



# Men's Health in Disasters: A Systematic Scoping Review

Sanaz Sohrabizadeh<sup>1,2\*</sup> and Akbar Eslami<sup>3,4</sup>

1. Air Quality and Climate Change Research Center, Research Institute for Health Sciences and Environment, Shahid Beheshti University of Medical Sciences, Tehran, Iran

2. Department of Health in Disasters and Emergencies, School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran

3. Environmental and Occupational Hazards Control Research Center, Research Institute for Health Sciences and Environment, Shahid Beheshti University of Medical Sciences, Tehran, Iran

4. Department of Environmental Health Engineering, School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran

## Abstract

**Background:** Disasters affect men and women unequally. While both male and female populations have their own needs, capacities and vulnerabilities, little is known about the men's health status in disasters. Thus, the present review is aimed to identify and explain the impacts of disasters on men's health status in the world.

**Methods:** The current scoping review was conducted using PRISMA protocol 2020. Web of Sciences, PubMed, Scopus databases were searched using related keywords. Inclusion and exclusion criteria were used to select the relevant references. EndNote software, version 17, was applied to manage the citations. The data were analyzed using thematic analysis.

**Results:** A number of 13 references was selected for final analysis after screening process. Physical and sexual health were the most frequent aspects of men's health which was studied by the gender and disaster researchers (23.1%). Men's health aspects in disasters were categorized as physical health, mental health, social health and sexual health.

**Conclusion:** Men are visible as the capable group in disasters and their health needs (physical, mental, social, sexual and spiritual health) may likely not be considered post-disasters. Developing gender analysis tools for assessing the vulnerabilities, needs and health status of male population in disasters as well as establishing a sex-disaggregated database for effective decision-making regarding men's health during disasters are highly suggested.

**Keywords:** Disasters, Gender, Health, Men

## \* Corresponding author

**Sanaz Sohrabizadeh, PhD,**  
Air Quality and Climate Change  
Research Center, Research Institute  
for Health Sciences and Environment,  
Shahid Beheshti University of Medical  
Sciences, Tehran, Iran  
**Tel:** +98 9120620346  
**Email:** sohrabizadeh@sbmu.ac.ir,  
ssohrabizadeh@gmail.com

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## Introduction

Vulnerability to natural hazards has been considered as the main determinant of disaster risk and the key driver of disaster damage and losses. Social factors and processes are responsible for the disaster vulnerability including livelihood disparities, urbanization, unsustainable development and social inequalities (1). Thus, people do not suffer from the same consequences of disasters and one of the important factors which need to be considered is gender (2). Distinct needs, roles and capacities of men and women result in the different effects of disasters on them (3). That is, disasters affect men and women unequally.

While both male and female populations have their own needs, capacities and vulnerabilities, little is known about the men's health status in disasters. The gender and disaster literature reported various aspects of women's needs and challenges in disasters and had inadequate focus on men's vulnerabilities and needs at the time of disasters. Men are not always strong, capable and superior during disasters. They seriously suffer from negative consequences of disasters including social, economic and health effects (4).

A few reports considered the men's status in the disastrous situations in several settings and suggested further research for investigating men's conditions in disasters. For example, Global Gender and Climate Alliance (GGCA) report addressing the effects of climate change on men and women showed that men have been more likely to die rather than women during heat waves in US and Australia. Furthermore, men are often at the greater risk of exposure to infectious diseases in US and Canada. Regarding mental health, male farmers were at the high risk of suicide after droughts in India and Australia (5). In Iran, men experienced more physical attacks and mental disorders than women after the Bam earthquake (6). The "invisible men" term can reflect neglecting men's needs and vulnerabilities in various disasters and indicate a need for urgent research and investigations on men's health status, challenges and vulnerabilities at the time of disasters (7). Focusing on men's capacities and capabilities along with ignoring their needs and vulnerabilities can endanger their health and well-being status in disasters. Men's deaths, injuries, physical diseases and mental health

disorders may increase after disasters due to the inadequate attention to their health status. The gender and disaster literature has a considerable deficiency for investigation on men's health issues in disasters. Thus, identifying the disasters' health impacts on male populations can highlight the important aspects of men's health status reported by gender and disaster research. On the other hand, there is a need to collect and conclude the studies addressing men's health in disasters to reveal the gaps which can be investigated by the gender and disasters researchers in the future. Considering such issues, the present review is aimed to identify and explain the impacts of disasters on men's health status in the world. The articles which merely reported any investigation on men's health in disasters were considered to be studied and reported through the current scoping review.

## Materials and Methods

The current scoping review was conducted and reported using PRISMA protocol 2020.

### *Databases and search strategy*

The literature search was conducted through Web of Sciences, PubMed, Scopus during June and July 2023. Google Scholar was used to check any missing references and find the related evidence. The keywords that were applied for searching databases were selected through similar documents and articles as well as suggestions of the experts. The main search terms were selected as men, male population, disasters, health. The search strategy was made by applying AND/OR between chosen keywords and terms. The search keywords and terms were used in text, abstracts and titles of articles.

### *Eligibility criteria*

The researchers used inclusion and exclusion criteria to select the relevant articles.

**Inclusion criteria:** The references had to accomplish the following criteria in order to be included:

The references that studied all aspects of men's health related to disasters

Original articles including the observational and interventional research designs as well as qualitative research method

**Exclusion criteria:** The references were excluded if

they met the following criteria: Gender-based studies that focused on both male and female populations  
 Gender-based references that focused on women's health and well-being  
 Technological disasters  
 Not publish in English

### Studies selection and analysis process

At the first step, studies selection was conducted by the researchers using the abstract and title as well as given the inclusion and exclusion criteria. The full texts of all remaining references were read and analyzed by the researchers. The references that met one of the exclusion criteria were rejected. The quality of the included papers was checked by researchers and all of them had suitable quality. Once the selection of studies was accomplished and the relevant references were finalized, primary analysis was conducted to recognize the main characteristics of the chosen literature. Authors designed a checklist based on the

sections of setting, disaster type and health dimension for all relevant documents. Then, the articles information was extracted according to name(s) of the author(s), title, publication year, article type and research design. All extracted data were evaluated by the authors to verify the completeness and accuracy. EndNote software, version 17, was applied to manage the citations. The data were analyzed using thematic analysis.

## Results

### Description of included studies

A number of 317364 references was retrieved by initial search. After excluding the duplication, 316343 references remained for screening. Out of 316343 extracted studies, 981 articles were removed after reading the abstracts and meeting the exclusion criteria. The number of 40 references were read in full and finally 13 references were included for final analysis (Figure 1).

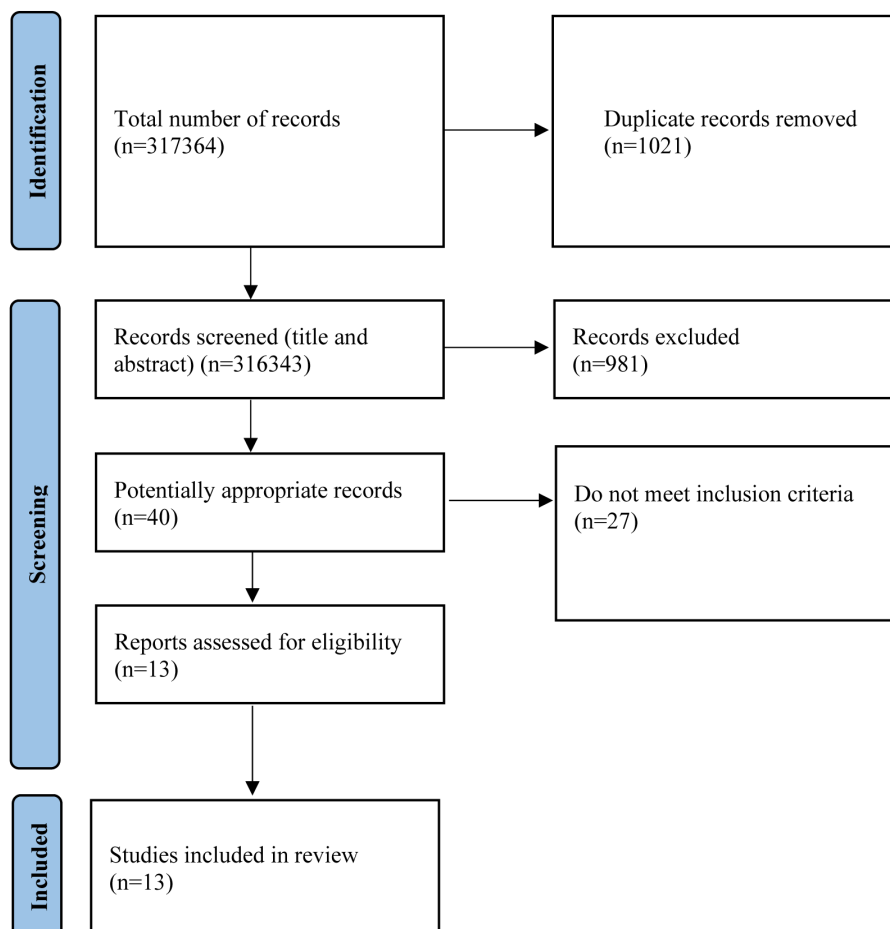


Figure 1. PRISMA flow diagram for articles screening and selections.

All selected articles were published between 1997 and 2022. All included articles were original ones conducted through qualitative (46%), quantitative (46%) and mixed method (8%) research. The main target group of all research was disaster-affected men. Earthquake was the most common disaster which its effects on men's health was investigated by scholars

(38.6%). Physical and sexual health were the most frequent aspects of men's health which was studied by the gender and disaster researchers (23.1%) (Tables 1 and 2).

### Thematic analysis

The final papers were analyzed using thematic

**Table 1.** characteristics of the final articles selected for analysis

Author	Title	Setting	Disaster type	Health dimension
Marc R, 2017	Sometimes you can't even sleep at night: social vulnerability to disasters among men experiencing homelessness in central florida	USA	Natural disasters	Social health
Benight CC <i>et al</i> , 1997	Coping self-efficacy buffers psychological and physiological disturbances in HIV-infected men following a natural disaster	USA	Hurricane	Mental health
O'Donnell MH, Behie AM, 2015	Effects of wildfire disaster exposure on male birth weight in an Australian population	Australia	Wildfire	Physical health
Sohrabizadeh S, Rahimi A, 2017	Men's health and livelihood status in disasters: a qualitative field study in eastern azerbaijan, bushehr, and mazandaran provinces in Iran	Iran	Earthquake, Flood	Physical and mental health
Hirai H <i>et al</i> , 2022	Psychological burden predicts new-onset diabetes in men: a longitudinal observational study in the Fukushima Health Management Survey after the Great East Japan earthquake	Japan	Earthquake	Mental health
Mills J <i>et al</i> , 2013	Sex and drug risk behavior pre- and post-emigration among Latino migrant men in post-Hurricane Katrina New Orleans	USA	Hurricane	Sexual health
Ebrahimian A, Babaei H, 2022	The earthquake's effect on the men's sexual function; 1 year after the earthquake's occurrence: a cross-sectional study	Iran	Earthquake	Sexual health
Labra O <i>et al</i> , 2018	Men's help-seeking attitudes in rural communities affected by a natural disaster	Chile	Earthquake	Social health
NejatiZarnaqi B, <i>et al</i> , 2022	Factors challenging the spiritual rehabilitation of Iranian men affected by natural disasters: a qualitative study	Iran	Natural disasters	Spiritual health
Labra O <i>et al</i> , 2017	Chilean men exposed to the major earthquake in 2010: investigation of the impacts on their health	Chile	Earthquake	Physical and mental health
Atherwood S, 2022	Does a prolonged hardship reduce life span? examining the longevity of young men who lived through the 1930s Great Plains drought	USA	Drought	Physical health
Dwinantoaji H, 2019	Issues related to men participation towards incidence of sexually transmitted infections (STIs) after the merapi eruption 2010 in indonesia	Indonesia	Volcano	Sexual health
Zara C <i>et al</i> , 2016	Men and disaster: men's experiences of the black saturday bushfires and the aftermath	Australia	Bushfires	Physical health

**Table 2.** Frequency of research design, disaster type, and health dimension

No	Subject	N	%
1	Quantitative research	6	46
	Qualitative research	6	46
	Mixed method	1	8
2	Earthquake	5	38.6
	Hurricane	2	15.4
	Wildfire	2	15.4
	Drought	1	7.6
	Volcano	1	7.6
	All hazard	2	15.4
3	Physical health	3	23.1
	Mental health	2	15.4
	Physical and mental health	2	15.4
	Sexual health	3	23.1
	Social health	2	15.4
	Spiritual health	1	7.6

analysis. Accordingly, men's health aspects in disasters were categorized as physical health, mental health, social health and sexual health. However, a number of papers did not consider men's physical health separately and thus, reported the other aspects of men's health in disasters (*e.g.* mental and social health).

### **Men's physical health**

The literature showed that disasters affected the physical health of men negatively. For instance, a research conducted in Australia showed that birth weights of male infants born in the severely fire-affected regions were higher average than their less exposed peers. The males born in the fire-affected area were heavier than males born in the same regions in non-fire years (8).

According to the study performed in Iran, men got involved in quarreling with others after disasters which can result in injuries and death. Furthermore, they usually showed heroic dangerous behaviors in the relief phase that put their lives at risk of death and injuries. In addition, some men had heart attack at

the time of getting stuck in the floods (4). Similarly, the risk-taking behaviors of Australian men during and after the Black Saturday bushfires increased their physical injuries and death. Men took themselves into risky situations that can threaten their lives during response phase (9).

The exposure of young men to drought and dust storms in 341 Great Plains counties and its link to a higher risk of death in early-old age was investigated using a massive mortality dataset. The findings showed that drought exposure had no adverse effects on men aged 65 years or older at the death time. However, the average age at death was partly higher among men with no drought exposure. The stronger effect was obvious among Plainsmen that stayed in place until the end of the drought (10).

### **Men's mental health**

The evidence reported that men's psychological health was affected by disasters. For example, comparing the Coping Self-Efficacy (CSE) of HIV-infected gay men and healthy male after Hurricane Andrew showed that lower Post-Traumatic Stress Disorder (PTSD)

symptoms and emotional distress were related to higher levels of CSE in both groups. Furthermore, higher CSE was related to lower norepinephrine to cortisol ratios in the HIV infected men but not the healthy ones (11).

In Iran, some disaster-affected men stop working on their post-disaster issues and got disappointed to do any effort for improving their status. The loss of family members and loved ones as well as livelihood destruction caused them to sense empty and insignificant feeling and that they did nothing valuable and useful for their society. Furthermore, experiencing the insecurity and disappointment feelings were other mental issues of men living in the disaster-stricken regions in Iran (4).

A 7-year longitudinal study evaluated the effect of possible depression and PTSD on new-onset diabetes mellitus among survivors of the Great East Japan Earthquake. The result of this research showed that the post-disaster burden of depression and PTSD was causally related to new-onset diabetes in men. Furthermore, the authors found that PTSD and mental burden were determined for new-onset diabetes without including the factors of sleep, work condition changes and evacuation in men (12).

Stress and depression were the main mental health complications among Chilean men after the earthquake. Destruction of their homes and livelihood resulted in emotional feelings and pain among affected men. Furthermore, PTSD was a common mental health disorder in men who were affected by the earthquake. The motivation of some men for solving their problems and improving their well-being reduced due to the major post-disaster challenges (13).

### **Men's sexual health**

Some studies reported that men's sexual health was affected by disasters. For example, a research which was conducted after the earthquake in Iran showed that disaster-affected men suffered from sexual dysfunctions. The social support, age, child numbers, location of living place, access to bathrooms and health facilities as well as underlying disease were the factors that influenced sexual dysfunction in men after the earthquake (14).

Research that investigated the sex behaviors of

Latino migrant men after the Hurricane Katrina showed that Female Sex Patronage (FSW) and same sex encounters (MSM) were adopted by the disaster-affected men who had arrived to New Orleans to seek a job. The impermanent nature of migrant work, insufficient social support, isolation and sex partner accessibility were the factors which contributed to sex behaviors of Latino migrant men after the Hurricane Katrina. On the other hand, living with a woman or family members and having a child were found as protective factors against choosing FSW patronage (15).

The perception, involvement and prevention barriers of Sexually Transmitted Infections (STIs) among affected men after the Merapi eruption in Indonesia were explored by a qualitative study. Accordingly, socio-cultural and environmental factors, men's participation, primary health care services and internal factors were identified as main factors affecting STIs perception, involvement and prevention among disaster-affected men. For instance, lack of knowledge on STIs, insufficient sexual and reproductive health information and inadequate access to health information were extracted as the internal factors addressing men's STIs conditions in disaster-stricken regions (16).

### **Men's social health**

Disasters destruct the community structure and result in the adverse social health consequences in the affected regions. Men are identified as one of the social groups who have been influenced by joblessness, homelessness and poverty. For instance, a research which was conducted in Central Florida, USA explored that special medical needs, social stigma, unemployment and unequal exposure increased the exposure of homeless men to natural hazards (17).

The study of help-seeking behavior among men after their exposure to the major earthquake in Chile in 2010 reported the related factors of positive attitudes for help-seeking behavior of men. These factors included higher education, younger age, stable relationship and above-average income. Of these, education levels played the most significant role for establishing the positive attitudes toward help-seeking behaviors after the earthquake (18).

### **Men's spiritual health**

Men's spiritual health factors were explored in the context of Iran. Accordingly, the factors affecting the spiritual rehabilitation of men during disaster recovery phase were identified as victim's perspectives, seeking help from God, psychological and tranquility factors, spiritual beliefs and God's characteristics description. For instance, hope, patience and empathy were explored as the important component of tranquility factors among disaster-affected men (19).

### **Discussion**

According to the findings, physical health, mental health, sexual health, social health and spiritual health are the main aspects of men's health in disasters. Since women are often known as the vulnerable group in disaster management field, different factors and dimensions of women's health in disasters have been identified and reported by gender and disasters researchers (20,21). On the other hand, men are considered as the most capable and resilient group to the extent that their vulnerabilities and health status in disaster have not been adequately studied (4). To the best of our knowledge, any review has not been conducted to investigate men's health in disasters.

According to the findings, men's exposure to disasters as well as their heroic dangerous behaviors and risk-taking actions were the main causes of their death and post-disaster injuries. That is, the physical health of men was reflected as the injuries and death caused by men's behaviors after disasters. However, the manifestations of women physical health were found as more chronic diseases and physical pain due to the increased work pressure and challenges of post-disaster situation (22,23).

Regarding men's mental health, PTSD was the most common mental health disorder among disaster-affected men. Hopelessness, depression, feeling empty and valueless due to losing loved ones and economical destructions were other important mental health issues of men in disasters. In accordance with this findings, disaster-affected women showed similar mental health disorders such as PTSD and depression (24). However, stress, anxiety fear of re-occurring disasters were the mental health disorders which were seen in disaster-affected women (23). It does not mean that disaster-affected men suffer from mental health

disorders less than women. One important reason can be mentioned as the post-disaster psychological health of women have been addressed and reported more than men in the gender and disaster literature.

The sexual health issues of disaster-affected men were found as sexual dysfunctions, FSW and same sex encounters (MSM) as well as prevalence of STIs in different post-disaster settings. That is, men suffer from the increased sexual dysfunctions and diseases after disasters and need reproductive and sexual health services. Women are addressed as the victims of men's sexual health disorder which can cause different types of violence against women post-disasters (25). Thus, men's sexual health disorders need to be treated or reduced by health systems after disasters. It seems that providing reproductive and sexual health for both women and men can reduce the sexual violence and diseases after disasters. Women and men are the target groups of receiving reproductive and sexual health services as well as education and training during disaster prevention and recovery phases.

The destruction of the community and households' livelihoods after disasters can adversely influence men's health. Post-disaster joblessness and poverty play important roles in social health status of men living in the disaster-stricken regions. In Iran, men were almost silent and did not intend to communicate and interact with others after earthquakes and floods. However, the educated men had positive attitude regarding the help seeking behaviors after the 2010 earthquake in Chile. On the other hand, women often tried to communicate and improve their networks after disasters. Women usually interact and talk to other members of the community about their disaster experiences and actively share their feelings and emotions with others (26).

Regarding the spiritual health, men were identified as one of the important groups who can be positively influenced by spiritual rehabilitation interventions in disaster-stricken regions. It seems that working on spiritual health of affected men may improve their general health during disaster recovery phase. On the other hand, women are more susceptible to use their spiritual beliefs for recovering from disasters and returning back to their normal lives. However, spiritual health interventions should be conducted by

trained and educated spiritual leaders or experts.

### Limitations

A huge number of references were found during the initial search due to multidisciplinary nature of the research topic and thus publishing in various journals. Furthermore, the most included references provided holistic picture of men's health in disasters without explaining the details of specific health impacts of disasters on men, especially men's spiritual health.

### Conclusion

The findings of the present review indicated that different aspects of men's health including physical, mental, sexual, social and spiritual health need to be considered after disasters. In various contexts of the world, men are visible as the capable group who must manage the post-disaster fields and help with rescue and relief actions. Thus, their needs and vulnerabilities may be ignored and not considered in disaster response and recovery plans or interventions. Accordingly, the following implications are highly suggested for improving the health status of disaster-affected men:

Gender analysis tools need to be developed for assessing the vulnerabilities, needs and health status of male population in highly disaster-prone regions. The current tools have been almost specified for women needs and health in disasters.

Establishing a sex-disaggregated database can be useful for health systems in order to effective decision-making and planning for meeting the health needs of men during and after disasters. All aspects of men's health (physical, mental, social, spiritual) are related to each other and need to be considered

at the same time. That is, post-disaster interventions and recovery plans should include physical, mental, social and spiritual rehabilitation of disaster-affected men simultaneously.

Community-based education and training need be provided in order to informing and notifying men regarding their health needs and vulnerabilities and improving their knowledge and information about their health status after disasters.

The well-known international disaster risk reduction frameworks and plans (e.g. Sendai Framework for Disaster Risk Reduction) can mention men's vulnerabilities and needs in their next revisions. It can balance considering vulnerabilities and capacities of men equally since their capabilities are highly focused than their vulnerabilities in disasters.

Further research is needed to explore all aspects of men's vulnerabilities and challenges in disasters. For instance, identifying their economic, social and livelihood vulnerabilities require more investigations in disaster settings. In addition, interventional research projects can be designed to identify effective interventions for improving men's health and quality of life after disasters. More research can be conducted for exploring men's needs and health status after the technological disasters.

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### Conflict of Interest

There was no conflict of interest in this manuscript.

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