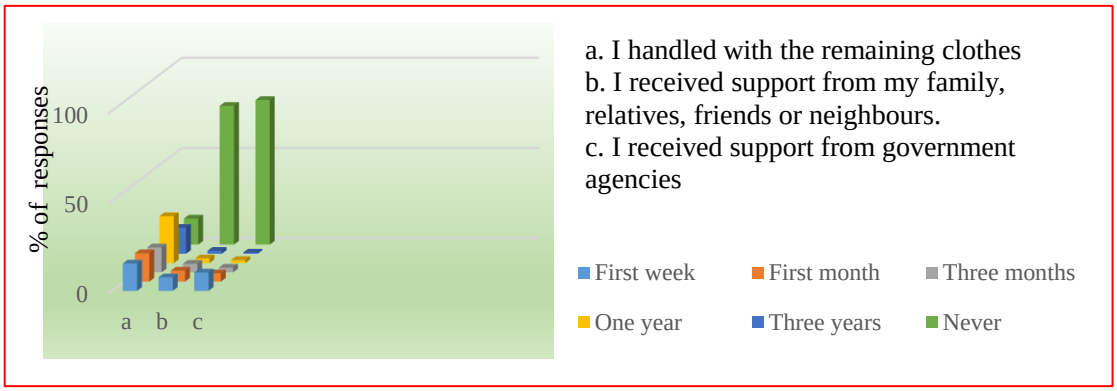

Figure 4

Strategies Applied in Coping with the Clothing Problem in time.

Source: Field survey, 2017

Of the participants experiencing clothing problems, the rate of those who handled with the remaining clothes is 15.2% in the first week, 15.8% in the first month, 13.9% in the first three months and 26.1% in the first year. The rate of those who received support from the relatives is 7.5% in the first week and 6.1% in the first month while it gradually drops in the following periods of time. The rate of the participants who received state support is at the highest level in the first week (10.2%9 but it gradually drops in the following periods of time and becomes 0.7% in the first three years.

Strategies Applied in Coping with the Problem of Supplying Potable Water

Due to possible damages that earthquakes can cause in the water supply network, tap water is not recommended to drink. Otherwise, epidemics might break out. Thus, disaster victims need to find other ways to supply potable water.

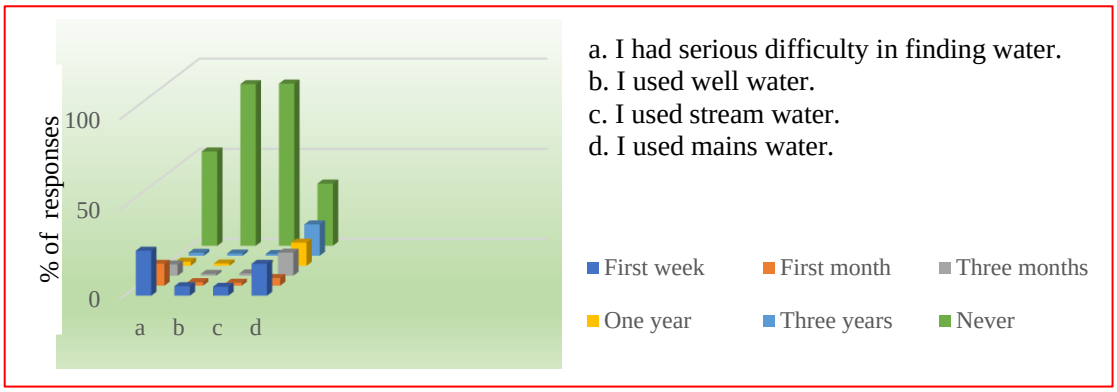

Figure 5

Strategies applied in coping with the problem of supplying potable water in time.

Source: Field survey, 2017

In the first week, participants (21.5%) had serious problems in supplying potable water and got used to this situation. It is seen that this need has decreased in time (12.2%, 6.3%, 2.3%, 1.7%). Fifty-two-point five percent of the participants did not have problem in supplying potable water. Despite the danger of using tap water, 17.8% of the participants used tap water in the first week.

Strategies Applied in Coping with Food Problems

Following the earthquakes, the needs for various foods and daily-consumed foods, in particular, increase. The findings given in this part reveal to what extent the disaster victims had access to food aids and in which periods of time their food needs increased.

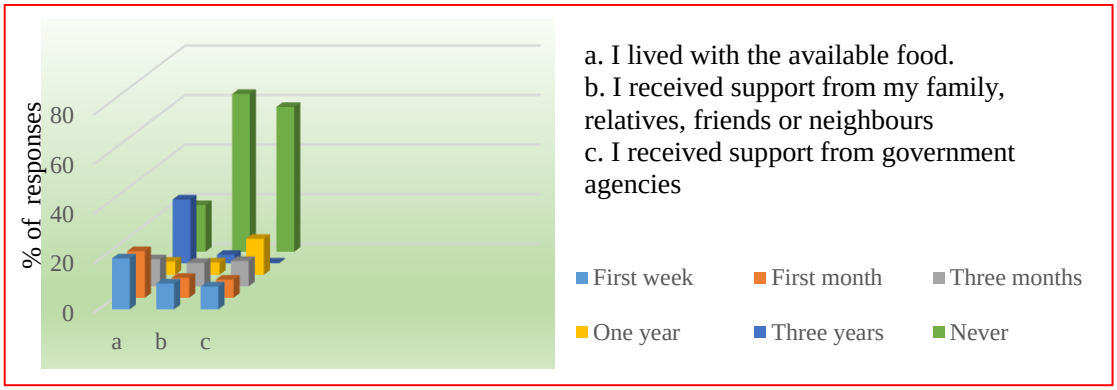

Figure 6

Strategies applied in coping with food problems in time.

Source: Field survey, 2017

The rate of the participants who had food problems after the disasters and lived with the available food is 20.5% in the first week while the rates of those receiving support from relatives and public institutions are 10.4% and 9.2%, respectively. The rate of those living with the available food in the first month (18.8%) is higher than the rates of those using the other adaptive strategy options (Figure 7). It is seen that state aids increase in the first three months and in the first year (10.2% and 14.5%). These findings show that the disaster victim society generally copes with the food problem by using the available opportunities.

Adaptive Strategies Applied in Coping with Health, Education, Vehicle/Transport, Energy/Electricity Problems

Big problems encountered by the people following the disasters are related to heath, education, transport and energy supply. Strategies applied by the victims against these problems are evaluated in this part.

Strategies Applied in Coping with Health Problems

Of the participants having health problems after the disaster, 12.2% saw a doctor in the first week, 7.9% went to a pharmacy, 4.3% tried using herbal medicines and 4% received psychological support.

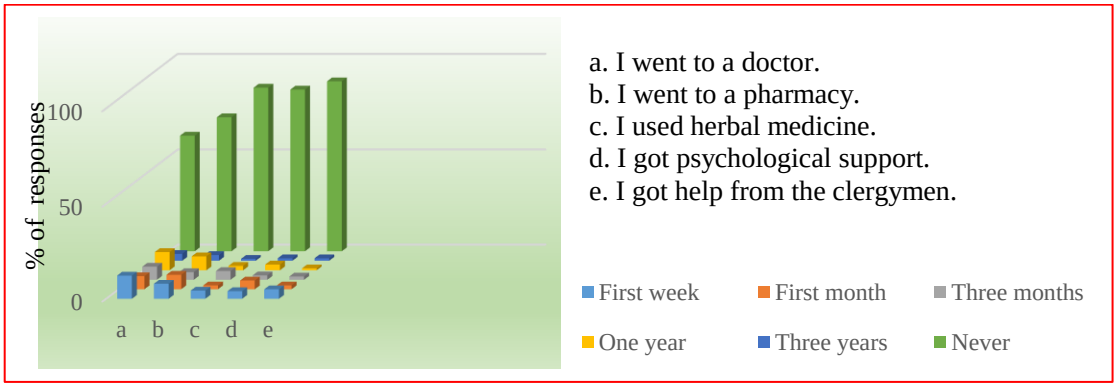

Figure 7

Strategies applied in coping with health problems in time.

Source: Field survey, 2017

The rate of those who received support from clergymen in the first week is 5%. While the rate of those applying these strategies decreased in the first month and in the first three months, the rates of the participants who went to a doctor (9.6%) and a pharmacy (7.3%) increased.

Strategies Applied in Coping with Education Problems

As stated in the parts titled literature review and theoretical framework, ¼ of the students receiving education in the province had to maintain their education temporarily in the other cities after the earthquake

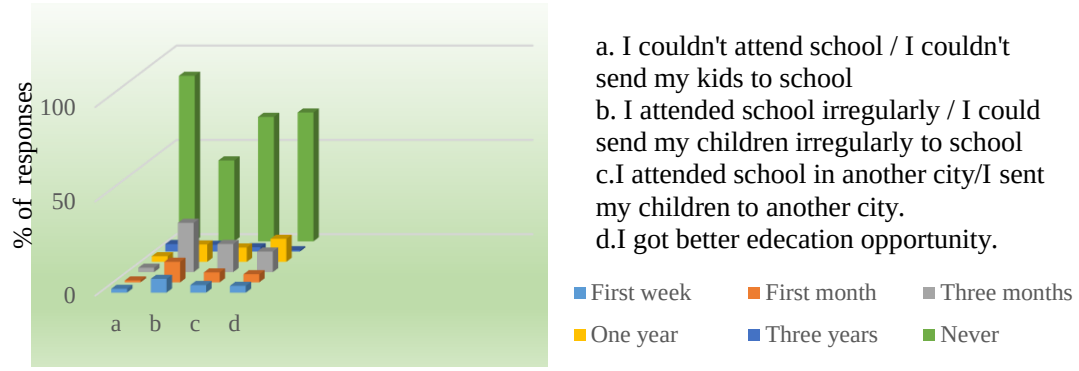

Figure 8

Strategies applied in coping with education problems in time.

Source: Field survey, 2017

In the first week, 2% of the participants could not attend school or send children to school, 7.3% of the participants attended school irregularly and 4% of the participants attended school in another city.

In the first month, 10.9% of the participants attended school or sent their children to school irregularly. This rate increased to 26.1% in the first three months, and also the rate (14.9%) of the participants who went to other places to receive education increased in the same period. Therefore, adaptive strategy of receiving education in another place was commonly applied.

Strategies Applied in Coping with Vehicle/Transport Problems

In the first week following the earthquake, 9.1% of the participants carried out their works by walking. This rate is 68% in all periods of time. The rate of those using public transport in the first week is higher than the other options (8.1%). Rates of using private cars (3%), motorcycles (1.7%) and taxis (2%) are lower than the other options. In the other periods of time, rates of walking and using public transport increased.

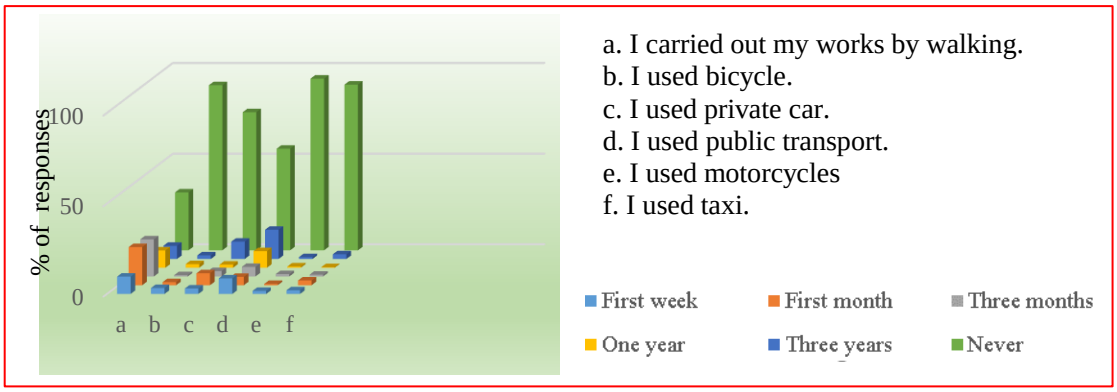

Figure 9

Strategies applied in coping with vehicle/transport problems in time.

Source: Field survey, 2017

Strategies Applied in Coping with Problems of Energy/Electricity Supply

One of the environmental factors affected by the earthquakes the most is energy infrastructure. Due to the damages to the energy lines, disaster victims try to overcome these problems with their own means for a period of time.

34% of the participants were left in the dark in the first week following the Van earthquakes. This rate drops to 11.2% in the first month and 5.6% in the first three months and zero in three years. 36.3% of the participants used candles in the first week. The use of candles gradually decreased in the following periods. The most common adaptive strategy applied by those left in the dark in the first week was using candles.

The rate of the participants who used rechargeable devices in the first week is 7.6% while the rate of those who did not use such devices is 79.9%. The rate of the participants using generator in the first week is 2.3% while the rate of those who did not use generator is 92.7%.

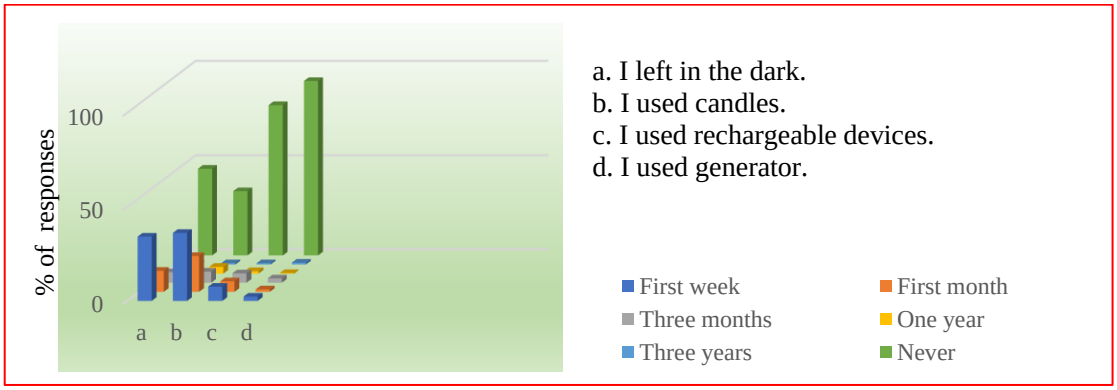

Figure 10

Strategies applied in coping with problems of energy/electricity supply in time.

Source: Field survey, 2017

Adaptive Strategies Applied in Coping with Income and Displacement Problems

Since commercial activities stop temporarily after the disasters, disaster victims experience serious problems in terms of their incomes. They have to migrate to the places other than their places of residence due to such problems.

Adaptive Strategies Applied in Coping with Income Problem

Of the disaster victims who were coping with the loss of income caused by the disaster in the first week, 8.6% lived with a lower income and did not obtain extra income from anywhere. 8.3% received income support from their families while 10.6% received support from friends, relatives and neighbours. While 13.2% received support from relief agencies, 10.2% received support from public institutions. The rate of income aids received in the first month decreased when compared to the first week while the rate of those who continued living with a lower income went up to 14.5%.

In the first month, the rates of those who received support from families and public institutions partially increased and became 9.6% and 11.2%, respectively. For the first year, the rate of those who continued living with a lower income dropped to 29%, the rates of those who received support from families and public institutions were relatively preserved, and aids received from relatives, friends, neighbours and relief agencies decreased. In three years, participants generally started to earn their normal incomes, only 7.6% of the participants continued living with a lower income, income aids from relief agencies stopped, the rate of the participants receiving aid from state and relatives dropped to 1.3% and family supports were maintained with a rate of 8.9%.

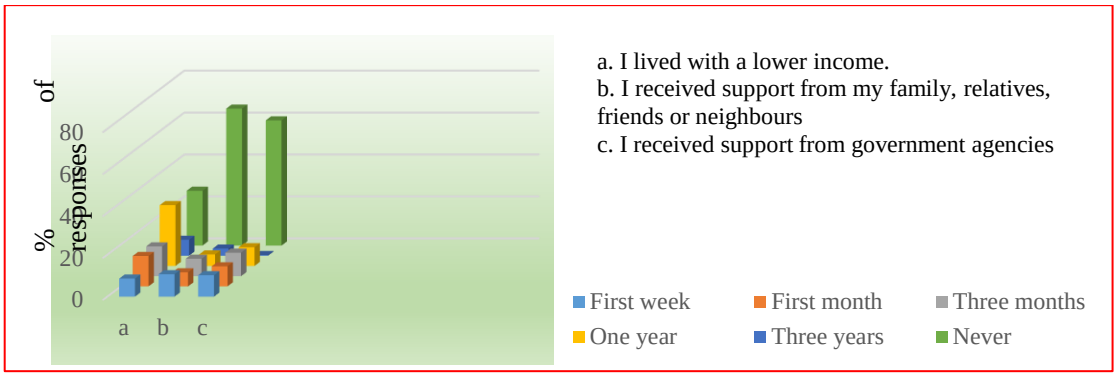

Figure 11. Adaptive strategies applied in coping with income problem in time.
Source: Field survey, 2017

It is seen that receiving support from family and public institutions has been long-time adaptive strategies in coping with the income problem. It is understood that the adaptive strategy of receiving support from relatives and relief agencies has lost its impact in the first three months.

Adaptive Strategies Applied in Coping with the Displacement Problem

Disaster victims have to migrate to places other than their places of residence due to financial and/or moral reasons they encounter.

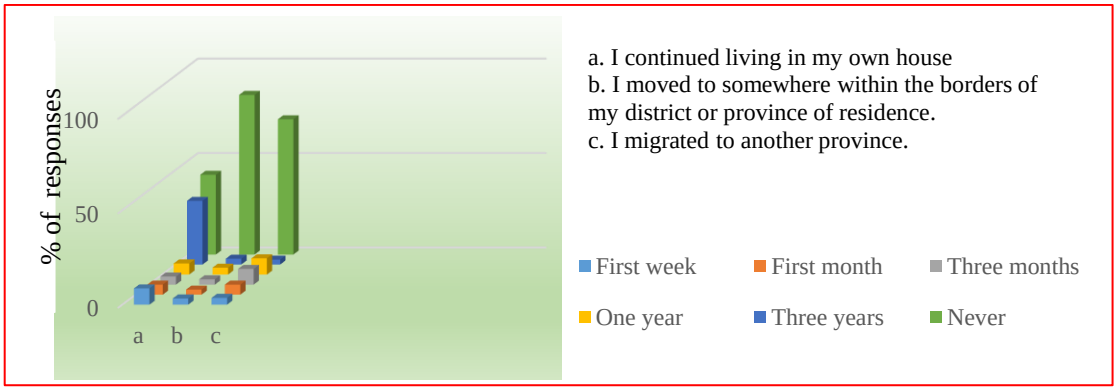

Figure 12
Adaptive strategies applied in coping with the displacement problem in time.
Source: Field survey, 2017

Of the victims of the Van earthquakes who had to migrate, 8.6% continued living in their own houses in the first week. Three-point three percent of those who migrated in the first week moved to somewhere within the borders of their district or province of residence while 3.6% migrated to another province. While the rate of the participants who preferred staying in their own houses

instead of migrating to somewhere else was 5.3% in the first month, it dropped to 4.3% in the first month and rose to 33.7% in three years. Therefore, participants who experienced displacement problem generally preferred staying in their own houses and tried to adapt to the post-disaster circumstances.

Damages Caused by the Earthquake and Priorities of Receiving Assistance

Lastly, disaster victims were asked about the organisation which helped them the most after the disasters.

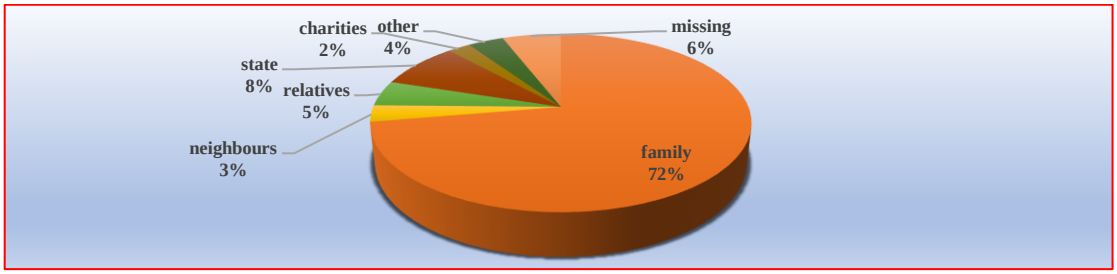

Figure 13

Priorities of receiving assistance

Source: Field survey, 2017

Seventy-two percent of the participants received assistance from their families and 8% from the state.

Discussion

First of all, it must be discussed that asking participants to remember which strategies they had implemented in such a long period of time (three years after the disaster) was a great concern for the researchers. However, it was assumed that this disaster was unforgettable because of living lost, injuries and sufferings.

When looked at the first week after the disaster, living in tents, tent cities or prefabricated houses was relatively high rate. Although this rate increased in three months then dropped gradually. Also, people chose to stay in their homes during three years period even it is damaged. Therefore, Permanent housing would be the best solution for the victims who suffered house damages.

The participants had big difficulties finding potable water especially in the first week after the disaster. However, coping strategies, in the same period, was mostly using mains water which could give rise to a public health problem.

Victims used the available food which showed the importance of having non-perishable foods in the basic disaster supplies kit.

One of the sufferings that the victims of the Van earthquake suffered in a long period of time was income and adaptive strategy mostly applied by them was living with a lower income in one year.

There are some geographical differences and similarities in terms of implementing adaptive strategies after a disaster. For example, Daramola et al. (2016) determined that participants used most commonly well water against potable water shortages, commercial motorcycles against transportation problem, rechargeable lamps against power cuts in the six states of Nigeria while using mains water, public transport vehicles and candles were the mostly applied strategies by the victims of the 2011 Van earthquake. As for the similarities, the victims of the two disasters mostly went to a doctor or pharmacy as a modern treatment after the disasters. Also, the strategy of moving to other regions following disasters stands out in both studies. These differences and similarities show that disaster management requires disaster managers complex thinking while responding any disaster.

It was identified by Skoufias (2003) reviewing 12 different studies that formal sources of assistance like self-insurances were much more effective than informal sources like family, relatives. However, a vast majority of the participants, who experienced the Van earthquakes, received assistance from their families as a source of informal assistance. The reason of this might be a lack of awareness, low socioeconomic status or cultural differences and this situation can be a proposed area of research.

Victims of any disaster can be confused, shocked or scared and because of that more than what is needed requested from the authorities. This situation was the case in the Van earthquake especially for the tent demands (Ergünay & Özmen, 2013; Laçiner & Yavuz, 2013). Apart from this, Ergünay and Özmen (2013) stated that hot meal distribution for a long period of time (3 months) following the earthquakes was a wrong policy since it delayed the normalisation of life for the people. Management efforts carried out like this will be inefficient without proper planning.

Conclusion

Disaster victims resorted to different adaptive strategies in order to cope with the problems they had after the earthquakes. They used the strategy of receiving support from one or several of family, relatives, neighbours, civil society organisations and public institutions in different periods of time. In particular, public institutions implemented various practices to support disaster victims in coping with problems. One of them was the establishment of a structure providing psychosocial support under the auspices of the Ministry of Family and Social Policies for the first time in Turkey. This structure helped disaster victims cope with psychological problems such as post-traumatic stress disorder.

Efficiency and effectiveness in the management of disasters require an accurate planning before the disaster as well as an accurate response after the disaster. To ensure this, needs of victims should be determined accurately, and the right response should be implemented in the right time. In the studies conducted in relation to the Van earthquakes, certain mistakes have been reported with respect to planning and response, such as distribution of a higher number of tents than needed. Also, since those who sent aids did not pack these aids properly, there were aid materials going off in the warehouses, and this finding points out to problems in disaster response and logistics.

The areas where the victims of the 2011 Van earthquakes suffered damage the most are income, education, housing and potable water supply. Eighty-five-point seven percent of the participants who experienced income problems continued living with a lower income and tried to adapt to post-disaster circumstances.

In coping with the education problem, receiving education in other provinces or sending children to other provinces was used as an adaptive strategy by 44.5% of the participants. In the first week following the earthquakes, 47.5% of the participants had difficulty in supplying potable water. The rate of the participants who had difficulty in having access to clean water is 25.1%. The rate of the use of tap water is 17.8% in the first week. These findings point out to potential serious problems in terms of public health.

While damages to houses has come to prominence, the findings of the present study show that it is necessary to determine the needs accurately for an efficient management in coping with this problem and disaster victims should be provided with correct and adequate information about the levels of damage to their houses. However, a vast majority of the participants (71.6%) continued living in their own houses whether they were damaged or not.

Other strategies used in coping with the earthquakes and the respective periods of time are listed below:

- 39.6% of the participants had health problems at varying degrees but the rate of those who saw a doctor is 12.2%. This shows that the rate of the disaster victims seeing a doctor following the earthquake is low.
- 73.9% of the participants had energy/electricity problems and the most common strategy applied in coping with these problems was the use of candles (36.3%).
- While 57.2% of the participants had problems with respect to vehicles/transport, 68% of the participants met their transport needs by walking.
- While 64% of the disaster victims stated that they had loss of income, the rates of the participants who received aid from their relatives and public institutions in the first week are 10.7% and 10.2%, respectively.
- The rate of the participants who suffered property damage is 66.7%, and 28.8% of the participants received aid from family, relatives, neighbours etc. while 25.1% of the participants received aid from public institutions in the first three years following the disaster.
- The majority of the participants received assistance from their families in coping with disasters.

Recommendations

For management of the disasters, which result in a highly complicated, dynamic and chaotic environment, it is important to determine the needs of the society affected by the disaster and to conduct an accurate planning prior to the disaster. A strong institutional structure is an absolute must to ensure this. However, this institutional structure cannot be expected to intervene in all kinds of events flawlessly and it is even possible that disaster victims do not receive any kind of assistance in the first 72 hours following the disasters.

In this case, the importance of family, relatives and local organisations becomes evident. Strengthening of these structures might contribute to an effective disaster response.

Another factor contributing to the restoration of the disrupted order of the affected society is disaster awareness of the society. People can be informed about the disaster plans made by the public disaster response institutions only through education.

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