Distribution Agreement

In presenting this thesis or dissertation as a partial fulfillment of the requirements for an advanced degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis or dissertation in whole or in part in all forms of media, now or hereafter known, including display on the world-wide web. I understand that I may select some access restrictions as part of the online submission of this thesis or dissertation. I retain all ownership rights to the copyright of the thesis or dissertation. I also retain the right to use in future works (such as articles or books) all or part of this thesis or dissertation.

Using community based participatory action research (CBPAR) amongst vulnerable populations in post disaster settings: A Scoping Review

By:

Megyn Gordon
Master of Public Health

Hubert Department of Global Health

Claudia Ordóñez, Anthropologist, MAIR
Adjunct Assistant Professor, Hubert Department of Global Health
Committee Chair

Using community based participatory action research (CBPAR) amongst vulnerable populations in post disaster settings: A Scoping Review

By:

Megyn Gordon

Bachelor of Science

Texas A&M University

2019

Thesis Committee Chair: Claudia Ordóñez, Anthropologist, MAIR

A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in Hubert Department of Global Health
2021

Abstract

Objective: This scoping review aimed to examine public health community based participatory interventions implemented among vulnerable populations in post-disaster settings and to identify appropriate and effective community based participatory action research (CBPAR) techniques and components in these settings.

Methods: A scoping review was conducted after searching multiple databases to retrieve the original publications. Eight studies were determined to fit all of the inclusion criteria after they were thoroughly reviewed. Relevant information including disaster type, population, and CBPAR method were identified.

Results: The studies highlighted three important CBPAR components that made the interventions feasible among vulnerable communities in post-disaster settings. These were flexibility, cultural humility and relationship building, and increasing collective and self-efficacy while using various CBPAR methods like photovoice to target participant needs.

Discussion: These main themes and components were important to the functioning of the CBPAR interventions in these post-disaster settings and for the best outcome for the participants. They allowed the studies to be sustainable while being able to fully address the culture and needs of the participants.

Conclusion: CBPAR was shown to successfully work in the post-disaster settings of the eight reviewed studies. Public health professionals should further investigate the effectiveness of CBPAR in post-disaster settings to confirm if community-based approaches can provide a more sustainable and effective approach to recovery, especially for vulnerable populations.

This scoping review was a precursor to more research that should be done in this area in order to determine if CBPAR is an effective method to use in public health interventions after a natural disaster and among vulnerable communities.

Acknowledgements

I would like to give my deepest thanks to Claudia Ordóñez for all of her help and guidance during this process. Her continuous patience and support throughout the writing process helped motivate me to continue. I'd also like to thank Lauren, the other data reviewer. This paper would not have been possible without your opinions, advice and support.

I also would like to acknowledge the friends I have made throughout the program. The constant encouragement through writing and the virtual learning environment was the support I needed the most.

Lastly, I'd like to thank my family for their encouragement and love, even from many states away.

Table of Contents

Introduction

Almost everyone in their lifetime will experience a natural disaster in some form. Model forecasting has estimated that every year during the next 20 years close to 14 million people around the world will be at risk of displacement after a disaster (Vetrhus, 2017). The year 2019 saw globally 24.9 million people displaced, either internally or externally, due to a natural disaster (Frey, 2020). Vulnerable populations are at much higher risk not only for negative impacts during a disaster, but also at much higher risk for poor or slower recovery in the aftermath of the disaster.

People deemed vulnerable are those who are economically disadvantaged, population minorities, the elderly, the homeless, and those with certain medical conditions. These population groups are usually far less prepared than others for disasters and often live in areas that put them at greater risk for problems when a disaster does strike (AJMC, 2006) (SAMHSA, 2017). One of the main difficulties vulnerable populations face is the aftermath of a disaster. They report higher levels of stress, a lack of housing, and more difficulty obtaining aid than those who are not part of a vulnerable group (SAMHSA, 2017). While many public health professionals feel that more of a commitment needs to be made to ensuring vulnerable populations are safe and healthy after a disaster, there isn't a consensus on the most effective way to fulfill this need.

Disaster recovery is difficult for everyone and, as described above, these difficulties are only exacerbated when someone is already considered vulnerable. Community-based participatory action research (CBPAR) has been shown to be an effective method to engage communities while implementing public health interventions. This method or approach allows the community to be a part of all aspects of a research or intervention project, thus opening a

pathway for community needs to be at the forefront of public health activities (Holkup et al., 2004). Using a scoping review, this thesis will explore CBPAR as a promising framework to fulfilling the need for an effective approach to aiding vulnerable populations impacted by disasters.

Problem Statement

While CBPAR has been effectively used for decades in various communities, there is little information on whether it is effective in a post-disaster setting. This scoping review aims to examine CBPAR public health interventions implemented among vulnerable populations in post-disaster settings and to identify appropriate and effective CBPAR techniques and components in these settings.

Literature Review

Community Based Participatory Action Research (CBPAR)

CBPAR is an approach to designing and conducting research in a way that meaningfully engages communities among which the research takes place, with researchers and members of the community working together in partnership in order to facilitate social change (Tremblay et al., 2018). CBPAR has been implemented in many different research contexts, including community health, environmental, and political research (Culhane-Pera et al., 2010). In the context of health research, CBPAR is centered on performing research in the community while creating a mutually beneficial partnership in order to address the health issue or disparity that the community faces (Israel et al., 1998; Jull et al., 2017; Tremblay et al., 2018; Wallerstein &

Duran, 2010). In the CBPAR approach, the research being conducted is centered on an issue deemed important by the community, not necessarily the researchers.

This method originated from the term "action research" coined by Kurt Lewin in the 1940's, who wanted to close the gap between theory and practice in research (Wallerstein & Duran, 2008). Lewin proposed that scientific research and methodologies are able to be directly applied to social progress in the communities being worked with, such as progress in the health of the community (Wallerstein & Duran, 2008). Lewin's method was for the researcher to be directly involved in the community in order to have a more objective view on the research topic.

In the 1970's, Colombian sociologist Orlando Fals-Borda and Brazilian educator and philosopher Paulo Freire led the development of participatory research in the global South (Latin America, Africa, and Asia). This branch of participatory research came to be known as the Southern Tradition (Wallerstein & Duran, 2008). Freire's approach promoted that people who are aware of their situation would be able to change their environment on their own accord. In the last few decades, the Freirian approach has taken hold with community and public health practitioners because it allows for the community members to be more involved in the process, giving them the tools to transform their lives and communities (Wallerstein & Duran, 2008).

Community health is an approach of public health practice that focuses on the well-being of the whole community, not just one person (Brooks, 2019; Goodman et al., 2014). The health of the community has direct effects on an individual's health and well-being, and public health experts argue that strong community health initiatives can help reduce disparities amongst vulnerable, marginalized populations (Goodman et al., 2014). CBPAR falls directly into the branch of community health and is used as a form of research and community engagement to help build health capacity (Burke et al., 2013; Goodman et al., 2014).

There are nine guiding principles for CBPAR that were established in 1998 by Barbara Israel and colleagues at the University of Michigan School of Public Health. They were established in order to enhance and integrate the knowledge known about CBPAR into actionable, well-defined guidelines that focus on engaging and empowering the community. It is also important to note that the overall concept of CBPAR in practice is a combination of all of the nine guiding principles listed below, and that using a single principle while conducting research does not constitute CBPAR. (Israel et al., 1998). The following is a summary of the nine CBPAR principles:

1. *Recognizes community as a unit of identity.*

   This principle is stressing how the community with which the participants identify is significant. Before starting to work, the community in which the research will be conducted needs to be defined (Burke et al., 2013). A community is more than racial and geographic boundaries and is heavily reliant on who feels to be a member of said community.

2. *Builds on strengths and resources within the community*.

   Acknowledging that every community has its own assets is important to the partnership. This is building on the strengths that the community has instead of focusing on their deficits, which is commonly known as "asset-based community development" (McKnight, 2018). Assets can be defined as skills, resources, local institutions, exchange and even social networks (Burke et al., 2013; McKnight, 2018).

3. *Facilitate collaborative, equitable partnership in all phases of the research.*

This principle is used to show the importance of working together and having shared accountability in all decision-making processes. It is also used to address the inequalities that inherently exist between researchers and communities by establishing a respectful relationship between all parties (Minkler, 2012).

4. *Fosters co-learning and capacity building among all partners.*

   As mentioned in the previous principle, it is important to have an equitable partnership which acknowledges that everyone has their own set of skills and experiences that are valuable to the research (Minkler, 2012).

5. *Integrates knowledge and action for mutual benefit of all partners.*

   This principle is used to assure that what is learned throughout the process is integrated into the continued work (Israel et al., 1998). Throughout research findings and new concerns arise. These new points should be worked into the remaining part of the partnership, assuring that it continues to be equally beneficial.

6. *Emphasizes local relevance of public health problems and ecological perspectives that recognize and attend to the multiple determinants of health and disease.*

   The history of the community and the public health issues it faces should be studied. It should be known that this history is what influences their social, economic and physical environment which plays a direct role in their health outcomes. These concepts should be used to shape the research done and shape how interactions with the community are carried out (Minkler, 2012) (Israel et al., 1998).

7. *Involves a cyclical and iterative process.*

   This is used to emphasize that research is a cyclical process: Every step should be revisited when necessary in order to ensure that everyone's comments and concerns are

heard and that the action performed is in everyone's best interest (Israel et al., 1998; Minkler, 2012)

8. *Disseminates findings and knowledge gained to all partners.*

   Ensuring that all parties involved receive the results and findings of the study is important to having an equal partnership. It is also important to make sure that all findings reported in a way that is easy to understand and that ownership is given to those who deserve it (Israel et al., 1998).

9. *Establishes a long-tern commitment to the process.*

   This is used to show that this form of research can and will be a long-term commitment. It is so that the parties involved understand that results take time, and to ensure the overall sustainability of the process after the initial research is over (Minkler, 2012) (Burke et al., 2013).

The principles above are used to help guide the process of community-based research and help ensure that this process is equitable and fair to everyone involved. There are a variety of techniques that are used when conducting CBPAR in communities. Some of the most common are asset mapping, photovoice, storytelling, and various forms of art.

Asset mapping gives communities the opportunity to document their available resources, instead of looking at their deficits (Kramer et al., 2012). This allows them to not only identify the tangible resources they have access to, but also the skills community members have. By identifying these assets, the community is able to become more resilient and gives them more development opportunities (Kramer et al., 2012).

Another CBPAR technique is the Asset-Based Community Development Process, or ABCD. This process involves asking the community questions such as “What can you do without outside help?,” “What can you do with little help?,” and “What do you need outside help for?.” This gives the community the opportunity to discover exactly what they do have and helps create a vision for what the future priorities for the community can be (McKnight, 2018).

Photovoice is another commonly used CBPAR technique. Caroline Wang and Mary Ann Burris developed the technique of photovoice inspired in the philosophy and teachings of Paulo Freire and his beliefs that photos can be an active and visual representation for social change (Budig et al., 2018). The process of photovoice involves reflective photography, meaning the participants actively reflect on the strengths or concerns of the community (Liebenberg, 2018). The research participants and research team decide on a topic of concern within the community. In line with the principles of CBPAR, this is decided on together as to be equitably beneficial for both parties. There is training involved in the use of the cameras, the ethics of photography and fieldwork, and on the exact process of photovoice (Liebenberg, 2018). Community research participants are then tasked with taking photos throughout their community that they feel answer the chosen research question. This is followed by a discussion about the photos amongst the group. The photos are also displayed for the entire community to view and discuss. Discussions lead to “identify the problem or the asset, critically discuss the roots of the situation, and develop strategies for improving the situation” (Wang, 1999). The topics found in the discussion are used to bring about meaningful change in the community with respect to the chosen research topic.

Storytelling techniques, including ethnographies and digital stories, are yet another widely used form of CBPAR. For example, in digital storytelling, instead of reading a story aloud, participants create their own videos through their own photos, sound and video clips. It

often starts the same way that photovoice does: the participants and research team come together to choose a specific topic of concern within the community. They then create a video telling a story of a time they dealt with this issue. It gives them the opportunity to reflect on their experiences, while also being able to convey emotions and tone in a more effective manner than still photographs or written word (Freidue, 2002). Ethnographies, specifically autoethnographies, are also used as a form of storytelling. An autobiography or story of a certain event or issue is written with a "cultural lens" (Ellis, 2011). Having a "cultural lens" gives the writer the ability to reflect on how their culture and community play a role in their life. This reflection can facilitate community building and social change throughout (Ellis, 2011).

Similar to the other approaches, art CBPAR techniques are used with the goal of answering a question about a concern in the community. Techniques such as drawing and painting are common forms of art used and are often implemented in youth groups (Yonas et al., 2009). Participants draw or paint how certain topics make them feel or what they want to feel when they reach certain goals. An open discussion is done at the end in order to identify common themes between art pieces, and then discuss how the community can address the feelings that participants have (Yonas et al., 2009).

All approaches to CBPAR involve creating a safe, trusting environment for everyone involved. Trust is important to build not only with the researchers, but within the participants as well (Christopher et al., 2008). A comfortable and trusting environment is crucial to have from the beginning, so everyone feels that their voice is heard and that true change can occur (Christopher et al., 2008).

Vulnerable Populations

Vulnerable populations include those that are economically disadvantaged, population minorities, the elderly, the homeless, and those with certain medical conditions (AJMC, 2006). They are considered vulnerable because while anyone can and will encounter health issues, these groups of people are more susceptible to negative and lasting effects (Mechanic & Tanner, 2007)

People who are considered low-income often lack the financial ability to pay for higher education, which directly effects housing, employment opportunities, nutrition and even access to medical care. Low socioeconomic status is also often associated with poor prenatal nutrition and care, which can lead to altered development and physical or mental issues (Mechanic & Tanner, 2007). Factors such as these not only contribute to poor future health, but also lower social status and continued poverty. This similarly applies to people who are homeless. While they are considered low-income, they also lack basic shelter and places to practice proper hygiene. When coupled with the fact they tend to live in larger groups, their risks for health issues are exacerbated compared to the average population (National Center for Immunization and Respiratory Diseases (NCIRD), 2020).

Discrimination among minority groups around the world also contributes to poorer health outcomes. While overt discrimination against minority groups such as the LGBTQ+ community, racial minorities, or ethnic minorities can directly prevent them from accessing care, discrimination can also have an effect on mental and physiological health (Davis, 2020). Experiencing or perceived discrimination leads to increased stress, poor cardiovascular health, and issues with weight (Davis, 2020). Immigrants, both documented and undocumented, are also considered minority groups in most settings. Their vulnerability is often attributed to the political and social alienation they face in their new country (Derose et al., 2007). They can also face

unique challenges such as the inability to obtain health insurance, along with many issues that minorities confront such as language barriers, stigma, and statistically lower socioeconomic status than the majority population (Derose et al., 2007).

Elderly people are considered vulnerable for a variety of reasons. They can often lack the social support to procure care when they are ill, and can depend on others for travel to healthcare facilities (Schröder-Butterfill & Marianti, 2006). This can lead to instabilities in care and overall access to it. People who are elderly also have a higher prevalence of chronic diseases, which makes them more vulnerable to other communicable diseases as well (Schröder-Butterfill & Marianti, 2006).

People with certain medical conditions can also be considered vulnerable. For example, the health of people with HIV have can become increasingly worse with inadequate healthcare (Waisel, 2013). Another example are people with mental illness, who are often stigmatized by society and restricted from participating in health programs, and can also have a lower socioeconomic status due to their mental illness (Funk, 2020). Social isolation, poor housing, and unemployment are all linked to mental health issues (Mental Health Foundation, 2015).

While health is difficult to measure, there are indicators that can be used to see a more accurate picture of a group's health status such as prevalence of chronic diseases and life expectancy (Aday, 1994). For example, the most disadvantaged groups of people who immigrate to the United States are more likely to have more serious health problems such as gastrointestinal issues and are less likely to have access to primary care (Aday, 1994). It has also been shown that 50% of all deaths in the United States are from behavioral causes, influenced by social groups and status, education, income, and employment (Braveman & Gottlieb, 2014). Overall,

vulnerable populations are at greater risk for poor health status, while they also face the most substantial disparities in healthcare access (AJMC, 2006).

Natural Disasters

While often thought of as uncommon, natural disasters should be seen as a normal occurrence in public health (Morabia & Benjamin, 2018). In 2009, a total of 111 out of 195 countries were reported to have been affected by a natural disaster (Vos et al., 2010) They often destroy property and exacerbate the injustices that people face such as poor housing and poverty. Vulnerable populations are at a higher disadvantage and more challenged than other communities, because they often lack the resources to adequately prepare for these types of events (Joy, 2017; Morabia & Benjamin, 2018). In recent years, natural disasters such as hurricanes, tsunamis, tornadoes and earthquakes are viewed as humanitarian crises due to their frequent and catastrophic nature (Morabia & Benjamin, 2018).

Post-disaster settings are often unsafe and unsanitary. For already vulnerable, at risk populations, the unsanitary setting can cause an increase in infectious diseases (Chan et al., 2019). People with chronic conditions such as hypertension and diabetes are often left without access to proper resources to manage their conditions (Chan et al., 2019). Injuries due to things such as debris, high water, and strong winds also increase during a disaster (Chan et al., 2019).

Natural disasters also have the ability to critically overrun or even damage healthcare facilities. While hospitals are often running close to capacity, disasters create a surge of patients which makes it difficult to care for everyone (Joy, 2017). The surge can last for many days after these events, not only from injuries caused from the disaster but due to the effects that disasters have on pre-existing conditions as well (Joy, 2017). If the facility is damaged, it also adds a

delay to care for many, by either reducing the capacity of the facility or causing them to travel farther distances to access care.

Disasters can occur in any part of the world. While some areas might be prone to summer hurricanes, others could be affected by persistent earthquakes. India, the United States, China, Ethiopia, and Malawi are the countries that are found to be most affected by natural disasters, and are at high risk for multiple types (Guha-Sapir; et al., 2016). However, the Asian continent as a whole has the highest frequency of disaster occurrence, while also having some of the largest groups of vulnerable communities (Chan et al., 2019).

Sustainability is exceptionally important in post-disaster settings as it helps increase the resilience of a community and gives them tools to handle and recover from the next disaster more easily (Institute of Medicine, 2015). CBPAR could be extremely effective in these settings due to its emphasis on sustainability and the community involved approach (Culhane-Pera et al., 2010). While CBPR approaches are widely used in a variety of public health contexts, natural disasters pose a unique challenge to implementing this type of intervention (Lichtveld, et al., 2016). In turn, there is a lack of research surrounding the potential benefits of using a community-based approach in post-disaster settings.

Methods

Systematic reviews strive to overview primary research in order to gather and synthesize evidence to answer a specific question (Paudel, 2013). They help guide and inform future research, along with pointing out key strengths and weaknesses in current practices (Paudel,

2013) (Booth et al., 2012). The methods that were used for this scoping systematic review were developed based on guidelines from *Systematic Approaches to a Successful Literature Review, Guidance on the Conduct of Narrative Synthesis in Systematic Reviews and Preferred Reporting Items for Systematic Reviews and Meta-Analyses* along with more updated guidelines after they were used in practice (Booth et al., 2012; David Moher et al., 2009; Paudel, 2013; Popay & al, 2006). These guidelines were used in this thesis project to develop a protocol and conduct a review, assuring all major components of a scoping review were met.

Scoping Review Goal

A scoping review aims to review evidence related to a specific research question. While other types of systematic reviews can include a meta-analysis, a scoping review focuses on synthesizing and describing information from studies, without statistical analysis (Munn et al., 2018). A scoping review was chosen for this thesis because minimal research has been done on using CBPAR approach in post-disaster settings among vulnerable populations and it could serve as a precursor to a more comprehensive systematic review in the future. The overall goal of this scoping review is to examine the effectiveness and appropriateness of public health interventions which have used the CBPAR approach in post-disaster settings among vulnerable populations.

Literature Search and Selection Strategy

A search for peer-reviewed literature using the databases PubMed, Embase, Scopus and CAB Direct was used to identify the literature used throughout the paper. The keywords used to identify the literature were: *Community based, participatory action, research* and *disasters.*

These were used along with Boolean connectors. The table below outlines the search strategy and day the database was searched.

Database	Search Terms	Date
Pubmed	"Community based" OR "participatory action" AND research AND disaster*	Searched on October 15th, 2020
Embase	"Community based" OR "participatory action" AND research AND disaster	Searched on October 16th, 2020
Scopus	"Community based" OR "participatory action" AND "research" AND "disaster"	Searched on October 15th, 2020
CAB Direct	"Community based" OR "participatory action" AND research AND disaster	Searched on October 16th, 2020

Table 1. Search Strategy

All citations were downloaded and exported to the website Covidence (Covidence, 2020), an online system that aids with organization and extraction of data for systematic reviews. Titles

and abstracts were reviewed by two reviewers using the following inclusion and exclusion criteria.

Inclusion:

- Must be in a post-disaster setting
- Must be in a vulnerable population
- Full text must be available through Emory University
- Published between 2000 and August 2020. The year 2000 was decided upon because the use of CBPAR in public health increased around the year of 1998, taking hold in the early 2000's (Israel et al., 1998).
- Evaluating or describing a CBPAR intervention

Exclusion:

- Published before 2000 or after August 2020
- Articles in languages other than English
- Articles where the full text was not available through Emory

Geographic Considerations

This review is not limited to any specific geographical area. Disasters and vulnerable populations exist in all areas of the world, so to get the most accurate view of how CBPAR works in these settings, all studies meeting the inclusion criteria are included.

Ethical Considerations

An Institutional Review Board (IRB) protocol was not submitted because this study did not involve human subjects.

Selection of Studies

Covidence was used to review each study found through searching each database. After reviewing each study, a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart was created outlining the reasons for which an article was excluded, and how many articles will be used in the study (Covidence, 2015). A PRISMA flowchart was used because of the simple way it presents the decision process for choosing studies and the prominent usage of it in all types of systematic reviews (D. Moher et al., 2009).

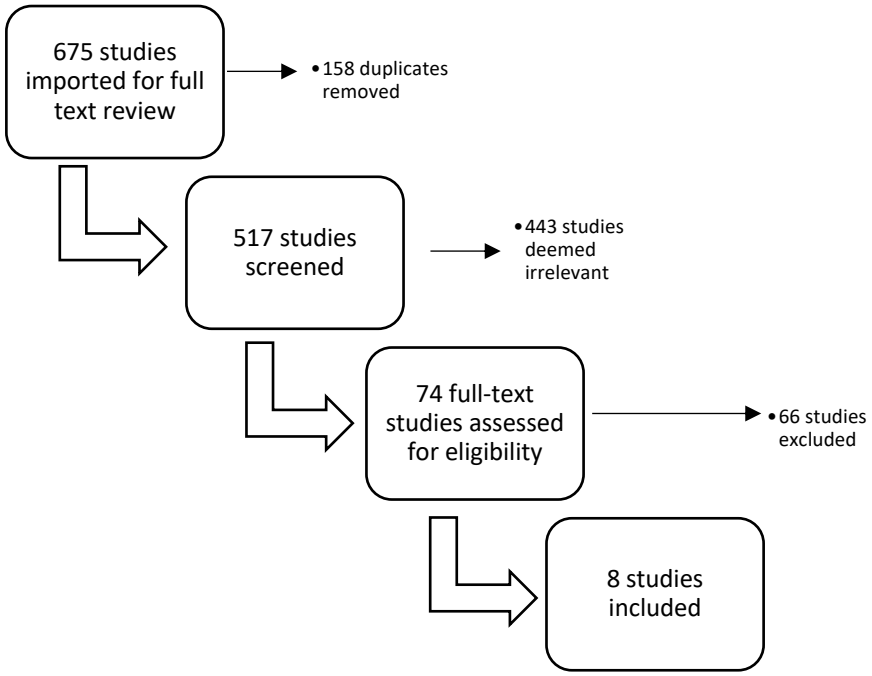

Figure 1. PRISMA Flowchart

Of the 66 studies excluded, 41 were excluded due to their study design, which focused either on a different aspect of a disaster than post-disaster settings, such as building resilience to future disasters, or on populations that are not considered vulnerable. Other studies were excluded for not using CBPAR or not having the full text available (12 and 13 respectively).

Data Extraction

Data was extracted using a data extraction template (Appendix A) made on the Covidence website. The author extracted the data while a reviewer, who is a registered nurse with a Bachelor of Science in Community Public Health, reviewed all data in the extraction form for relevance and added more information if needed. Study IDs were created for each retrieved document by combining the number of the study, which was assigned by the order in which the study was extracted from the database, surname of first author, and year of publication (e.g., 01Litchfield2020). The extraction template had the following sections:

1. General Information
2. Characteristics of included studies
3. Findings

The general information section included the study ID, title, year published, country and other notes deemed relevant. Characteristics of selected studies included two subsections, methods and participants. The methods section included aim of the study, type of disaster, and specific CBPAR technique used. The participants section included a description of the population that was targeted in the intervention. The last section, findings, was used to summarize the key findings from the study.

The information entered into the data extraction template was then extracted as an Excel file for analysis and review.

Results

In total, eight studies were selected for review. Half of the studies used the photovoice method, two of the studies used ethnographies, and two used public forum approaches. One study focused on the aftermath of a tsunami, one on an earthquake, two on nuclear or chemical disasters, and a four were focused on hurricanes. Five studies were conducted in the United States, two in Japan and one in Indonesia. Table 2 lists the condensed citations, with study ID (#first author and publication year), along with the methodology used, disaster type, location, and vulnerable population.

Study ID	Methodology	Disaster	Location	Targeted Population
01Anderson2016	Photovoice	Nuclear Disaster	Japan	Powerplant workers who were internally displaced
02Kingsbury2020	Photovoice	Tsunami	Indonesia	Population that relies on tourism/in poverty
03Lichtveld2016	Public Forum	Hurricane	USA	Low income minority groups
04Perez-Ramos2018	People to People/public forum	Hurricane	USA	Area of the island that lacked potable water and many people were in poverty
05Scheib2013	Photovoice	Hurricane	USA	Minority and impoverished

				communities in New Orleans
07Abara2012	Ethnographic	Chemical Disaster	USA	Population that was small, impoverished and in a medically underserved area
07Wennerstrom2011	Ethnographic	Hurricane	USA	Members of a low-income community with mental health issues
08Yoshihama2018	Photovoice	Earthquake	Japan	Population that had been recently affected by another disaster/internally displaced

Table 2: Articles eligible for the review

The first study focused on using photovoice following a nuclear disaster in Fukushima, Japan. Researchers noticed that there were many people who were internally displaced due to this disaster and they wanted to see how people felt that their lives had been affected. CBPAR was used to ultimately give the participants a sense of community and a voice moving forward to help improve their situation (Anderson et al., 2016).

Photovoice was also used after a disaster in a coastal area in Indonesia that was affected by a tsunami. The overall goal of the project was to assess if photovoice was an acceptable

method to use in these settings, finding this to be the case. The CBPAR intervention helped the participants feel more empowered and provided an outlet for the emotions that they felt (Kingsbury et al., 2020).

The next study, done in post-hurricane Katrina New Orleans, used public forums as a CBPAR technique. The study evaluated the feasibility of using CBPAR in post-disaster settings and applicability of CBPAR principles. It was shown that the application of the main principles of CBPAR was possible, and that flexibility was an important component for ensuring that the research was feasible (Lichtveld et al., 2016).

The fourth study used a public forum or, as they named it, "people to people" approach in Puerto Rico among a population that had been hit by multiple hurricanes. The researchers used CBPAR to help both the team and the participants identify the most urgent needs of the community. They found that engaging the community and working towards the goals identified by the community were the most important aspects of this type of research, and that adapting to the community helped respond to their needs more readily (Perez-Ramos et al., 2018).

Another study also done in post-Katrina New Orleans used photovoice as their CBPAR technique. This was used to help identify the ways that community health workers for two different neighborhoods were going to best address the needs of their community members. Through collaboration with the two neighborhoods, the participants felt that they could better handle the job as a community health worker by seeing how others dealt with the issues and also reported having more self-efficacy due to being able to share their stories with others (Scheib & Lykes, 2013).

An ethnographic study done after a chemical disaster in South Carolina wanted to focus on long-term community engagement in a disaster setting. They found that long term

engagement after a disaster was possible through direct interviews and stories told by community members. Community engagement in these settings allowed the participants to have better support and helped increase the collective efficacy of the community on dealing with the still present issues (Abara et al., 2014).

The third post-Katrina study focused on ethnographic methods. The goal was to establish more community centered mental health interventions with the help of community health workers. The community health workers felt an overall increased self-efficacy when doing their jobs and they noted the importance of being flexible with differing cultural needs, even within their own communities (Wennerstrom et al., 2011).

The last study included in this review was a photovoice project done after an earthquake in Japan. The goal of the study was to develop a more inclusive way to respond to disasters in marginalized communities. Researchers in this study noted that the respect for the community and culture they were working with was a very important aspect for the effectivity of the research. They also found that the ability to be flexible with both the participants and the projects helped keep the interest of the community (Yoshihama & Yunomae, 2018)

Three major themes were identified across all eight studies. These themes are flexibility, cultural humility and relationship building, and increased collective and self-efficacy.

Flexibility

Six of the studies highlighted the importance of flexibility when using CBPAR in post-disaster settings. Two studies highlighted the importance of flexibility due to the ever-changing environment after natural disasters. For example, the environment in post-Katrina New Orleans changed daily due to collapsing buildings, construction, and clean up. It was important to be flexible with the sites where the research was held and the availability of these sites due to the

constant changes in infrastructure that occurred after the disaster (Lichtveld et al., 2016). The review of the different studies showed the importance of flexibility for quickly adapting interventions to unexpected post-disaster conditions and showed how the initial implementation design and planning of a project may not be as effective in a post-disaster context due to barriers caused by damaged infrastructure.

The capacity of the community to host these types of research was an important aspect of the changing environment. The communities in post-disaster settings often lacked the ability to execute and provide the resources for these larger projects. It was shown by an additional study in New Orleans that being flexible with the community members participating in research can make the project more successful (Wennerstrom et al., 2011). The research team lead by Wennerstrom quickly realized that the community could not handle the project that was being implemented due to diminished ability caused by the disaster. The infrastructure was ruined and the community had other problems that needed to be addressed such as housing, resulting in a lack of time or resources to devote to the project in the manner that the research team had originally intended. By "meeting people on their own terms" and giving the community members less work for the project, the community's needs were met (Wennerstrom et al., 2011).

Flexibility, especially in terms of adapting to issues with technology, was an important part of the study in Indonesia. Relying on cell phone technology for this photovoice project proved to be difficult due to the lack of cell phone service. The project had initially planned to use a group chat to talk about the study and to connect with others. However, the researchers noticed problems with cell phone service and quickly turned the group chat into an outlet for finding the most reliable Internet, which gave the participants the ability to fully participate in the study when they wanted (Kingsbury et al., 2020) In this case, flexibility in allowing

participants to use their phones for photovoice and changing the purpose of the group chat enabled the research to continue (Kingsbury et al., 2020).

Flexibility when it comes to community needs was also an important characteristic of the reviewed studies. As previously mentioned, climate and both physical and social environments in post-disaster settings change frequently, in turn, changing community needs. In the photovoice study done in Japan following an earthquake, the researchers quickly learned the importance of catering to what the participants needed instead of what the research team wanted before the project started. The study showed that the participants weren't able to devote as much time to project activities as initially planned due to living in temporary housing and needing to care for families (Yoshihama & Yunomae, 2018). This called for immense flexibility from the research team in order to better meet the needs of research participants.

The review showed that public health interventions in post disaster communities are more effective when urgent needs of the community are met. The use of the CBPAR approach in these interventions seemed to be more beneficial when flexibility was exhibited and the interventions were adapted to the specific pressing needs of a community in post disaster contexts (Abara et al., 2014; Perez-Ramos et al., 2018).

Cultural Humility and Relationship Building

One way the reviewed studies approached relationship building amongst the entire team was through exhibiting cultural humility and awareness. The researchers in all of the studies recognized the importance of adapting their projects to the community and cultures they were working with, allowing participants to change aspects of the interventions that didn't culturally fit their communities. In one of the studies conducted in post-Katrina New Orleans the

intervention included two local communities which were affected more than others, Latino and Black residents of the central section of the city (Wennerstrom et al., 2011). These two communities were seen as vulnerable populations due to their ethnic minority status and the low income level of the area in which they resided, making them more susceptible to being harshly affected by a disaster. However, while Latino and Black residents were similarly affected, the project had to be implemented differently for each community due to the differing cultural values between these two groups, even though they lived in close proximity (Wennerstrom et al., 2011).

Another way community engagement was demonstrated was through establishing a connection with the community. Local leaders were recruited by projects as the facilitators of group discussions, establishing connections between differing communities with similar circumstances and also with participants from their own community as well. This is a key point of CBPAR, recognizing that the participants were the experts in their own community. The researchers used this approach throughout four of the studies in order to keep the members meaningfully engaged during the interventions (Lichtveld et al., 2016; Scheib & Lykes, 2013; Yoshihama & Yunomae, 2018). For example, the study in Indonesia supported the initiative of local leaders to use technology to create group chats on the provided study cell phones to establish relationships between community members, thereby keeping them engaged in the study and allowing them to foster new friendships (Kingsbury et al., 2020). As a key point in the study conducted in Indonesia, directly and meaningfully involving the leaders of the community its members feel that the intervention is tailored to them and they are more likely to engage with the project for a longer amount of time

Increased Self and Collective Efficacy

Four of the reviewed studies showed that public health emergency relief interventions using CBPAR methods helped increase the self-efficacy of those who were involved and the collective efficacy of the communities. By building on the strengths the community had, they were able to feel that they could fix things that they found were problems. The intervention implemented in Indonesia found that community participants were able to more easily recognize the things that they could do to help themselves and the communities they lived in after they used the photovoice technique, which in turn helped increase their self-efficacy when it came to their recovery (Kingsbury et al., 2020). Project participants felt that by seeing their community through a different point of view, the one of other participants, they were able to see both positive and negative aspects of their context. This approach resulted in participants feeling better about themselves and their communities because they were able to reflect on what they and others liked most about the place they called home. Community members also felt empowered by the new photography skills they learned. By being able to actively point out things in their community, the felt empowered to make the needed changes to move forward (Kingsbury et al., 2020). Similar observations were noted in another study as well. Participants in one of the two Japan photovoice projects felt that the assignment to capture different aspects of their community helped them focus on what was of immediate importance and what they could fix more easily (Yoshihama & Yunomae, 2018).

Community participants were also able to gain improved self-efficacy by pointing out the things they found were wrong with their communities to other community members. For example, community health workers in post-Katrina New Orleans found that examining the disparities that existed in their communities through the photovoice exercise helped them

prioritize the immediate health issues to address in the community (Scheib & Lykes, 2013). This intervention also showed that community health workers can help build the resilience of the community by allowing the members of the community to have a direct and accessible contact for their personal health needs within their own community, instead of trying to navigate a decimated and often stigmatizing health system (Scheib & Lykes, 2013). Overall, community participants in the reviewed interventions felt that they were able to take the next steps needed to fix the problems they faced after the projects were completed.

Discussion

This scoping review suggests that there are the common themes and components found among post-disaster interventions using the CBPAR approach were essential to the interventions success, not only for disaster contexts but also for working with vulnerable populations. The review also highlighted important aspects of research that could be improved to make CBPAR approaches even more effective in the future.

The reviewed interventions highlighted the critical importance of culturally appropriate approaches when working with vulnerable populations. Given that people who are considered part of a vulnerable populations are far more susceptible to having poorer health outcomes than other groups (Shi et al., 2008), displaying cultural humility and awareness when designing and implementing interventions among these populations could help reduce health disparities. Culturally aware health care respects the differences that exist in beliefs, culture and knowledge and meets the specific health and care needs of a group or community (Butler, 2014). People who are vulnerable experience health care in a far different manner than others. These differences are often related to culture and addressing this critical aspect can help to bridge the

gap between disparities in care (Brach & Fraser, 2002). This is especially important in CBPAR interventions. CBPAR's first guiding principle is to recognize that the community has its own specific identity (Burke et al., 2013). Revisiting the research goals and being flexible with the project gives the participants the best possible outcome from the projects.

While cultural barriers have been shown to cause poorer health outcomes, there is still a lack of cultural humility and awareness in many aspects of public health. Normalizing the centering of public health interventions around cultural awareness could overall create a better health care environment (Renzaho et al., 2013). It is important to note that, although it has been shown that the lack of cultural proficiency in health care can cause poorer health, more research is needed on the true positive effects of cultural humility and awareness in health care. The reviewed interventions highlighted the need to further develop this research in order to properly assess the true effects of cultural proficiency on health outcomes.

The sustainability of these and other public health interventions is another important factor that stems from the reviewed interventions. Sustainability, one of the main pillars of CBPAR, has become a more recent focus in public health interventions (Burke et al., 2013; Minkler, 2012; Shelton et al., 2018). One main reason sustainability is important is because when an intervention is sustainable, the researchers are able to see if the project actually does what it set out to accomplish. Many of the health outcomes that public health interventions focus on are long term, such as combatting obesity or reducing health gaps amongst minorities. Sustainability allows public health interventions to run their course and have the ability to affect the community's health in the future (Shelton et al., 2018).

Studies have shown that community engagement can be an effective way to address the many challenges that arise from trying to ensure sustainability in public health interventions

(LaPelle et al., 2006). CBPAR contributes to the sustainability of interventions by allowing the community to determine together with the research team what needs are addressed. Sustainable approaches using CBPAR create an action plan to improve people's lives by engaging the community in the co-creation of such plan. When using this approach community members are more willing to continue with the plan long after the research team leaves (Mckay, 2011). Understanding research as a cyclical and iterative process is one of CBPAR's nine guiding principles (Israel et al., 1998; Minkler, 2012) and this is exactly what flexibility meant in the reviewed studies.

The need to increase the implementation and evaluation of CBPAR based interventions after natural disasters in vulnerable communities, both international and domestic, is apparent with this study. There is a lack of a comprehensive number of studies that cover the full range of CBPAR methodologies in post-disaster settings. For example, among the eight studies evaluated in this review only three different CBPAR techniques were used out of the many different types that are available. Photovoice was the most commonly used technique throughout the interventions. One possible explanation for this situation is the extensive use of technology around the world today. It is easy and cost effective to use photovoice since participants would be comfortable using the technology and would potentially be able to use their own devices, such as phones or cameras. This helps make this method fairly simple to implement (Kingsbury et al., 2020). The reviewed interventions also showed that photovoice can be implemented after a variety of natural disasters, such as hurricanes, tsunamis, and nuclear disasters and used with different cultures and types of people, as demonstrated by its successful implementation in the United States and Asia.

Limitations of the Scoping Review

All of the eight post-disaster public health interventions reviewed were conducted in eastern Asia or the southern United States. Five interventions took place in the United States, with a couple of them being implemented for the same disaster. This caused a lack of variety in the information being used for this scoping review. Our search of the literature did not produce positive results for disaster public health interventions using CBPAR approaches in Africa, South and Central America, and Europe. While this could be due to the fact that fewer disasters occur in these areas, there should still be opportunities to implement these type of interventions in these regions (Wallemacq & Below, 2018). Further research needs to be done to assess if the effectiveness of CBPAR translates to settings in other world regions and countries as well. Another limitation relates to only searching and reviewing studies published in English. Publications in other languages should be reviewed to be able to evaluate similar overseas research that could have been done using CBPAR methods.

Conclusion

Overall, CBPAR is an effective approach for engaging communities to appropriately address their needs. CBPAR has been effectively used in countless settings and for many types of health outcomes, such as mental health approaches and food insecurity. Although natural disaster settings are more unpredictable than other settings due to the rapidly changing physical and social climates, CBPAR has been shown to successfully work in post-disaster settings as well.

By effectively engaging vulnerable populations, CBPAR bridges the gap that exists between the health of vulnerable communities and that of the rest of the population. Public health professionals should further investigate the effectiveness of CBPAR in post-disaster settings to determine if community-based approaches can provide a more sustainable and effective approach to recovery, especially for vulnerable populations.

Work Cited

Abara, W., Wilson, S., Vena, J., Sanders, L., Bevington, T., Culley, J. M., Annang, L., Dalemarre, L., & Svendsen, E. (2014, May 27). Engaging a chemical disaster community: lessons from Graniteville. *Int J Environ Res Public Health, 11*(6), 5684-5697. https://doi.org/10.3390/ijerph110605684

AJMC. (2006). *Vulnerable Populations: Who are they?* AJMC. https://www.ajmc.com/view/nov06-2390ps348-s352

Anderson, C. N., Mann, C., Massazza, A., Sekine, H., Yanagisawa, R., & Katz, C. (2016, 05/01). "The decontamination is not done": a photovoice exploration of the lives of internally displaced people in Fukushima. *Annals of Global Health, 82*, 401. https://doi.org/10.1016/j.aogh.2016.04.126

Booth, A., Papaioannou, D., & Sutton, A. (2012). Systematic Approaches to a Successful Literature Review. *Sage*.

Brach, C., & Fraser, I. (2002, Summer). Reducing disparities through culturally competent health care: an analysis of the business case. *Quality management in health care, 10*(4), 15-28. https://doi.org/10.1097/00019514-200210040-00005

Braveman, P., & Gottlieb, L. (2014, Jan-Feb). The social determinants of health: it's time to consider the causes of the causes. *Public health reports (Washington, D.C. : 1974), 129 Suppl 2*(Suppl 2), 19-31. https://doi.org/10.1177/00333549141291S206

Brooks, A. (2019). *What Is Community Health and Why Is It Important?* https://www.rasmussen.edu/degrees/health-sciences/blog/what-is-community-health/#:~:text=Community%20health%20is%20a%20medical,in%20a%20specific%20geographic%20region.&text=%E2%80%9CGood%20community%20health%20equates%20to,live%2C%E2%80%9D%20says%20Thomas%20G.

Budig, K., Diez, J., Conde, P., Sastre, M., Hernán, M., & Franco, M. (2018, 2018/04/02). Photovoice and empowerment: evaluating the transformative potential of a participatory action research project. *BMC Public Health, 18*(1), 432. https://doi.org/10.1186/s12889-018-5335-7

Burke, J. G., Hess, S., Hoffmann, K., Guizzetti, L., Loy, E., Gielen, A., Bailey, M., Walnoha, A., Barbee, G., & Yonas, M. (2013, Summer). Translating community-based participatory research principles into practice. *Progress in community health partnerships : research, education, and action, 7*(2), 115-122. https://doi.org/10.1353/cpr.2013.0025

Butler, M. M., E. Schwer, N. et al. (2014). Improving Cultural Competence to Reduce Health Disparities for Priority Populations. *Agency for Healthcare Research and Quality*.

Chan, E. Y. Y., Man, A. Y. T., & Lam, H. C. Y. (2019). Scientific evidence on natural disasters and health emergency and disaster risk management in Asian rural-based area. *British medical bulletin, 129*(1), 91-105. https://doi.org/10.1093/bmb/ldz002

Christopher, S., Watts, V., McCormick, A. K. H. G., & Young, S. (2008). Building and maintaining trust in a community-based participatory research partnership. *American Journal of Public Health, 98*(8), 1398-1406. https://doi.org/10.2105/AJPH.2007.125757

Covidence. (2015).

Culhane-Pera, K. A., Allen, M., Pergament, S. L., Call, K., Adawe, A., de la Torre, R., Hang, M., Jama, F., Navas, M., Ortega, L., Vue, P., & Yang, T. T. (2010, Apr). Improving health through community-based participatory action research. Giving immigrants and refugees a voice. *Minn Med, 93*(4), 54-57.

Davis, B. (2020, February 25, 2020). Discrimination: A Social Determinant Of Health Inequities. *Health Affairs Blog*.

Derose, K. P., Escarce, J. J., & Lurie, N. (2007, 2007/09/01). Immigrants And Health Care: Sources Of Vulnerability. *Health Affairs, 26*(5), 1258-1268. https://doi.org/10.1377/hlthaff.26.5.1258

Ellis, C. A., T.; Bochner, A. (2011). Autoethnography: A Review. *Historical Social Research,, 36*, 19.

Freidue, N. H., Michelle. (2002). Digital Storytelling for Reflective Practice in Communities of Learners.

Frey, L. (2020). *A Record Number Of People Have Been Displaced By Violence And Natural Disaster*. https://www.forbes.com/sites/freylindsay/2020/04/28/a-record-number-of-people-have-been-displaced-by-violence-and-natural-disaster/?sh=6420a3ae199c

Funk, M. D., Natalie, Robertson, Patricia. (2020). *Mental health, poverty and development*. https://www.who.int/mental_health/policy/development/en/#:~:text=People%20with%20mental%20and%20psychosocial%20disabilities%20are%20a%20vulnerable%20group,of%20physical%20and%20sexual%20victimization.

Goodman, R. A., Bunnell, R., & Posner, S. F. (2014). What is "community health"? Examining the meaning of an evolving field in public health. *Preventive medicine, 67 Suppl 1*(Suppl 1), S58-S61. https://doi.org/10.1016/j.ypmed.2014.07.028

Guha-Sapir;, D., Hoyois;, P., Wallemacq;, P., & Below, R. (2016). Annual Disaster Statistical Review 2016.

Holkup, P. A., Tripp-Reimer, T., Salois, E. M., & Weinert, C. (2004, Jul-Sep). Community-based participatory research: an approach to intervention research with a Native American community. *ANS. Advances in nursing science, 27*(3), 162-175. https://doi.org/10.1097/00012272-200407000-00002

Institute of Medicine. (2015). *Healthy, Resilient, and Sustainable Communities After Disasters*. The National Academies Press.

Israel, B. A., Schulz, A. J., Parker, E. A., & Becker, A. B. (1998). Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health, 19*, 173-202. https://doi.org/10.1146/annurev.publhealth.19.1.173

Joy, K. (2017). *Ripple Effect: How Hurricanes and Other Disasters Affect Hospital Care*. https://labblog.uofmhealth.org/industry-dx/ripple-effect-how-hurricanes-and-other-disasters-affect-hospital-care

Jull, J., Giles, A., & Graham, I. D. (2017, 2017/12/19). Community-based participatory research and integrated knowledge translation: advancing the co-creation of knowledge. *Implementation Science, 12*(1), 150. https://doi.org/10.1186/s13012-017-0696-3

Kingsbury, A., Cahyanto, I., Widodo, E., Puspita, N., & Harnadi, A. (2020). Adapting photovoice with ESRI Survey123 for tourism disaster research in Banten, Indonesia. *Current Issues in Tourism*, 1-17. https://doi.org/10.1080/13683500.2020.1806795

Kramer, S., Amos, T., Lazarus, S., & Seedat, M. (2012, 2012/01/01). The Philosophical Assumptions, Utility and Challenges of Asset Mapping Approaches to Community Engagement. *Journal of Psychology in Africa, 22*(4), 537-544. https://doi.org/10.1080/14330237.2012.10820565

LaPelle, N. R., Zapka, J., & Ockene, J. K. (2006). Sustainability of public health programs: the example of tobacco treatment services in Massachusetts. *American journal of public health, 96*(8), 1363-1369. https://doi.org/10.2105/AJPH.2005.067124

Lichtveld, M., Kennedy, S., Krouse, R. Z., Grimsley, F., El-Dahr, J., Bordelon, K., Sterling, Y., White, L., Barlow, N., DeGruy, S., Paul, D., Denham, S., Hayes, C., Sanders, M., Mvula, M. M., Thornton, E., Chulada, P., Mitchell, H., Martin, W. J., 2nd, Stephens, K. U., & Cohn, R. D. (2016). From Design to Dissemination: Implementing Community-Based Participatory Research in Postdisaster Communities. *American journal of public health, 106*(7), 1235-1242. https://doi.org/10.2105/AJPH.2016.303169

Liebenberg, L. (2018, 2018/12/01). Thinking Critically About Photovoice: Achieving Empowerment and Social Change. *International Journal of Qualitative Methods, 17*(1), 1609406918757631. https://doi.org/10.1177/1609406918757631

Mckay, S. (2011). Participatory Action Research, Community-Based. In *The Encyclopedia of Peace Psychology*. https://doi.org/https://doi.org/10.1002/9780470672532.wbepp186

McKnight, J. R., C. (2018). The Four Essential Elements of an Asset-Based Community Development Process.

Mechanic, D., & Tanner, J. (2007, 2007/09/01). Vulnerable People, Groups, And Populations: Societal View. *Health Affairs, 26*(5), 1220-1230. https://doi.org/10.1377/hlthaff.26.5.1220

Mental Health Foundation. (2015). *Stigma and discrimination*. https://www.mentalhealth.org.uk/a-to-z/s/stigma-and-discrimination#:~:text=Stigma%20and%20discrimination%20can%20also,in%20a%20cycle%20of%20illness.

Minkler, M. G., P. ; Rubin, V.; Wallerstein, N. . (2012). *Community-Based Participatory Research: A Strategy for Building Healthy Communities and Promoting Health through Policy Change*. Policy Link. https://www.policylink.org/sites/default/files/CBPR.pdf

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009, Jul 21). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med, 6*(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The, P. G. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLOS Medicine, 6*(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097

Morabia, A., & Benjamin, G. C. (2018). Preparing and Rebuilding After Natural Disasters: A New Public Health Normal! *American Journal of Public Health, 108*(1), 9-10. https://doi.org/10.2105/AJPH.2017.304202

Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018, 2018/11/19). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology, 18*(1), 143. https://doi.org/10.1186/s12874-018-0611-x

National Center for Immunization and Respiratory Diseases (NCIRD), D. o. V. D. (2020). *Homelessness and COVID-19*. https://www.cdc.gov/coronavirus/2019-ncov/community/homeless-shelters/faqs.html

Paudel, D. (2013, 01/22). Systematic Reviews in Public Health. *Health Prospect, 11*. https://doi.org/10.3126/hprospect.v11i0.7429

Perez-Ramos, J. G., Zayas, H. T., Cardona Cordero, N. R., Del Rio Pineda, D. M., Murphy, C., Velez Vega, C. M., & De Ver Dye, T. (2018). 2231 Research partnership, community commitment, and the people-to-people for Puerto Rico (#p2p4PUR) Movement:

Researchers and citizens in solidarity. *Journal of Clinical and Translational Science, 2*(S1), 74-74. https://doi.org/10.1017/cts.2018.262

Popay, J., & al, e. (2006). Guidance on the Conduct of Narrative Synthesis in Systematic Reviews

Renzaho, A. M. N., Romios, P., Crock, C., & Sønderlund, A. L. (2013). The effectiveness of cultural competence programs in ethnic minority patient-centered health care—a systematic review of the literature. *International Journal for Quality in Health Care, 25*(3), 261-269. https://doi.org/10.1093/intqhc/mzt006

SAMHSA. (2017). Greater Impact: How Disasters Affect People of Low Socioeconomic Status.

Scheib, H. A., & Lykes, M. B. (2013, Aug). African American and Latina community health workers engage PhotoPAR as a resource in a post-disaster context: Katrina at 5 years. *J Health Psychol, 18*(8), 1069-1084. https://doi.org/10.1177/1359105312470127

Schröder-Butterfill, E., & Marianti, R. (2006). A framework for understanding old-age vulnerabilities. *Ageing and society, 26*(1), 9-35. https://doi.org/10.1017/S0144686X05004423

Shelton, R. C., Cooper, B. R., & Stirman, S. W. (2018). The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care. *Annual Review of Public Health, 39*(1), 55-76. https://doi.org/10.1146/annurev-publhealth-040617-014731

Shi, L., Stevens, G. D., Lebrun, L. A., Faed, P., & Tsai, J. (2008). Enhancing the Measurement of Health Disparities for Vulnerable Populations. *Journal of Public Health Management and Practice, 14*(6), S45-S52. https://doi.org/10.1097/01.PHH.0000338386.59565.dc

Tremblay, M.-C., Martin, D. H., McComber, A. M., McGregor, A., & Macaulay, A. C. (2018, 2018/04/12). Understanding community-based participatory research through a social movement framework: a case study of the Kahnawake Schools Diabetes Prevention Project. *BMC Public Health, 18*(1), 487. https://doi.org/10.1186/s12889-018-5412-y

Vetrhus, I. (2017). *Disasters will displace 14 million people every year*. https://www.nrc.no/news/2017/october/disasters-will-displace-14-million-people-every-year/

Vos, F., Rodriguez, J., Below, R., & Guha-Sapir, D. (2010). Annual Disaster Statistical Review 2009. *Centre for Research on the Epidemiology of Disasters*.

Waisel, D. B. (2013, Apr). Vulnerable populations in healthcare. *Curr Opin Anaesthesiol, 26*(2), 186-192. https://doi.org/10.1097/ACO.0b013e32835e8c17

Wallemacq, P., & Below, R. (2018). *Natural disasters in 2017 - Lower Mortality, higher cost*. https://doi.org/10.13140/RG.2.2.27820.92808

Wallerstein, N., & Duran, B. (2008). The theoretical, historical, and practice roots of CBPR. In (pp. 25-46). https://doi.org/10.13140/RG.2.2.34282.72648

Wallerstein, N., & Duran, B. (2010). Community-Based Participatory Research Contributions to Intervention Research: The Intersection of Science and Practice to Improve Health Equity. *American Journal of Public Health, 100*(S1), S40-S46. https://doi.org/10.2105/ajph.2009.184036

Wang, C. C. (1999, Mar). Photovoice: a participatory action research strategy applied to women's health. *J Womens Health, 8*(2), 185-192. https://doi.org/10.1089/jwh.1999.8.185

Wennerstrom, A., Vannoy, S. D., 3rd, Allen, C. E., Meyers, D., O'Toole, E., Wells, K. B., & Springgate, B. F. (2011, Summer). Community-based participatory development of a community health worker mental health outreach role to extend collaborative care in post-Katrina New Orleans. *Ethn Dis, 21*(3 Suppl 1), S1-45-51.

Yonas, M. A., Burke, J. G., Rak, K., Bennett, A., Kelly, V., & Gielen, A. C. (2009, Winter). A picture's worth a thousand words: engaging youth in CBPR using the creative arts. *Progress in community health partnerships : research, education, and action, 3*(4), 349-358. https://doi.org/10.1353/cpr.0.0090

Yoshihama, M., & Yunomae, T. (2018, Jul 1). Participatory Investigation of the Great East Japan Disaster: PhotoVoice from Women Affected by the Calamity. *Soc Work, 63*(3), 234-243. https://doi.org/10.1093/sw/swy018

Appendix A: Data Extraction Template

	Reviewer Comments
Study ID	
Title	
Year	
Country	
Notes	
Aim of study	
Type of Disaster	
Specific CBPAR Technique Used	
Population description	
Key Findings of the Study:	