The likelihood of having a household emergency plan: understanding factors in the US context

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Abstract

Individual household emergency planning is the most fundamental and can be the least expensive way to prepare for natural disasters. However, despite government and non-profit educational campaigns, many Americans still do not have a household plan. Using a national sample of Americans, this research observes factors that influence people's likelihood of developing a household emergency plan. Based on the analysis, people's efficacy in preparedness activities, previous exposure to disasters and preparedness information positively influence the likelihood that someone will have developed a household emergency plan. Alternatively, demographic variables such as being Hispanic/Latino, identifying as Asian, and being a renter decrease the likelihood that someone will have developed a plan in the American context. But, the reason for these negative relationships are unclear. Subsequent to the analysis, recommendations for future research are provided to better understand observed relationships.

Keywords Household emergency plans · Preparedness · Self-efficacy · United States of America · Passive preparedness information

1 Introduction

Throughout the world, household disaster preparedness is viewed as the first step to reducing vulnerability to natural events. Within the USA, the Department of Health and Human Services, the Federal Emergency Management Agency, the Center for Disease Control and Prevention, and the American Red Cross have historically attempted to encourage individuals to develop and maintain household emergency plans (Murphy et al. 2009). However, despite the historic and widespread effort, Kapucu (2008) maintains that most people do not actually prepare for disasters despite knowing that they should. Along these lines, Levac et al. (2012) argue that many people overestimate their capacity to deal with emergency situations, and predominately plan to rely on emergency relief services for assistance in the aftermath of an event. As a result, according to the Institute for Catastrophic Loss

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Reduction for the Red Cross (Falkiner 2003), there is a general lack of household preparedness within the USA and Canada.

Because of this lack of preparedness, various studies have attempted to observe factors that contribute to individuals' preparedness behaviors. Although a variety of studies (Diekman et al. 2007; Burke et al. 2010; Levac et al. 2012; Silver and Mathews 2017) have sought to observe what effects individuals' stocking of supplies, household mitigation techniques, and information seeking, fewer have specifically attempted to investigate what effects the most basic form of disaster preparedness—the development of a household emergency plan. Household plans have been encouraged by a wide range of public, nonprofit and faith-based organizations because they require little to no upfront monetary investment due to their emphasis on household discussions and theorizing of hypothetical situations as opposed to investing in physical mitigation strategies. As such, this allows people from all socioeconomic levels to engage in this preparedness activity. However, despite the research that is available on what factors influence individuals to engage in this activity, people's perceived efficacy surrounding this encouraged action has not been investigated at a national level (Lindell and Prater 2002; Murphy et al. 2009; Lindell et al. 2009; Bourque 2013).

Due to the increasing frequency and severity of a variety of natural disaster occurrences in the USA and throughout the world (i.e., hurricanes, flooding, wildfire, etc.) that interact with human systems (Burton et al. 1978; Oliver 1980; Peek and Mileti 2002), this study seeks to observe how people's efficacy surrounding the development of a household emergency plan influences their decision to develop and discuss one with family members. Through the analysis of the Federal Emergency Management Agency's (FEMA's) 2018 National Household Survey, I observe that people's efficacy has a significant effect on people having had developed a household emergency plan. Additionally, other factors that have been observed in the literature to effect such a decision are tested to observe their respective influences on this most fundamental preparedness behavior (Burke et al. 2010; Levac et al. 2012; Silver and Mathews Silver and Matthews 2017). Based on the results of this study, recommendations are provided as a means of enhancing people's proclivity to engage in the development of household emergency plans, in addition to potential avenues for future research.

2 Factors effecting household emergency planning

According to Bourque (2013; see also Lindell 2013), there are a number of household characteristics that have been investigated as a means of understanding what influences individuals to prepare for disasters. One of these factors is self-efficacy. Bandura (1977) maintains that self-efficacy refers to one's perception of how competent they are in organizing and completing actions needed to manage risks. Along these lines, individuals with a relatively high sense of self-efficacy in disaster preparedness believe that their actions specifically contribute to reducing their vulnerability and enhancing their recovery in the aftermath of a disaster. As such, several studies have observed that households are more likely to engage in emergency planning when they believe their actions will be helpful or beneficial to their survival (Lindell and Whitney 2000; Lindell and Prater 2002; Martin et al. 2007, 2008, 2009; Olympia et al. 2010). However, most of these studies have observed preparedness behaviors as a continuum of actions, that include household planning, structural mitigation techniques, information seeking, stockpiling of nonperishable

goods, and developing an evacuation plan, but not specifically the sole action of developing a household emergency plan. Moreover, many of these studies have observed the effect of self-efficacy in relation to different types of disasters as opposed to populations in general. Although it is not argued that the development of a plan is where preparedness should end, it is the most fundamental and accessible way individuals can begin to prepare for future events. By understanding how the general population's self-efficacy effects the development of household disaster plans, programs can be enhanced in ways that attempt to build people's sense of capacity.

Another factor that has been observed to effect individual preparedness is exposure to hazards. A variety of studies (Bourque et al. 2012; Paul and Bhuiyan 2010; Perry and Lindell 2008; Pennings and Grossman 2008), across a host of different types of natural occurrences, have observed that when people have had past experiences with previous disasters, they are more inclined to engage in preparedness activities. For example, Peacock (2003), Heller et al. (2005), and Nguyen et al. (2006) have all observed that when households have been exposed to previous disasters, they are more likely to make structural investments in their homes to mitigate against future damages. Sattler et al. (2000) observed that when individual's perceptions of their risk to disasters is heightened as a function of their exposure, households are more likely to stockpile supplies for future events. Moreover, Basolo et al. (2009) found that people's fear of risk, which was partially a byproduct of their previous exposure to a disaster, was positively correlated with their development of a family emergency plan.

In addition to past experiences, exposure to information about preparedness practices has been observed to effect individuals' actions. A number of studies (Perry and Lindell 2008; Paton et al. 2005; Schwab et al. 2017) have observed that people's active information seeking has had a positive effect on households' preparedness; however, there are a number of other studies (Wood et al. 2012; Bourque 2015; Houston et al. 2015) that have observed positive influences on individual preparedness activities as a byproduct of their receipt of passive information. Along these lines, information received by households through the print media, radio, television, and, more recently, through social media have been observed to increase household preparedness and mitigation practices such as the development of emergency plans (Wood et al. 2012; Bourque 2015; Houston et al. 2015). Although the clarity and accessibility of messaging are important so that preparedness information has the broadest possible benefit to populations, simple exposure to this information is argued to be influential throughout all phases of emergency preparedness (Paton and Johnson 2001; Chen et al. 2009).

Finally, individuals' proclivity to engage in preparedness activities has also been studied as a function of their demographic characteristics. However, Lindell (2013) maintains that the findings relating to the influence of demographic characteristics on preparedness activities are mixed. Characteristics such as age, gender, race/ethnicity, number of dependents, educational level, and income level have been found to be significant in some studies, and not in others (Edwards 1993; Lindell and Whitney 2000; Nguyen et al. 2006; Eisenman et al. 2006; Spittal et al. 2008; Lee and Lemyre 2009; Tekeli-Yesil et al. 2010; O'Sullivan and Bourgoin 2010; Levac et al. 2012). Moreover, Mulilis et al. (2000) argue property owners typically engage in preparedness behaviors more than renters; however, even this characteristic is not always predictive (Lindell 2013).

As a result of these mixed observations, this study seeks to contribute to our scope of knowledge on what factors influence the likelihood of an individual developing a household emergency plan. Based on previous research that has theorized the influence of self-efficacy on other preparedness and mitigation activities, I hypothesize that a person's level

of self-efficacy in preparedness activities will positively affect the odds of them having developed a household emergency plan (H1). Additionally, since past studies have examined the effect of individuals' exposure to disaster mitigation and planning information on their individual preparedness, I also hypothesize that having received information on disaster preparedness will have a positive influence on the odds of an individual having developed a household emergency plan (H2). Finally, because of the lack of consensus on the effect that demographics has on preparedness and mitigation, this study will seek to observe the influence of various demographic factors on having developed a household emergency plan.

3 Methods

In order to investigate the factors that influence people to develop individual household emergency plans, data from FEMA's 2018 National Household Survey (NHS) (FEMA 2019)¹ was analyzed. This survey has been conducted annually since 2007 and seeks to measure people's preparedness behaviors, attitudes and motivations in relation to a number of different disaster events. The 2018 NHS interviewed 5003 adult respondents through mobile and landline telephones in both English and Spanish, and oversampled individuals that experienced earthquakes, flooding, wildfire, urban events, hurricanes, winter storms, extreme heat, and tornados. Oversamples were based on hazard histories on individuals (FEMA 2019). However, not all respondents answered all of the questions needed for this current study. As a result, the final sample is composed of 4538 respondents who addressed all of the germane questions. Table 1 presents a demographic breakdown of the sample used in the study.

Sampling weights were calculated to adjust for sample design aspects, such as the unequal probability of selection, and for nonresponse bias arising from differential response rates across various geographic regions and demographic groups (Maddala 1977; Kennedy 2007). The resulting weighted sample data reflect the entire target population of US adults. Beyond commonly used demographic variables, Table 1 includes a couple of variables important to this project. First, 50.55 percent of the sample indicated that they have developed and discussed a household emergency plan. Second, 63.16 percent of the sample indicated that they believed that taking actions to prepare for a disaster would be "Quite a Bit" or "A Great Deal" helpful to get them through a disaster. Third, 49.96 percent of the sample indicated that they had been exposed to information that could enhance their preparedness for a disaster in the last 6 months.

4 Variables

The dependent variable under investigation in this study is whether or not a respondent had developed and discussed a household emergency plan. Survey participants were asked: "Has your household developed and discussed an emergency plan that includes instructions for household members about where to go and what to do in the event of a local disaster?" The

¹ FEMA and the Federal Government cannot vouch for the data or analyses derived from these data after the data have been retrieved from the Agency's website.

Table 1 Descriptive statistics ($n = 4538$)

<i>Variable</i>	<i>Percent of sample</i>	<i>Variable</i>	<i>Percent of sample</i>
<i>Household emergency plan</i>		<i>Exposed to preparedness information</i>	
No	50.55	No	50.04
Yes	49.45	Yes	49.96
<i>Preparedness efficacy</i>		<i>Disaster experience</i>	
Not at all helpful	4.01	No	51.12
Very little helpful	8.68	Yes	48.52
Somewhat helpful	21.35	Don't know	0.31
Quite a bit helpful	22.39	Refused	0.04
A great deal helpful	40.77	<i>Gender</i>	
Don't know	2.60	Male	50.33
Refused	0.20	Female	49.34
<i>Hispanic/latino</i>		Don't know	0.04
No	76.99	Refused	0.29
Yes	21.55	<i>Race</i>	
Don't know	0.29	White	68.40
Refuse	1.17	Black or African American	12.83
<i>English is primary household language</i>		Asian	3.86
Yes	86.47	American Indian or Alaskan Native	2.12
No	12.76	Native Hawaiian or Pacific Islander	0.75
Don't know	0.33	Don't know	8.02
Refused	0.44	Refused	4.03
<i>Educational attainment</i>		<i>Own or rent home</i>	
High school degree or less	28.29	Own	62.30
Technical/vocational school	4.56	Rent	33.52
Some college	21.40	Other	1.63
College graduate	27.28	Don't know	0.55
Post graduate or degree	17.34	Refused	2.01
Don't know	0.37	<i>Monthly household income</i>	
Refused	0.75	\$0 to \$999	6.08
		\$1000 to \$3999	18.82
		\$4000 to \$9999	20.12
		\$10,000 and over	12.94
		Don't know	12.08
		Refused	29.97
	Mean	Standard Deviation	Min/max
<i>Age</i>	50.92	19.50	18/100
<i>Number of children under 18 in household</i>	0.67	1.20	0/17

close-ended responses were coded zero (No) and one (Yes). As such, the dichotomous variable measures whether an individual has a household emergency plan.

The main independent variable in this research is an individual's personal efficacy related to their disaster preparedness actions. In other words, respondents were asked to indicate how helpful they perceive preparedness behaviors to be in the event a disaster effected their geographic area. In response to this close-ended question, initial responses were coded from one to seven, but recoded in the analysis from zero to six, where zero indicated that the respondent believed that developing a household emergency plan in addition to other preparedness techniques would be "Not at all" helpful and four indicating that they believed preparing would be "A great deal" helpful. Responses that were coded with a five indicated that the respondent did not know, and those that were coded with a six indicated that the respondent had refused to answer the question. Because the data used in this study is secondary, there is no way to discern between respondents that specifically refused to answer the question and those that simply did not answer. As a result, all individuals that either refused to answer or simply did not answer compose the same category—"Refused." As Table 1 highlights that only 4.01 percent of the sample indicated that preparedness activities would be "Not at all" helpful versus 40.77 percent that indicated that these types of practices would be "A great deal" helpful.

Because past research has indicated that exposure to disasters and emergency preparedness information has an influence on whether individuals engage in preparedness and mitigation practices, a variable measuring whether a respondent had been previously exposed to this type of information was included in the analysis. The survey asked respondents: "In the past 6 months, have you read, seen or heard of any information about how to get better prepared for a disaster?" The responses to this question are coded dichotomously, with zero indicating that an individual had not been exposed to this type of information and one indicating that they had. As indicated in Table 1, 49.96 percent of the sample indicated that they recalled being exposed to information on how to become better prepared for disasters.

Literature also indicates an individual's experience with disasters in the past has an influence on their preparedness practices. As such, an individual's disaster experience was measured and included as a control variable in this study. The survey instrument asked respondents, "Have you or your family ever experienced the impacts of a disaster?" Responses to this question were coded from zero to three, with zero indicating no and one indicating yes. Individuals that indicated that they did not know were coded with two and those that refused to answer the question were coded with a three. Table 1 highlights that 51.12 percent of the sample indicated that neither they nor their families had ever experienced a disaster; whereas, 48.53 percent responded that they had.

Finally, various demographic variables were included in the analysis due to their argued importance in disaster preparedness practices in the literature. Along these lines, respondents' educational level, gender, race, homeownership, age, number of dependents under the age of 18 living in the same household, whether or not they are Hispanic/Latino, whether English is the primary language spoken in the household, and income were measured. Although household income is commonly measured per year, the survey asked respondents to indicate their level of household income per month. As such, the income categories represented in Table 1 are reflective of this.

5 Analysis

For this study, logistic regression was used to observe how the previously discussed factors were associated with the odds of a respondent having developed and discussed a household emergency plan. Logistic regression is a technique which allows a researcher to relate a dichotomous dependent variable to a set of independent variables that may be continuous, categorical, and discrete or a combination of these (Petersen 1985; Warner 2008; Tabachnick and Fidell 2007). According to Petersen (1985), logit models allow a researcher to predict the probabilities of belonging to one of the categories on the dependent variable, in addition to predicting changes in probabilities resulting from changes in independent variables. This technique is therefore appropriate for this research in the context of assessing whether respondents developed a household emergency plan or not as a result of other independent variables since the dependent variable under investigation is dichotomous.

In order to observe how various factors influence individuals to develop and discuss a household emergency plan, the following equation was used:

$$\Pr(\text{houseplan}_i = 1 | \mathbf{x}_i) = \Lambda(\mathbf{x}_i \boldsymbol{\beta})$$

In this equation, i indexes individual respondents, houseplan_i represents if a respondent indicated that they had developed and discussed a household emergency plan (1) or 0 if not, $\mathbf{x}_i$ is a vector of all the factors discussed previously that are represented in Table 1, $\boldsymbol{\beta}$ are the coefficients to be estimated, and Λ is the cumulative logistic probability function. Standard assumptions for logistic regression were evaluated by performing Spearman correlations, approximate likelihood ratio tests, and Brant tests (Brant 1990) on the regression model. The results of these tests demonstrated that the proportional odds assumptions held for each of the independent variables in the model. Moreover, the sample being analyzed in this study exceeds the ideal minimum number of observations for logistic regression (Petersen 1985).

Table 2 highlights the results of the logistic regression. Based on the analysis, several variables were observed to have statistically significant and positive influences on the odds of an individual having developed and discussed a household emergency plan. First, various levels of an individual's personal efficacy in preparedness practices were found to be statistically significant and positively related to the odds of an individual developing and discussing a household emergency plan while holding all other variables constant. Specifically, as an individual's level of efficacy increased the positive effect on the odds of them having developed and discussed a household plan also increased. Second, a statistically significant and positive relationship was observed between someone indicating they had been exposed to disaster preparedness information in the last six months and the odds of them having a household emergency plan in comparison to those that had not received similar information. Third, in comparison to individuals that indicated they nor their family had ever experienced a disaster, having experienced a disaster increased the odds of an individual having developed and discussed a household disaster plan while holding all other variables constant.

In addition to these variables that had positive effects on the odds of someone having and discussing a household emergency plan, several variables were observed to have statistically significant and negative relationships with the dependent variable. First, Hispanic/Latino respondents were observed to have a statistically significant and negative relationship with the odds of having developed and discussed a household emergency plan in comparison to those that indicated they were not Hispanic/Latino and while holding all

Table 2 Logistic regression of households with an emergency plan

Variable	Coefficient	Robust standard error	p Value	Confidence Interval	
<i>Preparedness efficacy (not at all helpful is reference)</i>					
Very little helpful	0.4451	0.3103	0.151	−0.16309	1.0533
Somewhat helpful	0.6370	0.2751	0.021	0.0979	1.1761
Quite a bit helpful	0.6537	0.2748	0.017	0.1152	1.1922
A great deal helpful	0.7243	0.2694	0.007	0.1963	1.2523
Don't know	−0.1335	0.4202	0.751	−0.9571	0.6901
Refused	−0.2817	0.8133	0.729	−1.8760	1.3124
<i>Exposed to preparedness information (no is reference)</i>					
Yes	1.0800	0.1047	<0.001	0.8748	1.2851
<i>Disaster experience (no is reference)</i>					
Yes	0.5232	0.1040	<0.001	0.3193	0.7270
Don't know	1.4373	0.7695	0.062	−0.0708	2.9455
Refused	0.5732	1.2449	0.645	−1.8667	3.0131
<i>Gender (male is reference)</i>					
Female	0.0601	0.1049	0.566	−0.1455	0.2658
Don't know	−2.2871	2.0789	0.271	−6.3617	1.7876
Refuse	2.9063	0.7938	<0.001	1.3505	4.4621
<i>Educational attainment (high school or less is reference)</i>					
Technical/vocational school	0.0923	0.2353	0.695	−0.3690	0.5536
Some college	0.2004	0.1418	0.158	−0.0776	0.4784
College graduate	−0.0061	0.1365	0.964	−0.2738	0.2615
Post graduate work or degree	−0.2973	0.1573	0.059	−0.6057	0.0110
Don't know	1.2241	0.9752	0.209	−0.6872	3.1354
Refused	−1.4232	0.6862	0.038	−2.7680	−0.0783
<i>Hispanic/latino (no is reference)</i>					
Yes	−0.3905	0.1732	0.024	−0.7300	−0.0510
Don't know	−0.1049	0.5987	0.861	−1.2784	1.0685
Refused	−0.3524	0.5517	0.523	−1.4337	0.7289
Age	−0.0032	0.0030	0.263	−0.0090	0.0024
Number of children under 18 in household	0.0659	0.0411	0.109	−0.0146	0.1464
<i>Race (white is reference)</i>					
Black or African American	−0.2720	0.1650	0.100	−0.5953	0.0516
Asian	−0.6170	0.2795	0.027	−1.1648	−0.0691
American Indian or Alaskan Native	0.2324	0.2974	0.434	−0.3505	0.8154
Native Hawaiian or Pacific Islander	−0.6216	0.5280	0.239	−1.6565	0.4132
Don't know	−0.1832	0.2453	0.455	−0.6640	0.2976
Refused	0.3282	0.2966	0.269	−0.2532	0.9096
<i>English is primary household language (yes is reference)</i>					
No	−0.0360	0.1999	0.857	−0.4278	0.3557
Don't know	−1.0601	1.0278	0.302	−3.0746	0.9544
Refused	−0.5887	1.1802	0.618	−2.9018	1.7244
<i>Own or rent home (own is reference)</i>					
Rent	−0.4210	0.1260	0.001	−0.6679	−0.1741

Table 2 (continued)

<i>Variable</i>	Coefficient	Robust standard error	<i>p</i> Value	Confidence Interval	
Other	−0.5155	0.4808	0.284	−1.4578	0.4268
Don't know	−0.4531	0.6116	0.459	−1.6518	0.7456
Refused	−0.0930	0.3819	0.808	−0.8416	0.6226
<i>Monthly household income (\$0 to \$999 is reference)</i>					
\$1000 to \$3999	−0.1121	0.2410	0.642	−0.5844	0.3603
\$4000 to \$9999	−0.0976	0.2451	0.690	−0.5781	0.3826
\$10,000 and over	0.0989	0.2602	0.704	−0.4111	0.6090
Don't know	0.0272	0.2572	0.916	−0.4771	0.5314
Refused	−0.0156	0.2327	0.947	−0.4717	0.4405
<i>Constant</i>	−1.0271	0.3761	0.006	−1.7642	−0.2900
Pseudo R ²					0.0965
Observations					4538

other variables constant. Second, being Asian also had a statistically significant and negative effect on the odds of having a household plan in comparison to Whites while holding all other variables constant. Third, renting one's home had a statistically significant and negative effect on the odds of a respondent having developed and discussed a household emergency plan.

6 Discussion

This study sought to investigate the influence of factors that have been observed to affect general household disaster preparedness on the specific action of developing a household emergency plan within the US context. Through the analysis of a national representative sample of Americans, various factors were observed to have an effect on the odds of someone developing a household emergency plan. Along these lines, two hypotheses were tested through the use of a logistic regression model. In line with past research on preparedness, an individuals' efficacy in relation to developing a disaster plan was hypothesized and observed to be positively related to the odds of them developing an emergency plan. Moreover, as one's relative level of efficacy increased, so too did the odds of them having developed a household plan. Additionally, it was also hypothesized and observed that having been passively exposed to disaster preparedness information, in addition to having previously experienced a disaster also positively influenced the odds of someone having developed a household emergency plan. As a result, this current research supports the observations of previous studies that have examined the influence of self-efficacy and passive information exposure on preparedness activities and broadens these variables' potential influence on the development of individual household emergency plans.

These results also seem to indicate that outreach initiatives focused on educating the public about preparedness practices are somewhat effective. However, what is less understood is why some people have higher levels of self-efficacy when it comes to household preparedness activities than others. Is it that exposure to information over

time contributes to someone's sense of capacity to effectively deal with future disasters, and if so, is the way in which the information is presented more or less important in bestowing psychological support to people's likelihood of engaging in these types of preparedness actions? Along these lines, future research should seek to address the influence preparedness information has on people's efficacy based on the mediums through which the information is presented in the USA. Or, is a person's efficacy a byproduct of their past experiences in disaster recovery? If this is the case, research should seek to qualify an individual's previous preparedness behaviors, and their perceived effectiveness on an individual's ability to recover from a past event as a means of observing whether the success or failure of past practices has affected their self-efficacy separately from their exposure to preparedness information.

In addition to understanding how efficacy influences people's odds of developing a household emergency plan in the US context, this research also observed the effect of demographic variables on this practice. As was previously pointed out, many of the demographic variables that were controlled for in this study were not found to have statistically significant influences; however, there were a few that did. First, being Hispanic/Latino had a negative effect on the odds of an individual having developed a household emergency plan. The reason for this is unclear. Is it that Hispanics/Latinos are exposed to lower levels of passive information about disaster preparedness than their ethnic counterparts? Or, do Hispanics/Latinos tend to have relatively lower levels of self-efficacy than individuals belonging to other racial/ethnic categories? Future research might investigate this dynamic to understand why Hispanic/Latinos in the US context have a decreased odds of developing a household emergency plan in comparison to individuals that are not.

A similar relationship was also observed in reference to Asians. The analysis showed that being Asian decreased the odds of an individual developing a household emergency plan in comparison to their White counterparts. The reason for this relationship may have some similarity to that of Hispanics/Latinos; however, the effect that information exposure may have on this relationship maybe more prominent for Asians. The reason for this hypothesis is potentially related to the availability of documents and other preparedness information materials in languages that are accessible to Asian populations throughout the USA. Unlike Hispanics/Latinos that might require materials translated into Spanish or possibly Portuguese, Asians living within the USA speak a wide range of different languages, which many disaster mitigation and preparedness organizations do not have the capacity to translate. But the true reason for this relationship is unknown. Again, future research should attempt to understand why Asians in the USA are less likely than their White counterparts to develop household emergency plans.

Finally, renters were observed to have a decreased likelihood of developing a household emergency plan in comparison to their homeownership counterparts. As a result, this research seems to support Mulilis et al.'s (2000) findings that property owners are more inclined to engage in preparedness activities than renters; however, the reason for this is unclear and beyond the scope of this study. Future research may attempt to investigate through qualitative designs why renters are less likely to engage in household disaster planning. Additionally, future research may seek to observe the likelihood of renters developing household plans using a representative sample entirely composed of renters as a mean of understanding what characteristics among this particular group may affect preparedness at the household level.

7 Limitations and conclusion

Although this study observed various factors that potentially influence an individual's odds of developing a household emergency plan, there are a few limitations that should be pointed out. First, this study did not account for the influence that an individual's geographic location may have on their odds of developing a household plan. It may be that place (Cutter 1996; Wisner et al. 2004), which affects an individuals' vulnerability to natural hazards, has a significant influence on household emergency planning. Second, and related to this first point, this study lacks clarity on the potentially differing affects that exposure to different types of disasters may have on household emergency planning. For example, does someone's previous exposure to hurricanes have a stronger or weaker influence on the odds of them developing a household plan than if they had been exposed to an earthquake or their lived experiences throughout the COVID-19 pandemic? By better understanding these dynamics beyond what was observed in this current study, emergency management planning agencies can enhance their messaging and educational campaigns to more geographically situated populations and also potentially develop people's self-efficacy in preparedness activities.

Despite these limitations, this study contributes to our knowledge of individual household emergency planning. Generally, speaking the development of a household emergency plan is the first step in enhancing people's resilience to disasters. However, if people do not feel that their actions will result in beneficial outcomes, they will be less inclined to engage in this fundamental preparedness activity. Along these lines, having access to preparedness information is important. But, it is equally important that people feel that if this information is internalized and transferred into action, there will be direct benefits to them. When we enhance people's efficacy in preparedness not only do we make individual households more prepared to deal with natural occurrences, but we also begin to more broadly influence the resilience of whole communities.

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