Floods Risk Perception, Preparedness, and Evacuation Intention among Saudi Older Adults.

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**Introduction**

Continued awareness and clarity concerning the link between weather extremes and climate change brings into attention natural hazards. Climate-induced natural disasters have been on the rise since 1900. As recorded by the U.N Office for Disaster Risk Reduction and International Disaster Database, one of the worst trends that are noticed as a result of climate change is hazardous floods and storms. In various urban centers, flooding is of significant concern because of increased population, infrastructure, and property. Disasters have frequently been occurring, with older adults experiencing significant adverse effects. There is various evidence that shows the vulnerability of older adults to natural disasters over the last few decades; for instance, the 2005 Hurricane Katrina and the 2010 Japan earthquake and tsunami. The residential settings type has a significant influence on the level of disaster preparedness and response; for example, older people who are living in nursing homes have health and functional challenges that need assistance with various daily activities. In case of an occurrence of a natural disaster like floods, the level of assistance to these older adults should be highly pronounced. However, the majority of older people live independently in the community, and they receive help from friends, families, and community-based care. After a disaster, many older adults may find themselves in their communities and homes without necessary support services. The purpose of this research paper to evaluate floods risk perceptions, preparedness, and evacuation intention among Saudi older adults. The article focuses on the purpose and needs of the study, initial literature review, and is various issues in project development and direction.

**Statement of Purpose of the Project**

The occurrence of floods in Saudi has shown evidence of the vulnerability of older people to natural hazards. Older adults bear the consequences of hazardous events due to their perceptions of the disaster. Many studies concerning older adults' vulnerability have indicated old age as a significant indicator of vulnerability. Areas that have gained some concern are how older people perceive disasters, their preparedness, and how they respond to these potential risks. The knowledge of these elements forms the development of various strategies that will accommodate the older adults' needs and behavioral interventions to help them deal with floods. The research will advance the understanding of the vulnerability of older people in flood risk areas, especially in Saudi. This research discusses in length patterns in risk perceptions, practices that are used during the preparedness process, and evacuation intentions.

The risk and impact of disasters have increased in the last few years. Evidence has revealed that many individuals are getting exposed to disaster risks faster than the ability to reduce these vulnerabilities to them (Montz, Tobin & Hagelman, 2017). The disaster management framework is essential for providing a comprehensive plan for protecting people in society, especially older adults. The priority for disaster management and reduction is understanding the risk. Perceiving the disaster risk is a way of getting an in-depth understanding of risks. Perceptions play a vital role in encouraging individuals to accept, avoid, and reduce risk. To attain community preparedness, it is important to improve the perceived risk of disasters in the community. Perceptions are mental processes that are internalized via cultural and social education, and media reports, peer impact, and other communication ways act as moderators. This research places older adults at the center of the study and also embraces their preparedness and evacuation intentions alongside their perceptions of flood risks. The study focuses on older adults in Saudi, which is one of the flood risk areas. Based on first-hand information gathered through interviews, the research project looks for risk perception patterns, preparation practices, and evacuation intentions. Some of the objectives of this research are to understand flood disaster perceptions, the level of preparedness, and flood evacuation intentions and decisions that older individuals make regarding evacuation. The research reveals an understanding of threats associated with floods and analyzes perceptions of the hazard risks among older adults. Also, in the project, there will be a description of the complexities that surrounds evacuation decisions that are made by older adults. Low-risk perception could result in minimal coping mechanisms among older people, while high-risk perceptions are related to the adoption of protective behaviors that are vital for higher resilience. Increasing public awareness of risks that are associated with disaster can influence older adults' attitudes to be more proactive in disaster preparedness. Exploration of older people's perceptions of disaster risks can help public health agencies and emergency team with useful information to formulate necessary risk management strategies and educational programs. Many contextual factors form an explanation of why individuals perceive risks in various ways. These features include hazardous events, characteristics of risks or hazards, proximity to the hazardous event, availability of information, demographic, and socioeconomic standing.

This research also seeks to understand preparedness during disaster occurrences like floods in Saudi. First, it is vital to understand what preparedness is and how it is used as a concept in practice. Preparedness is defined as readiness or the state of being prepared but which comes with various meanings when used for a different type of event. As the cost and frequency of disasters continue to increase globally, many initiatives concerned with the reduction of the risk from natural hazards. Preparedness is recognized as one of the phases of disaster alongside mitigation, response, and recovery that forms part of the disaster management cycle. Preparedness assists in increasing the chances of survival and enables effective response during a disaster. Preparation and mitigation support post-disaster recovery and restructuring efforts and further enhance coping capacity towards future disasters.

**Need for Study**

Older adults in the times of a disaster are the most vulnerable category of people, as indicated by experts and rescue teams in their specific roles or responsibility (Al-Rousan, Rubenstein & Wallace, 2015). In this case, this shows the strong need to understand this topic to better equip involved parties and the populations with the right information skills and also better methods of disaster recovery, especially for these older adults. The older adults have perceptions that, in many cases or during the occurrence of a disaster, leaves them exposed, vulnerable, and also making it difficult for the rescue teams to rescue them effectively.

Natural disasters such as floods, epidemics, dust storms, and others are frequent in Saudi Arabia, and many people are vulnerable (Rahman, Aldosary, Nahiduzzaman & Reza, 2016). These disasters, especially floods, have portrayed the vulnerability of the elderly adults in these environmental hazards, and this is contributed significantly by the perceptions that the elderly adults hold, which in many cases hinder the evacuation process. This scenario creates the need for further study of and research on this topic. This is because the cycles of disaster recovery are going to be more efficient and reliable if experts and researchers understand, on a detailed level, the perceptions of the elderly adults regarding disasters.

Citizens, especially of the Jeddah city in Makkah Province, are commonly affected by floods, and the older adults are the most affected and also children. The further study of disaster management in this topic on the perceptions of the older adults on natural disasters indicate that preparedness, as well as the response and recovery if well designed or planned and efficiently implemented, can combat these older people's perceptions and cause them to be responsive. Further or advanced need for studying this topic helps to develop and build literature, especially on the health needs of older adults. This is because most of these perceptions obstruct the administration of proper health care where epidemics arise, or waterborne disease that occurs often after floods.

Aligning and extending current preparedness programs to involve these older adults helps to enhance their disaster preparedness and resilience. The older adults do not prioritize disaster preparedness. This is dangerous since this category of people due to their perceptions significantly affect even evacuation procedures and other vital disaster management activities. In Saudi Arabia, the perceptions of the elderly are further escalated by their religious beliefs and lifestyle that sometimes forbids some critical or necessary activities in society. This signifies the critical need for continued and further research into this matter. It is clear from these perceptions that this age group lacks little understanding and awareness of the implications of the aftermath of a disaster.

These elements and factors lead to the formulation of these studies, which places these elderly individuals at the core center of research and analysis, which aims at providing a deeper understanding of the critical need of embracing disaster preparedness and the intentions of evacuation and also the elimination of these unhelpful perceptions. The need for this study in this case of Saudi Arabia seniors prone to disasters gives a better dimension of understanding for the researchers and other stakeholders. This is through the perceptions of the elderly, how much they understand the disasters, and what it is to formulate better policies and programs that will give them more knowledge and awareness. This knowledge and awareness in these situations help to eliminate some of these perceptions.

By carrying out these studies on the older adults in disaster-prone areas in Saudi Arabia, such as the regions in Makkah Province, the behaviors of these people gives an insight into the government's commitment and other disaster response operatives in helping them and also on how to behave or respond in the event of a disaster, for instance, a dust storm or floods among others. The studies also give additional literature or information on the exposure or vulnerability of this age group from a cognitive and behavioral dimension. The study of these older Saudis is a part of the developing work that seeks to bring to light the risks perceptions and self-protective activities that endanger the older people.

Some of the perceptions include trust and belief in media and county officials of these older people’s willingness to evacuate and also to follow the set preparedness programs (Yoo, Lee & Tullmann, 2016). Other perceptions associated with older people are physical challenges, such as hearing problems and frailty. Sometimes these older Saudis may carry the perception of not hearing in a noisy disaster recovery center or difficulties in moving around in the recovery center for the vital services. Due to such perceptions as hearing or even eye problems and frailty in general, disaster preparedness activities and response may continue to be delayed and interfere with a prompt response when an actual disaster occurs.

These studies also show that older people in Saudi Arabia due to these disaster perceptions may not fully understand the stipulated compliance measures and steps that should be followed when a disaster occurs, or during the aftermath of a disaster. It is through the detailed study and research on this topic that we can fully understand and set the necessary measures and policies that will help the older adults in Saudi Arabia. The key areas that stand to benefit from these studies are such dispensation of better health care, allocation of resettlement funds, and other vital materials in evacuation and the recovery phase of the disaster recovery cycle.

**Literature Review**

Peer-reviewed literature on flood risk perception, preparedness, and evacuation is quite diverse. This is due to various factors like epistemological approaches on research analysis and ontological beliefs. Ontology is concerned with the existence and reality structure; it is the study of being. Ontological research is about the existence and the relationship between various societal aspects like cultural norms, social actors and structures. In other words, ontology is concerned with beliefs about the type and nature of reality and what exists. Epistemology is generally the assumptions that people make about the nature of knowledge. It is a way of looking at the nature or world and making sense out of it. For example, in this study , both quantitative and qualitative are used in risk perceptions and evacuation studies, which assists the reseachers to address issues like effectively introduce bias. Psychological approaches bring an understanding of how individuals perceive different types of risks. Social- psychological studies show how social factors, norms, attitudes influence a person's ability and motivations for preparedness. Also, sociology studies on disaster focus on how various social groups experience disasters. To determine the literature search and eligibility criteria, search was conducted on Google Scholar databases and Websites like EBSCO to obtain peer-reviewed and scholarly articles that address the topic. I searched using different keywords like risk perceptions and older adults, disaster preparedness in Saudi, Floods in Saudi, disaster preparedness, and evacuation among older people. I picked the articles that followed this eligibility criterion; first, the hazard type, which is a flood, second reported on disaster risk perceptions among older people including preparedness and evacuation process, and third, that showed information about the occurrence of disasters in Saudi.

Saudi Arabia is one of the countries that are particularly vulnerable to human-made and natural disasters and threats as a result of long coastal zones, an annual mass gathering of millions of Muslim pilgrims and its geographical landscape (Bachmann et al., 2015). During 2015, it is estimated that 12,000 people were affected by natural and human-made disasters, and more than 2000 people were in need of emergency assistance. The most affected of this population were older adults who were in need of assistance due to some of the challenges that they faced mostly physically (Wang, 2016). Community preparedness and resilience efforts are vital in mitigation of the disaster crises. Timely response and also the adequate response is mandatory, and this can be enhanced by strengthening professional and effective preparedness and response leadership (Tambo, Fouad & Khater, 2017).

This research is based on in-depth literature on natural hazards and the vulnerability of older adults from behavioral and cognitive perspectives. The case study of Saudi's older adults adds to the already existing work that brings to light the risk perceptions and self-protective strategies of older adults who are facing a disaster. Empirical studies have displayed that older adults are the most affected part of the population during a disaster. According to Wang (2016), the vulnerability of older people in all disaster stages is well known by both the practitioners and scholars,There has been increased interest by various researchers on flood risk perceptions as the seek to provide crucial insights for risk management and communication strategies. Multiple studies have investigated the relationship that exists between flood risk perceptions and the use of flood mitigation measures. For example an article in the psychology &health journal by Weinstein, Alexander and Nicolich, (1998) shows the relationship between perceptions and evacuation process. Another research by Marvin , (2018)sublitted for the degree of Doctor of Philosophy at University of Queensland Shows the relationship between flood risks perceptions and mitigation measures during a disaster. Also, a number of studies have examined different factors that enhance flood mitigation behavior, especially risk perceptions. According to Bubech et al., (2012) there are factors that influence precautionary behavior apart from risk perceptions. Factors like coping appraisal are related to mitigation behaviors. Poussin et al., (2014) also discusses factors that influence flood risk mitigation behavior among peopleThe bulk of research on disaster regarding older adults has focused on the disastrous consequences, with much attention accorded to disaster recovery and reconstruction. Preparedness and response are also other key areas that have gained a lot of attention. Preparedness and response, which happens before and during a disaster, if well-managed and planned, can minimize vulnerability and promote resilience. The majority of the studies have also addressed preparedness and evacuation plans of the eldercare institutions like nursing care.

Research also focused on flood risk perceptions, which have been discussed by various scholars. Low-risk awareness of older adults living in flood-prone areas has been considered to be one of the core causes of low preparedness, which results in inadequate response to the hazard Risk perception is the process of selecting, collecting, and interpreting signs of uncertain impacts of some events. Risk perception offers individual perceptions and interpretations of flood disasters that need to be included in the decision-making process (Fuchs, et al., 2017) . Flood risk perceptions and awareness plays a central role in the risk management process. Tuohy et al. (2014) stated that the perceptions or views of older people have been ignored, and they have been seen as passive subjects. The authors have called for contextual methodological approaches that put into consideration these older adults' experiences and provide a clear picture of these vulnerable populations, like the older Saudis, who are at risk because of hazardous events like floods. Extensive research on risk has given us an insightful understanding of people's behavioral and attitudinal responses in different areas. For instance, increasing older people's perceptions of health risks has expanded knowledge of gerontologists of successful aging and preventive health attitudes. This research that investigates how older adults perceive flood risks adds to the available literature and also will assist in the interpretation of older people preparedness and evacuation planning.

**Methods to be Used to Complete the Project**

In this project, an effective method of conducting this research and study is vital to access and generate accurate data or information. This is going to provide all the stakeholders with informative work for better formulation and establishment of effective policies. Developing viable research is essential in comprehending the dimensions of knowing certain characteristics and factors that influence these older people in Saudi Arabia. These are characteristics and factors or elements that impact the perceptions of these older Saudis and especially the demographics. The method of research chosen is one that will give the readers a clear outlook of the of these perceptions and how they expose these individuals to even unforeseen vulnerabilities.

Several research methods are effective, but in this case, the most effective and efficient research methods that also offered reliable information and data are the quantitative methods (Bryman, 2017). This is because of the analysis that will be carried on the traits of these people involved in preparation and or evacuation. The methods further offer me the chance to develop or record statistical inferences on the obstacles to behaviors due to the underlying traits as mentioned above. In the area or process of interviews, a qualitative research approach is preferable for preparation activities, patterns of risk perception, and the intentions of evacuation.

Even though there is broad literature regarding these perceptions, preparedness, and evacuation activities or actions, it is still not adequate on the topic of these older people’s perceptions. Some other researchers have focused on this topic, and in this project, the research is mainly focused on a detailed level of the perceptions of the older adults in Saudi Arabia. The use of quantitative methods more than qualitative methods is because qualitative methods are still new in this sector of natural disasters and vulnerability. In the whole process, it is imperative to understand that this study or project grew due to the growing concerns of the vulnerability of the older Saudis during a disaster as a result of their perceptions.

Most of the first-hand information other than from database records will come from these older adults as respondents. A total of ten adults both female and men respondents will be interviewed. The interview will take place outside the mosque that will offer easy access and familiar environment to respondents. The interview will be conducted in English, this means that the respondents should be fluent in speaking English. Each interview is estimated to take between ten and fifteen minutes. Some of the open ended questions that I will ask the respondents are; what are your perception about hurricanes? What is the likelihood of a hurricane hitting Saudi? What do you think is the likelihood and severity of you being affected if hurricane or floods hit this area? What are the preparations you can do for future flood risks? Are you prepared for floods or hurricanes? What do you think should be prepared for hurricanes. This will mainly stand as the primary source of information on this subject matter. One of the core missions or objectives of this project as employ these research methods is to develop our understanding further on the association or link between disaster recovery or management and older adults in Saudi Arabia. It will also enhance in implementing and identifying efficient policies and regulations which will reduce these elderly adult’s vulnerabilities.

This research is exploratory in aspect, and it takes a personal focus on older adults in Saudi Arabia to understand their perceptions and behavioral response that they have towards natural hazard risk. Before going into the fieldwork, I will review the interview protocol and understand the interview language that is recommended. Concerning the recruitment of the respondents and site selection, I intend to approach older adults around the mosque after prayers. Mosques offer convenient access to those who are coming for prayers, and around the mosque, there are a variety of activities that make it a preferred place for those older adults who drive themselves or use public means of transport.

Some few days before conducting the fieldwork, the staff working in the mosque after prior request, will post flyers concerning the interviews and made several announcements about the interviews and scheduled time. The subject of the study will be informed to the respondents, and their rights as interviewees will be stipulated. Also, they will be required to sign informed consent forms before the interview — open-ended questions concerning the topics of hurricane or flood risk perception, hurricane preparedness, and evacuation plan. The interview will be constructed by three key pillars, which is first is the use of non-technical languages, second, a description of hurricane preparation activities, and thirdly is an explanation of their evacuation intentions and process.

My emphasis on quantitative research is based on the processes and understanding of the intended approaches. It is essential to note further that this project is not limited to quantitative research methods alone. It also includes some elements and aspects of qualitative research methods, especially for research on written literature or literature reviews from other researchers and or scholars involved in previous studies. In the same process of applying qualitative research methods, interviews are going to be in-depth as earlier mentioned, but the core methods of research will mostly be quantitative but will include the subsections of detailed information on the literature review acquired through qualitative research methods.

Because Saudi Arabia is largely a religious state, it is easy to find respondents around the mosque to engage on that level. The approach will focus on maximizing the objective of the project and what will reduce bias and falsification of my research in this project. I have set the process of research to offer me the opportunity to sample the respondents for convenience purposefully. I have also factored in the aspect of religious regulations or implications since Saudi Arabia is largely a Muslim state.In some areas, it is a taboo for women to be seen speaking to men, especially strangers. In this case, most of my respondents will be men and available, responsive women. However, I intend to involve a resident in such regions to help me maximize getting more information even from the women to reduce biases.

I will engage in collecting all the theoretical information on the demographics and background information as well as data from other research materials from literature reviews and other studies conducted by other scholars and researchers in related topics. This will help me have a quick understanding of the demographics of the region before proceeding to the physical and practical aspects of the research project. In addition to this, I want to research on the population of the older people in Saudi Arabia, mostly from sixty-five years and above. This is because, in most of the research guidelines, the age threshold holds or marks as the boundary between the young and the old.

**Issues in Project Development**

In every project, it is critical for the person or individuals involved to understand and align or familiarize themselves with the possible issues that may arise in the course of the project development. This is to ensure that the project is successful and that any point of concern that cause a downfall is mitigated or resolved before interfering with the project. In this case, my project is also prone to such issues, and I must address possible issues to avoid unnecessary failures or stalling of the project. I have analyzed the potential issues that I might face in this project and engaged the necessary mechanisms to prevent any possible negative effects.

I realized that without a comprehensive education program for my respondents, many of them are going to give unreliable information due to lack of proper understanding of the objective, which in this case revolves around perceptions of disaster management in older people in Saudi Arabia. This is going to be a quick understanding of my respondent's knowledge and awareness of the natural disaster common in their region and also other prone areas. A proper education program will help me prevent project failure or delays when dealing with the respondents and also in the accuracy or genuineness of the information given by my respondents in Saudi Arabia and mostly around the mosques.

Proper groundwork or homework, especially theoretically on the history of disasters in the region, the demographics of the region, and also the beneficiaries of this project, is a vital step in this project. In this scenario, I have ensured that I will conduct a thorough background research of every reliable information that will help me in this project, especially on these mentioned areas and aspects. This will be covered by the numerous literature reviews and the reliable demographic information available from databases and other trusted sources such as government databases or archives.

Clarity of the project and its requirements is another issue that may arise in this project development. In this concept and possible outcome that may be negative, unclear project requirements and objectives will always lead to project failure, no matter the available resources. In my project, I have ensured that my objectives are well laid and defined with a suitable language and also the use of a reliable research question. This summarizes my objective into an understandable guiding principle that will be the leading objective of the project, like, in this case, the perceptions of disaster among the older adults in Saudi Arabia.

Planning can perhaps be said to be the most underlying issue in every project. This is because the planning schedule incorporates every other component of the project, allocating it, or assigning it a specific period in the process of the project. Failure to do this exposes your project to unnecessary risks and failure. In my project, I have everything scheduled appropriately from the use or application of the research methods that are where and when and also the proper allocation of vital resources set aside for the project. I have also put in place a project scope to help keep me in track with the core objective of the project.

Communication, just like a planning schedule, is also another common cause of issues in any given project. This is because, in this project, there will be thorough and detailed research on the topic. The research will include, among other respondents from the target region. Therefore, I must ensure that in the process of conducting an interview, especially with the respondent's proper none faulty and clear communication avenues are in place to reduce communication barriers and also a conflict of issues such as religious implications associated with the respondents. Communication issues should be avoided by all means since it is among the top reasons for project failure.

When developing a research project, many issues may arise in the course of study. I should realistically think of practical implications of the topic that I choose in terms of necessary visits to the field, especially to meet the respondents, access, and availability of the population of interest and also possible costs that I may incur. By making consideration of these factors, I will prevent any delay in dissertation delivery and avoid possible inconvenience. Procrastination is another problem that may hinder the delivery of an effective and complete dissertation. This is a common issue with many of the students, and it happens because of various reasons like loss of motivation, poor management of time, personal problems, and problems in concentrating.

**Conclusion**

This research paper has targeted older adults from Saudi, and it explores their various perceptions of flood risks, the extent of flood preparedness, and evacuation intentions during the occurrence of floods and their decision-making. The primary source of information will come from in-depth interviews that engage older adults in the research process. Drawing from their response during the interview, this research paper will bring clarity on how older people of Saudi perceive flood risks, practice flood preparedness, and make flood evacuation decisions. I have dealt with older respondents’ perceptions of hurricane hazards. This research is based on in-depth literature on natural hazards and the vulnerability of older adults from a behavioral and cognitive perspective. The case study of Saudi's older adults adds to the already existing work that brings to light the risk perceptions and self-protective strategies of older adults who are facing a disaster. The research will expand on the understanding of evacuation and inform of better planning for older people during disaster management. Quantitative methods will be appropriate for this study, where there will be an examination of the characteristics of the people who are preparing or evacuating. Then I will make statistical inferences about barriers to behaviors as a result of these characteristics. The first-hand information will be collected through qualitative interviews in search of preparation practices, patterns in risk perception, and evacuation intentions.

References

Al-Rousan, T. M., Rubenstein, L. M., & Wallace, R. B. (2015). Preparedness for natural disasters among older US adults: a nationwide survey. American journal of public health, 105(S4), S621-S626.

Bachmann, D.J., Jamison, N.K., Martin, A., Delgado, J. and Kman, N.E. (2015) ‘Emergency

preparedness and disaster response: there’s an app for that’, Prehosp Disaster Med., Vol. 30, No. 5, pp.486–490.

Bryman, A. (2017). Quantitative and qualitative research: further reflections on their integration.

In Mixing methods: Qualitative and quantitative research (pp. 57-78). Routledge.

Fuchs, S., Karagiorgos, K., Kitikidou, K., Maris, F., Paparrizos, S., & Thaler, T. (2017). Flood

risk perception and adaptation capacity: A contribution to the socio-hydrology debate. *Hydrology and Earth System Sciences*, *21*(6), 3183-3198.

Montz, B. E., Tobin, G. A., & Hagelman, R. R. (2017). Natural hazards: explanation and integration. Guilford Publications.

Poussin, J. K., Botzen, W. W., & Aerts, J. C. (2014). Factors of influence on flood damage mitigation behaviour by households. *Environmental Science & Policy*, *40*, 69-77.

Rahman, M. T., Aldosary, A. S., Nahiduzzaman, K. M., & Reza, I. (2016). Vulnerability of flash

flooding in Riyadh, Saudi Arabia. Natural Hazards, 84(3), 1807-1830

Tambo, E., Fouad, A. M., & Khater, E. I. (2017). Strengthening community emergency

preparedness and response in threats and epidemics disasters prevention and management in Saudi Arabia. *International Journal of Emergency Management*, *13*(3), 288-303.

Uehara, M. S. (2018). Individual Risk Perception and Flood Mitigation: An Empirical Study of Protective Actions in Australia.

Tuohy, R., Stephens, C., & Johnston, D. (2014). Qualitative research can improve

understandings about disaster preparedness for independent older adults in the community. Disaster Prevention and Management, 23(3), 296-308.

Wang, C. (2016). Hurricane Risk Perception, Preparedness, and Evacuation Intention Among

Older Adults.

Weinstein, N. D., Rothman, A. J., & Nicolich, M. (1998). Use of correlational data to examine the effects of risk perceptions on precautionary behavior. *Psychology and Health*, *13*(3), 479-501.

Yoo, M., Lee, M., & Tullmann, D. (2016). Perceptions of disaster preparedness among older people in South Korea. *International journal of older people nursing*, *11*(1), 18-23.