

Disaster preparedness among Thai elderly emergency department patients: A survey of patients' perspective

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Abstract

Background: In disaster situations, the elderly are considered to be a particularly vulnerable population. Preparedness is the key to reduce post-disaster damage. There is limited research in middle income countries on how well elderly emergency department (ED) patients are prepared for disaster situations. The objective of this study was to determine the attitudes and behavior of elderly ED patients toward disaster preparedness. **Methods:** This study was a cross-sectional face-to-face survey at one urban teaching hospital in Bangkok, Thailand between August 1st and September 30th, 2016. Patients aged 60 and older who presented to the ED were included to this study. We excluded patients who had severe dementia [defined as Short Portable Mental State Questionnaire's (SPMSQ) > 8], were unable to speak Thai, had severe trauma and/or needed immediate resuscitation. The survey instruction was adapted from previous disaster surveys. This study was approved by the Thai Institutional Review Board (IRB). **Results:** A total of 243 patients were enrolled. Most of them were female [154 patients (63.4%)]. The median age was 72 [Interquartile range (IQR) 66-81] years and the most common underlying diseases were hypertension [148 patients(60.9%)] and diabetes [108 patients (44.4%)]. The majority of patients [172 patients(72.4%)] reported that they had had some teaching about disaster knowledge from a healthcare provider and had experienced a disaster [138 patients(56.8%)]. While 175/197 (81.8%) of patients who have underlying diseases reported that they had a medication supply for disaster situations, only 61 (25.1%) patients had an emergency tool-box for disasters. Most 159 (65.4%) patients did not know the emergency telephone number, and 133 (54.7%) patients reported transportation limitations. **Conclusions:** While most Thai elderly ED patients reported having a medication supply for disaster situations, many lacked comprehensive plans for a disaster situation. Work needs to be done to improve the quality of preparedness in disaster situations among elderly patients. Future research should focus on preparedness knowledge regarding evacuation, and shelter/residence for older patients.

Background

In disaster situations, the elderly are considered to be a particularly vulnerable population [1,2] . Older adults are usually more severely injured, have prolonged hospital length of stayed, lower physical quality of life and psychological well-being, a harder to recovery and higher death rate compared with the younger aged group in disaster situations [3-7].

Preparedness is the key to reducing post-disaster difficulty . Preparedness among community dwelling patients includes disaster awareness, understanding of the disaster, as well as accepting the consequences of ignoring safety instructions which may lead to injury, post-traumatic stress disorder (PTSD) and death [8-10].

One study in an Italian emergency department (ED) stated that only 45%¹¹ of EDs had a program for disaster preparedness. A study in the US [12], North Carolina state found 53% of emergency patients did not have a disaster plan and 46% had stored food and drinks for 3 days. Morin VM, et al [2]. conducted a

household survey in Philippines, a country often affected by natural disasters, and found that less than 1% of adults prepared for disaster situations.

Thailand is a middle income country and is a rapidly aging society. In 2020, one third of Thai population will be older than 60 years [13]. Several disaster occurred recently in Thailand, e.g. the Tsunami in 2004, Bangkok flooding in 2011 and the nearly famous flooded cave that stranded a soccer team in 2018 . After the Tsunami in 2004,Guarena-Burgueno F et al [14]. showed that the military and hospitals responded well to the disaster. Most of the Thai disaster studies only focus on the disaster response phase and hospital preparedness [14-16]. However, there has been no study of disaster preparedness among older adults in a middle income country and how well elderly ED patients are prepared for disaster situations. The objective of this study was to determine the knowledge, attitudes and behaviors of elderly ED patients for disaster preparedness .

Methods

This study was a cross-sectional face-to-face survey study at one urban teaching hospital in Bangkok, Thailand. There are approximately 50,000 ED annual visits; thirty percent of them were among those older than 60 years. This study was approved by our hospital institutional review board. We have obtained informed consent from study participants.

Participants.

This study was a descriptive cross-sectional survey. We surveyed a convenience sample of patients 7 days a week between 8.00 am. to 12.00 pm. We included patients aged 60 and older who presented to the ED between August 1st and September 30th, 2016 . We excluded patients who had severe dementia which was determined by using the short portable mental status questionnaire (SPMSQ) and had a score > 8, were unable to speak Thai, were totally blind, deaf, aphasic and had severe trauma and/or needed immediate resuscitation.

Survey development process

Survey was created through item generation, construction, pilot testing and clarification.

Firstly, items generation and survey construction. The survey was adapted from Alrousan TM et al [17]. and Daugherty JD et al. study [18]. Three attending emergency physicians (EPs) who were an expert in the disaster field performed a focus group to clarify all survey questions. The survey instrument consisted of a 22-item questionnaire with a true-false choice and Likert scale response format. The survey contained 7 categories: baseline demographic, knowledge about disasters, preparedness in disaster situation, communication in disaster situation, community preparedness in disaster situation, experiences in disaster situation and family support in disaster situation. (Survey questions are presented in supplement 1.)

Secondary, pilot testing and clarification. The survey was piloted by a group of 10 healthcare providers who worked in the hospital but were not physicians or nurses. All respondents were asked to survey and clarify of each survey items and the validity of each question. The approximate time to finish the survey in our pilot group was 10 minutes.

Survey administration

Two research assistants (RAs) who were blind to study hypothesis performed the survey data collection. Research assistants had two hours of training to clarify data collection and the enrollment process. RAs approached patients to consent them. Patients who could read administered the survey items by themselves, RAs helped clarifying about term and meaning of questions. For those who had read problems, RAs asked the patients the survey questions.

Statistical analysis

Data were analyzed by using STATA version 15.0. We presented categorical data as percentage. Comparisons between categorical data were done using Chi-square or Fisher's exact test where appropriate. A p-value of 0.5 was consider significant.

Results

We surveyed 243 patients . Detailed of enrollment were presented in figure 1. Most of them were female [154 patients (63.4 %)] . The median age was 72 [Interquartile range (IQR) 66-81] years and the most common underlying diseases were hypertension [148 patients(60 .9%)] and diabetes [108 patients(44 .4 %)] . About half of the elderly ED patients [137 patients(56.4%)] were independent with basic activities of daily living. (Table 1)

Table 1. Baseline Characteristics

Knowledge about disaster (Table 2)

Two-third of patients [162 patients(68%)] reported that they had good knowledge about disaster preparedness (points 4 and 5 on Likert scale). Two hundreds and thirteen (87 %) patients reported having had healthcare providers provide knowledge about disasters (point 4 and 5 on Likert scale). One hundred and sixty seven (69%) patients state that they knew the risk for disaster in the community (point 4 and 5 on Likert scale).

Table 2: Preparedness knowledge for disaster

Preparedness in disaster situation (Table 3)

In this survey 48(19.8%) patients reported knowing the specific location of emergency shelters. One hundred and ninety seven(81.1%) patients had underlying diseases that required a long term medications. 175/197(81.8%) of patients who had underlying diseases reported that they have

medications supply for disaster situations at least 3 weeks. The survey showed only 61 (25.1 %) patients had an emergency tool -box for disasters.

One hundred and fifty nine(65.4 %) patients did not know the emergency telephone number for ambulance. When we compared young older adults group (aged 60-74 years) with old older adults group (aged 75 and older; age related physiological and functional decline) we found that the old older adults group knew emergency phone numbers less than the young older adults group [25(24.5%) versus (vs.) 59(41.8%) p value <0.01], and the old older adults group had telephones for emergency calls less than young older adults group [59(57.8%) vs. 122(86.5%) p value < 0.01]. Likewise, 133 (54.7 %) patients in old older adults group reported having more transportation limitations than young older adults group [72(70.6%) vs. 61(43.3%) p value < 0.01].

Table 3. Disaster preparedness indicator

Community and family preparedness (Figure 2)

Thirty two(13.2%) of elderly ED patients had participated in community disaster preparation program. Almost half of the community [112 patients(46.09%)] had a plan for disaster preparedness. One hundred and thirty eight(56.8%) had experienced in the disaster event especially Bangkok flood in 2011. Interestingly, most of the elderly ED patients [226 patients(93%)] had household member who could help in disaster situations.

Discussion

This study demonstrated the low knowledge attitudes and high behavior responses of elderly ED patients in one middle income country for disaster preparedness. Disaster preparedness guidelines exist in developed country such as in 2012 the Center for Disease Control and Prevention “Identifying Vulnerable Older Adults and Legal Options for Increasing Their Protection During All-Hazards Emergencies” [19] and in 2013 American College of Emergency Physician “Disaster Planning Toolkit for the Elderly and Special Needs Persons” [20]. Still, there are limitations in the ability to prepare and develop preparedness guidelines to keep older adults from harm or injury, including a non-existence of consensus on the effective way to identify and protect older adults in a middle income country. Our survey may assist in planning for the first step of disaster preparedness among older adults in a middle income country.

Two- thirds of the study population reported that they had good knowledge about disaster preparedness and more than eighty percent reported that a healthcare worker provided knowledge about disasters. Our results are unlike Alrousan TM et al’s study [17] in older adults in US that reported two third had never participated in any disaster preparedness educational program. One reason for our high reported knowledge was that our survey was performed after the Bangkok flood in 2011 [21] which affected almost all Bangkok hospitals. Healthcare provider may have more awareness and enthusiasm to provide community disaster preparedness education.

Most of the elderly ED patients had underlying diseases that required long term medications; interestingly more than 80 percent reported that they have medications supply for three weeks. This results may be due to several reasons. First, our country has universal coverage healthcare [22] which covers all medical expenses for the Thai populations. Second, the ratio of patients per physician is high which leads physicians to order more months of medications for chronic diseases given the lack of clinic appointment availability.

In terms of specific disaster preparedness questions, only twenty percent of elderly ED patients knew specific shelter locations and more than one third did not have an emergency tool kit. These findings were consistent with Morin VM, et al. [2] study in the Philippines which shares a geographic risk for natural disasters such as flood as in Thailand. Two-thirds of elderly ED patients did not know the emergency telephone number and telephone for emergency call even less in the old older adults group. Half of elderly ED patients reported functional decline and mobility limitations. Impaired physical mobility, diminished sensory awareness, chronic health conditions make elderly patients vulnerable to disaster situation and in adequate preparation for disaster [23].

In terms of safety issues, most households used natural gas but little is known about how to cut off power. In this situation guidelines suggest a comprehensive emergency preparedness plan for specific needs such as a communication plan, transfer plan and safety issues plan. For example, using simple technology for communication and promote for emergency telephone number.

Most of the elderly ED patients in this study reporting have had family support. With an aging population, the demand for family support or caregivers is crucial. Each family who takes care of elderly person with chronic diseases such as dementia, stroke should be encouraged to have emergency plans and not relying on one caregiver who may be unable to adequately assist the dependent elderly ED patients [24]. Disaster preparedness for older population is a global need. Planning should address the issues of general and emergency health requirement for older adults.

This study has several limitations. This was one single center study so results may not be generalizable. Data were collected at specific times and may not reflect future preparedness capacities. Also, this survey focused on the attitudes of patients the results may not reflect the actual knowledge about disaster preparedness. The answer to the items in this survey we relied on self-reported answer this may be affected by memory. Not every respondent had experienced disasters so the findings may not reflect the true situation. However, some of the findings may be of value for disaster situations and may aid to planning for the first step of disaster preparedness in a middle income country.

Conclusions

While most Thai elderly ED patients reported having medications supply for disaster situations, many lacked comprehensive plans for a disaster situation. Given the increasing number of older adults, global warming and other disaster risk, we need more public health and prevention planning and programs to

improve the quality of preparedness in disaster situations . Future research should focus on preparedness knowledge regarding evacuation, and shelter/residence for older patients .

Abbreviations

ED: emergency department

SPMSQ: Short Portable Mental State Questionnaire

IRB: Institutional Review Board .

IQR: Interquartile range

PTSD: post-traumatic stress disorder

EPs: emergency physicians

RAs: research assistants

Declarations

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Authors' contributions

JS, AV, and SL conceived and design a study. JS, NS, and RR acquisition of the data. JS, AK analyses and interpretation of the data. JS, and SL drafted of the manuscript, JS, SL, AV, NS, RR critical revision of the manuscript for important intellectual content and statistical expertise. All authors approved the final version of the manuscript to be published.

Ethics approval and consent to participate

This study was approved by the Vajira Institutional Review Board (IRB) . We have obtained informed consent from study participants.

Consent for publication

This study does not contains any individual person's data

Competing interests

The authors declare that they have no competing interests.

Availability of data and materials

Data sharing not applicable to this articles as no datasets were generated or analysed during the current study.

References

1. Cherniack EP. The impact of natural disasters on the elderly. *Am J Disaster Med.* 2008;3(3):133–9.
2. Morin VM, Ahmad MM, Warnitchai P. Vulnerability to typhoon harzards in the coastal informal settlements of Metro Manila, the Philippines. *Disaster.* 2016;40(4):693-719.
3. Ashkenazi I, Einav S, Olsha O, et al. The impact of age upon contingency planning for multiple-casualty incidents based on a single center's experience. *Prehosp Disaster Med.* 2016;31(5):492-7.
4. Lin MR, Huang W, Huang C, et al. The impact of the Chi-Chi earthquake on quality of life among elderly survivors in Taiwan—a before and after study. *Qual Life Res.* 2002;11(4):379–88.
5. Jia Z, Tian W, Liu W, et al. Are the elderly more vulnerable to psychological impact of natural disaster? A population-based survey of adult survivors of the 2008 Sichuan earthquake. *BMC Public Health.* 2010;10(1):1–11.
6. Gotanda H, Fogel J, Husk G, et al . Hurricane Sandy : Impact on emergency department and hospital utilization by older adults in lower Manhattan, New York (USA). *Prehosp Disaster Med.* 2015;30 (5):496 -502 .

7. Goenjian AK, Najarian LM, Pynoos RS, et al. Posttraumatic stress disorder in elderly and younger adults after the 1988 earthquake in Armenia. *Am J Psychiatry*. 1994;151(6):895–901.
8. Perry RW, Lindell MK. Preparedness for emergency response: Guidelines for Emergency Planning Process. *Disasters*.2003;27 (4): 336-50.
9. Miceli R, Sotgiu I, Settanni M. Disaster preparedness and perception of flood risk: A study in an alpine valley in Italy. *J Environm Psy*. 2008; 28: 164-73.
10. Thieken A H, Kreibich H, Muller M, et al. Coping with floods: preparedness, response and recovery of flood-affected residents in Germany in 2002. *Hydrol Sci J*. 2001; 52:5:1016-37.
11. Paganini M, Borrelli F, Cattani J, et al. Assessment of disaster preparedness among emergency departments in Italian hospitals: a cautious warning for disaster risk reduction and management capacity. *Scand J Trauma Resusc Emerg Med*. 2016;15:24(1):101.
12. True NA, Adedoyin JD, Shofer FS, et al. Level of disaster preparedness in patients visiting the emergency department ; results of the civilian assessment of readiness for disaster (CARD) survey. *Prehosp Disaster Med*. 2013;28(2):127-31.
13. Older population and health system: A profile of Thailand.
http://www.who.int/ageing/projects/intra/phase_one/alc_intra1_cp_thailand.pdf. Accessed 4 January 2018.
14. Guerena-Burgueno F, Jongsakul K, Smith BL, et al. Rapid assessment of health needs and medical response after the tsunami in Thailand, 2004-2005. *Mil Med*. 2006;171(1):8-11.
15. Rattanakanlaya K, Sukonthasarn A, Wangsrikhun S, et al. A survey of flood disaster preparedness among hospitals in the central region of Thailand. *Australas Emerg Nurs J*. 2016;19(4):191-7.
16. Yoda T, Yokoyama K, Suzuki H, et al. Relationship between long-term flooding and serious mental illness after the 2011 flood in Thailand. *Disaster Med Public Health Prep*. 2017;11(3):300-4.
17. Al -rousan TM, Rubenstein LM, Wallace RB . Preparedness for natural disasters among older US adults : A national wide survey . *Am J Public Health* . 2014;104 :506 -11.
18. Daugherty JD, Hilary E, Blake S, Howard . Disaster preparedness in health and personal -care agencies : Are they ready? .*Gerontology* . 2012;58 (4):322 -30.
19. Centers for Disease Control and Prevention. Identifying vulnerable older adults and legal options for increasing their protection during all-hazards emergencies: a cross-sector guide for states and communities. 2012. <http://www.cdc.gov/phpr/documents/aging.pdf>. Accessed 20 March 2018.

20. American College of Emergency Physicians. Disaster Planning Toolkit for the Elderly and Special needs Persons. 2013. <https://www.acep.org/globalassets/uploads/uploaded-fils/acep/by-medical-focus/disaster/disaster-planning-toolkit-for-special-needs-and-the-elderly-06131.pdf>. Accessed 20 March 2018.
21. Torti J. Floods in Southeast Asia: a health priority. *J Glob Health* . 2012; 2(2): 020304.
22. Wattanapisit A, Saengow U. Patients' perspectives regarding hospital visits in the universal health coverage system of Thailand: a qualitative study. *Asia Pac Fam Med*. 2018;3:17:9.
23. Fernandez LS, Byard D, Lin CC, et al. Frail elderly as disaster victims: emergency management strategies. *Prehosp Disaster Med*. 2002;17(2):67–74.
24. O’Sullivan TL. Support for families coping with stroke or dementia: special considerations for emergency management. *Radiat Prot Dosimetry*. 2009;134(3-4):197–201.

Tables

Table 1. Baseline Characteristics

Variables	N=243(%)
Age, median (IQR)	72 (66-81)
SPMSQ Score, median (IQR)	4 (2-6)
Gender	
Female	154 (63.4)
Professional	
No work	197 (81.1)
Retired government employee	19 (7.8)
Housemaid	8 (3.3)
Business	19 (7.8)
Had monthly income	
Yes	46 (18.9)
No	199 (81.9)
Median income (IQR) Thai baht	10,000 (21,500)
Educations	
Primary school	140 (57.6)
Secondary School	55 (22.6)
College or Higher	25 (10.2)
Uneducated	23 (9.5)
Underlying Diseases	
Hypertension	148 (60.9)
Diabetes	108 (44.4)
Cardiovascular disease	56 (23.1)
Dyslipidemia	50 (20.6)
Chronic kidney disease	31 (12.8)
Chronic obstructive pulmonary disease or asthma	14 (5.8)
Cancer	11 (4.5)

Cerebrovascular disease	10 (4.1)
Functional status	
Doing basic activities of daily living	137 (56.4)
Used cane or walker to ambulate	85 (34.9)
Needed help to ambulate	18 (7.4)
Bed ridden	3 (1.2)

Table 2: Preparedness knowledge for disaster

Questions	Most					Least
	5	4	3	2	1	
1.Had knowledge about disaster preparedness	103 (42)	59(24)	52(21)	23(10)	6(3)	
2.Participant for disaster preparedness course	177 (73)	19(8)	29(12)	15(6)	3(1)	
3.Had healthcare provider provide knowledge about disaster	176 (72)	37(15)	16(7)	12(5)	2(1)	
4.Known risk for disaster in community	100 (41)	67(28)	51(21)	23(10)	2(1)	
5.Had plan for disaster situation	139(57)	55(23)	28(12)	18(7)	3(1)	

Table 3. Disaster preparedness indicator

Variables	60-74 Yrs N=141 (%)	>74 Yrs N=102 (%)	<i>P</i> <i>value</i>
Known specific location of shelter in emergency situation	30 (21.3)	18 (17.7)	0.48
Had emergency tool box	37 (26.2)	24 (23.5)	0.63
Had medications supply in disaster situation	101/115(87.8)	74/82 (90.2)	0.59
Limited mobility when need to transfer	61 (43.3)	72 (70.6)	<0.01
Used natural gas in residence	133 (94.3)	94 (92.2)	0.50
Had medical devices with electronic supply	8 (5.7)	6 (5.9)	0.95
Had power cut off system or known how to turn of abnormal electrical supply	14 (9.9)	6 (5.9)	0.26
Knows emergency telephone number	59 (41.8)	25 (24.5)	<0.01
Knows how to contact organization for helping in emergency situation	85 (60.3)	49 (48.0)	0.06
Had telephone for emergency call	122 (86.5)	59 (57.8)	<0.01

Figures

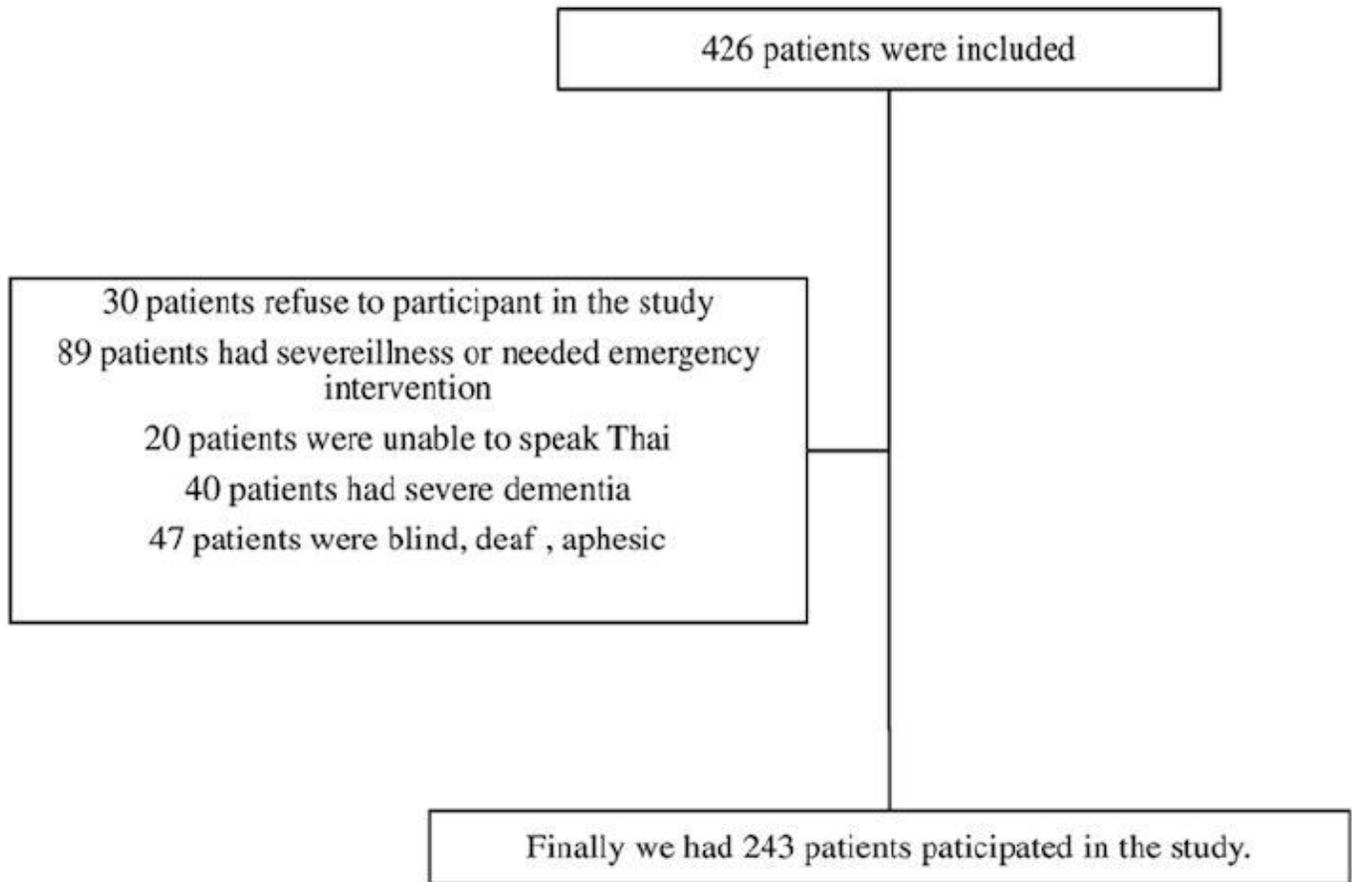
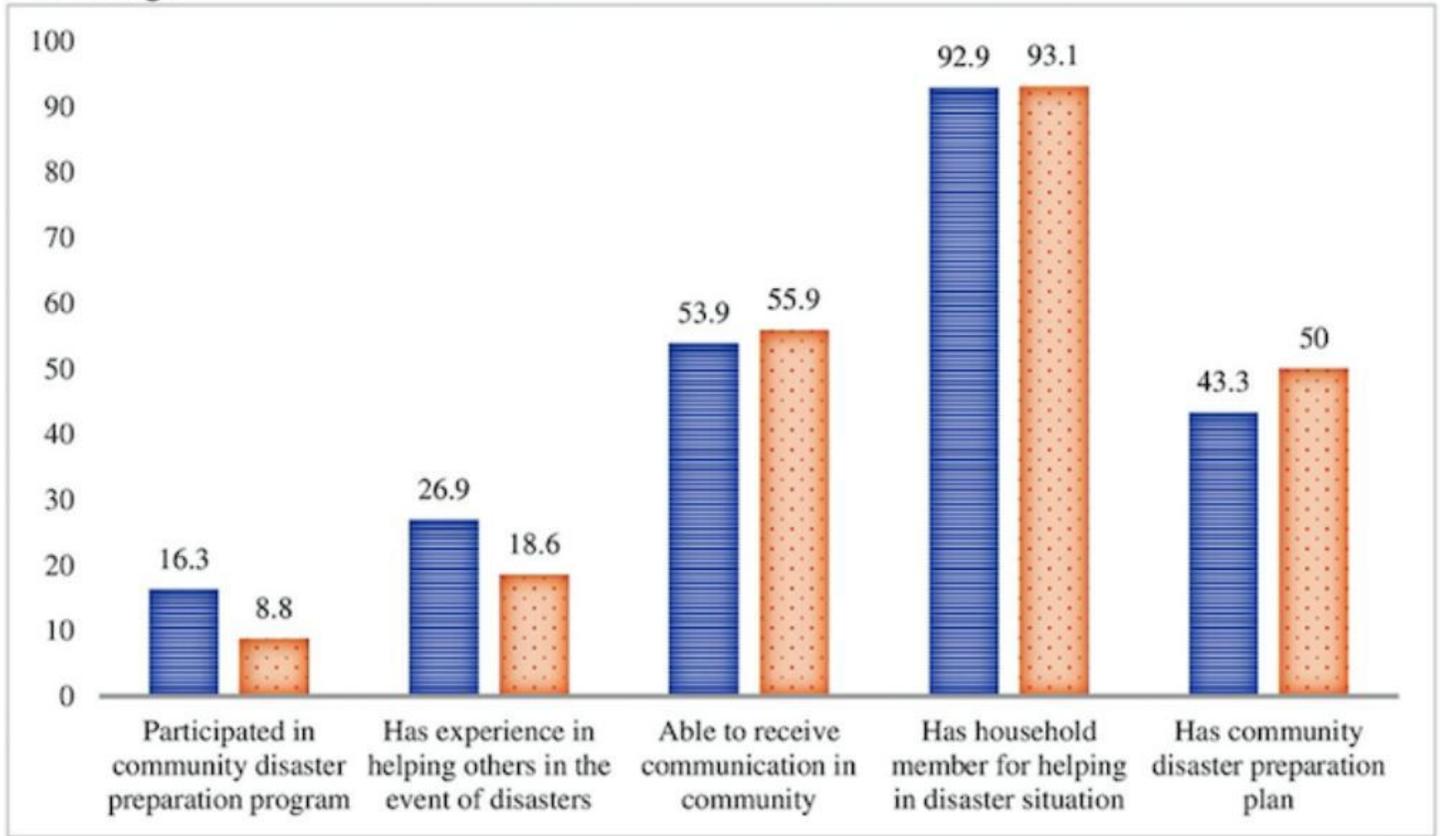


Figure 1

Subject enrollment

Percentage



 Age 60-74 years.  Age 75 years and older

Figure 2

Community and family preparedness indicator (percent as percentage)

Supplementary Files

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