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Women's health-related vulnerabilities in natural disasters: a systematic review protocol

Syadani Riyad Fatema ,[1,2] Md. Shahidul Islam,[1] Leah East,[1] Kim Usher[1]

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[1]Health, University of New England, Armidale, New South Wales, Australia
[2]Sociology, Noakhali Science and Technology University, Noakhali, Noakhali, Bangladesh

Correspondence to
Syadani Riyad Fatema;
sriyadfa@myune.edu.au

ABSTRACT

Introduction There is a paucity of evidence identifying both the physical and psychological health risks and underlying causes of women's health-related vulnerabilities related to natural disasters. Therefore, this systematic review will be conducted to determine the impact of natural disasters on women's health from a global perspective.

Methods and analysis Five electronic databases of health research, including ProQuest, ProQuest Health and Medicine, PubMed, PsycINFO and CINAHL, will be searched to retrieve relevant literature where Medical Subject Headings terms and keywords will be used depending on the search method of each database. Google Scholar will also be searched for preliminary information on the topic and to check for further evidence that may have been missed. Inclusion and exclusion criteria will be developed and refined by the research team. We will restrict our search for empirical full-text articles published in the English language peer-reviewed journals between July 2008 and June 2018 to ensure contemporary evidence is retrieved. Two authors will participate in each step in the process, including title, abstract and full-text screening against inclusion criteria, data extraction and quality appraisal. The quality of selected studies will be assessed using the Mixed Method Appraisal Tool. Data synthesis will follow a sequential explanatory approach. Finally, the quantitative and qualitative findings will be merged under themes and described using a narrative approach.

Ethics and dissemination Formal ethical approval is not required as primary data will not be collected. The results will be published in an international peer-reviewed journal and presented at national and international conferences.

PROSPERO registration number CRD42019123809.

Strengths and limitations of this study

- To the best of our knowledge, this is the first systematic review to identify the prevalence of women's physical and psychological health vulnerabilities in natural disasters based on published peer-reviewed research from a global perspective.
- This study includes a comprehensive search strategy across several health research-related databases to reduce the possibility of duplication and ensure the inclusion of representative studies.
- The review will follow robust guidelines and the quality of the papers included will be assessed using a validated tool.
- Restricting the review of English language articles published between July 2008 and June 2018 is a limitation.

INTRODUCTION

Natural disasters are adverse environmental events that are not directly attributable to human acts and include volcanic eruptions, earthquakes, floods and cyclones in addition to long-term events such as epidemics, drought and famine.[1] Although the 2016 Annual Disaster Statistical Review recorded that the number of natural disasters in 2016 was well below the average recorded in 2006–2015, Asia (46.7%) remained the highest natural disaster-affected continent compared with the USA (24.3%), Africa (16.7%), Europe (8.2%) and Oceania (3.8%).[2] It is evident that in recent decades the frequency of natural disasters is still alarmingly high in some parts of the world.[1–3] In addition, the WHO reported that in contrast to high-income countries, death rates resulting from disasters are four times higher in low-income countries.[1] Among the multifaceted effects of disasters, such as economic losses, damages to houses, roads, farmlands, loss of domestic animals and crops, the health vulnerabilities of disaster victims are serious and enduring. However, from country to country or region to region, women's health status is generally violated in disasters. Of the large number of studies conducted on the detrimental health effects of disasters, the majority has revealed that women are more affected by natural disasters than men,[4] indicating that women have a higher vulnerability to the impact of natural disasters.[5–7]

The concept of vulnerability is interpreted to mean susceptibility to health problems, harm or neglect.[8] It is the degree to which a population, individual or organisation is unable to anticipate, cope with, resist and recover from the impacts of disasters.[1] Additionally, according to Rogers, vulnerability

creates stress and anxiety which affects physical, psychological or social health; it can be personal, situational and environmental. However, women's health vulnerability is more often situational and environmental than personal, in relation to natural disasters.[9]

Many studies have reported that natural disasters have adverse effects on women's physical[6 10–15] and psychological health.[10 16–18] Previous studies have revealed that women's physical health vulnerabilities may impact reproductive outcomes, including early pregnancy loss, stillbirth, premature delivery, perianal rashes and urinary tract infections, leading to greater mortality rates compared with men, and higher rates of malnutrition, sexual exploitation and abuse because of displacement which may increase exposure to sexual violence.[6 10–15 19–22] For example, in China following the Wenchuan earthquake a high prevalence of pelvic fractures and inflammation were reported among women.[13] Similarly, another study on middle-school female students' revealed worse mental and physical health affects where females reported with post-traumatic stress disorder (PTSD), phobic anxiety and sleep disorders, and a higher incidence of abnormal menstruation.[14]

The psychological health vulnerabilities can be short term such as shock, anxiety and sleep disturbance, which in the longer term can lead to emotional disorders, ongoing distress and PTSD as a result of natural disasters.[10 11 16–18 23 24] Much of the research focused on the psychological health of women following natural disasters indicates that being female is the foremost risk factor for developing PTSD and depressive symptoms among adults, adolescents[18] and pregnant women.[24 25] In addition, the psychological health of mothers was worse when compared with other women.[26 27] Furthermore, it is proposed that the mental health conditions of women deteriorated when they do not receive support within a certain period of time,[18] as demonstrated by a high rate of attempted suicide among women after the Niigata-Chuetsu earthquake in Japan.[28] Research also indicates that women experience different levels of vulnerability across the globe. For example, women were found psychologically vulnerable after the earthquakes in Italy[29] and Wenchuan,[14 18] and physically, psychologically and sexually vulnerable after natural disasters in Haiti, Iran and Sri Lanka.[20 30] In developed countries, such as Australia, it is evident that there is a significant direct relationship between women's exposure to bush fires and mental health disorder.[31] In general, women are more vulnerable to being killed and injured as a result of natural disasters.[13–15]

Natural disaster affects poor people generally and disaster fatalities mostly (almost 95%) occur in low-income and middle-income countries,[32] where the death rates of women and children are 14 times higher than men during a disaster.[33] Cannon[34] argues that women from low-income countries like Bangladesh are more likely to be vulnerable as a result of sudden disasters compared with women in developed countries like the USA. The main reasons for this issue are poverty[35] and gender-specific attributes, such as socially determined roles and responsibilities including local customs where women sacrifice their food for other family members.[15 34] In a developing country like Bangladesh, the higher vulnerability of women to disasters is also related to their likelihood of injury due to the lack of adequate shelter, the use of fuel for cooking, lack of access to food and safe water and problems related to maintaining a hygienic lifestyle.[6]

More specifically, women in these regions are more vulnerable to loss of livelihood opportunities, and deprived of relief goods when compared with men.[5 6 36] It is also well documented that in all parts of the world women are more prone to intimate partner violence and sexual abuse/harassment after a natural disaster. For example, during Hurricanes Katrina and Rita, sexual abuse against women in the USA have been widely reported.[37] Despite current research, no prior systematic review was located in the searched databases which focused on the vulnerabilities of natural disasters on women's physical and psychological health and the underlying causes. Therefore, this study will be the first systematic review devoted to this topic. Thus, this systematic review will aim to identify the incidence of women's physical and psychological health vulnerabilities in natural disasters based on published research on the subject from a global perspective. Here, the physical health vulnerabilities will include physical trauma, acute disease, chronic disease, waterborne disease and infectious disease, where emotional trauma, such as shock, anxiety, sleeping disorder, PTSD health outcomes will be considered as psychological health vulnerabilities. The review will provide an opportunity to identify what is currently known and identify gaps in the literature about women's health vulnerabilities in natural disaster-prone areas globally.

Research question

This systematic review aims to answer the following specific review questions:

1. What are the vulnerabilities of natural disasters on women's physical and psychological health?
2. What are the underlying causes for women's health vulnerabilities in natural disasters?

METHODS

Protocol and registration

The protocol is registered in the PROSPERO international prospective register of systematic reviews (CRD42019123809).[38] The Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guideline has been followed to structure the protocol[39] (see online supplementary file 1). The final review will be reported following the PRISMA statement,[40] in accordance with the Joanna Briggs Institute 2014 systematic review manual.[41] In addition, this systematic review will thoroughly review quasi-experimental studies as naturally occurring variables are measured within quasi-experiments.[42]

Patient and public involvement

Patients and public were not involved in this study as this is a systematic review protocol.

Eligibility criteria

Type of participants

Women whose physical and psychological health were affected following natural disasters were included in this study. Studies that evaluate the health outcomes of both men and women will be included if women's health outcomes are reported and discussed separately. Respondents of studies must be adults aged 18 years and above. Informants and women not affected by natural disasters will be excluded.

Type of studies

This systematic review will include peer-reviewed, empirical studies written in English and only those where the full text of the study was available published between July 2008 and June 2018. Literature based on secondary data, grey literature, review articles, commentary, editorials, opinions, debate articles and short or preliminary communication will be excluded. We will also exclude all clinical trials, randomised control trials (RCTs), cluster-RCT and quasi-RCT as this study area includes public health research.

Type of intervention

Natural disasters such as volcanic eruptions, earthquakes, floods, cyclones, hurricane, drought, tsunami, tornado, landslides or mudslides and their impact on women's physical and psychological health.

OUTCOME MEASURES

Primary outcomes

The primary outcomes of this study are to (1) identify the patterns of women's physical and psychological health vulnerabilities in natural disaster-affected areas; (2) examine the causes and consequences of health vulnerabilities of women in disaster-affected areas; (3) identify the association between economic factor/status and women's health vulnerabilities in natural disaster-affected areas; and (4) determine the incidence of physical and psychological health status of women following natural disasters.

Secondary outcomes

To consider the implications of the review findings for further research and policymaking procedures for natural disaster-prone countries.

Search strategy

We searched PROSPERO to identify whether the proposed review has already been conducted in a similar area. Hereafter, the selection of electronic databases and the search strategy were developed in consultation with the Senior Health Sciences Librarian. Population, issue/intervention and context framework has been used to identify the search terms using Boolean operators (AND), wherePopulation/Problem (P): Women OR Woman OR Gender OR Female OR Girls; Intervention/Issue (I): Health OR Health Vulnerabilities OR Health Risk OR Health Hazards OR Psychological health OR Mental health OR Physical Health OR Sexual Harassment and Context (Co): Natural Disaster OR Natural Calamities OR Flood OR Volcanic Eruption OR Earthquake OR Cyclones OR Drought OR Tornado OR Landslide OR Mudslide.

The preliminary idea of the research topic will be gathered from Google Scholar. Then five electronic databases specifically ProQuest, ProQuest Health and Medicine, PubMed, PsycINFO and CINAHL will be searched. These databases are extensively renowned for health research. In addition, different search strategy will be used for each database where we will use a combination of Medical Subject Headings (MeSH) terms and keywords depending on the search methods of databases. An example of a search strategy for the PubMed database is added in online supplementary file 2.

Study selection

Two independent reviewers followed a three-phase search procedure to identify eligible studies. During the initial phase, studies will be identified through title search based on the selection criteria described above. In the second phase, the abstracts of the studies will be screened against the selection criteria of primary screening and will determine whether a full-text review is needed. In the final phase, the full texts of potentially eligible studies will be retrieved, reviewed and assessed for final inclusion. If any duplicated studies are identified, they will be removed. In cases of disagreements, the supervisory team together made the final decision regarding the inclusion or exclusion of a paper.

Data extraction

A standardised data extraction tool will be developed to record information about the selected studies. Data on the following aspects of each study will be extracted independently by the two authors: bibliographic information (ie, author, title, journal name, year of publication, volume, page numbers), study characteristics (ie, study design/methodology, study objectives, country of the study, instruments for data collection, sample size, time of data collection, types of physical and psychological health vulnerability), participant characteristics (ie, age, gender) and main findings and limitations. Discrepancies between reviewers will be resolved in the same manner as described for the quality assessment.

Risk of bias (quality) assessment

The latest version of the Mixed Method Appraisal Tool (MMAT version 2018) will be used to evaluate the risk of bias.[43] The MMAT is designed for the methodological quality appraisal of systematic mixed-method reviews including quantitative, qualitative and mixed-method

studies that are based on empirical data only. The tool comprises two screening questions and 25 criteria for the critical appraisal under five categories: qualitative research (5), RCTs (5), non-randomised studies (5), quantitative descriptive studies (5) and mixed-method studies (5). The quantitative articles will be assessed using the following criteria: (1) representative participants; (2) appropriate measurements; (3) completed outcome data; (4) confounders accounted in design and analysis and (5) conducting an intended intervention. The qualitative categories are (1) appropriate approach to answer a research question; (2) adequate data collection methods to address research question; (3) proper data analysis; (4) interpretation of results sufficiently verified by data and (5) coherence between data sources, collection, analysis and interpretation.

In appraising mixed methods studies, three criteria are assessed: the qualitative component, the quantitative component (either the RCT, non-randomised studies or quantitative descriptive studies) and the mixed method component. Each criterion is scored on a categorical scale (yes, no and cannot tell), and the number of items scored 'yes' is summed for an overall score.[43 44] Each criterion will carry 1 point in the assessment of study, with a maximum score of 7 along with the points of 2 screening questions. As per this assessment model, articles scoring 1–4 points will be considered as 'low quality', 4–5 as 'medium' and those that will score 6–7 points will be regarded as 'high quality'. Two reviewers will independently assess the quality of the included studies. Any disagreements between the reviewers over the risk of bias in particular studies will be resolved through discussion, with the involvement of a third review author where necessary to ensure the quality appraisal process is robust and transparent.

Data synthesis

Depending on the final selected studies, the following analytical technique and interpretation may be required. A sequential explanatory[45] mixed-method approach will be used for data analysis in a single review. In the first phase, the findings of quantitative studies and quantitative parts of mixed-method studies will be analysed. Depending on the selected quantitative studies, statistical intervention outcomes or statistically descriptive analysis will be undertaken and described. In the second phase, the findings of qualitative studies and qualitative parts of mixed-method studies will be analysed using a qualitative thematic analysis. Retrieved studies will be grouped into women's physical health vulnerabilities, psychological health vulnerabilities and both physical and psychological health vulnerabilities. Moreover, outcome variables of women's physical and psychological health vulnerabilities will be identified as with specific health vulnerabilities. Finally, the quantitative and qualitative findings will be merged using a narrative approach. In this case, we will aggregate themes from qualitative studies and synthesise them with the findings of the quantitative studies to develop a synthesis of the overall findings.

DISCUSSION

To the best of our knowledge, this will be the first systematic review of women's physical and psychological health vulnerabilities in natural disaster-affected areas. The results of the review will help to deepen understanding of the patterns of physical and psychological health vulnerabilities during and postnatural disasters in disaster-affected areas. It will also emphasise the significant causes of these vulnerabilities.

We propose that this study will contribute to women's health by identifying their specific vulnerabilities to natural disasters. The results will contribute to the development of effective management policies for women in predisaster, during a disaster and postdisaster periods, respectively. In addition, the research will be part of a doctoral thesis, articles, posters and discussion which will identify the implications of the review and the need for further research in this area.

This systematic review may have some potential limitations. Studies other than peer-reviewed studies will be excluded. The same will be applied for studies in a language other than English which may cause language bias. Moreover, some studies might be missed even though the search strategy followed will be rigorous.

Current study status

This is an ongoing study. At the time of writing this manuscript, quality assessment and data extraction have been completed by two independent reviewers and data analysis is close to completion. At the time of revision of this manuscript, two independent reviewers have completed primary and secondary screening, quality assessment and data extraction.

Amendments

Any amendments to this protocol will be clearly documented specifying the changes with justification. In addition, the amended protocol will be updated/recorded in PROSPERO for final publication with the details of the earlier version of the systematic review protocol.

Ethics and dissemination

The systematic review results will be published in an international peer-reviewed journal following the PRISMA guidance. The authors will also plan a poster or oral presentation at potential conferences to disseminate the review results among the research community. Moreover, to disseminate the findings among non-academics, a link to the published review will be circulated via social media.

Contributors SRF was responsible for drafting the protocol and registering it in PROSPERO. MSI, LE and KU made substantive contributions to the protocol. They significantly contributed towards the development of search strategy, inclusion/exclusion criteria, selection of the appropriate study design, methods and tools. All authors read, revised and approved the final manuscript.

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Competing interests None declared.

Patient consent for publication Not required.

Ethics approval This study involves analysis of data from published studies publicly available without directly involve human participants; hence no ethical approval is required.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iD

Syadani Riyad Fatema http://orcid.org/0000-0002-1096-1230

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