The Effects of Natural Disasters on Access to Healthcare in Low-Income Communities in the United States

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Research Question

What are barriers to healthcare access following natural disasters in low-income communities of the United States?

Introduction

Natural disasters are isolated, extreme weather events that have the potential to threaten human life, health, safety, property, infrastructure, and overall homeland security (Natural Disasters | Homeland Security, 2024). There are a variety of natural disasters that can occur in multiple different geographical areas, such as winter storms, floods, tornados, hurricanes, wildfires, and earthquakes (Natural Disasters | Homeland Security, 2024). These catastrophic events are unpredictable and have the ability to destroy a multitude of infrastructures, which creates the potential for economic insecurity and disruptions in healthcare services (Natural Disasters | Homeland Security, 2024). These incidences result in immediate public health emergencies because these disasters result in exacerbated barriers in access to healthcare in vulnerable communities, as well as long-term health issues that may become prevalent (Bates, 2019). Natural disasters have multiple implications for public health concerns. Immediately following a natural disaster, the first step is to treat immediate threats to physical health, such as wounds that may become infected, release of pollutants in the air, and contaminants in the ground (Bates, 2019). Without the initial treatment of these physical and environmental threats, several long-term health consequences may arise and exacerbate pre-existing chronic health conditions (Bates, 2019). To continue, infrastructure damage to necessary healthcare facilities, destruction of medications, and the absence of power contribute to barriers for obtaining proper medical care (Bates, 2019). Psychological risk factors may also become prevalent following a

natural disaster because of the stress and trauma that these survivors face, leading to mental health issues in the long-term (Bates, 2019).

Insufficient emergency preparedness and disaster management before and during these events both create unique barriers to healthcare access and exacerbates the impact of pre-existing barriers. Disparities in public health can increase vulnerable populations exposure to these barriers. Low-income families typically reside in communities that are more susceptible to environmental hazards, increasing their susceptibility to long-term health conditions and poor health outcomes due to their increased exposure (Schmitt & Sullivan, 2022). Many factors contribute to systematic inequities in access to healthcare, and the effects of natural disasters that can heighten these challenges in receiving proper healthcare. In the past, low-income populations in the United States have been found to bear the most health disparities and issues with access to healthcare due to predisposing risk factors (Baik et al., 2023). Accounting for health disparities and inequities in the healthcare system, efficient disaster management and emergency preparedness strategies, and psychological, social, and socioeconomic risk factors are crucial in achieving efficient access to healthcare that is necessary for these vulnerable populations. The aim of this literature is to evaluate these healthcare barriers that low-income communities experience, following natural disasters in the United States

Methods

For this literature review, two different searches were conducted using the GALILEO database for information regarding barriers in access to healthcare, following natural disasters that occurred in the United States. The GALILEO database is a University System of Georgia virtual library that provides access to numerous journals, eBooks, articles, other databases, and multiple other resources.

To begin, the initial search in the GALILEO database included “(low income) AND (natural disasters) AND (health disparities)”. This primary search yielded 139 articles. The articles chosen could only include those that have been published within the last ten years, 2014-2025, with accessibility to the free full text, and must include information regarding healthcare access barriers and their effects on low-income households or individuals. The final inclusion/exclusion criteria for this search limited the articles to peer-reviewed articles. The addition of the inclusion/exclusion criteria yielded 15 articles, and seven articles were selected. These seven articles were chosen based on the relevancy of the research that was conducted to this literature review.

The second search that was conducted in the GALILEO database included “(natural disasters) AND (healthcare access)”. This search yielded 1,334 articles. The articles chosen included those regarding healthcare access in a pre or post natural disaster environment. Inclusion/exclusion criteria remain as articles published within the last ten years, 2014-2025, and limited to peer-reviewed articles. After filtering by means of the inclusion/exclusion criteria, the search yielded 1,921 articles. A new search was conducted and included “After* (natural disasters) AND (healthcare access)”. 566 articles were yielded, and 8 articles were selected after conducting this search. These articles were selected by choosing studies that were conducted within the United States and pertained to relevant information regarding access to healthcare following the occurrence of a natural disaster.

To continue, two different searches were conducted using the PubMed database for information regarding emergency preparedness, disaster management, and health disparities in response to natural disasters in the United States. The PubMed database is a resource that retrieves biomedical and life science literature with the primary mission to improve overall

health, and it is maintained by the National Center for Biotechnology Information (NCBI), the U.S. National Library of Medicine (NLM), and is located at the National Institutes of Health (NIH).

The first search that was conducted using the PubMed database evaluated information regarding emergency preparedness and disaster management, following natural disasters. This search consisted of "emergency* (preparedness) AND (disaster management) after* a (natural disaster)". This primary search yielded 240 results. The inclusion criteria consisted of articles that were published in the past ten years, ranging from 2014 to 2025, and filtered articles that were systematic reviews. After the inclusion criteria was added, seven articles were yielded, and three articles were chosen. The three articles that were chosen displayed relevancy towards the research of this literature review.

The second search conducted on the PubMed database assessed information relating to health disparities, particularly following natural disasters. The initial search included "(health disparities) AND natural disasters", which yielded 265 results. To narrow down this search, the inclusion criteria was added. These criteria filtered the search to articles that were published in the last ten years, 2014-2025, and only included reviews. Once these filters were applied, the search yielded 28 results, and two articles were chosen. These two articles were chosen because of the applicability of the information to the research conducted in this literature review.

Results

Natural disasters are unpredictable, catastrophic events that disrupt accessibility to healthcare, especially in low-income communities. The articles that were selected provided evidence that barriers to healthcare access are prevalent in these communities, following the effects of natural disasters in the United States. There are three overarching themes that were

established from the articles that contribute to these barriers. These themes include disruptions and inequities in the healthcare system, lack of emergency preparedness and disaster relief, and psychological, social, and financial hardships.

Disruptions and Inequities in the Healthcare System

Disruptions in the healthcare system include any event that causes medical facilities or essential medical personnel to not be fully capable for performing medicine efficiently or having temporary office closures. This could have adverse health complications for those with severe or chronic health issues if they are unable to be treated effectively. Infrastructures, such as hospitals, clinics, and pharmacies, that collapse and are unable to treat individuals in need create barriers in accessing essential medical care (Laboy Baiz, 2022). This causes staffing issues of crucial medical personnel and creates supply shortages for medications and necessary medical equipment that is needed through a time of crisis (Laboy Baiz, 2022). Chronic issues that go untreated, even temporarily, can have a negative effect on the ability of an individual to maintain a good health outcome and overall quality of life (Baum et al., 2019). Infrastructure issues can also affect transportation methods by disrupting roads, parking lots, and modes of transportation (Laboy Baiz, 2022). These factors can implicate many long-term health consequences, especially for those with chronic conditions, which can worsen health outcomes and result in preventable fatalities (Baum et al., 2019; Laboy Baiz, 2022). Although these disruptions in medical access are temporary, there can be long-lasting effects on individual health and disease management (Baum et al., 2019). It is important to create stronger, more resilient infrastructure to prevent issues like this from happening in the future. Supporting community strategies as a temporary healthcare intervention to provide immediate access to healthcare and could be more responsive during disasters (Davis et al., 2020). The most vulnerable populations that face barriers with

access to healthcare, especially during times of emergency, are low-income and minority populations (Flores et al., 2020). These populations are already at-risk for health concerns due to pre-existing lack of healthcare access due to financial constraints and lack of insurance.

Furthermore, these barriers expose overall structural inequalities that are long-standing within low-income communities (Smith et al., 2022). This systematic inequitable structure is the root of health disparities, especially following a disaster (Smith et al., 2022). Low-income communities facing inequities are already at risk for environmental concerns due to previously established precedents that expose them to a multitude of environment hazards (Smith et al., 2022). These communities are heavily impacted by these long-term racial and discriminatory policies, established over the course of time, and creates an environment in which they are unsafe and unprotected from the effects of natural disasters (Smith et al., 2022). Disparities in the land-usage of these communities, its built environment, and natural surroundings cause populations to become more vulnerable to the effects of natural disasters that build on pre-existing inequities that have been established by this system (Smith et al., 2022). In the United States, three pathways were identified that pre-expose susceptible populations to health disparities- exposure, sensitivity, and resilience (Smith et al., 2022). First, exposure refers to the geographical exposure in areas which vulnerable populations reside, which makes them more susceptible to environmental disasters and hazards, such as flood zones and poor air quality (Smith et al., 2022). Next, sensitivity refers to the exacerbation of pre-existing health conditions and the prevalence of poor health outcomes due to limited access to healthcare, following a natural disaster (Smith et al., 2022). Finally, resilience refers to factors such as economic burdens and insufficient infrastructure and how these factors hinder the ability to recover after a disaster has occurred (Smith et al., 2022). There are several forms of environmental and natural disasters

that affect communities, and low-income communities typically recover slowly due to the continuity of issues regarding obtaining access to healthcare, leading to greater long-term health impacts (Smith et al., 2022). A study conducted by Smith et al., researched a range of natural disasters that occur in the United States and potential health impacts that may become prevalent following them. These natural disasters included hurricanes, drought, wildfires, extreme temperatures, and flooding (Smith et al., 2022). To begin, hurricanes have the potential for the exacerbation of pre-exiting chronic conditions, increases the incidence of infectious illnesses, hospitalizations, and deaths, and bring about many physical injuries, such as lacerations, sprains, fractures, amputations, which could lead to infections (Smith et al., 2022). Next, flooding can lead to a number of health impacts, including drowning-related deaths, increased risk for waterborne illnesses, and long-term respiratory issues due to moldy and damp environments (Smith et al., 2022). Droughts, a period of time in which the environment is dry, can lead to aggravation of the lungs and the airway, leading to long-term respiratory infections, and the increase of heat exhaustion and deaths (Smith et al., 2022). Along with drought, extreme increases or decreasing in temperature can lead to heat-related illnesses, and the increase of cardiovascular, kidney, and respiratory diseases (Smith et al., 2022). Finally, wildfires lead to increasing incidence of respiratory illnesses and infections, as well as rising mortality rates (Smith et al., 2022). These examples of natural disasters show the wide variety of health complications that may become prevalent in the aftermath, especially in low-income communities. These populations are most susceptible to these health long-term health conditions because of their pre-disposition to them and their inability to mitigate the effects of health inequities (Smith et al., 2022).

The addition of new policies that are more inclusive to vulnerable populations and furthering research to address health disparities could mitigate long-term health impacts of high-risk populations (Smith et al., 2022). Identifying the root of the problem and creating policies to combat health inequalities can improve long-term health outcomes, especially for those populations who are more vulnerable to environmental and geographical risk factors (Smith et al., 2022). By partnering with communities that are more susceptible to experiencing poor health impacts due the natural disasters and implementing policies to increase funding for these issues, potential health inequities can be alleviated (Flores et al., 2024; Smith et al., 2022). Creating baseline data to explore future research methods can uncover social, geographical, and economic susceptibilities to diminish the issue of health inequalities in the structure of the current healthcare system (Flores et al., 2024).

Individuals and families of low socioeconomic status have an association with a poor health-related quality of life (HRQoL) due to rising poverty rates, reduction in access to healthcare, increased rates of chronic illnesses, etc. (Frontera-Escudero et al., 2023). Their poor HRQoL outcome is exacerbated by demands such as competition in employment, wealth inequalities, and financial constraints of the household (Frontera-Escudero et al., 2023). Many of the difficulties in accessing healthcare are due to these lack of employment opportunities, which can be detrimental to an individual's well-being, overall. The implementation of intervention strategies that monitor relationships between sociodemographic status, risk factors for health issues, and overall HRQoL can aide in the prioritization of health needs assessment in these low-income communities that struggle to make ends meet (Frontera-Escudero et al., 2023). The lack of promotion in health equity of susceptible populations has catastrophic effects on the well-being of these communities, it is critical to mitigate the short-term and long-term effects that take

a toll on these populations (Raker et al., 2020). Government action and policy changes are necessary to preventing barriers in access to healthcare in these communities, especially when in recovery from a natural disaster.

Lack of Emergency Preparedness and Disaster Relief

Emergency preparedness and disaster management are critical steps in the recovery process, following a natural disaster. Emergency preparedness is defined as the mitigation of the impact of disastrous events by using strategic planning intervention methods and allocating necessary resources in preparation for the aftereffects of a major event. Much of this responsibility falls on government aid and resources to fill in gaps of emergency preparation (Raker et al., 2020). Government negligence towards addressing essential needs leads to difficulties in accessing healthcare and the disruption of numerous healthcare services (Laboy Baiz, 2022). The lack of government assistance increases the probability of healthcare access challenges following the events of a natural disaster, while the influence of assistance can have many benefits. Government assistance can ensure access to programs for certain health conditions, provide stable housing, and secure employment opportunities in low-income communities (Kracht et al., 2024). This implementation of these enhanced government assistance strategies could be a significant addition to emergency preparedness before the affects have already become catastrophic. Another approach to emergency preparedness planning is to assess vulnerable populations and their risk for catastrophic damages based on geographical location, infrastructure development, and sociodemographic status (Kaushal et al., 2024). Since low-income families are typically more susceptible to living in vulnerable geographical locations for natural disasters, it is important to build up the infrastructure of these communities, spread community awareness, and promote emergency preparedness (Kaushal et al., 2024). These

strategies could aid in prevention methods of challenges in access to healthcare and assist vulnerable populations with efficient strategies of preparation.

Disaster relief can be defined as measures taken following a catastrophic event that require immediate assistance, support, and resources for the purpose of recovery. Targeted relief methods through funding, especially for potential vulnerable populations, can lead to significant improvements in recovery efforts (Davis et al., 2020). The relief process plays a crucial role in recovery efforts, but there are often disparities found when experiencing relief efforts. Access to healthcare is particularly difficult during this time. Many difficulties arise from the burden of natural disaster regarding access to healthcare, such as long travel periods, financial hardships, access to basic medical care, delayed or denied care, and many more issues regarding access to healthcare (Leyser-Whalen et al., 2020). Reduction in access to healthcare in the disaster relief process can implicate long-term consequences and health issues, such as chronic and mental health disorders due to not receiving the proper medical treatment that is needed (Baum et al., 2019). There needs to be implications for policy changes regarding equitable and basic healthcare services following a natural disaster (Leyser-Whalen et al., 2020). Influences on the creation of new public health policies can implicate improvements to disaster relief strategies (Arcaya et al., 2014).

Continually, there are several methods of action that can be taken in order to prevent inadequacies of disaster preparedness, in the future. Generally, there is a lack of knowledge of the best method to alleviate insufficient care, following natural disasters (Gorji et al., 2018). Developing action plans, establishing leadership, ensuring that everyone has a proper role in addressing proper treatments (Gorji et al., 2018). Facilitating effective education and training for disaster management and evacuation, especially in areas that are more prone to a natural disaster

can enhance disaster preparedness and ensure that treatment for immediate disaster relief and pre-existing conditions are carried out effectively (Gorji et al., 2018; Moslehi et al., 2024). Allocating resources, the management of patients, and effective planning can ensure that all patient needs are met, securing the most efficient patient care by identifying, documenting, and treating their needs (Moslehi et al., 2024). Furthermore, implementing effective communication strategies are critical to ensuring that health outcomes are improved throughout this process (Moslehi et al., 2024). Internal communication within the hospital and external communication with surrounding facilities that have not been effected can aid all healthcare personnel with establishing electronic health records that can be accessed across a variety of facilities can ensure that proper treatment of conditions can be obtained, especially if victims of a natural disaster are relocated to other facilities that have not been impacted by the disaster (Gorji et al., 2018; Moslehi et al., 2024). Inconsistencies of effective communication can be catastrophic because it is important to obtain necessary patient information, such as current medications, patient history, family history, allergies, etc. There are five primary components that impact effective disaster risk communication- message, message sender, message receiver, and message process (Fathollahzadeh et al., 2023). The message refers to the clarity and content of vital information to advocate for patient needs (Fathollahzadeh et al., 2023). The message sender establishes the source's credibility of the message that was delivered (Fathollahzadeh et al., 2023). The message receiver refers to the characteristics of the recipient, including their scope of practice, perceptions, and understanding of the situation and tasks that must be performed to ensure effective patient care (Fathollahzadeh et al., 2023). The message environment consists of the cultural, social, and situational context in which communication must be carried out (Fathollahzadeh et al., 2023). Finally, the message process refers to the channels used and

methods for liaising vital information (Fathollahzadeh et al., 2023). These communication strategies can establish the distribution of critical information that may aide in the recovery process in the long-term.

Psychological, Social, and Financial Hardships

There are many psychological, social, and financial hardships and risk factors that arise by not being able to access essential access to healthcare. The diagnoses of pre-existing medical conditions can make individuals more vulnerable to experience adverse medical and social affects, as well as barriers with access to healthcare to treat these issues can be catastrophic to a person's overall well-being in the future (Paquette et al., 2024). The implementation of harm reduction strategies during this time can influence a person's psychological and social health (Paquette et al., 2024). However, this could implicate a financial burden on individuals who may not be able to afford the medication and treatment necessary to their condition. Low-income communities that are negatively impacted in the aftermath of natural disasters are predisposed to these conditions due to the absence of financial stability and the essential resources to mitigate the effects of natural disasters. They are often discriminated against and politically marginalized which has affects the recovery of these communities (Paquette et al., 2024). A study conducted in Houston, Texas by Paquette et al. discovered that it is difficult to obtain government financial aid for disaster-related assistance in these communities, creating a financial barrier to access healthcare (Paquette et al., 2024). This can lead to further inequalities and difficulties in accessing proper healthcare treatment following a natural disaster, especially since they are predisposed to these barriers due to their low socioeconomic status, pre-natural disaster.

Financial burdens of access to health may also be affected by households that rent their properties (Ma ChenYi & Smith, 2020). There is evidence to show that low-income households

are more likely to rent properties, however this makes these families more liable to damages for damages caused by these disasters. Housing structures of low-income households are typically unable to withstand the effects of a natural disaster, leading to the inability to efficiently rebuild these facilities in a timely manner in the aftermath (Lowe et al., 2014). Renters are more liable for property damage than homeowners, so these low-income families fall into financial burdens. (Ma ChenYi & Smith, 2020). A study conducted by Ma ChenYi & Smith, made the discovery that renters and low-income households suffer housing damages more frequently, and typically face more financial burdens to fix these damages (Ma ChenYi & Smith, 2020). It was also concluded that the risk of structural damages between low-income renters and homeowners are contributed to the overall household income level (Ma ChenYi & Smith, 2020). Continually, low-income household are more vulnerable to environment disasters because the structure of the housing options that are available to them (Ma ChenYi & Smith, 2020). This makes these household vulnerable to relocation, creating barriers to essential healthcare for disaster-related injuries, as well as acute and chronic conditions (Ma ChenYi & Smith, 2020).

Psychological risk factors are an important health-related component, when considering the damages of natural disasters. Physical and psychological conditions can arise, following the trauma of a natural disaster, and interventions for survivor mental health should be considered as part of the recovery process (Lowe et al., 2014). There are many stressors could predispose individuals and communities to psychological distress in the aftermath of a natural disaster, such as relocation and loss or disruptions in employment status (Lowe et al., 2014). Psychological health has effects on an individuals' physical health in the recovery process, and community resilience towards a natural disaster event can encourage communities to join together with one another can have many psychological benefits (Heinz et al., 2022). Mental health contributes to a

large portion of long-term health because poor mental health status can result in unexplained physical symptoms that occur in a post-disaster setting (Lowe et al., 2014). Every individual experiences this form of trauma differently, so it is important that barriers to access to healthcare are minimalized during this process to, not only conquer physical risk factors, but psychological ones, as well (Lowe et al., 2014). This is especially true in low-income communities because they are the most impacted by the effects of natural disasters and are more susceptible to poor mental health outcomes (Lowe et al., 2014). Social support in these communities who have gone through similar events can aide in an individual's healing process (Ahmadiani & Ferreira, 2021). Communities often come together in times of crisis and trauma, and low-income household are no exception to this (Ahmadiani & Ferreira, 2021). Social and community support have the ability to buffer the traumatic effects of natural disasters, and it is important for low-income communities to show resilience as a safety net throughout the recovery process (Ahmadiani & Ferreira, 2021). However, this social support is difficult to achieve, at times, due to relocation and barriers to healthcare access contribute to stressors in low-income communities after a disaster, leading to poor mental and physical health outcomes (Ahmadiani & Ferreira, 2021).

Discussion

This literature review provides an evaluation as to how natural disasters effect access to healthcare in low-income communities, as they are typically impacted the most by these catastrophic events. Natural disasters give rise to incidental health outcomes, exacerbate pre-established health disparities, and highlight systemic issues found within the healthcare system. It is important in healthcare settings that strengths and weaknesses are defined and contribute to constant improvements in emergency response and disaster preparedness (Naik et al., 2023). In these public health emergencies, it is critical that communication within internal and external

facilities occur, in order to determine the best treatment options for everyone in the community (Naik et al., 2023). Implementing strong communication and coordination, resource distribution, emergency planning, surveillance of potential emergencies, and sharing knowledge of disaster management strategies are all exercises that should be implemented by healthcare personnel in preparation for these events (Naik et al., 2023).

Moreover, low-income communities are already at a disadvantage before the effects of a natural disaster due to lack of access to healthcare and resources, which only exacerbates poor health outcomes (Bates, 2019). Low-income communities are most at risk for barriers to access necessary care, and they are socially and physically more vulnerable to disasters (Bates, 2019). Awareness of these communities that are most impacted of this issue and providing necessary resources for them beforehand will show improvements in the health of these populations (Bates, 2019). During the process of recovery and rebuilding, it is important that public health interventions from governments, international agencies, and nongovernmental organizations to aide in long-term solutions, especially for those communities that are most disadvantaged before and after a natural disaster (Bates, 2019).

Finally, another solution that will aide in combatting barriers in access to healthcare is the integration of primary health care into disaster relief strategies (Swathi et al., 2017). When resources are limited, primary health care has the ability to provide cost-efficient and immediate emergency care that is essential for the recovery process (Swathi et al., 2017). Not only will this aide in access to healthcare in low-income communities, but it enhances resilience within them that result in the reduction of physical and mental morbidities (Swathi et al., 2017). Targeting low-income communities that are resource-poor, do not have access to necessary medical

facilities, and lack essential health-related knowledge will result in improved availability to emergency medical assistance, if primary health care is implemented (Swathi et al., 2017).

Implications

The lack of essential healthcare to low-income communities provides further implications for research in this field. This literature review identified gaps in which disaster-related research, practices, and education strategies could provide better healthcare access and resource allocation for these vulnerable communities. Beginning at the local level, assessing infrastructural, financial, and overall community vulnerabilities can evaluate barriers that are present, and this will provide knowledge as to what populations are more susceptible to the impacts of these disasters (Nashwan et al., 2023). Implementing more resilient healthcare systems that are resistant towards exacerbated health disparities and creating more efficient disaster management strategies to properly allocate resources can resulted in more accessible healthcare options to low-income communities (Nashwan et al., 2023).

Limitations

Limitations of the research analysis that was conducted could have impacted this literature review. By limiting the research to only focusing on natural disasters in the United States, there is potential that the findings may not be generalizable to the effects of natural disasters in other countries. Also, limiting the time frame to articles that were published in the past ten years led to the inability of analyzing articles that address how the healthcare system has previously combatted the effects of barriers to access to healthcare due to natural disasters. Finally, recall and response biases, as well as confounding variables may have risen due to the fragile state of vulnerable communities following a natural disaster. These limitations can affect

the generalizability of the findings of this literature review, however there is strong evidence in the article analysis to suggest that further research of this topic should be explored in the future.

Conclusion

This literature review analyzed barriers in access to healthcare in low-income communities in the aftermath of a natural disaster. These multifaceted barriers decrease communities' resilience and have catastrophic results in these already disadvantaged populations, resulting in poor health outcomes. Providing accessible healthcare and providing more efficient allocation of resources to establish a better, disaster-resilient healthcare system will yield positive health outcomes in predisposed vulnerable populations. In a post-disaster setting, the need for healthcare is more critical than ever, and it important that there is strategic planning to account for these populations that are most affected by the barriers placed on them. Further research is essential to combat this public health issue to prevent further exacerbation to these healthcare barriers, in the future.

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