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Disaster preparedness of households of educational staff at Yasuj University of Medical Sciences: a descriptive cross-sectional study

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Abstract

Disaster preparedness in households of educational staff plays a crucial role in effective disaster management and training strategies. Accordingly, this study was designed to assess the level of disaster preparedness among households of educational staff at Yasuj University of Medical Sciences. A descriptive cross-sectional study was conducted with 214 randomly selected participants, including faculty members, administrative, and service staff. Data were collected using demographic forms and a household disaster preparedness questionnaire. Statistical analysis was performed using SPSS version 23. The overall household preparedness score was low at 21.3%. Faculty members and educational instructors had the highest preparedness level with a mean score of 24%, while other groups scored lower. Household disaster preparedness was suboptimal and influenced by socioeconomic factors. Enhancing resilience requires transitioning from theoretical education to practical interventions, including simulation drills, financial subsidies for supplies, and psychological support to empower staff.

Key words: disasters, preparedness, household, university staff.

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Introduction

The United Nations Office for Disaster Risk Reduction (UNISDR) defines a disaster as a significant disruption in the functioning of a community at various scales, resulting from the interaction of vulnerability, exposure to risk and capacities. A disaster is "a serious disruption of the functioning of a community causing widespread human, material, or environmental losses that exceed the affected community's ability to cope using its resources".[1] Disasters may be natural or human made. Natural disasters include sudden, large-scale events such as earthquakes, storms, tsunamis, and floods that are generally unpredictable and uncontrollable. Human-induced disasters include armed conflicts (wars, terrorist attacks, religious conflicts) and nuclear accidents.[2] In 2023, 399 disasters were recorded worldwide, resulting in 86,473 deaths, affecting 93.1 million people, and causing economic losses of 202.7 billion USD.[3] Iran ranks among the top ten countries most exposed to both natural and man-made disasters.[4] Over the past century, Iran has experienced natural disasters such as the Bam earthquake (2001), Golestan floods (2001), and the COVID-19 pandemic (2020), as well as human-made disasters like the imposed war (1980-1988).[5] In the last 17 years, nearly 20 earthquakes of magnitude greater than 5 Richter have occurred near Yasuj city; given the city's ageing infrastructure and non-standard building construction, this poses a significant risk of future disaster.[6,7] One of the priorities in the Sendai Framework for Disaster Risk Reduction 2015–2030 is reducing disaster deaths by minimizing damage to primary health infrastructure and service delivery facilities.[8] The World Health Organization (WHO) emphasizes preventive measures and preparedness. Appropriate importance of relief efforts during disasters, preventive actions and preparedness are fundamentally more critical,[9] whereby an appropriate disaster response is feasible only if adequate preparedness is assessed in advance.[10]

Regardless of governmental and affiliated institutional planning and preparedness levels, individual self-reliance can significantly reduce the adverse effects of disasters on individuals and families. Every society, family, and individual should have a preparedness plan to minimize disaster consequences. As the basic unit of society, the family must possess fundamental concepts and understanding of disaster preparedness to protect its members.[11] This underscores the need for comprehensive educational programs to enhance family preparedness and thus reduce the level of disaster-related harm. Universities, especially medical universities, as the leading institutions in the field of health and hygiene, should possess the highest level of expertise in educating families and members of society. Studies have shown that the level of disaster preparedness and knowledge among university staff, particularly medical university faculty, is low.[12,13] This has caused concern and resulted in the implementation of educational workshops that successfully increased faculty preparedness, reaching up to 96% in some studies.[14,15]

A cross-sectional study assessing faculty members' preparedness for earthquakes revealed that only one person (6%) met all preparedness criteria, 115 people (65%) met at least one criterion, and 61 people (34.5%) met none of the preparedness criteria. The study showed that faculty did not have sufficient preparedness for earthquakes. Given their important role in raising student and community awareness about disaster preparedness, motivating faculty to improve their preparedness for earthquakes and similar disasters is essential.[16]

By evaluating the preparedness level of families of staff and faculty, we can obtain a reasonable assessment of their capacity to confront disasters. Since no study has yet investigated the preparedness of families of staff in the Educational and Graduate Studies Deputy of Yasuj University of Medical Sciences against disasters, this research was designed and conducted. The findings and the identification of strengths and weaknesses among these families can provide a basis for developing effective educational strategies to improve their performance and ultimately play a significant role in enhancing community resilience against disasters. Accordingly, this study was designed to assess the Disaster Preparedness of Households of Educational Staff at Yasuj University of Medical Sciences.

Materials and Methods

This descriptive cross-sectional study aimed to assess the level of disaster preparedness among households of staff members affiliated with the Deputy of Education and Graduate Studies at Yasuj University of Medical Sciences. A proportional stratified sampling was employed to select participants. Given the homogeneity of the target population in terms of demographic variables, the staff were categorized into three strata: faculty members, administrative employees, and service personnel. The sample size was calculated using Cochran's formula for a population of 438 individuals, with a confidence level of 95% (α=0.05), an estimated proportion (p) of 0.5, and a margin of error (precision) (d) of 0.05, resulting in a required sample size of 214 participants. Accordingly, 112 faculty members, 91 administrative staff, and 11 service personnel randomly selected from each stratum. Data collection took place from January 25, 2025, to March 12, 2025. The study proposal was approved by the Yasuj University Medical Sciences Research Ethics Committee (code: IR. IR.YUMS.REC.1401.103). Following an explanation of the study's objectives, each participant provided written informed consent. The right to withdraw at any time and the confidentiality of the data were guaranteed, and participation was entirely optional. The study adhered to the principles of the Declaration of Helsinki, ensuring respect for autonomy, privacy, and welfare of all participants.

Inclusion criteria included being a member of a household comprising a father, a mother, and at least one child, voluntary consent to participate in the study and signing the informed consent form.

Exclusion criteria included withdrawal or unwillingness to continue cooperation in the study

Data collection instruments

Demographic information form

This form was designed to collect participants' demographic data, including age, gender, occupation, educational level, and number of children.

Household disaster preparedness questionnaire

This instrument consists of 15 items and was developed by the Ministry of Health and Medical Education of the Islamic Republic of Iran under the title "Household Disaster Preparedness Index (HDPI)." The questionnaire evaluates multiple dimensions of household readiness for disasters, including: conducting family meetings to plan disaster response, creating hazard maps, familiarity with official warning systems, assessment of structural and non-structural home safety, implementation of vulnerability reduction measures, possession of emergency kits and fire extinguishers, development of emergency evacuation routes, establishment of family communication plans during crises, attention to vulnerable groups such as the elderly, first aid training, participation in community-based programs, and conducting emergency preparedness drills. The questionnaire items are dichotomous (Yes/No), with a score of 1 assigned to each "Yes" response and 0 to each "No." The total score is expressed as a percentage on a 100-point scale, reflecting the overall level of household preparedness. The validity and reliability of this questionnaire have been confirmed in prior studies by Ardalan *et al.*[17] and Najafi *et al.*,[17] with a reported Cronbach's alpha of 0.78, indicating acceptable internal consistency.

Study procedure

Following protocol approval and receipt of necessary permissions, coordination with the research environment was conducted prior to sampling. Staff members of the Deputy of Education were categorized into three groups – faculty members, administrative employees, and service staff – based on job type, and sample sizes for each stratum were determined proportionally according to the formula. The household disaster preparedness questionnaire, accompanied by comprehensive instructions at the beginning of the form, was provided to the research units. The data collection instrument was designed as a Google Form and completed by the research units.

Statistical analyses

Statistical analyses were performed using IBM SPSS Statistics (version 23.0). To evaluate household preparedness status, two primary indicators were examined: the percentage coverage of the Household Disaster Preparedness Training program, and the mean household disaster preparedness based on Household Disaster Preparedness Index (HDPI) scores. Continuous variables were described using mean ± Standard Deviation [SD] and median (Interquartile Range [IQR]). Categorical variables were presented as frequencies and relative frequencies along with 95% Confidence Intervals (CIs). Differences in household preparedness levels across various groups were determined using non-parametric Mann-Whitney U and Kruskal-Wallis H tests. *P*-values less than 0.05 were considered statistically significant.

Results

A total of 214 individuals participated in this study. The age range of participants was between 31 and 66 years, with a mean age of 45.42±6.8 years. The gender distribution of the sample was relatively balanced, comprising 108 females (50.5%) and 106 males (49.5%). Regarding educational level, the highest proportion was individuals with a master's degree (33.6%), followed by those holding a doctoral degree (28%). In terms of employment status, the majority were university faculty members (42.5%). Most participants resided in the city of Yasuj (81.8%), while the

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remainder came from the cities of Sisakht, Dehdasht, and Gachsaran (each 6.1%).

The results indicated that the highest level of household preparedness was associated with familiarity with early warnings, with 182 affirmative responses, equivalent to 85.05% (79.57%–89.25%). Conversely, the lowest levels of preparedness pertained to holding family planning meetings and possessing a home emergency kit, for which no households reported a positive response (Table 1).

Of the 214 households assessed, only 79 (36.9%) had received training related to disaster preparedness. The overall mean preparedness score for households was reported at 21.3%, indicating a low level of preparedness within the study population. This rate varied across occupational groups; specifically, the 'Educational Instructors and Faculty Members' group exhibited the highest level of preparedness with a mean of 24%. This group also accounted for the highest coverage of both training (47.9%). Conversely, service sector employees had received no preparedness training, and their preparedness level was the lowest among all groups, with a mean of 10.4% (Table 2). Further statistical analysis was conducted to evaluate the significance of differences between groups (Table 3).

Households with owned housing demonstrated a significantly higher average level of preparedness (23.2%) compared to renting households (15.5%) (P=0.002). The highest preparedness levels were observed among residents of Dehdasht (22.2%), while the lowest levels were seen in Sisakht and Gachsaran (18.5% each), however, these differences were not statistically significant (P=0.858). Individuals with a master's degree reported the highest average preparedness (27.8%), followed by doctoral degree holders (22.8%), whereas those with associate diplomas had the lowest preparedness (12.6%). Preparedness increased with the number of children in the household, with those having two or more children exhibiting significantly higher preparedness than those with only one child (P=0.013) (Table 3).

Discussion

This study examined the disaster preparedness of households belonging to staff members of the Deputy of Education and Graduate Studies at Yasuj University of Medical Sciences in 2024. The findings revealed that the mean household disaster preparedness was 21.3%, indicating a suboptimal level of readiness within the studied population. This preparedness varied significantly across occupational groups, with educational instructors and faculty members exhibiting the highest mean score (24%). This group also demonstrated the highest relative coverage of training (30.7%) and assessment programs (64%). In contrast, despite relatively high assessment coverage (75%), service staff received no related preparedness training and possessed the lowest preparedness level at 10.4%.

Consistent with previous research, prior training appears to be a critical factor; Inal *et al.* (2019) demonstrated that training enhances cognitive skills and hazard assessment abilities, thereby improving individual preparedness.[19] A review of global literature indicates that insufficient household preparedness is a worldwide concern.[20,21] This trend is evident in Iran as well; despite multiple educational programs, Iranian households have not yet reached the desired readiness level. For instance, a study in Tehran found that

Table 1. Distribution of positive responses to the household disaster preparedness questionnaire items.

Questionnaire items	n (%: 95% CI) 214 (100)
Has your household held a planning session to deal with disasters in the past year?	0 (0: 0.00-0.00)
Has your household drawn a map of important hazards?	3 (1.40: 0.45-4.29)
Has the earthquake resistance of your home's structure been assessed by a specialist in the past year?	51 (23.83: 18.56-30.05)
If your home's structure was found not to be earthquake resistant, have you taken any action to reinforce it?	72 (33.64: 27.59-40.29)
Have you assessed the vulnerability of non-structural elements in your residence to earthquakes in the past year?	40 (18.69: 13.98-24.53)
Have you taken any action to reduce the vulnerability of non-structural elements in your home in the past year?	37 (17.29: 12.76-23.00)
Does your household have an emergency/disaster preparedness kit?	0 (0: 0.00-0.00)
Does your household have a communication plan for emergencies and disasters?	15 (7.01: 4.25-11.34)
Does your household have an evacuation plan for emergencies and disasters?	13 (6.07: 3.54-10.22)
Does your household have a specific plan to assist vulnerable groups during emergencies and disasters?	29 (13.55: 9.56-18.87)
Are members of your household familiar with early warnings for major hazards (e.g., flood, storm, etc.)?	182 (85.05: 79.57-89.25)
Are ready-to-use fire extinguishing equipment available in your home?	114 (53.27: 46.51-59.91)
Has at least one member of your household received training in medical first aid in the past year?	108 (50.47: 43.75-57.17)
Does your household participate in disaster management programs in your neighborhood?	8 (3.74: 1.87-7.33)
Has your household conducted an emergency and disaster drill in the past year?	8 (3.74: 1.87-7.33)

Table 2. Household preparedness for natural disasters by job.

Job	Total number of households	Number of trained households	Training coverage %	Mean Preparedness score %
Total	214	79	36.9	21.3
Service	18	0	0.0	10.4
Admin	50	9	18	17.3
Edu staff	146	70	47.9	24

only 10% of participants had taken effective preventive measures,[18] and comparable findings from New York evaluated household disaster preparedness as moderate.[22]

Various factors explain the observed disparities in preparedness, including socioeconomic status, prior disaster experience, and hazard awareness. A major barrier identified in this study is the high cost of preventive actions coupled with financial constraints. These findings align with recent studies in similar contexts; for instance, Yin *et al.* (2025) in China identified income and education as key determinants of preparedness, suggesting that economic stability facilitates the stockpiling of emergency supplies.[23] Similarly, our results regarding low overall preparedness (21.3%) mirror the findings of Karimi Kivi *et al.* (2022) in Ardabil (31%)[24] and Ardalan *et al.* (2020) nationally (9.3%),[17] highlighting a persistent gap in readiness across developing regions. However, unlike the study by Vista *et al.* (2022) in the Philippines, which reported higher preparedness due to frequent typhoon exposure,[25] our population demonstrated lower readiness, possibly due to differences in risk perception. This underscores that the lack of preparedness primarily stems from the substantial expenses of safety equipment relative to household income, highlighting the crucial need for institutional support to reduce vulnerability.

Regarding occupational status, faculty members and educational instructors exhibited higher preparedness (24%) compared to administrative employees (17.3%) and service staff (10.4%). This pattern is consistent with both domestic and international studies, where individuals with higher income, occupational status, and education levels score higher in preparedness indices.[19,26,27] Similarly, this study showed that families with master's (27.8%) and doctoral degrees (22%) were better prepared than those with bachelor's (15.7%) and associate diplomas (12.7%). These findings align with studies conducted in Iran,[17] Hong Kong,[18] and Ghana.[29]

Household composition and tenure also played significant roles. Preparedness increased with the number of children; households with two or more children showed higher readiness than those with only one child, supporting the notion that family size influences the head of the household's motivation to prepare.[19] Housing ownership was another significant factor, with owner-occupied households exhibiting a mean preparedness of 23.2% versus 15.5% among renters. Ozdemir *et al.* (2021) indicate that homeownership increases a sense of responsibility and attachment to the property, correspondingly improving readiness to mitigate disaster risks.[16] From a geographical perspective, while the highest preparedness was observed in Dehdasht (22.2%) and the lowest in Sisakht and Gachsaran (18.5%), these differences were not statistically significant.

Detailed findings on preparedness components revealed a disparity between awareness and action. The highest levels of readiness were related to familiarity with early hazard warnings (85%), possession of firefighting equipment (53.3%), and recent first aid training (50.5%). Conversely, the lowest levels were observed in conducting family planning meetings (0%), drawing hazard maps (1.4%), and participation in emergency drills (3.7%). Compared to a study in Hormozgan Province, which reported higher awareness of warnings (52.52%) and non-structural vulnerability reduction (49.12%), our population showed better access to fire safety equipment but significantly lower engagement in planning and drills.[30]

Limitations

This study relied on self-reported measures of household preparedness, which may not accurately reflect actual behaviors or levels of readiness and may be subject to social desirability bias. Data were collected during a single timeframe, precluding determination of causal relationships. The sample was limited to educational staff of a single university in Yasuj, restricting the generalizability of results to other populations or regions. It is recommended that future research adopt longitudinal designs to assess changes in

Table 3. Comparison of household preparedness levels based on demographic characteristics.

Variables		Median (IQR)	Mean ± SD	p
Residence status	Owner	20.10 (13.40-26.80)	23.24±16.73	0.002
	Renter	13.40 (6.70-21.77)	15.51±11.84	
Residence location	Yasuj	20.10 (13.40-26.80)	21.63±16.84	0.858
	Sisakht	20.10 (6.70-26.80)	18.55±9.92	
	Dehdasht	20.10 (13.40-26.80)	22.16±10.37	
	Gachsaran	20.10 (3.55-26.80)	18.55±13.99	
Age group	31-45	13.40 (6.70-26.80)	18.49±16.35	<0.001
	46-66	20.10 (13.40-30.15)	24.66±14.90	
Gender	Male	20.10 (13.40-26.80)	21.49±15.81	0.285
	Female	13.40 (13.40-26.80)	21.15±16.21	
Education level	Associate/Diploma	13.40 (0.00-20.10)	12.61±10.82	<0.001
	Bachelor's	13.40 (6.70-20.10)	15.67±11.80	
	Master's	20.10 (13.40-33.50)	27.82±19.95	
	PhD	20.10 (13.40-26.80)	22.00±12.28	
Number of children	1	13.40 (6.70, 26.68)	17.40±13.14	0.013
	2	20.10 (13.40-33.50)	24.02±17.44	
	≥3	20.10 (13.40-26.68)	24.45±17.29	
Occupation	Service	13.40 (0.00-15.07)	10.42±8.03	<0.001
	Administrative	13.40 (6.70-20.10)	17.29±15.26	
	Educator/Academic	20.10 (13.40-26.80)	24.00±16.16	

Data are presented as mean ± standard deviation and median (interquartile range). Group comparisons were performed using Mann-Whitney and Kruskal-Wallis tests.

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household preparedness over time and evaluate the impact of educational or structural interventions. Additionally, studies in diverse populations and geographic regions employing mixed methods, including self-reports, direct observation, and objective data, are advised to enhance the validity of preparedness assessments.

Conclusions

The findings of this study reveal a suboptimal level of household preparedness, significantly influenced by determinants such as educational attainment, occupational status, and housing tenure. This underscores the critical need to transition from purely theoretical education toward practical and supportive interventions. Consequently, to enhance resilience and mitigate identified barriers, the university should operationalize annual simulation drills to detect functional vulnerabilities while simultaneously addressing economic constraints by subsidizing essential emergency supplies for staff. Moreover, interventions must extend beyond physical measures to target psychological constructs—specifically self-efficacy—through resilience workshops to empower proactive household behavior. Ultimately, integrating these targeted support mechanisms with local contextual factors will establish a robust foundation for an effective and sustainable disaster response.

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