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The effects of fatalism and denial on earthquake preparedness levels

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Abstract

Purpose – The purpose of this paper is to investigate the effects of awareness and beliefs on college students' preparedness for earthquake risks in Lebanon.

Design/methodology/approach – A questionnaire was used to investigate Lebanese college students' ($n = 901$) perceptions and preparedness for earthquake hazards. Three factors were assessed to determine students' disaster preparedness (DP): hazard and vulnerability awareness (HVA), fatalistic beliefs (FB) and denial beliefs (DB).

Findings – The findings indicate an above average level of earthquake HVA among college students. Although the results do not reflect a high tendency towards DB, participants showed some inclinations to FB. Multiple regression showed that earthquake HVA plays the most important role in determining earthquake preparedness while denial and FB have a negative effect on DP. Fatalism is embedded in Middle Eastern societies, so higher education institutions are urged to increase the preparation knowledge of college students.

Originality/value – This study offers a discussion of the interaction of awareness and belief factors and their effects on vulnerable communities.

Keywords Middle East, Educational institutions, Denial beliefs, Fatalistic beliefs, Risk preparedness, Earthquake risk reduction

Paper type Research paper

Introduction

Earthquakes kill tens of thousands every year, and approximately 90 per cent of these fatalities occur in developing countries (OECD, 2008), mostly due to a lack of awareness and preparedness and poor construction design and practices caused by corruption (Escaleras *et al.*, 2007). For instance, the tragic 7.0-magnitude Haiti earthquake in 2010 claimed the lives of more than 200,000 people, while the 8.0-magnitude Sichuan Earthquake in 2008 killed more than 80,000 people and destroyed thousands of buildings, including schools and hospitals, in China. As well, the 6.3-magnitude in Bam, Iran, in 2003 resulted in the loss of 30,000 human lives, while the 1999 Marmara earthquake in Turkey killed more than 19,000 (Anbarci *et al.*, 2005). Thus, earthquake-vulnerable communities must be properly and adequately educated and aware of the involved seismic risks in order to cautiously prepare to respond to this hazard and to take the necessary safety measures to reduce the damaging effects of such disasters.

People respond to earthquakes according to their view of the hazard as perceptions and awareness influence behaviour (Mileti, 1993). After reviewing 23 studies, Lindell and Perry (2000) confirmed that households' adoption of earthquake hazard adjustments is correlated with perceptions of the hazard, demographic characteristics and social influences. Lindell and Perry (2012) suggested the Protective Action Decision Model (PADM)

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and identified three core perceptions to environmental hazards and disasters (threat perceptions, protective action perceptions and stakeholder perceptions) that show how people respond to an immediate or long-term threat. The application of the PADM showed a positive correlation between risk perception and preparedness intentions (Terpstra and Lindell, 2013). Janis and Mann (1977) show that actions are motivated by perceptions and awareness of hazards, knowledge of their effects on the community and feelings of personal vulnerability to the potential consequences. Lindell and Perry (1993) argue that people do not need to understand a hazard to be sufficiently motivated to prepare for it, but they need to believe that the hazard exists and that protection is needed. Therefore, understanding public perceptions of earthquake hazards is necessary to influence hazard preparedness.

Lebanon, one of the most urbanised countries in the Eastern Mediterranean region, is highly vulnerable to earthquakes. Seismic activity in Lebanon and along the Dead Sea Fault has been documented for more than 2,000 years. Strong earthquakes have ruined many cities and towns, transforming thousands of buildings into rubble and leaving behind hundreds of thousands of casualties in the Eastern Mediterranean region. Historically, governments in Lebanon have not prioritised earthquake threats, although they have been aware of their devastating consequences. Consequently, the Lebanese people's perceptions of earthquake hazards have never been evaluated, and their level of preparation for earthquake disasters is unknown. As well, school education programmes in Lebanon do not cover any aspect of earthquake disaster awareness and preparation, and no commitment to seismic hazard reduction has been observed in recent decades. In addition, mass media, especially television programmes, have poorly addressed this issue. The consequences will be devastating if an earthquake strikes while the country remains ill equipped, unaware and underprepared.

Purpose and importance of the study

Lebanon has insufficient infrastructure to resist an earthquake hazard, and disaster planning is limited at the government and local community levels. Moreover, the Lebanese community's perceptions of earthquakes risks are not well understood. The purpose of this study is to evaluate Lebanese youths' perceptions of earthquake risk. Literature on this subject is scarce, and no scholars have attempted to evaluate the Lebanese public's perceptions of earthquake hazards. This research investigates the preparedness level of Lebanese college students for earthquake disasters based on a questionnaire that assesses their level of awareness, fatalism and denial regarding disasters.

Theoretical framework

Researchers have discussed the factors that affect individuals' preparedness for natural hazards. Based on previous models for disaster preparedness (DP), Paton (2003) proposed the social cognitive model which consists of three phases: the factors that might motivate people to be prepared, these motivational factors linked with intentions to preparedness, and these intentions linked with preparedness. This study explores the first phase of Paton's (2003) social cognitive model to identify factors that might motivate or de-motivate people to be prepared for disasters. Specifically, this study examines college students' DP and mainly the effects of hazard and vulnerability awareness (HVA), denial beliefs (DB) and fatalistic beliefs (FB) on college students' behaviour towards earthquake disasters:

- HVA: like other hazards around the world, historical experiences have provided considerable knowledge and certainty about the characteristics of earthquakes in

Lebanon, such as frequency, magnitude, probability of recurrence and geographical areas at risk. Increasing public awareness of the risk of earthquakes is recognised as an essential step in reducing their effects (ISDR, 2004). Evidence from previous earthquake events shows that communities with sufficient earthquake risk awareness and basic preparedness levels suffer significantly fewer casualties and losses in sudden, catastrophic earthquakes (Kapucu, 2008; King, 2000; Mileti, 1999; Tierney *et al.*, 2001).

- DB: Ager (2008) defines denial as "a natural, dynamic psychic mechanism to preserve a dearly held person-in-environment schema that if challenged would result in highly feared anxiety and discomfort" (p. 52). The initial response to any warning often is denial, called threat denial (Drabek, 1999). In other words, individuals keep their mental images safe and refute anything that contradicts them. People with DB try to avoid or simply ignore any information that might challenge their images in an unsafe situation. Also, denial can occur when individuals consider that the information sources are not credible lacking in expertise and trustworthiness. Denial is usually supported by one's family and social groups.
- FB: Rotter (1966) distinguished between internal and external control. External control occurs when an individual receives any type of reinforcement that was not entirely dependent upon his action; in this case, it is perceived as the result of luck, chance, fate, as under the control of powerful others. Internal control is when an individual perceives that an event is dependent upon his own behaviour or his own permanent characteristics. Researchers believe that people living in regions at risk from earthquakes often hold FB towards disasters; a state of helplessness, in which people judge that negative outcomes are uncontrollable (Lindell and Perry, 1992; Turner *et al.*, 1986). For example, uncontrollable cause is the earthquake's magnitude whereas controllable cause is when people attribute damage to human design (McClure *et al.*, 2001). Pargament (1997) speculated that religion can be an effective coping method when facing tragedies and losses. FB traditionally dominated pre-industrial societies in medieval Europe and continue to do so in contemporary developing countries (Akasoy, 2007). Sometimes, FB provide relief to victims of exhausting wars and sectarian conflicts, allowing individuals to conveniently refer to the will of God to escape from blaming themselves and authorities for the neglect and unpreparedness that led to their tragedy (Gaillard and Texier, 2010).
- DP: preparation for earthquakes is essential, but people need to understand the risks and know how to prepare for them. Covan and Rosenkoetter (2001) consider people to be at risk if they cannot or do not know how to prepare. It has been argued that only through education and knowledge (Shaw *et al.*, 2004) can communities minimise the suffering and losses caused by earthquakes. Studies have found that pre-disaster planning can save lives, prevent injuries, limit property damage and minimise disruptions, enabling communities to recover more quickly (MCEER, 2000). The Amercian-Red-Cross (2015) provides a checklist to plan and prepare for possible disasters. Based on this checklist, five variables that reflect DP were included in the survey used in the present study: storing food and water, having an emergency kit, developing an emergency plan, attending at least one workshop related to earthquake preparedness and practicing drills related to earthquake preparedness.

The goal of this study is to identify and explore the factors that might affect DP, particularly awareness and beliefs, using a Likert-scale survey. The following hypotheses were tested in this study:

H1. There is a direct, negative relationship between DB and DP.

H2. There is a direct, negative relationship between FB and DP.

H3. There is a direct, positive relationship between HVA and DP.

Methodology

Research on hazard perception defines perceived risks in terms of one's expectations of the personal impacts (death, injuries, disruption to daily activities, etc.) from a natural hazard. It was shown that prior beliefs about a natural hazard, information, and social warnings have an effect on personal risk perception (Lindell and Prater, 2000; Mileti and Peek, 2000; Mileti and Sorensen, 1987). Individuals' level of knowledge about disasters influences their ability to handle disaster information and their awareness and behaviours of disaster prevention and reduction.

Students ($n = 901$) attending two universities in Lebanon (the public Lebanese University and the American University of Beirut, a leading private university) were surveyed to evaluate their awareness and perceptions of earthquake hazards. The questionnaire included a section related to students' demographic information and a section with 20 items which used a five-point Likert-scale (1 = strongly disagree, 5 = strongly agree) and were based on previous studies related to earthquake risk perceptions (Mulilis *et al.*, 1990; Whitney *et al.*, 2004) to evaluate the factors of HVA, FB, DB and DP.

The questionnaire was first administered to 50 students in a pilot study. Feedback was obtained from these participants, and changes were made to ensure that the wording of the survey was comprehensible. The researcher coordinated with department chairpersons at the two universities and contacted professors to distribute and collect the questionnaires. Students were ensured of complete anonymity and encouraged to participate because of the national importance of this study. Respondents were chosen from several branches and the main campuses of the universities to obtain viewpoints from across the country.

Findings

The majority of respondents were female (54 per cent). Participants were distributed among the following majors: engineering and sciences (36 per cent), humanities and social sciences (32 per cent) medicine and nursing (14 per cent), and business (18 per cent). As shown in Table I, 41 per cent of participants were sophomores, 37 per cent juniors and 22 per cent seniors.

Exploratory factor analysis (EFA) was applied to the questionnaire's set of 20 items. The objective is to combine factors into variables that are correlated with one another but largely independent of other subsets of items (Kim and Mueller, 1978; Tabachnick and Fidell, 2007). This method can efficiently identify a small number of constructs (subsets) that represent Likert-type items. To form the potential factors, the EFA was performed using SPSS software with principal components extraction, varimax rotation, eigenvalues greater than 1.00 and absolute values of more than 0.40 (Field, 2005; Ho, 2006). The Kaiser-Meyer-Olkin measure of sampling participants produced a result of 0.852, while Bartlett's test ($p < 0.0001$) showed that using factor

analysis is appropriate for this study (Kaiser, 1970). Table II shows the rotated factor loadings, which are the correlations between the variables and the factors.

The sizes of the loadings reflect the extent of the relationship between each variable and each factor. The higher the factor loading is, the more the particular item contributes to the given factor. For items loaded under two factors, only the highest loading was retained. Factor analysis with principal components extraction confirmed that the yield of the four factors accounts for 65.07 per cent of the total variance.

Table I. Participants' demographics

Category	%
Gender	
Male	46
Female	54
Major	
Engineering and sciences	36
Humanities and social studies	32
Medicine and nursing	14
Business	18
Class	
Sophomore	41
Junior	37
Senior	22

Table II. Rotated factor matrix with extraction method: principal component; rotation method: varimax with Kaiser normalisation

Questionnaire items	DB	FB	HVA	DP
Earthquakes are unlikely to have a major impact on Lebanon	0.87			
Concerns about earthquakes in Lebanon are over-exaggerated	0.73			
Earthquakes are not a serious threat to Lebanon	0.62			
Earthquakes will not affect the daily life in Lebanon	0.61			
God will protect the righteous people during an earthquake		0.82		
Earthquakes sometimes occur as punishment for sin		0.75		
Earthquakes are something that we cannot prepare for		0.72		
Earthquake is an act from God		0.62		
A major earthquake will likely to occur in Lebanon during my life time			0.81	
Lebanon has suffered several destructive earthquakes in the past			0.73	
There are several active seismic faults in Lebanon			0.62	
Tens of thousands of people may be injured or killed by a major earthquake in Lebanon			0.84	
Property damage amounting to billions of dollars may occur if a major earthquake hits Lebanon			0.75	
A Building that has been seismically retrofitted is immune to collapse			0.68	
I have stored food and water because it makes a difference if a major earthquake hits somewhere near my home				0.82
I am prepared for an earthquake because the degree to which an individual is prepared can mean the difference between life and death				0.82
I have prepared an emergency kit because it is essential for earthquake survival				0.80
We have prepared an emergency plan to help reduce the impact of earthquake on the family				0.73
I have attended at least one workshop related to earthquake preparedness				0.69
I have practiced drills related to earthquake preparedness				0.67

After confirming the construct and the items that belong to each component, a new variable was calculated based on the mean of the items falling under each component. Five new variables were created: DB = mean (DB1, DB2, DB3, DB4), FB = mean (FB1, FB2, FB3, FB4), HVA = mean (HVA1, HVA2, HVA3, HVA4, HVA5, HVA6) and DP = mean (DP1, DP2, DP3, DP4, DP5, DP6).

Table III shows the components of the survey and the means and standard deviations of their corresponding items as rated by participants. Also, the mean and the internal consistency reliability estimates (Cronbach's α) for each of the components (FB, DB, HVA and DP) is provided.

The following analyses were conducted to assess the relationships between the predictor variables (HVA, DB, FB) and the criterion variable (preparedness for earthquake disasters):

- Pearson correlation between the components DB, FB, HVA and DP level;
- Pearson correlation between DB, FB and HVA, respectively;

Construct components	Questions	Mean	SD
Denial beliefs (DB) $M = 2.65$ Cronbach's $\alpha = 0.792$	DB1: earthquakes are unlikely to have a major impact on Lebanon	2.69	0.94
	DB2: concerns about earthquakes in Lebanon are over-exaggerated	2.78	0.98
	DB3: earthquakes are not a serious threat to Lebanon	2.69	0.85
	DB4: earthquakes will not affect the daily life in Lebanon	2.45	0.81
Fatalistic beliefs (FB)	FB1: God will protect the righteous people during an earthquake	3.51	0.93
$M = 3.54$	FB2: earthquakes sometimes occur as punishment for sin	3.34	0.96
Cronbach's $\alpha = 0.747$	FB3: earthquakes are something that we cannot prepare for	3.52	0.88
	FB4: earthquake is an act from God	3.79	0.82
Hazard and vulnerability	HVA1: a major earthquake will likely to occur in Lebanon during my life time	2.90	0.98
Awareness (HVA)	HVA2: Lebanon has suffered several destructive earthquakes in the past	3.38	0.87
$M = 3.48$	HVA3: there are several active seismic faults in Lebanon	3.47	0.93
Cronbach's $\alpha = 0.811$	HVA4: tens of thousands of people may be injured or killed by a major earthquake in Lebanon	3.91	0.87
	HVA5: property damage amounting to billions of dollars may occur if a major earthquake hits Lebanon	4.10	0.92
	HVA6: a building that has been seismically retrofitted is immune to collapse	3.15	0.97
Disaster preparedness (DP) $M = 2.21$ Cronbach's $\alpha = 0.824$	DP1: I have stored food and water because it makes a difference if a major earthquake hits somewhere near my home	2.14	0.96
	DP2: I am prepared for an earthquake because the degree to which an individual is prepared can mean the difference between life and death	2.32	0.87
	DP3: I have prepared an emergency kit because it is essential for earthquake survival	2.29	0.93
	DP4: we have prepared an emergency plan to help reduce the impact of earthquake on the family	2.31	0.92
	DP5: I have attended at least one workshop related to earthquake preparedness	2.17	0.95
	DP6: I have practiced drills related to earthquake preparedness	2.05	0.89

Table III. Mean and standard deviation of the questionnaire items mean and Cronbach's α estimates for each of the components

- multiple correlation (R) between the components DB, FB, HVA and DP; and
- multiple regression between the components DB, FB, HVA and DP to obtain the regression weights representing the relative importance of beliefs and awareness.

The results of the Pearson product-moment correlations appear in Table IV.

Consistent with *H1*, there was a significant negative correlation between DB and DP ($r_{DB,DP} = -0.26$) confirming that DB have negative effects on planning and preparing for earthquakes hazards. Also consistent with *H2*, there was a significant negative correlation between FB and DP ($r_{FB,\ DP} = -0.42$) indicating that FB have a negative influence on participants' behaviour towards earthquakes. Moreover, the results showed consistency with *H3* where a significant positive correlation was found between HVA and DP ($r_{HVA,\ DP} = 0.14$).

One objective of this study is to provide an index of the relationship between two variables as shown in Table IV. Another objective is to find the index that predicts the variable (DP) from the other variables (awareness and beliefs). Table V shows that multiple R (0.75) represents the multiple correlation, in other words, the correlation between the dependent variable (DP) and the weighted sum of the predictor variables (DB, FB, HVA). R^2 (0.57) explains the variance of the dependent variable with all of the predictor variables combined. The adjusted R^2 (0.57) is an estimate of the variance while taking error variance into account. Both the R^2 and the adjusted R^2 indicate that the combined predictor variables – DB, FB and HVA – make strong contributions to the explained variance explained by the variable (DP).

Thus, the equation becomes: DP = 0.24HVA−0.21FB−0.17DB.

The F statistic ($F = 147.81$) is found to be highly statistically significant, and the β weights in Table V (DB = −0.17, FB = −0.21, HVA = 0.24) reveal that, compared to the

Table IV.
Pearson product-moment correlations for beliefs and awareness components

	DB	FB	HVA	DP
DB	1			
FB	0.31**	1		
HVA	0.12	0.17	1	
DP	−0.26**	−0.42**	0.14*	1

Note: *,**Correlation is significant at the 0.05 and 0.01 levels, respectively (two-tailed)

Table V.
Multiple regression of criterion variable "disaster preparedness" with predictor variables "DB, FB, HVA"

Multiple R	0.758				
R^2	0.574				
Adjusted R^2	0.572				
Analysis of variance	Sum of squares	df	Mean square	F	Sig.
Regression	121.03	3	40.38	147.81	0.000
Residual	244.83	897	0.273		
Coefficients					
Variables in equation	B	SE	β	t	Sig.
(Constant)	0.14	0.11		0.72	0.124
DB	−0.27	0.02	−0.17	−6.10	0.000
FB	−0.25	0.03	−0.21	−4.62	0.000
HVA	0.23	0.03	0.24	5.30	0.000

other variables, HVA plays the most important role in determining earthquake preparedness. Also, DB and FB have a negative effect on DP, and thus confirming the study hypotheses.

Discussion

The above average level of the HVA ($M_{HVA} = 3.48$) reflects college students' acquisition of basic knowledge and facts about seismic risks in Lebanon. However, this awareness is shown to have weak influence on the preparedness level ($M_{DP} = 2.21$) expected to reduce such risks. This observation confirms previous research (Mulilis *et al.*, 1990; Paton, 2000, 2003) findings that good awareness of disaster risks does not ensure a satisfactory preparedness level. Although participants do not show high DB ($M_{DB} = 2.65$), the results show that these students are poorly prepared for future earthquakes. The observed indifference towards preparatory measures is probably due to a lack of knowledge of to how to prepare. If people cannot or do not know how to prepare, then, inevitably, they are at risk (Covan and Rosenkoetter, 2001).

Although the relation between awareness and DB was not one of the objectives of this study, one would expect that awareness should be negatively correlated with DB. Interestingly, the results showed that HVA was positively correlated with DB. The long returned period of earthquakes in the region has contributed to the lack of trust in scientific sources as well as in the indifference towards information regarding earthquake disasters. Lindell and Perry (1993) believe that hazard knowledge will not necessary initiate hazard adjustments. People need to believe in the existence of the threat and to learn about how to be protected. In fact, the "threat belief", which is the awareness of the possibility to get exposed to a threat, has a great impact on risk perception (Lindell and Perry, 2004).

Another reason for the poor preparedness of participants is their inclination to FB ($M_{FB} = 3.54$). Similar results were found in previous studies showing that fatalism about earthquake has negative effects on adjustment adoption (Farley *et al.*, 1993; Turner *et al.*, 1986). Local researchers and educators have paid limited attention to the dominant religious fatalistic attitudes on disaster risk perception and mitigation in Middle Eastern communities. Acevedo (2008) believes that fatalism remains a largely misunderstood phenomenon while Islamic fatalism has been the focus of many scholarly works. In Middle Eastern communities and within the different existing religions, fatalism can be affected by several complex factors such as the political, cultural, economic and historical context. Culture and religion have contributed significantly to the formation of the belief that earthquakes occur by divine decree and have predestined locations selected by Allah (Acevedo, 2008). Moreover, educational curricula in most Middle Eastern schools and universities are typically based more on rote teaching and learning style rather than on critical thinking, problem solving skills, analysis and synthesis of information (Neill, 2006; Rugh, 2002). In the majority of Middle Eastern countries, education excludes the possibility of subjecting religious and cultural beliefs to rational and critical investigation (Halstead, 2004). In such context, education has reinforced the existing religious and cultural beliefs and has taken the form of indoctrination as a means of control over people's lives (Baytiyeh and Naja, 2014). Fatalism regarding earthquake risks and hazards varies according to individuals' belief set, educational level, social values, culture, ethnicity and gender (Flynn *et al.*, 1994). As such, Gregory (1995) showed that African Americans are more fatalistic than Caucasians regarding earthquakes and floods and are less likely to protect themselves because these phenomena are viewed as uncontrollable natural events.

Fatalism is a self-defeating attitude that can lead communities into helpless, passive ones. As a result, fatalists, regardless of their religions, become blindly confident in illusive protection, such as protective medals and sacrifices, which leads them to take risks while neglecting safety procedures (Kouabenan, 1998).

The current political neglect and unstable economy in Lebanon, where people have survived exhausting wars and sectarian conflicts, encourage the spread of FB among individuals. Especially after tragedies and crises, FB provide relief to victims, allowing them to refer to the will of God (Gaillard and Texier, 2010). Chester (2005) notes that, in Islam, disaster-related suffering is viewed as a means Allah uses to discipline humans and bring them back to his prophet's teachings. For instance, Jalaluddin Al-Suyuti, a leading sixteenth-century scholar, believed that many catastrophes in the Middle East were divine judgements for sins, including adultery and alcohol consumption (Chester *et al.*, 2013). In a study in Saudi Arabia, a majority of respondents (97 per cent) agreed that God is in control of all events that occur in the world; approximately 93 per cent believed that earthquakes, floods and other natural hazards are signs from God; and 70 per cent believed that God sometimes punishes nations for the sins of citizens (Alshehri *et al.*, 2013). As well, in a study in Indonesia, the majority of participants believed that tsunamis are caused by God's will to test the patience of humankind and are God's signs warning that people should change their behaviour to avoid another tsunami (Adiyoso and Kanegae, 2013).

The multiple regression equation shows the effect of each component – DB, FB and HVA – on students' earthquake preparedness level. Although HVA has positive effect on DP level, FB and DB can reduce this level. Therefore, two major goals should be considered to increase the preparedness level of the Lebanese community: first, increasing HVA while second, reducing the existing FB.

Increasing HVA

Adequate information of how to handle disasters is crucial. Higher education institutions not only possess the structures, facilities and resources for emerging leadership in disaster relief but also enjoy a high reputation amongst the public, government and businesses (Baytiyeh and Naja, 2013). Anticipatory guidance is needed to urge the Lebanese to develop emergency plans, which includes a kit of essential medical supplies and information, important contact information and relocation sites in times of disasters (Rosenkoetter *et al.*, 2007). Specific websites can be designed to promote knowledge of the needed emergency measures and where citizens can access information. Training sessions might improve college students' preparedness level and engage them in volunteer groups to create and distribute educational information to communities. Emergency, non-governmental and governmental agencies should act together with academic institutions to organise seminars and workshops on hazards preparedness. Higher education institutions can collaborate to ensure the safety of the Lebanese community by disseminating adequate preparatory knowledge for disasters in general and earthquakes in particular. College students must be educated and prepared to take immediate action in the event of a disaster, as well as be responsible for themselves and their families after an earthquake. Led by universities, educational institutions can actively engage in disaster prevention measures to respond in the event of an earthquake (Baytiyeh and Naja, 2013). Finally, universities and colleges should incorporate earthquake disaster risk education into their academic curricula, engage in research activities and projects, promote community awareness and initiate earthquake volunteer programmes to ensure that students and staff are adequately informed and prepared to face an earthquake (Baytiyeh, 2015).

Reducing the existing FB

The existing religious, FB towards disasters in Middle Eastern countries deserve serious attention (Baytiyeh and Naja, 2014). Although religion can help in coping with and managing trauma, it can also be dysfunctional and allow believers to put themselves in danger by ignoring reality and facts (Ager, 2008). The role of education, then, is critical as education is a process of enlightenment that enables individuals to effectively contribute to social progress (Brown, 1932). However, traditional educational methods used in Lebanese schools do not provide an environment conducive to reducing the FB among children and youth as religious views strongly influence the vision of the entire educational curricula (Roald, 1994; Rugh, 2002). Facts and logical views are reluctantly supported when they contradict existing social norms and religious beliefs (Baytiyeh and Naja, 2014). Therefore, educational institutions should provide an open environment which encourages reasoning and questioning to prevent the adoption of FB and to resist indoctrination. In the early stage, this new education style should be implemented in high schools, where students need to learn how to think and to evaluate and judge information independently of any cultural or religious context (Baytiyeh and Naja, 2014).

Limitations

This research is a case study that included college students from one country in the Middle-East region. The dearth of available information about DP in general and factors that influence preparedness activities in particular in the Arab World was one of the main constraints of this study. Therefore, there is a strong need for more studies in the region providing data and analysis assessing the status of disaster planning in the Middle-East region. The use of the Red Cross measures of preparedness which is not specific to earthquakes is another limitation of this study and has narrowed the definition of preparedness. Future investigations should explore preparation scales dealing with essential dimensions for earthquake DP activities that include actions for survival, preparedness planning and hazard mitigation. Also, surveys are a convenient way for gathering information from a large number of participants, but are not enough to gain a complete understanding of students' beliefs regarding natural hazards. Interviews may confirm the findings and may be appropriate to gain a more complete picture of participants' awareness, denial and FB towards earthquake disasters.

Conclusion

This study sheds light on the factors impacting the preparedness level of college students in Lebanon for earthquake disasters. The findings indicate an above average level of earthquake HVA but poor level of DP. Although participants do not exhibit high DB towards earthquake hazards, they possess some inclinations to FB. The statistical analysis showed a significant negative correlation between DB and DP as well as a significant negative correlation between FB and DP. Moreover, a significant positive correlation was found between HVA and DP. Multiple regression confirmed that earthquake HVA has positive effect on college students' preparedness while denial and FB play a negative role on their earthquake preparedness level.

This paper discusses the findings and provides two major recommendations. Increasing the awareness of college students and reducing existing FB are significant actions that should be taken into consideration to increase the preparedness level of the Lebanese community.

Clearly, misinterpretations of some beliefs in the Middle East have negatively impacted the development and prosperity of these communities. Although FB towards disasters are commonly observed among individuals in this region, it was expected that college students would possess less adherence to such beliefs and have better awareness about earthquake hazards. It is unsurprising that such fatalism has been disseminated in such communities and across generations when college students do not possess the adequate rational thinking skills to analyse, criticise and judge information. Education in the region has indeed failed to equip students with the needed aptitudes to discern misconceptions and superstitions. Middle Eastern societies do not appear aware of the impact of FB on communities' progress and consequently remain passive towards risk reduction and vulnerable to existing hazards. The existing fatalism in these societies is a complex phenomenon that cannot be reduced through simple solutions. It requires efforts at all levels – government, education, religion, media and other resources – to minimise its propagation and proliferation in communities.

The evidence provided will alert higher educational institutions in Lebanon and international relief agencies to the current preparedness status of the Lebanese community for earthquake disasters.

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