



# Determinants of Disaster Preparedness Behaviors Based on the Theory of Planned Behavior among Residents of Kerman, Iran: A Cross-sectional Study

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## Abstract:

**Introduction:** Preparedness for disasters is critical for households and is influenced by various factors. This study aimed to investigate the determinants of disaster preparedness behaviors [DPB] based on the theory of planned behavior [TPB] in Kerman.

**Materials and Methods:** This cross-sectional study was conducted on 400 residents of Kerman. The standard DPB questionnaire and a researcher-made questionnaire based on the TPB were used to collect data through phone calls to the heads of families. Participants were selected via a multistage sampling technique. Data were analyzed using descriptive and analytical statistics, including T-test, one-way ANOVA, Pearson's correlation, and linear regression via SPSS software [version 21].

**Results:** Most of the participants were not prepared to deal with disasters. A significant positive relationship was observed between DPB and behavioral intentions [ $r=0.282$ ,  $p<0.0001$ ]. Besides, DPB had a significant difference with individuals' experiences of disasters [ $P=0.001$ ]. Behavioral intentions had a direct and significant relationship with perceived behavioral control [ $r=0.208$ ,  $p<0.0001$ ] and subjective norms [ $r=0.114$ ,  $p=0.023$ ]. The final model indicated that intention and disaster experience were significant predictors of preparedness behaviors.

**Conclusion:** In this study, DPB were not favorable. Behavioral intention was the strong predictor of DPB. Therefore, interventions based on the constructs of the TPB are recommended to increase behavioral intention and ultimately improve disaster preparedness behavior.

**Keywords:** Disaster planning, Theory of planned behavior, Family.

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## 1. INTRODUCTION

Hazards are dynamic processes that can affect large populations, leading to population displacement, death,

injury, disruption of health systems, threats to human health, and shortages of food, water, and energy [1]. In recent decades, the number and severity of hazards have

increased due to deforestation, environmental degradation, temperature rise, heavy rains, and storms [2]. Furthermore, increasing urbanization, population growth, limited resources, rapid technological advancement, living in high-risk areas, and poorly designed buildings have made societies increasingly vulnerable to hazards [3]. In 2023 alone, there were 399 natural disasters worldwide, resulting in 86,473 deaths and affecting approximately 93 million people, with economic damages amounting to 202.7 billion dollars [4].

In Iran, nearly 90% of the population is exposed to natural hazards [5]. The most significant natural hazards in Iran include earthquakes, floods, and droughts [6]. Kerman is one of the earthquake-prone cities in Iran, threatened by numerous faults. With 483 hectares of the city comprised of worn-out structures, it is highly vulnerable to earthquakes [7]. The devastating earthquake on December 26, 2003, claimed more than 26,000 lives in Kerman Province, Southeast Iran [8].

Preparedness reduces vulnerability, enables effective and prompt responses to hazards, shortens recovery periods, and enhances community resilience [9]. Essential measures in the preparedness phase include acquiring knowledge and skills, planning to mitigate the effects of hazards, and providing emergency equipment and supplies [10]. Societies that have started to develop preparedness plans before the occurrence of hazards have witnessed a significant reduction in casualties and damages [11]. However, a systematic review revealed that most households globally were not sufficiently prepared to deal with hazards [12]. Preparedness against hazards is affected by various individual, behavioral, environmental, social, cognitive, economic, physical, and cultural factors [10, 13-17]. Traditionally, disaster preparedness focused on individual factors influencing preparedness and preventive behaviors. However, today, it is essential to also consider the impact of other factors on disaster preparedness behaviors, alongside determining individual influences [14].

The TPB is widely used in health and social behavior research. Its effectiveness has been demonstrated in various studies within the field of disasters [13, 18, 19]. TPB was proposed by Fishbein and Ajzen in 1981 [20]. According to this theory, the intention to perform a behavior is formed by attitudes toward the behavior, subjective norms, and perceived behavioral control [21]. Attitude refers to the degree to which an individual has a favorable or unfavorable evaluation of a behavior [13]. Subjective norms are based on the influence of others in society, including family members, relatives, health officials, and religious leaders, leading individuals to perform or avoid behaviors under their influence or pressure [22]. Perceived behavioral control refers to the perceived ease or difficulty of performing the behavior [13].

A study conducted by Najafi et al. on residents of Tehran found that attitudes, subjective norms, and perceived behavioral control were predictors of preparedness behavior intentions. It was also indicated

that preparedness behaviors had a significant relationship with intention and perceived behavioral control [13].

A systematic review revealed that behavioral theories and models have been predominantly utilized in developed countries and often applied during infectious disease epidemics [9]. Therefore, Considering the distinct cultural characteristics and varying determinants of disaster preparedness behaviors [DPB] across different societies, it is essential to apply these theories and models in developing countries. By identifying the most significant behavior determinants, resources can be directed toward factors with the highest influence, enabling interventions to focus on the variables that have the greatest impact on household readiness.

Despite numerous studies on disasters in Iran, there is a scarcity of research incorporating behavioral theories and models. Given the importance of preparation and preventive measures to reduce the harmful effects of natural hazards and the significant occurrence of earthquakes in Kerman City, as well as the distinct cultural and socio-economic characteristics of Southeast Iran compared to other regions, research is crucial.

### **1.1. Targets**

This study aimed to investigate the determinants of DPB based on the TPB in households covered by Kerman health centers.

## **2. MATERIALS AND METHODS**

### **2.1. The Study Area and Sampling**

The current study is a descriptive-analytic cross-sectional study conducted in 2021 on households covered by the health centers in Kerman, located in the southeastern region of Iran. The statistical population included all households in Kerman. According to the data from the Statistics Center of Iran, Kerman had 141,867 households in 2020.

The sample size, calculated using Cochran's formula with a sampling error of 0.05 and a 95% confidence level, was determined to be 383 households. Participants were selected using a multistage sampling technique. Initially, two health centers were randomly chosen from two areas in Kerman. Subsequently, 400 residents covered by urban health centers in Kerman were selected using a simple random sampling method from the Integrated Health System.

The inclusion criteria were living in Kerman, literacy at least at the level of reading and writing, and age between 25 and 60 years. The exclusion criterion was the unwillingness to participate in the study.

### **2.2. Data Collection**

The questionnaire used for data collection consists of three domains: demographic characteristics, disaster preparedness behaviors, and predictors of disaster preparedness based on the TPB.

### Demographic Characteristics

Data were collected using a demographic information form that included age, number of family members, gender, marital status, education level, occupation, homeownership, house type, monthly income level, and previous disaster experience.

### Disaster Preparedness Behaviors

We measured household preparedness using a disaster preparedness checklist. The DPB score ranges from 0 to 7, based on responses to 7 yes-or-no answers. These questions cover preparation of a home disaster supply kit, preparation of a disaster supply kit for work or car, creation of a family communication plan, designation of a specific meeting place during an emergency, practicing and performing emergency drills, volunteering to help in emergencies, and having completed first aid training in the past 5 years. The validity and reliability of the DPB have been demonstrated in previous studies [23].

### TPB Constructs Questionnaire

The TPB constructs included attitudes [11 items], subjective norms [8 items], perceived behavioral control [16 items], and behavioral intentions [2 items]. These constructs were measured using a 5-point Likert scale.

The face validity of the researcher-made questionnaire was evaluated using qualitative approaches. The items were sent to six individuals with diverse socioeconomic backgrounds and six experts to assess clarity and

readability. Based on the feedback from the participants and experts, complex or incomprehensible items were modified.

The content validity was assessed through both qualitative and quantitative approaches. In qualitative assessment, the tool was reviewed by six experts in health education and promotion, who provided feedback on grammar, terminology and wording, item placement, and clarity. Modifications were made based on their suggestions. For example, item 4 of the TPB constructs questionnaire was revised from “disaster preparedness provides for my family’s basic needs” to “DPB provide for my family’s basic needs [water, food, medicine, etc.] until help arrives.”

Quantitative content validity was assessed by calculating the Content Validity Ratio [CVR] and Content Validity Index [CVI]. The CVR reflects whether the items were deemed essential by professionals. Thus, ten experts evaluated the necessity of each item on a three-point Likert scale. According to Lawshe’s table, the minimum acceptable level of CVR was 0.62 [24]. The CVI indicates the relevance of the items in the scale. Thus, the same ten experts rated the relevance of the items on a four-point Likert scale. The CVI was calculated for each item on the scale [I-CVI] and for the overall scale [S-CVI/Ave]. To retain an item, the modified kappa coefficient [K\*] was used. The kappa coefficient remained above 0.74 [25]. The optimal criterion for S-CVI/Ave was 0.90 or higher [25].

**Table 1. Demographic characteristics of heads of household participating in the study [n = 400].**

Variable	Groups	Frequency [%]
Number of family members	≤ 3 people	164 [41]
	≥ 3 people	236 [59]
Gender	Male	350 [87.5]
	Female	50 [12.5]
Marital status	Single, divorced, widow	27 [6.7]
	Married	373 [93.3]
Education level	Less than a diploma	53 [13.2]
	Diploma	150 [37.5]
	Academic	197 [49.3]
Occupation	Housewife	31 [7.8]
	Employee	214 [53.5]
	Worker	54 [13.5]
	Retired	50 [12.5]
	Others	51 [12.8]
Homeownership	Owner	268 [67]
	Tenant	132 [33]
House type	Apartment	229 [58]
	Villa	171 [42]
Monthly income level	≤ 30 million Iranian Rials	47 [11.8]
	30-50 million Iranian Rials	180 [45]
	≥ 50 million Iranian Rials	173 [43.3]
Previous disaster experience	No	248 [62]
	Yes	152 [38]

The tool's reliability was assessed by evaluating its internal consistency, calculated using Cronbach's alpha to determine the absolute agreement between individual items. Alpha values of 0.7 or greater show satisfactory internal consistency. Besides, stability was evaluated by calculating the intraclass correlation coefficients [ICC]. For this purpose, the test-retest method was used with a 2-week interval involving 20 heads of families. Burns & Grove consider the time interval for re-evaluation to be 2 to 4 weeks after the first stage [26]. An ICC value greater than 0.8 was considered acceptable. Cronbach's alpha and ICC in the present study were calculated as 0.75 and 0.82, respectively.

### 2.3. Research Ethics

The Ethics Committee of Kerman University of Medical Sciences approved this study [IR.KMU.REC.1400.315]. Participants were given adequate information about the study's objective, and informed consent was obtained from them. It was ensured that the information collected would be kept completely confidential and used solely for this research.

### 2.4. Data Analysis

Data were analyzed using descriptive and analytical statistics, including one-way ANOVA, T-test, Pearson's correlation, and linear regression with SPSS Software [version 21]. A p-value of less than 0.05 was considered statistically significant. Descriptive statistics [frequency, percentage, mean, and standard deviation] were used to assess the demographic variables and the levels of Disaster Preparedness Behavior [DPB]. The Pearson correlation test examined the relationship between DPB and the TPB constructs. Additionally, the Pearson correlation coefficient, along with univariate and multivariate regression analyses, was conducted to explore the relationship between DPB, TPB constructs,

and demographic variables. The T-test compared the means of two groups, while the one-way ANOVA compared the means of multiple populations.

## 3. RESULTS

The mean age of the participants was  $43.45 \pm 9.18$  years, with a majority being male [87.5%] and married [93.3%]. More than half of the participants reported no prior experience with disasters [62%]. The demographic characteristics of the participants are detailed in Table 1.

The findings from the present study revealed a significant difference between attitudes with the number of family members [ $P=0.01$ ] and education level [ $P=0.008$ ]. Moreover, there was a significant difference between behavioral intentions and the house type [ $p=0.01$ ], as well as between DPB and previous disaster experience [ $P=0.001$ ].

Most participants were not fully prepared for all indicators related to DPB. The lowest level of preparedness was associated with "having prepared a disaster supply kit containing water, food, and medicine kept in a designated place" [17%]. Conversely, the highest level of preparedness was related to "having practiced on what to do at home in an emergency" [29.5%] [Table 2].

A significant positive relationship was observed between DPB and behavioral intentions [ $r=0.282$ ,  $p<0.0001$ ]. Furthermore, behavioral intentions had a direct and significant relationship with perceived behavioral control [ $r=0.208$ ,  $p<0.0001$ ] and subjective norms [ $r=0.114$ ,  $p=0.023$ ].

However, there was no statistically significant relationship between behavioral intentions and attitudes [ $r=0.067$ ,  $p=0.185$ ]. Attitudes also had a direct and significant relationship with perceived behavioral control [ $r=0.208$ ,  $p<0.0001$ ] and subjective norms [ $r=0.298$ ,  $p<0.0001$ ]. In addition, a direct and significant relationship was identified between perceived behavioral control and subjective norms [ $r=0.323$ ,  $p<0.0001$ ] [Table 3].

**Table 2. Disaster preparedness behaviors score for the participants.**

Disaster Preparedness Behaviors	Variable Levels	Frequency [%]
Have you prepared a disaster supply kit with emergency supplies like water, food and medicine that is kept in a designated place in your home?	yes	82 [20.5]
	No	318 [79.5]
Have you prepared a small kit with emergency supplies that you keep at home, in your car or at work to take with you if you have to leave quickly?	yes	68 [17]
	No	332 [83]
Have you made a specific plan for how you and your family would communicate in an emergency if you were separated?	yes	72 [18]
	No	328 [82]
Have you established a specific meeting place to reunite if you and your family cannot return home or are evacuated?	yes	87 [21.8]
	No	313 [78.3]
Have you practiced or drilled on what to do in an emergency at home?	yes	118 [29.5]
	No	282 [70.5]
Have you volunteered to help prepare for or respond to a significant emergency?	yes	87 [21.8]
	No	313 [78.3]
Have you taken first aid training, such as CPR, in the past five years?	yes	97 [24.3]
	No	303 [75.8]

**Table 3. Correlation of the theory of planned behavior constructs with disaster preparedness behaviors.**

Variables	Behavioral Intentions	Attitudes	Subjective Norms	Perceived Behavioral Control	Preparedness Behaviors
behavioral intentions	1	r=0.067, p=0.185	r=0.114, p=0.023	r=0.208, p<0.0001	r=0.282, p<0.0001
Attitudes		1	r=0.298, p<0.0001	r=0.208, p<0.0001	r=-0.025, p=0.625
subjective norms			1	r=0.323, p<0.0001	r=0.031, p=0.539
perceived behavioral control				1	r=0.032, p=0.523

The univariate regression analysis showed that behavioral intention [ $\beta = 0.28$ , CI = 0.16-0.32,  $P \leq 0.001$ ] and disaster experience [ $\beta = 0.25$ , CI = 0.53-1.20,  $P \leq 0.001$ ] were positively associated with disaster preparedness behavior. The multivariate regression analysis demonstrated that behavioral intention [ $\beta = 0.25$ , CI = 0.17-0.33,  $P \leq 0.001$ ] and disaster experience [ $\beta = 0.88$ , CI = 0.56-1.27,  $P \leq 0.001$ ] were predictors of disaster preparedness behavior.

**4. DISCUSSION**

This study aimed to investigate the determinants of DPB based on the TPB in Kerman.

**Disaster Preparedness Behaviors**

The results of this study indicated that most participants were not fully prepared for all indicators related to DPB.

Studies conducted worldwide showed that although there are differences in the level of preparedness among households in different societies, most households are not sufficiently prepared for disasters [12, 27-31]. Despite the implementation of training programs and evaluation of household preparedness against disasters in Iran, studies have shown that Iranian households do not have an adequate level of preparedness against disasters. For instance, in a study by Najafi et al. conducted in Tehran, only 10% of the participants reported taking actions related to disaster preparedness, and 43.1% reported doing so rarely [13]. Martins et al. found that the level of household preparedness in New York during storms was average [32]. The discrepancies in the levels of disaster preparedness among households in different regions may be attributed to various factors, including the socioeconomic status of households, their experiences with harmful risks, the level of risk perception, and the efforts of governments to enhance community preparedness and mitigate disaster risks [33, 34].

One reason for this lack of preparedness may be the high cost of preparedness measures and insufficient household income. Therefore, support from authorities is necessary to reduce household vulnerability. Currently, the Disaster Assessment of Readiness and Training [DART] is being carried out in Iran's health centers. It is recommended to use proper and effective planning and the high potential of health workers to provide appropriate messages to improve Disaster Preparedness Behavior [DPB].

**Disaster Experience**

The results of the present study showed that the mean score of DPB was higher among participants without prior disaster experience compared to those with a history of facing disasters. This possibly reflects a higher sense of preparedness, driven by the fear of facing an unknown hazard, which motivates them to engage in disaster preparedness. Contrary to the results of the present study, the study by Wang et al. in China reported that respondents who had experienced disasters were more willing to take disaster preparedness measures [29]. Najafi et al. showed that experiencing risk and concerns about future harm had a significant effect on enhancing preparedness behaviors and intentions [13]. Experiencing a destructive hazard might heighten risk perception in residents, leading them to be more willing to prepare for possible future hazards. In a study conducted by Ao et al. in China, despite the heavy casualties and damage caused to villagers by the 2008 earthquake, 60% of the residents were not sufficiently prepared [34].

This contradiction may stem from differences in the type of hazards experienced, whether destructive or non-destructive, and the demographic factors of the study populations. For example, the results of a study showed that people who had experienced hurricane were significantly more prepared, while earthquake experience had no significant relationship with the level of preparedness [35]. People may be less prepared when they feel they have less control over hazards or when hazards are not predictable.

Since most earthquakes are non-destructive, the frequency of such hazards may result in a false sense of security among residents, discouraging them from taking preventive measures and preparations. Conversely, after experiencing destructive earthquakes, residents might believe that earthquake preparedness measures are ineffective. Additionally, the emotional trauma from the loss of relatives may decrease their motivation to prepare for future disasters. Conversely, reconstruction and retrofitting measures after a destructive earthquake might assure residents of their safety from future earthquakes, resulting in less preparedness for future disasters.

**Behavioral Intentions**

In the present study, there was a significant positive relationship between intentions and DPB, and behavioral intentions predicted DPB. The TPB assumes that attitude, subjective norms, and perceived behavioral control lead to

the development of a behavioral intention, and thus, the behavioral intention is the immediate antecedent of behavior [21].

Studies conducted in different parts of the world have consistently highlighted intention as a positive and important factor in disaster preparedness. For instance, in a study on residents of a typhoon-prone area in Hong Kong, Ng showed that preparedness intentions predict DPB [36]. In Zaremohzzabieh et al.'s study, preparedness intention was reported to be a significant positive factor influencing actual earthquake preparedness [19]. In their study, Gumasing and Sobrevilla showed that the intention to prepare is the most crucial factor affecting protective behaviors during natural disasters [37]. In a study conducted by Najafi et al. in Tehran, preparedness behaviors had a strong statistical relationship with intention [13]. Thus, the stronger an individual's intention toward preparedness measures, the more likely they are to take the necessary measures to prepare for disasters. Moreover, a study conducted after the Taiwan earthquake revealed that, although people had a high intention to engage in earthquake preparedness behaviors, their implementation of these measures was insufficient [38].

The lack of preparedness measures among individuals with prior disaster experience, despite their high intention, may be due to a deficiency in necessary knowledge and skills in that population.

### **Subjective Norms**

In the present study, there was found a positive relationship between DPB and subjective norms; however, this relationship was not significant. Conversely, a statistically significant relationship was observed between the intention to take preparedness measures and subjective norms. Subjective norm refers to the perceived social pressure to perform or not to perform a behavior. It encompasses the belief that an important person or group will approve and support a particular behavior. Individuals build their intentions based on the demands of others [21].

The results of studies conducted in different parts of the world, including those by Najafi et al. in Tehran [13], Paek et al. in the United States [39], McIvor et al. in New Zealand [40], Daellenbach et al. in Australia [41], Ridzuan et al. in Malaysia [42], and Gumasing and Sobrevilla in the Philippines [37] consistently showed a significant positive relationship between subjective norms, intentions, and actions regarding disaster preparedness. A qualitative study conducted by Najafi et al. in Tehran underscored that normative beliefs [approval or disapproval by significant others] were prominent in influencing preparedness behaviors, particularly emphasizing the role of family members [43]. Contrary to the studies mentioned above, the study by Nurjanah and Reza in Indonesia revealed that subjective norms had no significant effect on DPB [44]. Individual characteristics of the studied group, cultural differences, and individualistic or collectivist traits may affect the study results. Therefore, cultural context, social relations, and networks must be considered.

If individuals feel that their disaster preparedness actions are approved by their family members, friends, health professionals, and significant others, they will be more willing to take disaster preparedness actions. Thus, improving interpersonal and social communication, strengthening social networks, and receiving informal support could effectively influence preventative actions and intentions.

In addition to family and community members, health workers with whom people interact regularly can influence increasing household preparedness against earthquakes. Therefore, it is necessary to empower health workers to have a greater impact on the preparedness of communities against disasters.

### **Perceived Behavioral Control**

The present study also demonstrated a positive relationship between DPB and perceived behavioral control, though this relationship was insignificant. However, there was a statistically significant relationship between the intention to take preparedness measures and perceived behavioral control.

Perceived behavioral control is an individual's assessment of the difficulty or ease of performing a specific action, as well as the resources and opportunities available [21].

In Najafi et al.'s study in Tehran, perceived behavioral control was a predictor of behavioral intentions, and preparedness behavior had a strong and significant relationship with perceived behavioral control [13]. The results of Wang Tsai's study in Taiwan showed that perceived behavioral control affected teachers' participation in school DPB [18]. In Daellenbach et al.'s study conducted in Australia and New Zealand, perceived behavioral control had a moderate positive relationship with preparedness intentions [41]. In the study by Ridzuan et al. in Malaysia, no positive relationship was observed between flood preparedness intention and perceived behavioral control [42]. Moreover, the results of the studies by Zaremohzzabieh et al. in Malaysia [19] and Nurjanah and Reza in Indonesia [44] indicated that perceived behavioral control did not have a significant effect on the intention for preparedness behaviors. These results suggest that the impact of perceived behavioral control on disaster preparedness intentions and behaviors varies across different societies.

Perceived behavioral control affects an individual's performance and understanding of the difficulties involved in performing the desired actions and the extent of control over the conditions related to these actions, which can differ from one person to another [45]. If individuals feel they lack the necessary facilities, skills, abilities, or information to deal with disasters or perceive external and environmental factors as obstacles to preparedness, they are less likely to take any measures to prepare for disasters, even if they have positive attitudes toward it or believe that important others would approve of it. Therefore, appropriate interventions are recommended to provide more resources, especially in developing societies,

as well as to improve self-confidence and skills [e.g., first aid, fire extinguishing, emergency drills] to increase household preparedness against disasters.

### Attitudes

In the present study, there was a significant positive relationship between disaster preparedness intentions and attitudes, although this relationship was not significant.

Attitude toward the behavior refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior. In other words, when an individual wants to perform a behavior, they first evaluate the outcome and then form an intention to perform it [21].

Studies have shown that attitude is a critical construct related to DPB and intentions. For example, the study by Najafi et al. in Tehran revealed that attitude predicted DPB and intentions [13]. In the study by Ning et al. in China, attitude had a significant relationship with emergency preparedness behaviors [28]. Ridzuan et al. also showed a positive relationship between attitude and the intention for flood preparedness among regional residents in Malaysia [42]. Zaremohzzabieh et al. reported that attitude was a significant predictor of earthquake preparedness behavior intention [19]. In their study, Gumasing et al. and Sobrevilla et al. showed that attitude significantly affected the preparedness intention of Philippines residents [37]. In general, the more positive an individual's attitude toward preventive measures and preparedness behaviors, the stronger their preparedness intentions and behaviors would be.

### Limitations

This study was conducted in the city of Kerman in the southeast of Iran. However, it's important to note that the findings from this research may not be applicable to other regions or populations facing different types of hazards. Additionally, the COVID-19 pandemic created constraints that affected our data collection process. Specifically, we couldn't conduct in-person interviews, and all questionnaires had to be completed via telephone interviews. This limitation likely impacted the participants' ability to thoroughly reflect on the questions posed.

### CONCLUSION

In this study, DPB were found to be unfavorable. The study demonstrated a significant positive relationship between disaster preparedness intentions and behaviors, with behavioral intention identified as a strong predictor of DPB. Additionally, the intention to take preparedness measures showed a statistically significant relationship with perceived behavioral control and subjective norms.

Therefore, it is possible to enhance DPB by organizing training sessions for influential individuals such as health workers, religious leaders, and officials. Additionally, interventions are needed to improve knowledge and skills, as well as to address obstacles and challenges aimed at enhancing perceived behavioral control. It is also recommended to utilize mass communication media and

social media to educate the public and increase the level of household preparedness against disasters.

The TPB can be effectively utilized to develop educational programs and interventions aimed at increasing preventive measures and preparedness behaviors. It is recommended to conduct research to evaluate the impact of educational interventions on DPB based on TPB.

Inadequate household preparedness for disasters may be due to many obstacles and challenges. Therefore, designing and validating a tool to determine the barriers and challenges is recommended.

Given that several factors are related to household disaster preparedness, it is recommended to conduct studies based on other models and theories of behavior change to identify these factors.

### AUTHORS CONTRIBUTIONS

Study conception and design: SV.AT and S.SM; data collection: S.SM; analysis and interpretation of results: A.SIN; draft manuscript: F.RD. All authors reviewed the results and approved the final version of the manuscript.

### ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Ethics Committee of the University of Medical Sciences, Kerman, Iran [Ethics code: IR.KMU.REC.1400.315]

### HUMAN AND ANIMAL RIGHTS

No animals were used in the studies that are the basis of this research. All human procedures followed were in accordance with the guidelines of the Helsinki Declaration of 1975.

### CONSENT FOR PUBLICATION

Informed consent was obtained from all participants of this study.

### AVAILABILITY OF DATA AND MATERIALS

All the data and supportive information are provided within the article.

### STANDARDS OF REPORTING

STROBE guidelines were been followed.

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### CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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