

Examining the Use of Photovoice to Explore Disaster Risk Perception Among Native Hawaiians Living on O‘ahu: A Feasibility Study

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Abstract

The purpose of this feasibility study was to evaluate the use of Photovoice (PV) to explore disaster risk perception (RP) among Native Hawaiians living on O‘ahu. Six participants identified 5 primary concerns: (a) issues of infrastructure, (b) Oahu’s dependence on imports, (c) concern for family, (d) the presence of outsiders in the community during disaster warning periods, and (e) the complexity of the issue. Findings from this study suggest PV shows potential as a useful tool for evaluating risk perception and providing valuable community insight. Despite the potentially stressful nature of examining the outcomes of a disaster, speaking with members of the community in a supportive environment provided protection and encouragement. Finally, the use of community-based participatory research (CBPR) and participatory action research (PAR) methodologies facilitates a trusting relationship between the researcher and the community which may help improve disaster-planning efforts.

Keywords

CBPR, disaster preparedness, Native Hawaiians, Photovoice, qualitative methods, risk perception

Abbreviations

*CBPR = community-based participatory research
PAR = participatory action research
PV = Photovoice (PV)
RP = risk perception*

As various hazards increasingly threaten Hawai‘i, the need for disaster planning expands. The complicated dynamics potentiating catastrophic events are an interaction of natural hazards, human behavior, and sociocultural factors.¹⁻³ Effective preparedness minimizes the consequences of disasters and improves outcomes.¹⁻³ Despite efforts to communicate concerns to the public, community members’ understanding of risk and potential dangers remains largely unknown.⁴⁻⁶ This feasibility study evaluated the use of a research method called Photovoice (PV) to determine disaster risk perception (RP) among Native Hawaiians on the island of O‘ahu, Hawai‘i. Owing to cultural and historical factors, Native Hawaiians may have unique perspectives regarding risk. Understanding how Native Hawaiians perceive the risk for disasters in their communities can assist emergency planners with developing risk communication and disaster preparedness strategies.

Risk Perception

RP is the awareness of possible consequences or outcomes and their likely costs.⁷ Honolulu faces a range of threats including earthquakes, hurricanes, tsunamis, landslides, flooding, and wildfires.⁸ Determining whether communities recognize these as concerns is vital to developing effective preparedness plans.^{6,7} RP is essential to emergency planners because of the role it plays in decision-making; people prepare when they feel threatened or stand to lose something.^{2,3,7,9} RP is generated within communities in response to the threats the community prioritizes.⁹⁻¹² Because community members share concerns, people respond to threats perceived within their social systems.¹¹⁻¹⁴ Culture is a dominant influence on RP because it acts as the basis for understanding threats and ascribing value to outcomes.¹⁰⁻¹³ Understanding a community’s unique perspective regarding risk strengthens the ability to make accurate assessments of the community’s concerns based on the shared experiences of community members.^{10, 12,13}

Understanding Risk

Encouraging disaster planning is challenging because knowledge alone does not motivate change.^{10,11,14} Paton identified RP as a contributing factor for taking action.¹⁵ The literature supports Paton’s model, demonstrating that people are more likely to plan for disasters when they understand potential threats.^{9,16} Slepski identified 3 antecedents to disaster preparedness: awareness of the environment, perceived threat, and recognition of needs.¹⁶ Abramson explained that culture, socioeconomic, age, and ethnicity contribute to risk perception and influence how people prepare.⁹

Native Hawaiians

Native Hawaiians have a unique relationship to the land and may have extensive knowledge of the local area.¹⁷⁻¹⁹ That knowledge may provide contextual understanding that will better prepare disaster planners working in Hawai‘i.^{10,11,13,20} Understanding RP from the perspective of Native Hawaiians could help disaster planners determine if existing risk assessments match perceived risk.^{3,21,22} This information could then be used to improve risk communications and preparedness efforts.^{3,22,23}

Photovoice

PV is a qualitative research method that uses photographs taken by participants to answer research questions and is rooted in participatory action research (PAR) and community-based participatory research (CBPR).^{24,25} PV involves participants recording day-to-day phenomena and provides graphic authenticity of participants' lives to facilitate understanding.²⁶⁻²⁸ The images that participants capture form the basis for discussions to further develop their research questions.^{25,26}

PV involves 3 steps. First, participants learn camera use, discuss ethical issues, and develop research questions. Second, they take pictures to address the research questions. Third, the researcher works with participants to respond to concerns uncovered through the research process.²⁶⁻²⁹ There are many ways to utilize PV research; investigators take into account the specifics of a project and aim to meet the needs of the participating community. For example, participants may use cameras or the cameras built into their phones. Images may be shared in person or presented online. All PV projects require participants to take pictures and share the meaning of those images in a group setting to describe the significance of their images and establish which pictures best present the concerns of the group.²⁵⁻²⁹ Participants in this study used cameras provided by the researcher and shared their images at meetings held in the community.

Despite its use in an array of settings to examine a multitude of questions, PV has been used minimally to explore disaster risk perception. This study sought to explore the use of PV as a method for assessing community-based disaster risk perception in a Native Hawaiian community. The researcher was a faculty member at the University of Hawai'i when this research was conducted and formed a relationship with the community as a community nursing clinical instructor. The researcher received no funding and has no conflict of interest to disclose.

Methods

Research Design

This feasibility study was conducted to explore the use of PV as a method for assessing community-based disaster risk perception. Community leaders reviewed the study to affirm its appropriateness before recruitment began. The Institutional Review Board at the University of Hawai'i Human Studies Program approved the study protocol and all participants gave written informed consent. Recruitment began in May 2017. Participants met as a group for a total of 5 times over 2 weeks. At the first meeting, the researcher explained the goal of the research, the use of PV, the anticipated time commitment, and the need to share images with one another and the public. Par-

ticipants also received their cameras and instructions on how to use them from a professional photographer.^{25,27,29} Participants then met 3 more times to review photos they took and refine their response to the research question. At the final meeting, the group clarified remaining questions, decided what they wanted to do in response to the issues they uncovered, and discussed the use of PV.

Participants

Participants meeting criteria for this study included individuals who lived or worked in the community, identified as Native Hawaiian, were at least 18 years old, and could speak English to the extent required by the project. Minors were excluded from the project because of the potential for the topic to cause anxiety.^{7,9} Participants were recruited using convenience sampling with the help of community leaders who screened potential participants and discussed the project at community meetings. A sample size of 6 participants was supported by the research design and previous PV projects.^{25,28,29} Participants received a \$5 gift card at each meeting they attended and were asked to keep the cameras they used, valued at \$40.

Setting

The research took place in a Hawaiian Homestead community elevated above the surrounding neighborhoods and accessible by a single road through the community and several parallel cross-streets. Hawaiian Homesteads are divisions of land set aside for individuals who meet the criteria of having at least 50 percent Hawaiian blood. These areas were designated by the Hawaiian Homes Commission Act of 1920 and are managed by the Department of Hawaiian Home Lands.³⁰ Due to the topography, many homes in the neighborhood are built above or below roads on steep inclines. Meetings were held in a semi-private setting at the neighborhood community center.

Measures

Participants were asked their age, gender, how long they had lived or worked in the community, and if they had experienced a disaster event. No personally identifiable information was collected. Using images, participants were asked to answer the question, "How do you identify risks for the consequences for natural disasters in this community?" Participants were asked not to photograph identifiers such as faces, addresses, and homes. Participants returned in 2 days with 5 images each that best expressed their responses. Photos were shared with the group via projector, allowing examination of one photo at a time for analysis and discussion. At the conclusion of the study, the researcher asked a series of questions related to the use of PV to clarify participants' perceptions of accuracy, ease of use, and value of what was uncovered using PV.

Data Management and Analysis

The group as a whole reviewed photos in an iterative process during 3 meetings. Participants used the mnemonic SHOWeD to explore each image systematically.³¹ This technique asks participants to consider each image in terms of S (what do you See?), H (what's Happening), O (how does the image relate to Our lives), W (Why does this image concern or strengthen us), and eD (what can we Do about what we see?). This procedure was initiated by the person who took the photo and expanded on collectively. Rather than direct the conversation, the researcher interjected only as needed while the group explored ideas. Concentrated dialogue shaped the focus of each session, where participants developed ideas about images they wanted for the next meeting.

During each meeting, conversations were audio-recorded and handwritten notes were taken. A total of 159 photos were reviewed; images eliciting strong responses were logged and discussed separately in connection with the audio recordings. The researcher sought to clarify thematic concerns and explore pictures that provoked the most noteworthy reactions from the group. Images, recordings, and notes were made available to the group for their review throughout the process.²⁵⁻²⁹ The researcher reviewed the recordings and notes, confirming his interpretation with the participants at each meeting. Themes were identified and validated by the group as a whole throughout the sessions.

Results

Six participants took part in the study. Participants came from 3 age groups: 18-39, 40-59, and >59. There were 2 people in each age group. Four of the participants were women, 1 of the men was in the 18-39 age-group, and 1 man was in the >59 group. All participants had experienced some form of disaster, though participants in the 18-39 age group said they had not experienced a "serious" or "significant" event. One of the younger participants had considerable disaster preparedness training through the American Red Cross.

Participants characterized 5 themes during the group discussions: (a) infrastructure and upkeep, (b) dependence on imports, (c) concern for family, (d) outsiders in the community, and (e) complexity of disasters. The group confirmed that these topics were the most critical issues for the community.

Infrastructure and Upkeep

The condition of homes was a constant concern. Participants worried that rubbish could become dangerous in high winds or washed into drainage culverts by heavy rains. One person stated, "I've seen all that stuff, you know, get washed down the road into the ditches and making things worse downstream, sometimes." Yard debris, including tree clippings, rocks, building material, and car parts, were included in photos. Every

participant recalled how trash clogging drains and culvert grates exacerbated flooding.

Participants explained that community members are obligated to keep their homes and yards clean, safe, and in good condition, worrying that failure to keep them maintained could make things worse during a disaster. One participant wondered, "*Some of these houses are so bad right now . . . the overall condition, what would happen in an earthquake, could they stand?*"

Participants also identified issues they felt the local government was responsible for, such as maintenance of drainage systems. They provided images of power lines running through trees and expressed concern for electrical outages as a result of high winds or earthquakes. One participant stated, "*This stuff isn't on us, I mean, we can't be the ones to do this work, or haul some of this stuff away, we don't have the equipment for it.*"

Dependence on Imports

Participants were surprised upon seeing an image of Costco (Figure 1) and hearing worry-related to stores closing during a disaster: "*What will we do when the stores close, or run out of stuff, this is where everything comes from, right here.*" Participants listed things they needed from stores: food, household goods, fuel, medication, bottled water, and other goods. They expressed concern as they realized O'ahu's dependence on imports: "*It won't be just us you know, it's going to be everyone, everyone will only have what they have, they won't be able to go get anything.*"

This conversation led to questions regarding stores running out of supplies and how long the community might have to



wait for imports. One participant wondered: “*Seems like we should know how long it will take for ships to come when we think about planning?*”

Concern for Family

Family was identified as both a strength and vulnerability. The participants saw themselves as responsible for older and younger members of the community but also recognized they might need help from family. No issue demanded as much attention as family, as the connection to family and friends was discussed at length. One participant explained, “*All I know for sure is I’m going to have to take care of my mom, that’s where I’ll be, you can find me there.*” All participants identified family as their greatest concern. Thinking about family made participants feel vulnerable but also motivated them to take action. Despite having been asked not to share photos of people, everyone shared images of children and parents, explaining the responsibility they felt for family superseded self-concern. One participant said, “*You guys know these are the people I take care of, and these are the people who will help me.*”

Acutely aware of the vulnerability of family members, participants identified frail adults and young children as primary concerns. They talked about limited evacuation options because some family members could not be moved. A participant who cared for her mother said, “*You know my mom can’t move, so I don’t know, I mean, we aren’t going to leave her.*” Participants unable to identify threats to themselves were easily able to explain family members’ risks.

Outsiders in the Community

Participants identified 2 groups of outsiders regularly who make their way into the community: people who are homeless and those seeking higher ground during tsunami warnings. Participants worried that people who are homeless would be a liability because no one would know to look for them. The concern was not for the safety of community residents but the safety of the homeless. One participant said, “*These guys kind of hide, they lay low, some of us know where they stay, but most people don’t know, so how would anyone know if they get hurt?*” This concern was greater among the older participants who had more experience with the homeless.

Because the community is above surrounding neighborhoods (Figure 2), it is considered a refuge from tsunamis. Outsiders seeking high ground are viewed as a vulnerability for the community because they would need resources. Participants explained they had witnessed “*cars lining the street, up and down*” during tsunami warnings, congested roads and crowded public toilets. They wondered how outsiders would fit into the community during a disaster. In this community, where everyone has a role and history with one another, outsiders do not fit in well. One person asked: “*Nobody knows these people, they don’t know us, what are we going to do with them, how are they going to help?*” Despite these concerns, participants agreed they could not turn people away. Part of the community’s identity is expressed through their capacity to give and care for others, even strangers, when resources are limited. This belief was echoed by all 6 participants, articulated most clearly by older participants.



Figure 2. A view of the city. Participants agreed this photo illustrates the number of people who might be affected by a disaster and move into the community. Used with permission.

Complexity of the Issue

Participants repeatedly identified the complexity of their concerns related to disasters. *“This issue is just so big, when you think about it, I mean, think about how much could happen, how complicated it is.”* They talked about how disasters could affect the community, wondering how earthquakes differ from hurricanes. They voiced worry for people who assume that someone else will help, and they discussed difficulty bringing up the issue in the community at large. All participants recognized the need to discuss personal responsibility within the community before an event takes place. Much of this conversation focused on avoiding embarrassing others: *“Some of these people want to do the right thing I’m sure, but they don’t have the time or the money, you know, those guys need help now.”* By the conclusion of the project, all participants recognized the interconnectedness between their fears and the need to plan for identified threats.

Participatory Action Aspect

At the conclusion of this study, participants asked the researcher to provide a PowerPoint for future presentations in the community. Community leaders presented the findings of this project to representatives from the Department of Hawaiian Home Lands. The participants felt that using their images would communicate concerns directly to an entity with the power to make necessary changes.

Observations Regarding Photovoice

Participants believed the results of this study were accurate and described the concerns of the community as a whole. They felt PV was easy to understand and fun to use. Finally, they felt the issues they uncovered needed to be addressed, and explained a sense of needing to prepare or take action. Though participants shared project ownership, the researcher led the project, maintained IRB guidelines, and maintained methodological fidelity. From this perspective, the researcher noticed the following 3 issues: participant input, photo variance, and topic anxiety.

Participant Input

Participants can change direction of the research. For example, participants asked to include community members not approved by the IRB. While this was understandable, the researcher felt the project should be limited to the participants approved by the IRB.

Participants wanted to share their “happy space,” the things they enjoyed and worried about losing in a disaster. This deviated from the original research question, but added depth to discussion and allowed participants to discuss factors that motivated them to prepare.

Photo Variance

Consistent with PV-based studies, some images were unanticipated by the researcher and participants, which led to consideration of ideas the group wanted to further explore. Participants felt some photos did not make sense or strayed from the project’s aim, and it was difficult to determine if the researcher should interject, but allowing the group to decide seemed the best approach.

A participant shared pictures of medications, bank statements, and family records, which generated conversation regarding the idea of threats from natural disasters. Participants realized threats could be more than damage-causing hazards and started discussing risks affecting needs and responsibilities: *“It’s not just something like a flood, it’s going to be having to get to family, or get medications for my mom, that’s a risk too.”*

Topic Anxiety

Discussing disasters and catastrophic consequences caused worry among participants. The discussion often focused on vulnerable community members like children and the elderly. Participants named family members and explained reasons for worry: dependence on medication or anxiety that a child might lose a parent. Tense moments never lasted long; someone would refocus the group to stay motivated. Having 3 age groups facilitated confronting stressful topics, this support may also be a result of the unique community dynamic of being associated by geography, ethnicity, and local ties. In other groups, researcher intervention may be necessary.

Discussion

PV is useful for evaluating RP and providing community insight. Participants enjoyed the method and learned from the discussions. Sharing images gave participants confidence to discuss issues using pictures as guides. Similarly, images provided understanding of other peoples’ perspectives. Iterative discussions allowed for reflection and facilitated the opportunity to build upon earlier ideas. This process helped participants explain themselves and gave them time to develop questions about one another’s photos and ideas.

Ongoing reflection and clarification among the participants may be particularly helpful in exploring disaster risk perception, as the topic is often difficult to describe or articulate. Because PV uses participant-generated images for discussion and allows for clarification and collaboration, ideas can be thoroughly articulated during multiple meetings.

Despite the stress of examining disaster outcomes, speaking with participants in a supportive environment provided encouragement. Participants reminded one another of the importance of preparatory action and affirmed community

members' responsibility. Finally, the ongoing nature of PV interviews and the depth of the discussions helped to form a relationship between the researcher and the participants who became increasingly comfortable asking questions related to preparedness and planning. The participatory action nature of PV requires the researcher strive for a solution to identified issues which reinforces the feeling of trust between the researcher and the participants.

Limitations

This study has several limitations. In PV projects, it is difficult to determine if the participants' views and concerns accurately represent those of their community. Despite the cross-section of participants, transferability may be difficult. Also, timely completion of the project limited the number of meetings, but the group had begun to move their focus away from risks. The research question motivated participants to seek solutions, and in the final session, participants shifted the discussion to preparation and planning rather than risk identification. Despite the limited number of meetings, the group's focus changed, and it seemed the emphasis on risk gave way to preparation. Finally, the researcher worked independently, although community members provided clarification to ensure accuracy themes were identified alone. Future projects would benefit from collaboration involving at least one more researcher to code themes independently to improve validity of the findings.

Conclusion

PV is a viable investigative instrument with the potential to reveal perspectives from diverse communities. The method allows partner communities to become co-investigators, encourages ownership of the process, and facilitates discovery of community members' priorities. Images potentially serve as the impetus for in-depth conversations leading to contextual understanding of participants' perspectives. The collaborative nature of PV and development of group dynamics may provide a safe environment for exploring a potentially distressing topic such as disasters.

Researchers utilizing PV should be prepared for the time required for the project. They have to appreciate that conversations need focused engagement with community members who may demand clarification and guidance. Researchers should also prepare to uncover information beyond the scope of the project.

Conflict of Interest

The author does not identify a conflict of interest.

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