



# Identifying the Preparedness Components for Sexual Violence in Natural Disasters: A Systematic Review

Haleh Adibi Larijani<sup>1</sup>, Shandiz Moslehi<sup>1,2\*</sup> , Mohsen Dowlati<sup>1</sup>

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## Abstract

**Background:** The probability of sexual violence in areas affected by natural disasters may increase. An increase in the rate of unwanted pregnancies and subsequent intentional abortions, physical and mental injuries, and death can be the consequences of sexual violence. One of the characteristics of natural disasters is their unpredictability and ambiguity. Since decisions must be made quickly during the response, there must be adequate planning in advance, and preparedness in the community will reduce surprises in the responding organizations. This study aimed to identify the factors affecting the preparedness against sexual violence in natural disasters.

**Methods:** In this study, an electronic search was performed in the MEDLINE (PubMed), Scopus, Web of Science, and ProQuest databases. Other search resources, such as Science.gov, Scienceopen.com, Meta-search engines, organizational websites, including UNICEF, UNFPA, and IFRC, as well as key journals and the International Disaster and Risk Conference were hand-searched from 1/1/1990 to 8/29/2021. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) checklist was used to select the studies, and the findings were finally analyzed by thematic analysis method using MAXQDA10 software.

**Results:** A total of 40 papers out of a total of 2978 studies were considered in this analysis. Macropolicies, empowerment, contextualization, management and organization, command community-based, and responsive planning were the five primary categories that were found.

**Conclusion:** Preparedness measures are highly important to respond promptly and effectively to sexual violence and should be integrated into disaster preparedness programs. The findings of this study can be used by disaster response managers and policymakers in developing and improving preparedness programs.

**Keywords:** Sexual Violence, Preparedness, Natural Disasters, Health Services

**Conflicts of Interest:** None declared

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## Introduction

In natural disasters, the possibility of sexual violence may increase due to the destruction of infrastructure, insecurity, and economic and social disruption (1). In such

situations, women, men, and children are all at risk of sexual violence, which can happen to family members, community, military personnel, and humanitarian staff (2).

**Corresponding author:** Dr Shandiz Moslehi, [moslehi.sh@iums.ac.ir](mailto:moslehi.sh@iums.ac.ir)

<sup>1</sup> Department of Health in Disasters and Emergencies, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran

<sup>2</sup> Health Management and Economics Research Center, Health Management Research Institute, Iran University of Medical Sciences, Tehran, Iran

### ↑What is “already known” in this topic:

The likelihood of sexual violence as a concern in disaster-stricken areas increases after disasters. Despite this, a comprehensive study has not been conducted to identify the factors affecting the readiness for sexual violence in natural disasters.

### →What this article adds:

This study identifies the components affecting sexual violence preparedness in disasters by examining other available studies and documents. By understanding these components, policymakers can increase the community's level of preparedness for better prevention and response to sexual violence in natural disasters.

Sexual violence refers to any sexual act, attempt to obtain a sexual act, unwanted sexual comments, or advance or sex trade, or other acts committed against an individual's sexual orientation by any person regardless of the relationship with the victim in any environment, including home and workplace but not limited to it (3). Types of sexual violence can include forced or complete penetration or attempt to do so, drug-facilitated complete penetration or attempt to do so, forcing the victim to completely penetrate or attempt to do so to a third party, with or without using alcohol and drugs, unwanted physical contact, such as contact with different parts of the body, non-physical sexual contact, such as using sexual words, spreading rumors, using power, threatening to rape another person et cetera (2). Sexual violence can lead to consequences, such as an increase in the prevalence of unwanted pregnancies, stillbirths, the prevalence of sexually transmitted infections (STDs), especially human immunodeficiency virus (HIV), unsafe abortions, criminal consequences, psychological trauma, injuries and mortality, and many other problems (4). One in 4 countries does not have the necessary laws and policies to combat sexual violence, while 1 in 3 women has experienced physical or sexual violence at least once in their lifetime (5). In some societies, many of which are also vulnerable to disasters, they do not pay much attention to sexual violence and preparedness against it in disasters, and do not integrate this issue into their disaster management policies and programs. Inadequate recovery and response to postdisaster sexual violence indicate inadequate predisaster preparedness. Therefore, it is necessary to take appropriate predisaster risk management measures to provide adequate health and medical services to victims of postdisaster sexual violence and to provide adequate preparation before the occurrence of disasters (6).

Vulnerable groups, such as the disabled, especially women with disabilities, are more likely than other people to experience sexual violence in areas that need humanitarian assistance. Misunderstanding of risk by planners is a challenge requiring special attention. Disability is an important factor that should be considered in planning to respond to sexual violence in disaster-affected areas (7). Women and men with disabilities are more likely to be sexually abused than women and men without disabilities. Two out of every 5 women and 1 out of every 4 men had a disability at the time of experiencing the violence (8). After disasters, homeless and displaced men and boys frequently endure sexual assault, but these incidents go unreported because it is considered taboo (9). One in 4 men has experienced sexual violence in their lifetime in which there has been physical contact, and 1 in 38 men has experienced rape (10). Despite such problems, many countries are not prepared to respond to these problems (9). The prevention, preparation, and response to sexual violence as one of the needs of reproductive health are substantial difficulties that are not frequently addressed due to cultural sensitivities and the taboo nature of many topics in this field. Education at the community level and taking into account social norms can reduce the incidence of post disaster sexual violence by increasing public awareness

and preparedness, requiring careful design of predisaster educational programs as one of the preparedness measures (11). Preparedness against sexual violence must happen both at the community and individual levels, since better preparedness leads to better response (12). Given that decisions must be made quickly at the time of response, the existence of a regular structure and proper planning in advance and adequate preparation will prevent responsible organizations from surprises, wasting limited resources, and working in parallel after disasters (13). Due to the importance of providing health services to sexual violence victims, it is essential to take the necessary measures to be prepared for violence. This study aimed to systematically review the measures needed to be prepared for sexual violence in natural disasters. The findings of this study can help policymakers in the field of disaster management to improve sexual violence preparedness in natural disasters.

### Methods

#### *Protocol and Registration*

The protocol for the present study was registered in the PROSPERO database on April 10, 2021, with the registration code CRD42021276948.

#### *Eligibility Criteria*

All studies from January 1, 1990, to August 29, 2021, with the subject of the studies or their primary goals on post-disaster sexual violence, were examined in this systematic review. There was no limitation regarding the choice of study method, including descriptive, analytical, quantitative, and qualitative studies. Moreover, sexual violence was not limited to women and girls, and a wide range of sexual violence in general (including men, boys, the elderly, vulnerable groups, etc.) was considered. Studies on sexual violence following unnatural crises, such as wars and civil strife, were excluded. Studies on sexual violence against migrants, the homeless, and refugees that did not occur as a result of natural disasters were also excluded from the study. There were no language restrictions to prevent language bias (Table 1).

#### *Information Sources*

The main key terms in this systematic review are "natural disaster," "preparedness," and "sexual violence," which were selected as the main components of searching. After identifying the synonyms of the key terms by 3 methods, including MeSH, asking experts, and reviewing synonyms in 15 to 20 studies completely related to the research topic, the search syntax was written by combining synonyms with OR and AND operators. Then, an electronic search was performed in 4 databases, including MEDLINE (PubMed), Scopus, Web of Science, and ProQuest. Other search resources, such as Science.gov, Scienceopen.com, and Meta-search engines, organizational websites, including United Nations Children's Fund, the United Nations Population Fund, and the International Federation of Red Cross and Red Crescent Societies, To increase the breadth of search resources, hand searches were conducted in addition to key journals like Disaster Medicine and Public Health Preparedness, Plos One, and the International Dis-

Table 1. Inclusion and exclusion criteria

Eligibility criteria	Inclusion criteria	Exclusion criteria
Community	Moreover, sexual violence was not limited to women and girls, and a wide range of sexual violence in general (including men, boys, the elderly, vulnerable groups, etc.) was considered	-----
Language	There were no language restrictions to prevent language bias.	-----
Context	Natural disaster	. Studies on sexual violence following unnatural crises, such as wars and civil strife, were excluded. Studies on sexual violence against migrants, the homeless, and refugees that did not occur as a result of natural disasters were also excluded from the study.
Date	From 1990/1/1 to 2022/1/1	After and before this date
Result	A wide range of consequences of sexual violence was considered and no limitation was intended	-----
Kind of study	There was no limitation regarding the choice of study method, including descriptive, analytical, quantitative, and qualitative studies.	-----

aster and Risk Conference as International Conference on Integrated Natural Disaster Management (ICINDM), International Conference on Gender-based Violence, and International Conference on Sexual and Reproductive. First, the search term in the PubMed database as the main search database in this systematic review was examined and finalized step by step from inclusive searching to ex-

clusive searching using title and abstract tags. The search syntax was then assigned to other databases and searched in the relevant database. The table is provided in Appendix 1.

### Study Selection

In this study, considering the principle of comprehen-

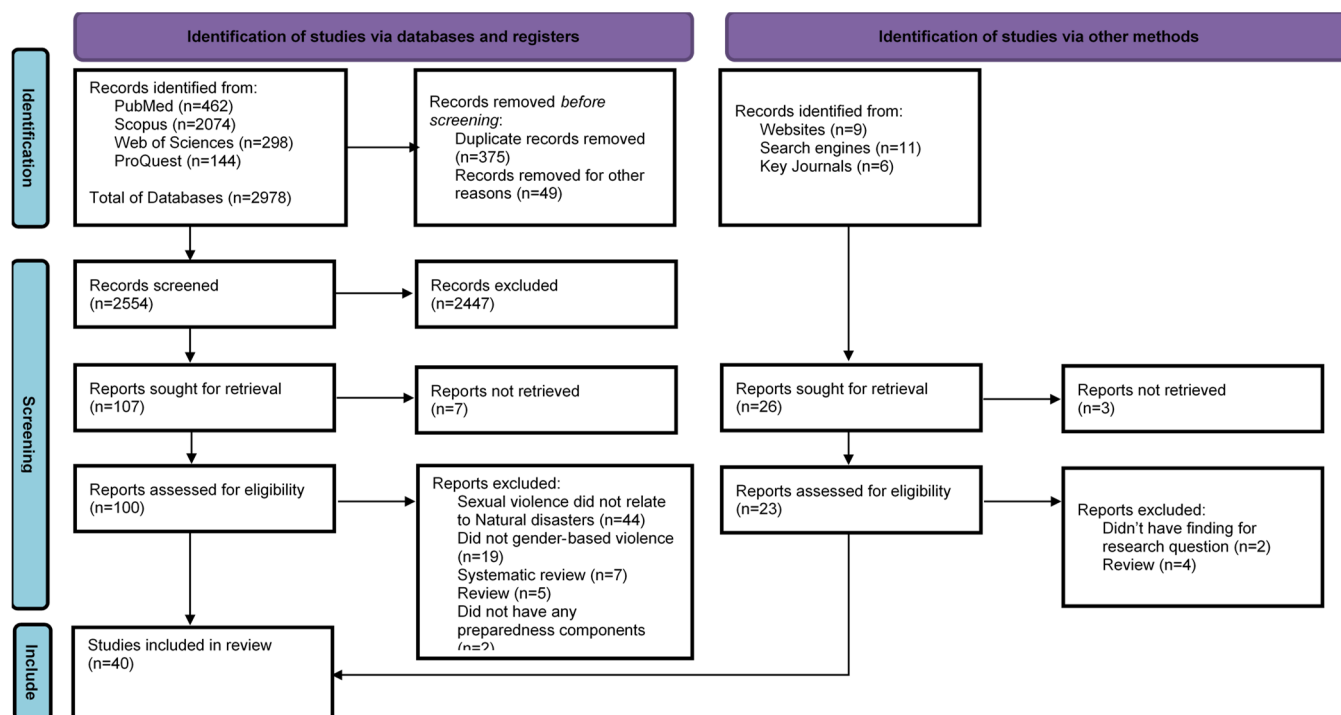


Fig. 1. PRISMA 2020 flow diagram for systematic review of identifying the preparedness components for sexual violence in natural disasters

siveness in searching studies, all the searched studies were transferred to Endnote software (EndNote X7; Thomson Reuters), and duplicate references were removed automatically by the software and also by comparing similar records by the researcher. Then, the initial screening of the studies was performed by the main author, based on the titles and abstracts. In the selection phase, 2 authors selected the studies independently. First, they extracted the full text of the selected studies from the screening phase and reviewed the full text of the studies in response to the main research question. All the studies that were hand-searched in the grey literature search process were directly entered into the selection phase. After studying the full text of the studies, the selection of grey literature studies was performed similarly to the phase of selecting database outputs. The selected articles were then divided into 3 groups: relevant, irrelevant, and unsure.

Studies that were considered irrelevant by both reviewers were removed from the study. Then, each reviewer reviewed the full text of the remaining articles and prepared a list of their included articles. Then the 2 lists were compared and the discrepancies between the 2 lists were discussed. In cases where no agreement was reached, the third person from the team (leader of the research team) made the final decision to include articles. The articles were impartially evaluated by 2 researchers and the quality of the journal publishing the article did not influence the article choice.

The extraction of relevant information from the identified publications to the phase of selecting studies is represented in [Figure 1](#).

#### Data Extraction

In this systematic literature review, study information—including the author's name, year of publication, format (journal article, conference paper), study design, study objective, and the main findings of the relevant studies—were extracted from each included study ([Table 2](#)). The main findings of this study in response to the research question "What are the preparedness components for sexual violence in natural disasters?" were identified and extracted according to the data extraction form ([Appendix 1](#)). The data extraction process was performed by 2 researchers independently and all preparedness components for sexual violence following the occurrence of natural disasters were extracted from the findings and results of studies and analyzed by thematic analysis approach.

#### Risk of Bias in Individual Studies

The studies were critically appraised considering the diversity of studies included in this systematic review. Quality assessment of qualitative studies was performed using the Center for Evidence-Based Management, and grey literature and texts were assessed using the JBI critical appraisal tool for text and opinion (14). In the observational research, thoss-sectional studies are conducted; therefore, the JBI critical appraisal checklist for analytical cross-sectional studies was provided (14). The quality assessment of all the included articles was done separately by 2 authors.

To provide a better description of evaluating the quality of studies with a dedicated risk of bias assessment tools, the scores of the studies were reported in a descensus scoring is as follows: 0 to 2 as weak, 3 to 5 as moderate, and 6 to 8 as strong. The result of the risk of bias assessment of the included studies showed that more than 72% of the studies had strong quality, and no weak study was included ([Appendix 2a-c](#)).

## Results

### Search Results

Based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) table, out of 2554 studies searched with the term "syntax" in databases and 26 studies retrieved from hand searching of grey literature sources, based on matching the title and abstract of articles with the inclusion and exclusion criteria, the full text of 107 studies and 26 grey literature were retrieved, of which 7 papers lacked the full text, while the researcher was unable to obtain the full text for 3 studies.

Finally, the full text of 100 studies and 23 grey literature were reviewed focusing on the systematic review research question.

Out of the total number of studies included in the selection phase, 82 studies were excluded due to a lack of inclusion criteria. These studies were classified into 6 categories. Moreover, 44 studies were not related to natural disasters and epidemics, despite focusing on sexual violence. Nineteen studies did not indicate sexual violence and 7 studies were systematic reviews, and 9 studies were review studies and were not considered original studies, and thus they were excluded from this study. Two studies, despite focusing on sexual violence in natural disasters, did not find any findings appropriate to the issue of preparedness, and 2 studies found no findings in response to the research question of this systematic review.

As a result of the selection phase, 40 studies were included in this study, and the quality of studies and data extraction of the included studies were assessed ([Table 2](#)).

### Data Analysis

The included studies were reviewed using the content analysis approach, which is an inductive qualitative analysis method. Data analysis consisted of 6 steps, including familiarization with the interview, indexing, searching themes, developing the themes, naming themes, and reporting (15, 16). After immersion in the data with the help of the content analysis method, semantic units were extracted, and then by merging these units, the codes were extracted from the text. The codes were categorized and subcategories were identified.

They were obtained from the reclassification of subcategories, categories, and by reviewing many themes. MaxQDA10 software was used in the data analysis process. [Table 3](#) demonstrates the results of 5 themes, including macropolicies, empowerment, contextualization, management, and organization, and community-based and responsive planning.

Table 2. Characteristics of the included studies

No.	Title	Author(s)	Year	Setting	Study method	Journal	Study object(s)	Main Results on sexual violence preparedness	Quality assessment
1	Preparing for and responding to sexual and reproductive health in disaster settings: evidence from Fiji and Tonga	Dawson, A. et al.	2021	Fiji-Tonga	Qualitative study	Research square	Identifying different approaches to capacity building and sexual health response in disasters and future investments	Based on the findings of this study, clarity about stakeholder engagement roles and education are very important in preparing and providing appropriate responses	Strong
48	COVID-19 and gender-based violence: reflections from a “data for development” project on the Colombia-Venezuela border	Zulver, J. M.	2021	Colombia-Venezuela	Conversation	International Feminist Journal of Politics	Investigating the role of feminist research in responding to global health crises	Gender data kit is an information communication technology for responding to GBV reports from affected women, and planning and providing effective services	Strong
32	WHO runs the world-(not) girls: gender neglect during global health emergencies	Wenham, C.	2021	UK	Report	International Feminist Journal of Politics	Identifying the WHO organizational responsibility in policy-making and implementation of prevention, diagnosis and response to sexually transmitted diseases	Providing three suggestions for reforming formal and informal gender emergencies, including: -Developing a gender-based analytical framework for rapid response processes to understand the risk of epidemics. -Ensuring the presence of gender advocates in decision-making bodies to prepare for and respond to the epidemic. -Adding feminist methods to evidence gathering tools to inform policy institutions about epidemic outbreaks	Strong
51	The dark shadow pandemic – assault and sexual violence during COVID-19	Sasidharan, S.	2021	Congo	Short communication	Journal of Medical Sciences (Taiwan)	Investigating the impact of epidemics on increasing domestic violence and sexual violence	-Paying special attention to vulnerable groups, such as the disabled, poor women, the elderly, etc. in preparedness programs to provide sexual violence treatment services -Safe use of mobile health and telemedicine to support people in the face of sexual violence	Strong
36	The impact of the COVID-19 pandemic on gender-based violence in the United States: Framework and policy recommendations	Rieger, Agnes	2021	America	Observational	Psychological trauma: theory, research, practice, and policy	Investigation of GBV risk exacerbation in the socio-ecological model of COVID-19 crisis	GBV interventions in the field of COVID-19 should be increased by considering access to social levels to mental health services.	Moderate

Table 2. Continued

No.	Title	Author(s)	Year	Setting	Study method	Journal	Study object(s)	Main Results on sexual violence preparedness	Quality assessment
59	RHCC intervention: strengthening the delivery and coverage of sexual and reproductive health care during floods in Bangladesh	Ray-Bennett, N. S.	2021	Bangladesh	Qualitative	International Journal of Human Rights in Healthcare	Establishing an RHCC (Reproductive Health Kit 8; Capacity building; Community awareness) intervention package and implementing and evaluating it at three primary health care centers (PHC) in Belkuchi, Bangladesh, to improve the quality and availability of post-abortion care (PAC) during floods	Improving the quality of access to reproductive health care during disasters at the primary health care level was provided by integrated evidence-based intervention packages, such as the RHCC	Strong
37	Droughts, cyclones, and intimate partner violence: A disastrous mix for Indian women	Rai, A.	2021	India	Observational	International Journal of Disaster Risk Reduction	Designing a gender-sensitive evidence-based disaster recovery program to help disaster-affected populations	-Using trained emergency response teams to identify IPV symptoms in disasters and share IPV prevention messages in disasters -Designing mobile applications to connect disaster survivors with response teams as a secure reporting method	Strong
43	Midwifery curricula inclusion of sexual and reproductive health in crisis settings in the Democratic Republic of Congo	Lordfred, A.	2021	Congo	Case Study	Nurse Education in Practice	Reasoning to include the minimum initial service package (MISP) for sexual and reproductive health in crisis in all midwifery curricula	In addition to knowledge, the necessary skills to implement the MISP for midwifery staff with the help of complementary educational modules	Moderate
24	The Impact of the COVID-19 Pandemic on Intimate Partner Violence Advocates and Agencies	Garcia, R.	2021	America	Qualitative	Journal of Family Violence	Investigating personal challenges and resilience of IPV advocates during the COVID-19 epidemic; and how organizations adapt to support IPV survivors during the epidemic	-The way of advocating against IPV -Adopting new methods to advocate against IPV -Providing new solutions -Opportunities and challenges of advocating virtually -Pandemic constraints and effects of pre-existing pandemic challenges on IPV advocacy organizations	Strong
25	Role of Climate Change in Exacerbating Sexual and Gender-Based Violence against Women: A New Challenge for International Law	Desai, Bharat H. et al.	2021	India	Prognostic study	Environmental Policy and Law	Increasing the understanding of the impact of climate change on sexual and gender-based violence	Integrating gender and responding to sexual violence in international law on internally displaced people, human rights law, environmental law and human rights law during war, establishing a coordinated structure between areas, such as the environment, human rights, and refugees, adoption of specific laws by UN member states on the effects of climate change and gender-based violence	Strong

Table 2. Continued

No.	Title	Author(s)	Year	Setting	Study method	Journal	Study object(s)	Main Results on sexual violence preparedness	Quality assessment
40	Evaluation of reproductive health program during disaster in West Sumatra Province	Azrimaidaliza, A. et al.	2021	Indonesia	Qualitative study	E3S Web of Conferences	Evaluation of reproductive health services in disasters	-Lack of equipment and logistics - Lack of specialized manpower -Lack of appropriate policies -Lack of funds -Lack of proper pre- and post- disaster program - Lack of coordination at local, regional, and national levels	Moderate
19	Family violence and COVID-19: Increased vulnerability and reduced options for support	Usher, K.	2020	Australia	Editorial	International Journal of Mental Health Nursing	Study of individual and social vulnerabilities in social isolation	Establishing support networks for people living with domestic violence challenges during quarantine	Strong
17	Interpersonal violence and mental health outcomes following disaster	Molyneaux, Robyn	2020	Australia	Observational	BJPsych open	Examining the experience of victims of violence in communities affected by high, moderate, and low disasters after the 2009 fires in Victoria, Australia	Experiencing post-disaster violence is associated with post-disaster income changes and post-traumatic stress disorder and depressive symptoms among women	Strong
53	Home is not always a haven: The domestic violence crisis amid the COVID-19 pandemic	Kofman, Y. B.	2020	America	Commentary	Psychol Trauma	Investigating the events leading to the increase in domestic violence	Comprehensive post-disaster response and recovery guidelines, including PTSD and DV were proposed at the national, state, and local levels depending on the type of event. In the long run, the epidemic is a critical turning point in implementing guidelines of planning and preparedness to protect domestic violence victims and survivors from the threat of COVID-19 and the inevitability of future disasters.	Moderate
44	A Study on Potential Leadership Approaches to Address Gender-Based Constraints Effective Preparedness for Disasters in Nepal	Nepal, U.	2020	Australia	Mixed method	J Disaster Emerg Res	Understanding effective management approaches to be prepared for sexual violence	-Increased violence after the Haiti earthquake -The positive impact of leadership at the individual, organizational and community levels in reducing gender-based violence -The Impact of Awareness Campaigns, Workshops, and Legal Support on Reducing Gender-Based Violence	Strong

Table 2. Continued

No.	Title	Author(s)	Year	Setting	Study method	Journal	Study object(s)	Main Results on sexual violence preparedness	Quality assessment
46	Violence against women and children following the 2011 great East Japan disaster: making the invisible visible through research	Yoshihama, Mieko.	2019	Japan	Qualitative study	Violence against women	Investigating post-disaster violence against women and children in Japan	Feelings of fear, helplessness, and inability to provide the necessities of life increase the vulnerability of victims of sexual violence; this finding should be taken into account in the prevention and response to gender-based violence.	Moderate
34	Facilitators and barriers in implementing the Minimum Initial Services Package (MISP) for reproductive health in Nepal post-earthquake	Myers, A.	2018	Nepal	Mixed method	Conflict and Health	Description of facilitating factors, implementation barriers and ways to improve response to RH services in Nepal earthquake	Inadequate education of MISP service managers and coordinators, and limited attention to GBV organizations, limited access to clinical management of rape services, low awareness of GBV services, and benefits of providing timely care to victims of reproductive health challenges identified in the Nepal earthquake have been identified.	Strong
38	Reproductive health in the recent disasters of Iran: A management perspective	Jahangiry, K. et al.	2018	Iran	Qualitative study	BMC Public Health	Investigating the executive challenges of reproductive health after disasters in Iran	In providing reproductive health services, cultural factors, planning, education, data collection, establishing a monitoring system and paying attention to men's reproductive health should be considered. Non-discriminatory access, community participation at all stages, and educating men on pre- and post-disaster reproductive health are recommended.	Strong
18	Humanitarian response to reproductive and sexual health needs in a disaster: The Nepal Earthquake 2015 case study	Chaudhary, P.	2017	Nepal	Case study	Reproductive Health Matters	Identifying the challenges and lessons of post-disaster health response provided by the Ministry of Health with the support of UN agencies to meet the needs of adolescents and women	-Organizing RH relief camps, providing emergency RH kits and midwifery kits to health and psychosocial counseling support centers, providing shelter, providing motivational kits for affected women and girls. -Creating female-friendly spaces alongside health facilities to provide a response to gender-based violence -Identifying suitable places for health and mental health information for adolescents	Moderate
50	'Life under the tent is not safe, especially for young women': Understanding intersectional violence among internally displaced youth in Leogane, Haiti	Logie, CH. et al.	2017	Canada	Qualitative study	GLOBAL HEALTH ACTION	Investigating sexual violence experiences among displaced Haitian men and women	Challenges: Insecurity of tents and temporary accommodation, poverty as a factor for rape and theft, trading sex for food Solutions: Creating equal job opportunities, education, hope in the community, and community support	Strong



Table 2. Continued

No.	Title	Author(s)	Year	Setting	Study method	Journal	Study object(s)	Main Results on sexual violence preparedness	Quality assessment
28	A qualitative study of violence against women after the recent disasters of Iran	Sohrabzadeh, S.	2016	Iran	Qualitative study	Prehospital and Disaster Medicine	Investigating different types of violence against women and girls in floods and earthquakes in Iran	Different types of violence against women, including sexual, physical, and psychological violence, must be integrated into disaster healthcare programs in Iran. Fundamental changes must be made to the relevant legislation at the national level. Women should be aware of their rights. The participation of women and men should be considered in all stages of management. A system for monitoring, supervising, and reporting violence against women should be established and a safe environment has to be created for men and women.	Strong
49	Violence and abuse of internally displaced women survivors of the 2010 Haiti earthquake	Campbell, Doris W. et al.	2016	Haiti	comparative descriptive correlational design	Int J Public Health	Describing the level of violence before and after the Haiti earthquake, investigating health consequences, risk factors, cultural factors about sexual violence in women	Significant increase in violence against women before and after the earthquake, increase in physical and mental problems among victims of sexual violence compared to those who did not experience violence, sharing resources, communication between responsible organizations	Strong
56	Unseen, unheard: Gender-based violence in disasters	International Federation of Red Cross Red Crescent Societies	2015	Swiss	Report	IFRC	Better understanding of the risk of sexual violence by national Red Crescent population	-Increase in post-disaster sexual and domestic violence -Homelessness is a factor in increasing sexual violence -Lack of awareness about sexual violence -The need to access legal authorities for survivors of sexual violence in disasters -Integrating prevention and response to sexual violence into disaster programs	Strong
62	Developing institutional capacity for reproductive health in humanitarian settings: A descriptive study	Tran, Nguyen-Toan. et al.	2015	America	Descriptive study	PLOS ONE	Gaining insight into reproductive health services by taking into account the capacities of governmental, non-governmental, and international organizations and NGOs and helping to improve the provision of these services	-The 48 participating countries promoted the provision of reproductive health services in areas requiring humanitarian services through the following measures: coordinating, gender mainstreaming in service delivery, gender-based planning, efforts to improve capacity, take the necessary measures to prevent and respond to sexual violence, holding online educational courses on sexual violence, using reproductive health kits, managing STDs, increasing the budget, training special health workers to respond to reproductive health	Strong
26	"The Women, They Maltreat Them...Therefore, We Cannot Assure That the Future Society Will Be Good": Male Perspectives on Gender-Based Violence: A Focus Group Study With Young Men in Haiti	Gabriel, NC. et al.	2015	America	Qualitative study	Health Care For Women International	Examining Haitian men's perceptions of violence against women and better understanding of the reason of violence against women before and after the 2010 earthquake	- Education regarding violence against women at home and at school -Factors affecting sexual violence include poverty, poor communication between parents, changes in the role of women, culture, education, alcohol and drugs consumption -Increasing the protective role of the police against women in society -Raising public awareness regarding the laws on sexual violence	Moderate

## Preparedness for Sexual Violence in Natural Disasters

Table 2. Continued

No.	Title	Author(s)	Year	Setting	Study method	Journal	Study object(s)	Main Results on sexual violence preparedness	Quality assessment
37	Minimum Standards for Prevention and Response to Gender-Based Violence in emergencies	UNFPA	2015	America	Book section	UNFPA	Determining standard measures for prevention, preparedness, and appropriate and timely response and recovery in the field of gender-based violence	Strengthening national systems and capacity building, preparedness program, prevention and response with regard to positive norms and gender equality, care and reporting, development of community participation guidelines, data collection, access to medical and mental health services for all victims of sexual violence, safety and security, enactment of protection laws for victims of sexual violence, socio-economic empowerment, provision of human resources, coordination, evaluation and provision of mobile services	Strong
31	Guidelines for Integrating Gender-Based Violence Interventions in Humanitarian Action	Inter-Agency Standing Committee	2015	America	Guideline	Inter-Agency Standing Committee	Helping humanitarian communities in areas affected by armed conflicts, natural disasters and other emergencies to prevent and reduce gender-based violence through coordination, planning, implementation, monitoring and evaluation of essential measures	Key factors, such as assessment, planning, implementation, coordination in various areas, such as shelter and housing, education on gender-based violence, child protection, health care provision, nutrition, livelihood, protection, health and safe water, livelihood with aim to reduce risk, increasing resilience, providing response and recovery in the field of gender-based violence in areas requiring humanitarian services, integrating sexual violence into response programs	Strong
20	A framework to understand gender and structural vulnerability to climate change in the Ganges River Basin: Lessons from Bangladesh, India and Nepal	Sugden, F. et al.	2014	Sri Lanka	Lesson learned	International water management institute	Investigating the vulnerabilities and ways of adaptation of women and men in natural disasters	Insecurity in housing, increasing the likelihood of gender-based violence in women when providing water, food, and fuel; reducing job opportunities and poverty after natural disasters among women compared to men; loss of social support, loss of socio-economic structures, participation of women and men in planning	Strong
35	Symptoms of PTSD in a sample of female victims of sexual violence in post-earthquake Haiti	Rahill, Guitele J. et al.	2014	America	Qualitative study	Affective Disorders	Identifying the biological, neurological and psychological effects of sexual violence on women after the Haiti earthquake	Rising PTSD in victims of sexual violence after the Haiti earthquake, the need for access to STDs services, including HIV, access to mental health services for screening, the impact of poverty and pre-disaster violence on its prevalence after disasters, access to trauma services as one of the consequences of sexual violence	Moderate
41	Midwives' professional competence for prevention of sexual violence and spread of HIV during disasters in Tehran-2014	Khoshknaz et al.	2014	Iran	Cross-sectional	Nursing Journal of the vulnerable	Assessing the professional competence of midwives in preventing sexual violence and preventing the spread of HIV and other STDs in disasters	The average competence of midwives to provide reproductive health services in these two areas, it seems that the present education is insufficient. The inadequacy of university education and training courses shows the need to revise the content of education. Incorporating related training into the midwifery curriculum may be helpful.	Strong

Table 2. Continued

No.	Title	Author(s)	Year	Setting	Study method	Journal	Study object(s)	Main Results on sexual violence preparedness	Quality assessment
23	Flood-Induced Vulnerabilities and Problems Encountered by Women in Northern Bangladesh	Azad, AK. et al.	2013	Bangladesh	Mixed/ Survey & Interview	Int. J. Disaster Risk Sci	Investigating the vulnerabilities of women in natural disasters	To reduce rape after natural disasters, law enforcement officials need to be trained to meet the needs of women at all stages of the crisis management cycle. The security of the area should be maintained. The reporting of cases of sexual violence should be paid attention. Protection against sexual violence should be prioritized. Primary prevention at the community level, including education, empowerment of women, and a disaster response team trained in sexual violence should be provided. Necessary agreements and coordination should be made between disaster relief organizations.	Moderate
52	Gendered violence in natural disasters: Learning from New Orleans, Haiti and Christchurch	True, J. et al.	2013	Australia	Lesson learned	Aotearoa New Zealand Social Work	Providing lesson learned from earthquakes to highlight the importance of ensuring disaster response planning and decision-making by considering gender and related sensitivities.	-Disasters as an opportunity to create social and economic support for women -Planning during and after disasters, taking into account sexual violence and its consequences -Women's participation in decision-making and planning	Moderate
27	Why Not the University of New Orleans? Social Disorganization and Sexual Violence Among Internally Displaced Women of Hurricane Katrina	Anderson, Peter B. et al.	2011	America	Prevalence study	J Community Health	Prevalence of sexual violence among students before and after Hurricane Katrina	Law enforcement training to reduce sexual violence after natural disasters, expressing the needs of women in all stages of disaster management, prioritizing protection against sexual violence in disasters, proper reporting, disaster prevention measures, women empowerment program, training post-disaster service teams on sexual violence, coordination and signing of memorandums between relevant organizations, public awareness about sexual violence	Strong
22	Effects of Pre- and Post-Katrina Non-violent and Violent Experiences on Male Veterans' Psychological Functioning	Tharp, A. T. et al.	2011	America	Relational study	Disaster Medicine and Public Health Preparedness	Investigating the relationship between the experience of violence and other effective factors before disasters with the experience of violence and its psychological consequences after disasters	Identifying the underlying risk factors for experiencing post-disaster sexual violence as a way to prevent violence, integrating post-disaster response to violence programs	Strong
54	Gendered dimensions of disaster care: critical distinctions in female psychosocial needs, triage, pain assessment, and care	Richter, R. Flowers, T.	2008	South Africa	Survey	American Journal of Disaster Medicine	Paying attention to gender differences and women's needs in preparedness, response, and recovery in disaster	Providing reproductive health needs during disasters, such as providing facilities for childbirth, managing rape and providing services to victims of sexual violence, providing gender-based health services, preventive approach in providing health services, integrating health care into programs , triage	Strong

Table 2. Continued

No.	Title	Author(s)	Year	Setting	Study method	Journal	Study object(s)	Main Results on sexual violence preparedness	Quality assessment
55	Increased Gender-based Violence Among Women Internally Displaced in Mississippi 2 Years Post-Hurricane Katrina	Anastario, M. et al.	2008	America	Cross sectional randomized survey	Disaster Medicine and Public Health Preparedness	Assessing the change in the rate of gender-based violence among IDPs after Hurricane Katrina	Insecurity in housing, increasing the likelihood of gender-based violence in women when providing water, food and fuel, reducing job opportunities and poverty after natural disasters among women compared to men, loss of social support, loss of socio-economic structures, participation of women and men in planning	Moderate
21	Protecting Children from Sexual Exploitation & Sexual Violence in Disaster & Emergency Situations	Delaney, Stephanie, Naik, Asmita	2006	Australia	Monography	ECPAT International	The way of protecting children against sexual violence in disasters	Programs based on human rights, identifying the roots of violence in society, and providing a framework for protecting children from violence in disasters, including existing socio-economic context, community resilience strategies, and support systems	Strong
29	Protection Mainstreaming Training Package	Lee.et.al.	2014	Swiss	Book	UNHCR	-Increasing participants' understanding of mainstream protection -Increasing participants' skills in developing mainstream protection -Demonstrating value and importance of mainstream protection to participants to encourage others to do so	-Providing a community-based approach to support mainstream protection -Establishing coordination among accountable organizations -Increasing public awareness -Integrating mainstream protection in response programs in disaster and emergency affected areas -Promoting a culture of security, respect for human rights, and empowerment of society	Strong
45	Building Capacity for Disability Inclusion in Gender-Based Violence Programming in Humanitarian Settings	Women's Refugee Commission	2015	America	Guideline	Women's Refugee Commission	Providing an overview of the processes, tools and barriers to accessing GBV services for people with disabilities	-Developing a program with the participation of the disabled -Preparing interview forms for the disabled to develop a program -Educating the community about gender-based violence and its impact on preparedness -The roots of violence include: disrespect, inequality, abuse of power	Strong
57	Gender and Disaster Risk Reduction A training pack	Ciampi.et.al.	2011	UK	Book	Oxfam	Training guide on gender mainstreaming in disaster risk reduction programs	-Gender mainstreaming in planning and implementation -Developing preparedness and response programs with a view of gender equality -Prioritizing gender in disaster risk reduction programs -The importance of men's and women's intervention in developing response programs -The importance of using local capacity -The need for women to be involved in decision-making and policy-making	Strong

Table 3. Preparedness components for sexual violence in natural disasters

Code	Sub-category	Category	Theme			
Enabling financial independence for women	Livelihood	Socio-economic roots	Macro-policies			
Educating skills for making a living						
Supportive measures in the community	A safe and supportive community	Policies				
Creating safety in the community						
Eliminating the grounds for delinquency						
Providing appropriate social services	Changes in policies and strategies					
Gender mainstreaming						
Reforming the existing policies	The role of policy makers					
Sensitizing policymakers and decision makers about sexual violence						
Inviting policymakers in sexual violence meetings						
Evidence-based policies	Protective rules	Human rights	Contextualization			
Changes in health care regulations and structures to better respond to sexual violence in disasters						
Advocacy	Changes in society norms					
Identifying legal challenges						
Establishing and reviewing rules						
Making men aware of their role in violating women's rights						
Changing men's attitudes toward sexual violence through awareness						
Preventing stigmatization						
Identifying and breaking taboos in society						
Promoting a culture of gender equality						
Changes in the behaviors and habits of society						
Making women aware of the right to life without violence						
Integrating specialized sexual violence services into disaster health services				Access to health services		
Incorporating outreach services to victims of sexual violence to increase access						
Increasing in access to health services after sexual violence by increasing the number of fixed centers						
Developing teams to provide sexual violence services in disasters	Beyond capacity	Infrastructure and organization				
Organizing teams providing sexual violence services in disasters						
Improving the readiness of responsible organizations	Structuring					
Creating a context for implementing MISP						
Identifying existing structures and their challenges						
Creating a referral system						
Identifying the roles of responsible organizations in the prevention, response, and recovery against sexual violence in disasters						
Establishing a secure structure to respond to victims of sexual violence						
Developing a mechanism to monitor the occurrence of sexual violence						
Promoting the level of mental health in the community against effects of sexual violence				Psychological effects management	Resilience	Empowerment
Improving the level of mental health in employees to reduce the stress of dealing with victims of sexual violence						
Increasing self-confidence in women				Reducing vulnerabilities		
Perception of risk by managers						
Perception of risk by community						
Identifying risks and providing risk reduction methods	Increasing the level of knowledge and changing the attitude of the society	Education and practice				
Raising public awareness formally and informally						
Paying attention to the needs of vulnerable groups in education	Increasing the level of knowledge and skills in the field of accountable organizations					
Educating the community, especially women and girls, on how to access services after sexual violence						
Educating the community, especially women and girls, about prevention and response to sexual violence						
Educating medical staff on prevention and response to sexual violence						
Teaching how to collect forensic medicine samples						
Educating security forces						
Educating the judiciary						
Educating medical staff regarding counseling the victims of sexual violence						
Educating managers in responsible organizations about prevention and response to sexual violence						
Holding retraining and practice courses						
Strengthening the skills of health staff in using equipment						
Strengthening disaster management skills in managers						

### The Results of Survey Studies

**Macropolicies:** The findings of the present study show that to be prepared for disasters, social and economic fac-

tors should be considered. Economic and social pressures increase the rate of violence in disasters, especially against children and women. Creating a safe, supportive, and an-

tipoverty environment are some of the issues that need to be addressed in preparing (17-23). Given the increase in natural disasters due to climate change, policy change is important and policies should be rich enough to support victims of sexual violence in natural disasters and to reduce inequality and discrimination in society (24). Gender mainstreaming in disaster preparedness policies and programs is an important step (10, 25).

**Contextualization:** The findings of this systematic review indicate that contextualization is one of the dimensions of preparedness for sexual violence in natural disasters. Developing new laws to protect victims of sexual assault and amending existing laws (24), altering societal norms and attitudes toward sexual assault, and educating society members, particularly women and girls, about their right to live without violence have all been referred to as preparation measures (26-29). Access to a variety of medical and legal services reduces by destructing infrastructure; therefore, before disasters, measures must be taken to increase access to sexual violence services, including mental health services, and integrate them into the disaster response structure (25, 28, 30-36). To prevent and respond to victims of sexual violence in a timely and appropriate manner, it is necessary to establish super capacity structures for monitoring, response, and referral before occurring disasters (28, 37-40). Understanding the obligations of responsible organizations and enhancing their preparedness have been acknowledged as essential to being ready for sexual violence (1).

**Empowerment:** The findings show that education can increase the level of knowledge and change society's attitude to increase public awareness of how to prevent and access sexual violence services. On the other hand, educating men can reduce the incidence of post disaster sexual violence (31, 38). In order to prevent sexual violence or, in the event that it does occur, to provide appropriate and prompt medical services to victims of sexual violence, it is necessary to educate managers, medical service providers, and judicial staff on the concepts of sexual violence, prevention, and how to respond to sexual violence (1, 23, 26, 27, 30, 34, 41-43). Raising awareness and educating individuals in the community can both stop violence from happening and better prepare them to handle it if it does (34, 44, 45). Creating psychological preparedness and reducing vulnerability at the community level and among medical service providers can increase resilience in sexual violence (46). To integrate the issue of sexual violence in disaster response structure, it is also necessary to create a proper understanding of risk among the managers of responsible organizations (1, 19, 41).

**Management and Organization:** The findings of this study show that coordination at different local and national levels is one of the key measures to be prepared for sexual violence in disasters. Holding memoranda of understanding, intraorganizational coordination meetings, as well as coordination with other service providers, such as safety, nutrition, psychological support, et cetera, make the responsible organizations more prepared (1, 23, 27, 39, 47). Given the taboo nature of sexual violence in many societies, it is necessary to define a mechanism in advance

by collecting and sharing information (37, 38, 48, 49). Other measures of the planning stage that can deliver quality services and speed up the process include allocating resources and funds to victims of sexual assault and providing the appropriate tools (24, 34, 40). Studies have shown that the distribution of health equipment among people in disaster-affected areas can reduce the likelihood of sexual violence. Therefore, providing essential equipment is one of the measures that should be done before occurring disasters. In this context, improving local capabilities can be seen as a solution for improved management (10, 31, 47, 50).

**Community-based and Responsive Planning:** The results obtained in this systematic review revealed that the development of various programs, methods, and processes against disasters is one of the aspects of preparedness for sexual violence and community-based planning should take into account the views and needs of men, women, and special groups, such as disabled people, on the issue of sexual violence (20, 23, 26, 28, 31, 38, 47, 51, 52). The development of procedures and guidelines has also been regarded as useful for fostering readiness and delivering consistent, high-quality services (1, 38, 39, 53). It has been suggested that programs for managing sexual violence be developed and included in the post-disaster health care program (10, 22, 54-57).

## Discussion

The findings of this study show that in macropolicies and socioeconomic factors affecting sexual violence should be considered. The necessary policies to be prepared for sexual violence in disasters should be also established or amended. Other research has shown that women are more susceptible to and impacted by natural disasters due to their lower socioeconomic status than men. Despite the appearance that men and women are equally affected by disasters, women are far more vulnerable because of gender inequality (58), a lack of income, housing issues, and exposure to sexual abuse in order to make a living (6, 35). By increasing women's economic power, their access to health services increases (59). Sexual violence roots in social structures, frameworks, and policies, and their weakness can lead to pre- and postdisaster sexual violence (60). A study has stated that in the event of a disaster, the society should support and protect people, especially women and girls, which requires years of planning in the community before disasters (61, 62), which is in line with the results of the present study. To properly manage sexual violence, it is necessary to identify the cultural, socio-economical roots and social norms and consider them in policies (61, 63) and consider the important role of policymakers in preparing and providing appropriate responses to sexual violence in disasters (11). The results of these studies are consistent with the those of the present study.

According to the findings of this study, paving the way for disaster preparedness for sexual violence is important. It is also necessary to pay attention to the observance of human rights as a fundamental right, the enactment of laws to protect victims of sexual violence, and the establishment of infrastructure and organizations to provide

appropriate and timely services (28, 64, 65). A study has reported that one of the most important measures is to provide the necessary facilities before disasters to ensure access to reproductive health services, including sexual violence services. Other measures that have been mentioned include considering the necessary arrangements for establishing a referral system (18) for victims of sexual violence, confirming the findings of this study (11). Another study has also stated that providing mobile health services by reducing the rate of movement and increasing the access of women and girls to health services can reduce the incidence of sexual violence in disaster-affected areas (66). Failure to provide appropriate services or delay in receiving these services can have irreparable consequences for victims of sexual violence and rape (65). Other studies have reported that social norms in some societies and fear of social stigma are one of the barriers to accessing health services after sexual violence, requiring to be changed before the occurrence of disasters (67-69), which is in line with the present study. The expectations of men in society can lead them to believe that they can abuse women and justify their actions; therefore, changing the norms is effective in reducing the rate of sexual violence; to this end, it is necessary to change the norms before disasters (70). Another important measure for the proper management of sexual violence is the creation of information circulation systems, and it is necessary to take technical measures to establish a system for collecting information (71), which is also consistent with the current study.

The findings of this study show that one of the effective preparedness components for sexual violence in natural disasters is empowering the community as well as the medical staff by increasing resilience, education, and training. In other studies, researchers have found that community knowledge is crucial to preventing sexual violence during disasters and providing the necessary resources in the event of one (9, 18, 72, 73). Raising public awareness of dangerous behaviors helps in preventing sexual violence and letting those who are exposed to it know what services and treatment they should receive (34, 74-77). Education increases the self-esteem of women and girls and empowers them against sexual violence (61). Another study has found that educating women about sexual violence in disasters is a very useful step, confirming the results of this study. Another study found that education is one of the key factors in disaster preparedness, and that in order to include the response to sexual violence program in the response structure, managers of responsible organizations must be informed and trained (66). Lack of knowledge of health care providers about the importance of cultural sensitivities in response to victims of sexual violence can prevent rape victims from reporting. Another study has pointed to the necessity for health care staff to be familiar with the equipment needed to provide services and how to provide services (27, 78). This issue highlights the importance of educating health care providers to be prepared. In line with the findings of the current study, a different investigation has discovered that there is a shortage of medical professionals who are qualified to

treat sexual assault victims (77). In the present study, management and organization are reported as one of the components of preparedness for sexual violence in natural disasters. According to a study, resource management activities like distributing equipment and replenishing equipment that is used to deliver services to victims of sexual assault are all considered preliminary actions (18, 68). Another study has reported that the preparation of equipment and provision of temporary accommodation by considering security points to provide health services to sexual victims must be performed before the occurrence of disasters (59, 79, 80). Capacity building, resource allocation, and funding for sexual violence response programs must take place before the occurrence of disasters (preparedness step) (76). Gathering information about the type and extent of violence in the community before disasters can help identify high-risk locations and individuals, and responsible organizations will be more prepared after disasters, confirming the results of the present study (75, 76, 81). Coordination between different organizations, such as humanitarian organizations, nongovernmental organizations, health care providers, and security forces is important to prevent working in parallel during the response (71, 77), which is consistent with the results of the present study.

The development of a community-based and responsive program in the present study is one of the components of preparedness for sexual violence in natural disasters. A study has stated that community members play an important role in developing a preparedness plan to respond to reproductive health needs, including sexual violence in natural disasters (11, 31, 78, 82). In another study, it has been stated that in disasters, the risk of various forms of violence against women and children increases, and the opinions of people in the community, especially women and disabled people will be more effective in developing more comprehensive programs (7, 83). Another study has stated that medical services provided to victims of sexual violence should be considered based on the community's needs to be accepted by the affected community (69). Researchers have found that comprehensive planning is required to be in line with the culture of the people in affected areas and provide appropriate and timely services and protect human rights. Therefore, strong and sustainable preparedness programs are needed to respond to the needs of sexual violence victims (62, 75). Developing a contingency plan will also help to prevent disasters and their consequences. These results are consistent with the results of the present study. Given that sexual violence is taboo in many societies, reporting is an important challenge in this regard, and defining the reporting process based on the cultural sensitivities of that society can be a good solution (70, 76).

### Conclusion

After occurring natural disasters, the probability of sexual violence in the affected area increases. Therefore, the community and health care workers should be prepared to prevent and respond to sexual violence. The results of this study show that the preparedness components for sexual

violence include macropolicies in the field of sexual violence, contextualization, empowerment, management, and organization, as well as the development of community-based standards and programs. It is expected that by considering these components during disaster preparedness, a more effective response can be provided during disasters. The results of the present study can be used by disaster health managers, policymakers, decisionmakers, and emergency medical service providers in disasters. It is suggested that a qualitative study be conducted to obtain a more complete preparedness component for sexual violence in natural disasters. As a result, managers, healthcare professionals, and, if possible, sexual assault victims' experiences will be available.

### Ethical Approval

The ethical approval of this study was obtained from the Research Ethics Committees of Iran University of Medical Sciences in Tehran, Iran (IR. IUMS. REC.1400.562).

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### Conflict of Interests

The authors declare that they have no competing interests.

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## Appendix 1. Search strategy PubMed

Round	Search Syntax	Records	NNR
1	((Preparedness) OR (preparation) OR (Prepare) OR (Preparing) OR ("Emergency Preparedness") OR ("Disaster preparedness") OR (Preparedness AND Emergency) OR (Readiness) AND ((Violence) OR ("Sexual violence") OR ("Sexual Violences") OR ("Sexual abuse") OR ("Sexual Abuses") OR (Sexual AND violence) OR (Violences AND Sexual) OR ("Sexual Assault") OR (Assault AND Sexual) OR (Assaults AND Sexual) OR ("Sexual Assaults") OR (Abuse AND Sexual) OR (Abuses AND Sexual) OR ("Assaultive Behavior" AND sexual) OR ("Gender Based Violence") OR ("Gender-Based Violence") OR (Gender-based AND Violence) OR ("Violence Exposure" AND sexual) OR ("Violence Exposure") OR (Abuse AND Physical) OR ("Physical Violence") OR (Violence AND Physical) OR ("Physical Maltreatment" AND abuse) OR ("Physical Maltreatment") OR ("Physical Maltreatment" AND sexual) OR ("sexual maltreat") OR ("Reproductive health") OR (sexual AND "reproductive health") OR (Post-rape) OR ("Post-rape care") OR (Rape) OR ("gang rape") OR ("sexual coercion") OR ("Opportunistic violence") OR ("Violence against women") OR ("Violence experiences") OR ("Violence cases") OR ("Sexual harassment") OR ("Violence reduction") OR ("Intimate partner violence") OR ("intimate partner" AND violence) OR ("Violence against women") OR (Violence AND "against women")) AND ((disaster) OR ("Natural disasters") OR ("Disaster settings") OR ("Disaster settings") OR (Cyclones) OR ("Tropical Cyclones") OR (Earthquakes) OR (disaster-stricken) OR (post-disaster) OR (post-earthquake) OR (Earthquake) OR (Refugee) OR (Displacement) OR (Floods) OR (Flood) OR (Migrants) OR ("Asylum seekers") OR (firestorm) OR (firestorms) OR (duststorms) OR ("dust storm") OR (dust-storm) OR (hurricanes) OR (hurricane) OR (tornadoes) OR (tornado) OR (volcanic) OR (eruptions) OR (tsunamis) OR (tsunami) OR (storms) OR (storm) OR (crisis) AND (1990:2021[pat]))	2231	100
2	((Preparedness[tiab]) OR (preparation) OR (Prepare) OR (Preparing) OR ("Emergency Preparedness") OR ("Disaster preparedness") OR (Preparedness AND Emergency) OR (Readiness[tiab])) AND ((Violence) OR ("Sexual violence" [tiab]) OR ("Sexual Violences" [tiab]) OR ("Sexual abuse" [tiab]) OR ("Sexual Abuses" [tiab]) OR (Sexual AND violence) OR (Violences AND Sexual) OR ("Sexual Assault") OR (Assault AND Sexual) OR (Assaults AND Sexual) OR ("Sexual Assaults") OR (Abuse AND Sexual) OR (Abuses AND Sexual) OR ("Assaultive Behavior" AND sexual) OR ("Gender Based Violence") OR ("Gender-Based Violence") OR (Gender-based AND Violence) OR ("Violence Exposure" AND sexual) OR ("Violence Exposure") OR (Abuse AND Physical) OR ("Physical Violence") OR (Violence AND Physical) OR ("Physical Maltreatment" AND abuse) OR ("Physical Maltreatment") OR ("Physical Maltreatment" AND sexual) OR ("sexual maltreat") OR ("Reproductive health") OR (sexual AND "reproductive health") OR (Post-rape) OR ("Post-rape care") OR (Rape) OR ("gang rape") OR ("sexual coercion") OR ("Opportunistic violence") OR ("Violence against women") OR ("Violence experiences") OR ("Violence cases") OR ("Sexual harassment") OR ("Violence reduction") OR ("Intimate partner violence") OR ("intimate partner" AND violence) OR ("Violence against women") OR (Violence AND "against women")) AND ((disaster) OR ("Natural disasters" [tiab]) OR ("Disaster setting") OR ("Disaster settings") OR (Cyclones) OR ("Tropical Cyclones") OR (Earthquakes) OR (disaster-stricken) OR (post-disaster) OR (post-earthquake) OR (Earthquake) OR (Refugee) OR (Displacement) OR (Floods) OR (Flood) OR (Migrants) OR ("Asylum seekers") OR (firestorm) OR (firestorms) OR (duststorms) OR ("dust storm") OR (dust-storm) OR (hurricanes) OR (hurricane) OR (tornadoes) OR (tornado) OR (volcanic) OR (eruptions) OR (tsunamis) OR (tsunami) OR (storms) OR (storm) OR (crisis) AND (1990:2021[pat]))	2133	50
3	((Preparedness[tiab]) OR (preparation[tiab]) OR (Prepare) OR (Preparing) OR ("Emergency Preparedness") OR ("Disaster preparedness") OR (Preparedness AND Emergency) OR (Readiness[tiab])) AND ((Violence) OR ("Sexual violence" [tiab]) OR ("Sexual Violences" [tiab]) OR ("Sexual abuse" [tiab]) OR ("Sexual Abuses" [tiab]) OR (Sexual[tiab] AND violence[tiab]) OR (Violences[tiab] AND Sexual[tiab]) OR ("Sexual Assault") OR (Assault AND Sexual) OR (Assaults AND Sexual) OR ("Sexual Assaults") OR (Abuse[tiab] AND Sexual[tiab]) OR (Abuses[tiab] AND Sexual[tiab]) OR ("Assaultive Behavior" AND sexual) OR ("Gender Based Violence"[tiab]) OR ("Gender-Based Violence"[tiab]) OR (Gender-based[tiab] AND Violence[tiab]) OR ("Violence Exposure" AND sexual) OR ("Violence Exposure") OR (Abuse AND Physical) OR ("Physical Violence") OR (Violence AND Physical) OR ("Physical maltreatment" AND abuse) OR ("Physical Maltreatment") OR ("Physical Maltreatment" AND sexual) OR ("sexual maltreat") OR ("Reproductive health") OR (sexual AND "reproductive health") OR (Post-rape) OR ("Post-rape care") OR (Rape) OR ("gang rape") OR ("sexual coercion") OR ("Opportunistic violence") OR ("Violence against women") OR ("Violence experiences"[tiab]) OR ("Violence cases") OR ("Sexual harassment") OR ("Violence reduction") OR ("Intimate partner violence") OR ("intimate partner" AND violence) OR ("Violence against women") OR (Violence AND "against women")) AND ((disaster[tiab]) OR ("Natural disasters" [tiab]) OR ("Disaster setting" [tiab]) OR ("Disaster settings" [tiab]) OR (Cyclones) OR ("Tropical Cyclones") OR (Earthquakes) OR (disaster-stricken) OR (post-disaster) OR (post-earthquake) OR (Earthquake) OR (Refugee) OR (Displacement) OR (Floods) OR (Flood) OR (Migrants) OR ("Asylum seekers") OR (firestorm) OR (firestorms) OR (duststorms) OR ("dust storm") OR (dust-storm) OR (hurricanes) OR (hurricane) OR (tornadoes) OR (tornado) OR (volcanic) OR (eruptions) OR (tsunamis) OR (tsunami) OR (storms) OR (storm) OR (crisis) AND (1990:2021[pat]))	1058	25
4	((Preparedness[tiab]) OR (preparation[tiab]) OR (Prepare) OR (Preparing) OR ("Emergency Preparedness") OR ("Disaster preparedness") OR (Preparedness AND Emergency) OR (Readiness[tiab])) AND ((Violence) OR ("Sexual violence" [tiab]) OR ("Sexual Violences" [tiab]) OR ("Sexual abuse" [tiab]) OR ("Sexual Abuses" [tiab]) OR (Sexual[tiab] AND violence[tiab]) OR (Violences[tiab] AND Sexual[tiab]) OR ("Sexual Assault"[tiab]) OR (Assault AND Sexual) OR (Assaults AND Sexual) OR ("Sexual Assaults"[tiab]) OR (Abuse[tiab] AND Sexual[tiab]) OR (Abuses[tiab] AND Sexual[tiab]) OR ("Assaultive Behavior" AND sexual) OR ("Gender Based Violence"[tiab]) OR ("Gender-Based Violence"[tiab]) OR (Gender-based[tiab] AND Violence[tiab]) OR ("Violence Exposure"[tiab] AND sexual[tiab]) OR ("Violence Exposure"[tiab]) OR (Abuse AND Physical) OR ("Physical Violence") OR (Violence AND Physical) OR ("Physical Maltreatment" AND abuse) OR ("Physical Maltreatment") OR ("Physical Maltreatment" AND sexual) OR ("sexual maltreat") OR ("Reproductive health") OR (sexual AND "reproductive health") OR (Post-rape) OR ("Post-rape care") OR (Rape[tiab]) OR ("gang rape") OR ("sexual coercion") OR ("Opportunistic violence") OR ("Violence against women") OR ("Violence experiences"[tiab]) OR ("Violence cases") OR ("Sexual harassment") OR ("Violence reduction") OR ("Intimate partner violence") OR ("intimate partner" AND violence) OR ("Violence against women") OR (Violence AND "against women")) AND ((Disater[tiab]) OR ("Natural disasters" [tiab]) OR ("Disaster setting" [tiab]) OR ("Disaster settings" [tiab]) OR (Cyclones) OR ("Tropical Cyclones") OR (Earthquakes) OR (disaster-stricken) OR (post-disaster) OR (post-earthquake) OR (Earthquake) OR (Refugee) OR (Displacement) OR (Floods) OR (Flood) OR (Migrants) OR ("Asylum seekers") OR (firestorm) OR (firestorms) OR (duststorms) OR ("dust storm") OR (dust-storm) OR (hurricanes) OR (hurricane) OR (tornadoes) OR (tornado) OR (volcanic) OR (eruptions) OR (tsunamis) OR (tsunami) OR (storms) OR (storm) OR (crisis[tiab])) AND (1990:2021[pat]))	462	16

*Appendix 2a.* JBI critical appraisal checklist for analytical cross-sectional studies

Included articles	Were the criteria for inclusion in the sample clearly defined?	Were the study subjects and the setting described in detail?	Was the exposure measured in a valid and reliable way?	Were objective, standard criteria used for measurement of the condition?	Were the confounding factors identified?	Were strategies to deal with confounding factors stated?	Were the outcomes measured in a valid and reliable way?	Was appropriate statistical analysis used?	8/8
The impact of the COVID-19 pandemic on gender-based violence in the United States: Framework and policy recommendations	Yes	Yes	Yes	No	Yes	Yes	Yes	No	6/8
Droughts, cyclones, and intimate partner violence: A disastrous mix for Indian women	Yes	Yes	Not Clear	Not Clear	Yes	Yes	Yes	Yes	6/8
Midwifery curricula inclusion of sexual and reproductive health in crisis settings in the Democratic Republic of Congo	Yes	Yes	No	Yes	Yes	Yes	Yes	No	6/8
Interpersonal violence and mental health outcomes following disaster	Yes	Yes	Yes	No	Yes	Yes	Yes	No	6/8
Facilitators and barriers in implementing the Minimum Initial Services Package (MISP) for reproductive health in Nepal post-earthquake	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7/8
Humanitarian response to reproductive and sexual health needs in a disaster: the Nepal Earthquake 2015 case study	Yes	Yes	Yes	Not Clear	Yes	Yes	Yes	No	6/8
A Study on Potential Leadership Approaches to Address Gender-Based Constraints Effective Preparedness for Disasters in Nepal	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	7/8
Flood-Induced Vulnerabilities and Problems Encountered by Women in Northern Bangladesh	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	7/8

## Appendix 2a. Continued

Included articles	Were the criteria for inclusion in the sample clearly defined?	Were the study subjects and the setting described in detail?	Was the exposure measured in a valid and reliable way?	Were objective, standard criteria used for measurement of the condition?	Were the confounding factors identified?	Were strategies to deal with confounding factors stated?	Were the outcomes measured in a valid and reliable way?	Was appropriate statistical analysis used?	
Why Not the University of New Orleans? Social Disorganization and Sexual Violence Among Internally Displaced Women of Hurricane Katrina	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	7/8
Gendered dimensions of disaster care: critical distinctions in female psychosocial needs, triage, pain assessment, and care	Yes	Yes	Yes	Not Clear	Yes	Yes	Yes	Not Clear	6/8
Increased Gender-based Violence Among Women Internally Displaced in Mississippi 2 Years Post-Hurricane Katrina	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not Clear	7/8
Violence and abuse of internally displaced women survivors of the 2010 Haiti earthquake	Yes	Yes	Yes	No	Yes	No	Yes	No	5/8
A Study on Potential Leadership Approaches to Address Gender-Based Constraints Effective Preparedness for Disasters in Nepal	Yes	Yes	Yes	Yes	Not Clear	Yes	No	Yes	6/8
Developing Institutional Capacity for Reproductive Health in Humanitarian Settings: A Descriptive Study	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	7/8
Midwives' professional competence for prevention of sexual violence and spread of HIV during disasters in Tehran-2014	Yes	Yes	No	Yes	Yes	Not Clear	Yes	Yes	7/8
Effects of Pre- and Post-Katrina Nonviolent and Violent Experiences on Male Veterans' Psychological Functioning	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	7/8

Appendix 2b. The Center for Evidence Based Management (CEBM) checklist for qualitative studies

Included articles	Critical appraisal for qualitative studies								Total score
	Was a qualitative approach appropriate?	Was the <u>sampling</u> strategy appropriate for the approach?	What were the <u>data</u> collection methods?	How were data <u>analyzed</u> and checked?	Is the researcher's <u>position</u> described?	Do the results make <u>sense</u> ?	Are the conclusions drawn <u>justified</u> by the results?	Are the findings <u>transferable</u> to other clinical settings?	
RHCC intervention: strengthening the delivery and coverage of sexual and reproductive health care during floods in Bangladesh	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not clear	7/8
The Impact of the COVID-19 Pandemic on Intimate Partner Violence Advocates and Agencies	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	7/8
Violence against women and children following the 2011 great East Japan disaster: making the invisible visible through research	No	Yes	No	Yes	Yes	No	Yes	No	4/8
Preparing for and responding to sexual and reproductive health in disaster settings: evidence from Fiji and Tonga	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8/8
Reproductive health in the recent disasters of Iran: a management perspective	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8/8
A Qualitative Study of Violence Against Women after the Recent Disasters of Iran	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	7/8
Symptoms of PTSD in a sample of female victims of sexual violence in post-earthquake Haiti	No	Yes	Yes	Yes	Not clear	Yes	Yes	No	5/8
'Life under the tent is not safe, especially for young women': understanding intersectional violence among internally displaced youth in Leogane, Haiti	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not clear	7/8
Evaluation of reproductive health program during disaster in West Sumatra Province	Yes	Yes	Yes	Yes	No	No	Yes	Not clear	5/8
"The women, they maltreat them... therefore, we cannot assure that the future society will be good": Male perspectives on gender-based violence: A focus group study with young men in haiti	No	Yes	Yes	Yes	Yes	Yes	Yes	No	6/8

## Appendix 2c. Critical appraisal tools for use in JBI

Included articles	Is the source of the opinion clearly identified?	Does the source of opinion have standing in the field of expertise?	Are the interests of the relevant population the central focus of the opinion?	Is the stated position the result of an analytical process, and is there logic in the opinion expressed?	Is there reference to the extant literature?	Is any incongruence with the literature/sources logically defended?	Total score
							6/6
COVID-19 and gender-based violence: reflections from a “data for development” project on the Colombia–Venezuela border	Yes	Yes	Yes	Not clear	Yes	Yes	5/6
WHO runs the world–(not) girls: gender neglect during global health emergencies	Yes	Yes	Yes	Yes	Yes	Yes	6/6
The dark shadow pandemic – Assault and sexual violence during COVID-19	Yes	Yes	Yes	Not clear	Yes	Yes	5/6
Family violence and COVID-19: Increased vulnerability and reduced options for support	Yes	No	Yes	Yes	Yes	Yes	5/6
Home is not always a haven: The domestic violence crisis amid the COVID-19 pandemic	Yes	No	Yes	No	Yes	Yes	4/6
Guidelines for Integrating Gender-Based Violence Interventions in Humanitarian Action	Yes	Yes	Yes	Yes	Yes	Yes	6/6
Minimum Standards for Prevention and Response to Gender-Based Violence in emergencies	Yes	Yes	Yes	Yes	Yes	Yes	6/6

## Appendix 2c. Continued

Included articles	Is the source of the opinion clearly identified?	Does the source of opinion have standing in the field of expertise?	Are the interests of the relevant population the central focus of the opinion?	Is the stated position the result of an analytical process, and is there logic in the opinion expressed?	Is there reference to the extant literature?	Is any incongruence with the literature/sources logically defended?	Total score
							6/6
Gendered violence in natural disasters: Learning from New Orleans, Haiti and Christchurch	Yes	Yes	Not clear	No	Yes	Yes	4/6
Role of Climate Change in Exacerbating Sexual and Gender-Based Violence against Women: A New Challenge for International Law	Yes	No	Yes	Yes	Yes	Yes	5/6
Unseen, unheard: Gender-based violence in disasters	Yes	Yes	Yes	Not clear	Yes	Yes	5/6
A framework to understand gender and structural vulnerability to climate change in the Ganges River Basin: Lessons from Bangladesh, India and Nepal	Yes	Yes	Yes	Yes	Yes	Yes	6/6
Protecting Children from Sexual Exploitation & Sexual Violence in Disaster & Emergency Situations	Yes	No	Yes	Yes	No	Yes	4/6
Protection Mainstreaming Training Package	Yes	Yes	Yes	Yes	Yes	Yes	6/6
Building Capacity for Disability Inclusion in Gender-Based Violence Programming in Humanitarian Settings	Yes	Yes	Yes	Yes	Yes	Yes	6/6
Gender and Disaster Risk Reduction	Yes	Yes	Yes	Yes	Yes	Yes	6/6
A training pack							