

Empirical Model of Household's Earthquake Risk Mitigation Behaviors Using Path Analysis Method

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1. Introduction

How people manage risks and which variables influence on the process of risk management play a crucial role in providing productive urban disaster management and increasing public participation in the urban risk management programs. The purpose of this study is to better understand the motivations of residents in adopting reduction risk behaviors to protect themselves and their residents against earthquake risk. Understanding this process will help urban disaster management enhances participation in and implementation of their programs.

2. Study Area

The city of Tehran, which is adjacent to several major fault lines, was selected as a case study. Mosha-Fasham Fault is in the North of the city and the South Faults and Rey Fault are the most prominent faults in the southern plains. According to the Atlas of Tehran Metropolis, Tehran has had few severe injuries in an earthquake over the past 150 years. The largest historical earthquake in the region occurred in 958 (7/7 Mw magnitude) and its distance to the center of Tehran was less than 50 kilometers. Tehran has had about 1,000 large and small earthquakes recorded within a radius of 100 km of its center.

3. Material and Methods

Because earthquake risk mitigation behaviors are affected by both individual and social processes, to identify variables in this study a combination of psychological and cultural approaches were applied. We restricted our study to actual and intended behaviors. We developed a conceptual model based on the literature review. The instrument was a questionnaire with a sample size of 267 cases that was carried out from March 2013 until the end of April 2014. The questionnaire was designed with four sections. The first section includes some questions about the mediator variable of risk perception, the second section contains some questions about independent variables, the third section includes questions about the risk mitigation behavior variables as a depended variable,

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and the final section contains questions about demographic characteristics. To analyze the conceptual model and obtain the empirical model Path Analysis Method was used. Path Analysis was used to test the conceptual model empirically. Data were analyzed using SPSS version 20. To perform path analysis, we used linear regression analysis with the Enter method. The reliability of questions associated with earthquake risk perception in questionnaire was assessed using Cronbach's Alpha.

4. Results and Discussion

In terms of reliability we found out a Cronbach's Alpha of 0.83 for the collection of earthquake risk perception questions. The result of the study demonstrated that the earthquake risk perception of households were slightly higher than the mid level ($1 < 4.71 < 7$ with visionary mid 4). The results of Path Analysis showed that the correlation between perceived risk and actual behaviors was not significant while the Perceived risk and intended behaviors had a significant relationship. The results of path analysis on the dependent variable of actual behaviors showed that only four variables of knowledge, income, age and home ownership had direct effects on earthquake risk mitigation actual behaviors ($P > .05$). Despite our expectation, other variables were not significantly associated with the dependent variable of risk mitigation actual behaviors ($P > .05$). This research showed that in spite of household perception regarding safety and risk, there is a lack of adequate consideration and effective action on the threat of earthquake up to now. The results of path analysis on the dependent variable of intended behaviors showed that four variables of risk perception, controllability, trust in urban disaster management and length of residence in Tehran had significant relationship with intended behaviors ($P > .05$). Among these variables, only effect of risk perception was positive.

5. Conclusion

It seems that trust is an important factor that urban disaster management decision-makers should consider more and do more effort to increase public trust. As well, three variables contain age, self-efficacy and the need to be protected had a positive effect and two variables contain optimistic biases and income had a negative effect on intended behaviors through risk perception as a mediator variable. It is clear that there is a great need to provide a base in increasing public awareness and promoting their perception by the governments and authorities to reduce risks associated with earthquake in Tehran.

Keywords: Risk perception, Risk mitigation behaviors, Earthquake in Tehran, Path Analysis.

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