Title

Aspects of Partnership Formation between Local Citizens and Researchers Who Implemented Support Activities Related to Recovery and Preparedness for Natural Disasters - Quantitative Text Analysis of Interviews with Researchers

Abstract

Aim: One of the most crucial aspects of recovery and preparedness from natural disasters is the involvement of local citizens. This study aims to elucidate the circumstances and processes by which partnerships between local citizens and supporting researchers were established for the purposes of recovery, reconstruction, and preparedness from natural disasters.

Method: Semi-structured interviews were conducted with researchers who had practical experience in supporting activities related to recovery and preparedness from natural disasters. The data were analyzed using quantitative text mining software, KH Coder, and elements that form a partnership between citizens and researchers were identified.

Results: Nine researchers, all affiliated with Japanese universities, participated in this study. By reading the relationship between the 13 codes along the axis of time,

three phases were derived: A. Disaster relief initiation, B. Support continuation, and C. Relationship maintenance. The process of collaboration and cooperation between local citizens and researchers in recovery and preparedness from natural disasters involves entering the field through organizations and institutions that are trusted by local citizens, listening to their voices through activities, and continuing to research common problems from the same perspective as the citizens. This relationship continued even after the research was completed.

Conclusion: Citizen-centered research on natural disaster recovery and preparedness necessitates the integration of research and action. It is therefore an essential requirement for researchers to conduct research in partnership with citizens. In order to promote the research, it is essential that ethical attitudes, actions, and awareness are fostered.

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INTRODUCTION

1) Current status and challenges of disaster research

Natural disasters occur worldwide and have a significant impact on the lives of those affected. Disaster response is a global issue, and four priority actions were proposed in the Sendai Framework for Disaster Risk Reduction 2015-2030 of the United Nations World Conference on Disaster Risk Reduction. Among the four priority actions, this research is relevant to strengthening disaster preparedness for effective response and ``Build Back Better'' for recovery, rehabilitation, and reconstruction （The United Nations Office for Disaster Risk Reduction, 2015）.

In recent years, large-scale natural disasters caused by global warming have occurred around the world. Prior to 2000, there were very few studies on disaster nursing. However, following the September 11 terrorist attacks in the United States in 2001 reports on disaster nursing have increased. Furthermore, following the outbreak of Hurricane Katrina in 2005, practical reports on disaster nursing increased(Kelin & Nagel, 2007; Leiby, 2008).

In recent years, Japan has experienced a number of large-scale natural disasters, including earthquakes and floods. In response, academic organizations such as the Japanese Society for Disaster Medicine and the Japanese Society for Disaster

Nursing have been established to develop support methods. In Japan, the current status and challenges of disaster research are as follows:

Disaster response is a global issue, and four priority actions were proposed in the Sendai Framework for Disaster Risk Reduction 2015-2030 of the United Nations World Conference on Disaster Risk Reduction. Among the four priority actions, this research is relevant to strengthening disaster preparedness for effective response and ``Build Back Better'' for recovery, rehabilitation, and reconstruction （The United Nations Office for Disaster Risk Reduction, 2015）.

In recent years, a number of large-scale natural disasters have been caused by global warming, with the majority occurring around the world. Prior to 2000, there were very few studies on disaster nursing, but following the September 11 terrorist attacks in the United States in 2001, reports on disaster nursing began to emerge. Furthermore, following the outbreak of Hurricane Katrina in 2005, there was a notable increase in the number of practical reports on disaster nursing.

In recent years, Japan has experienced a number of large-scale natural disasters, including earthquakes and floods. In response, academic organizations dedicated to disaster medicine and nursing have been established to develop support methods. These include the Japanese Society for Disaster Medicine and the

Japanese Society for Disaster Nursing(Japanese Association for Disaster Medicine, n.d.; Japanese Society Disaster Nursing, n.d.). In Japan, the necessity for research in disaster nursing began to be widely recognized after the Great Hanshin-Awaji Earthquake in 1995. Initially, reports were published on the disaster situation of local citizens and support activities at the time of the disaster (Sakashita, 2014). It is reported that over 80% of nursing universities in Japan provide disaster nursing education as of 2018（Shimizu, Haida, Ishibashi, & Masaki, 2022）.

From the preceding analysis, it can be concluded that since 2000, interest in practical disaster nursing has gradually expanded to encompass its education and research, not only in Japan but also around the world. One of the most crucial aspects of disaster recovery and preparation is for the citizen living in the affected area to assume the initiative in formulating and implementing recovery plans that are tailored to their specific circumstances. However, the recovery period, which is the process of recovery from a natural disaster, is a lengthy one, and there are aspects of it that make it challenging to set clear goals. Consequently, in comparison to research conducted during the acute phase, research on life restructuring during the recovery period has not been conducted in a systematic manner.

2）Citizen-centered research methods are needed during the recovery period from natural disasters

In the field of community health, Community-Based Participatory Research (CBPR) has been utilized as a method of community participation activities since the 2000s. CBPR advocates nine principles, one of which is a partnership that works equally at all stages of research (Israel et al., 2008). In other words, the role of researchers in CBPR is not to conduct research, but to act as a facilitator, working with local citizens to clarify community issues and work toward solutions together (Stringer & Dwyer, 2005). Lichtveld et al.(2016) reported that CBPR is useful for disaster research based on their experience of conducting disaster research with citizens after Hurricane Katrina. Conversely, among the nine principles of CBPR, it has been demonstrated that it is challenging to consider the health of individuals in economic terms and to maintain long-term commitments with all participants.

 Community-based participatory research (CBPR) is a valuable methodology for studying the recovery process of disaster victims. However, its effectiveness in addressing various types of disasters and citizen-led reconstruction remains to be demonstrated.

3) Clarification of the process of forming partnerships between researchers and citizens in the development of citizen-centered research methods

Successful partnership formation between citizens and researchers is an important determining factor in whether citizen-centered research in the disaster recovery process will truly benefit the region (Israel et al., 2008; Takeda, 2015).

The community health CBPR process begins with the creation of a CBPR partnership with local citizens. Subsequently, it is demonstrated that the process of assessing community strengths, prioritizing health issues, intervening, interpreting results, and communicating clearly to local citizens is a continuous cycle. Furthermore, maintenance, sustenance, and evaluation of CBPR partnerships are identified as the driving force that perpetuates the CBPR process (CBPR Research Group, 2010). Therefore, this study is based on the actual experiences of researchers who have carried out disaster relief activities and examines the timing and timing of partnerships between local citizens and supporting researchers for recovery and reconstruction from natural disasters.

Aim

The purpose of this study is to clarify when and how partnerships between local citizens and supporting researchers were built toward recovery, reconstruction,

and preparedness from natural disasters.

METHODS

The following terms are defined in this study:

Partnership: Based on the cultural and social background of Japan's regions and referring to the CBPR's definition of partnership in Japan, it is defined as "mutual trust formed through the activities of organizations made up of institutions and citizens from different positions. A relationship in which each person grows by leveraging their respective strengths." (CBPR Research Group, 2010; Israel, Coombe & Mcgranaghan, 2010)

Natural Disaster Recovery and Preparedness: Regardless of the magnitude of the impact of natural disasters, the stage and process of restoring daily life and preparing for the next disaster while leveraging the region's strengths.

Local Citizens: Citizens of communities supported by study participants

Supporting researchers: Researchers affiliated with universities, etc., who have conducted support activities related to natural disaster recovery and preparedness in Japan.

Research Design

Semi-structured interviews were conducted with researchers in various specialties

who have experience working with local citizens to support recovery and preparedness from natural disasters about the content and history of support activities and their relationships with local citizens. All members of this study specialize in nursing. For this reason, quantitative text analysis software, which can mechanically and comprehensively analyze data, was used to ensure that no data was extracted from the verbatim transcripts of researchers specializing in fields other than nursing.

Participants and sampling

Participants must be researchers with experience in implementing support activities related to recovery and preparedness from natural disasters. Furthermore, the researchers are not citizens of the area, and their field of expertise does not matter.

Also includes participants who worked in collaboration with local governments.

Recruitment of participants was conducted through network sampling.

Researchers who published content related to recovery support and preparedness for natural disasters at academic conferences, academic journals, and books were searched, and those who agreed to cooperate with this study participated.

Data Collection

Semi-structured interviews were conducted using an interview guide. The questions asked included the motivation and background for getting involved with disasters, the motivation and content of support activities (research) in disaster-stricken areas, the status of forming partnerships with citizens through activities, and ethical considerations and issues in implementing support and activities. In addition, changes in citizens' health and lifestyles observed through the activities were also investigated.

The interview was recorded with the participant's permission using either an IC recorder or the recording function of a web conference system. In the event that permission was not obtained, the interviewer would write down the content in field notes.

Data analysis

Data analysis was conducted using the quantitative text analysis software KH Coder Ver. 3. The quantitative text analysis proposed by Higuchi et al. comprises two stages (Higuchi, 2016, 2017). The first stage is to summarize the data mechanically, with minimal influence from the analyst (quantitative analysis). The second stage is to pursue the analyst's awareness of the problem (qualitative analysis).

In this research, the initial step is to obtain an overview of the text data obtained from the interviews without being constrained by the researcher's preconceptions. Based on the results of the quantitative analysis in the first stage, the second stage investigated the circumstances and processes by which partnerships between local citizens and supporting researchers were established in disaster relief and research activities. Finally, the aspect of partnership formation was derived by examining the tenses of the elements and the relationships between the forming elements. The analysis was initially performed in Japanese, and the results were translated into English when preparing this paper. The English language translation was subjected to back-translation.

In this study, hierarchical cluster analysis and co-occurrence network construction were performed. The rationale for adopting hierarchical cluster analysis was that it allows the search for combinations of words with similar patterns of occurrence and is useful for clarifying the elements of partnership formation. The results of the initial quantitative analysis are presented as a dendogram, which can be divided into appropriate clusters by inputting the number of clusters according to the research purpose. The results of the division are depicted as rectangles, with the length of the rectangle indicating the number

of words appearing.

In the second stage, the analyst's awareness of the problem was investigated by manually adjusting the number of clusters and coefficients while checking the original text based on KWIC (Key Word in Context). The focus was on researchers' thoughts and actions, with the meaning and content of topics that appeared frequently in the data interpreted as elements that form a partnership between local citizens and researchers who are supporters. Similarities in meaning and content were identified, tenses were considered, and the partnership formation process was organized.

Ethical considerations

It is not uncommon for experiences in disaster areas to evoke memories of the situation in a very real way, which can cause psychological distress and flashbacks. Therefore, the interview was conducted after the participants were informed that they were not obliged to recall anything they did not want to remember. Should the interview be continued, it should be conducted with appropriate breaks. The interviewer was careful not to make facial expressions while speaking to avoid forcing the interview to continue and to ensure that the interview could be interrupted midway through. This study was conducted with the approval of the

Ethics Review Committee of Chiba University Graduate School of Nursing (approval number 31-115).

RESULTS

Demographics

A total of nine individuals participated in this study. All nine were affiliated with Japanese universities. Five individuals specialized in nursing, while the remaining four specialized in hydrology (geography), information engineering, landscape science, and horticulture.

The interviews were conducted between February and March 2021. The method of implementation was online for eight participants, while one individual was interviewed in person (Table 1). One individual discussed his experience of providing support from his position as a local government employee, having previously worked in that capacity. Six of the nine participants discussed support activities during the recovery period following the Great East Japan Earthquake. The average interview time was 83.1 minutes (57-109 minutes).

Quantitative text analysis results

A total of 2,563 sentences and 563 paragraphs were extracted from the interview records of nine participants for analysis.

Hierarchical cluster analysis (Figure 1)

All authors collaborated to gain an understanding of the results. The initial analysis outcomes were validated by all authors, and subsequently, the minimum number of words was set at 35, with the number of clusters arbitrarily determined to be 11 through the use of the software's merging level confirmation function.

The formation of partnerships between local citizens and researchers who implemented support activities regarding recovery and preparedness from natural disasters is a key aspect of this study (Table 2).

All authors examined the KWICs included in the 11 clusters obtained by hierarchical cluster analysis. The elements of partnership formation were gleaned from the actual experiences of researchers who conducted disaster relief activities.

As a result, 13 codes were identified as thoughts and actions of researchers related to partnership formation. A temporal analysis of the 13 codes revealed three distinct phases: A. Disaster assistance initiation, B. Support continuation, and C. Relationship maintenance (Table 2).

A. Disaster assistance initiation

Entering the disaster area and conducting relief activities together with an organization trusted by local citizens was the beginning of a partnership between

assisting researchers and local citizens. The participants had started disaster relief work in the area, not as a research activity, but to contribute their specialized knowledge and skills to disaster relief efforts. The participants discussed the role of external support organizations that provide assistance to disaster-stricken areas on the ground. These organizations offer support in advance of a disaster, and some researchers were originally active as core members of the organization, while others entered the field in response to requests from the organization for specialized knowledge and skills.

There was an external organization that I was working with, and they were asked to provide disaster relief. First of all, the organization (external support organization) does not have any medical personnel. When I entered the field, I was invited (as a medical professional) to come with me, and that's how it all started.〔①〕

Furthermore, researchers have identified that in the initial stages of relief efforts, it is of paramount importance to listen to the narratives of the local population. They have repeatedly approached disaster-affected areas based on their own volition, rather than in response to work or a sense of duty. They conducted activities in the area, interacted with citizens, and initiated engagement.

In the beginning, there were some people who spent a lot of time talking to me

about their incredibly painful experiences. So, I don't know how to react anymore.

As I continued to think about it, I came to the conclusion that all I had to do was

listen to the story. I realized that listening to people's stories is an important form

of support. [②]

B. Support continuation

All participants in this study emphasized the significance of listening to the

voices of local citizens and continued to engage in activities related to disaster

recovery and preparedness, with a particular focus on the needs of citizens. As

participants in this study carried out support activities, they identified issues that

should be prioritized and resolved through dialogue with local citizens.

Moreover, participants engaged in support and research activities with an

awareness of the connection between the issues and vision of the region they

supported and the local government's disaster prevention plan.

Always get information from various people. By listening to people from a

variety of positions, I made sure to be able to see the situation in a particular place

from multiple perspectives. If I only get information from one source, you won't

know if it's accurate or not. After all, multiple sources of information. I meet a lot

of people as sources of information. 〔⑪〕

I thought that the mindset of the citizens and the people at the city hall needed to change, so I thought about how the citizens and the city hall staff could work together to get women involved in disaster prevention and to enable women to play an active role. [④]

Furthermore, the participants demonstrated an impartial stance, attended meetings, continued to gather information, collaborated with citizens to address challenges, and proposed solutions based on evidence using their specialized knowledge and skills. As a result, the relationship of trust appeared to deepen further.

Even if the people or teams change, the place of discussion remains the same, so we can check in with each other. In that sense, I think it's easier for both those who receive support and those who come to support us to come to a mutual understanding because we had a place like this where we all talked about the future. [⑦]

In this situation, researchers, through dialogue with citizens, assess the needs of citizens and create research plans to avoid disparities and divisions between their research topics and issues necessary for citizens' lives.

In particular, the data for this study was obtained from the narratives of six of the nine participants' experiences related to the Great East Japan Earthquake. Consequently, specific disaster support included radiation dose monitoring, information acquisition support at evacuation centers, and post-disaster childcare support. In both cases, researchers devised and implemented support that utilized their expertise to meet citizens' needs.

There is information that researchers need and want to know as part of their research activities, right? This information does not necessarily correspond to the information they want to know in their daily lives. Therefore, I think that in many areas, even though he is a university professor, he probably doesn't really need residents, but they cannot refuse and agree to that. It may sound strange to say, but even if it doesn't match the researchers' goals, it's important to stay close to the residents, and ultimately let the citizens do what they want. [⑨]

A further aspect of this study is that all the subjects were researchers affiliated with Japanese universities. As a university teacher, there were instances where supporting the support activities of students led to the drawing out and enhancement of the power of local citizens and related parties.

When the students started thinking about things they could do even if they didn't

have enough expertise, they came up with the idea of creating an opportunity for students to say "thank you" (to people in the local community). They put a lot of thought into the plan, so even I (as a teacher) was impressed and said, ``Ah, I see." [⑧]

Moreover, researchers underscored the importance of clearly defining the objectives and deadlines of the projects they were engaged in, making commitments to citizens, and honoring those commitments.

It's a contract, right? After all, in our mutual contract, I said something like ``I'm going to be involved here for five years for this purpose and this kind of business," and if I get rejected, I'll go with the same reaction (according to the reaction). So, it's about keeping your promises.   [⑤⑥]

The participants of this study engaged in both support activities and research activities, with the objective of facilitating the achievement of long-term goals in a manner that was consistent with the pace of the citizens and that involved the determination of goal steps in a step-by-step manner. This approach allowed for the identification of necessary activities, their implementation, and their continuation on the initiative of the citizens.

Once they can properly handle it locally, I will be done with it..   [⑫]

C. Relationship maintenance

The participants encountered difficulty in determining the termination of support activities. However, rather than being driven by a sense of obligation or work, the researchers repeatedly visited the disaster-affected areas of their own volition, maintaining a relationship of trust with the citizens. They then summarized their experience in problem-solving together with citizens from a professional perspective, shared it with citizens, and then disseminated it to the outside world.

My job now is not only to focus on the disaster-stricken areas but also to communicate the experiences that occurred in the disaster-stricken areas to the outside world. This will become my (main) job [⑬]

DISCUSSION

The aspects of partnership formation: The relationship between local citizens and researchers who carried out support activities regarding recovery and preparedness from natural disasters

At the outset of the support activities, a situation arose in which local citizens welcomed researchers by initiating local support through a network of organizations that were trusted by local citizens (administrative organizations, NPOs with a proven track record, etc.). When a researcher visits a region for the

first time as a supporter, it is considered that the initial step in establishing a relationship of trust is to commence providing support to the organizations that will be present in the region first.

A series of processes during the continuation of support activities, such as identifying issues that should be prioritized and resolved through dialogue with local citizens, researchers maintaining a fair position, continuing to collect information, and tackling issues together with local citizens, is considered to be common to the nine principles of CBPR proposed by Israel et al. (2008).

A systematic review of guidelines for research ethics in disaster situations reveals that disasters often necessitate approaches distinct from those typically employed in research and that the rights and interests of vulnerable research subjects are always upheld. (Mezinska, Kakuk, Mijaljica, Waligóra, & O'Mathúna, 2016). All participants in this study emphasized the importance of listening to the voices of local citizens and continued to engage in citizen-led activities related to disaster recovery and preparedness. Therefore, in order to facilitate the formation of partnerships between researchers and local citizens, researchers must continue to provide disaster prevention and recovery support with ethical considerations in mind.

A further aspect of this study is that all participants were researchers affiliated with Japanese universities. It is our contention that universities can contribute to the creation and development of a long-term, sustainable recovery support system, as evidenced by the Beyond Bushfires project (Gibbs et al., 2018), in which universities collaborated with local governments to assist local communities in their recovery from large-scale disasters.

In contrast, another crucial aspect of disaster research is the need for effective coordination between research activities and humanitarian relief operations (Mezinska, Kakuk, Mijaljica, Waligóra, & O'Mathúna, 2016). Through dialogue with local citizens, the participants of this study identified a discrepancy between the information they sought as researchers and the information necessary for citizens' daily lives. This led them to design a research plan that would avoid any potential divisions. At that time, they underscored the importance of clearly defining the objectives and deadlines for research projects in which researchers were involved, as well as the necessity of maintaining commitments to local citizens. The findings of this study serve as a tangible illustration of the efficacy of coordinating research activities with humanitarian relief operations.

During the relationship maintenance phase, researchers encountered

challenges in determining the optimal point at which to conclude support activities. However, they consistently visited the disaster-stricken areas and engaged with local citizens, not merely out of a sense of obligation or work, but rather out of their own volition. This study conducted an interview survey precisely 10 years after the Great East Japan Earthquake. At that point, several participants continued to engage in fieldwork and provide support. Additionally, participants who discussed other disaster prevention activities maintained relationships with local citizens as local advisors even after completing their research.

CBPR is a cyclical and iterative process that involves community members and researchers working together to achieve community improvement and social change. Long-term involvement is essential for building and maintaining partnerships, as well as for the success of CBPR. This is because it is important to remain involved even after the research grant ends (Israel et al., 2008; Takeda, 2015). It appears that all participants in this study integrated research and action in a cyclical and iterative manner, thus practicing the principles of CBPR.

Ethical responses: the formation of partnerships between local citizens and researchers who have implemented support activities related to recovery and

preparedness from natural disasters

In the context of disaster research, it is crucial for researchers to recognize their role in preparing the environment so that local citizens can assume the lead in the recovery process. To avoid a separation between action and research, it is essential for researchers to engage with citizens in the affected area and to continuously assess whether there is a discrepancy between the issues that citizens prioritize and the concerns that researchers address. Consequently, during the disaster recovery period, researchers must identify the goals of support activities. Furthermore, even after support has ceased, researchers should continue to interact with local citizens and become supporters. It was previously thought that supporting researchers would become a relevant population for the area. Moreover, it is crucial to maintain attention to the affected areas and their citizens even after the conclusion of support activities. This entails collaboration with local citizens to devise disaster recovery and preparedness plans that are tailored to the specific context. Additionally, it necessitates joint efforts to address challenges. This process, in itself, will yield research outcomes. Continued engagement in this process will indirectly contribute to the development of resilient communities.

Disaster citizen science research for recovery and preparation from natural

disasters

One of the primary findings of this study is that researchers collaborate with local

citizens to sustain long-term support activities related to recovery and

preparedness. This collaboration results in a cyclical iterative process of research

and activities. Another finding is that it demonstrated the formation of a

partnership between local citizens and researchers who conducted support

activities related to disaster recovery and preparedness. This aspect will serve as

the foundation for developing disaster citizen science research methods.

The formation of partnerships can be understood in terms of two elements. The

first element is comprised of three phases, which can be described as the initiation

period, continuation period, and maintenance period of support activities. The

second element is the researchers' thoughts and actions related to the formation

of partnerships between researchers and local citizens. This research contributes

a new finding, which is to demonstrate these relationships using 13 codes.

Furthermore, the relationship between the two elements was demonstrated,

leading to the formulation of a framework and structure for research in which local

citizens and researchers collaborate to promote recovery and preparedness from

natural disasters. Consequently, the results of this study will serve as the

foundation for deriving citizen-centered disaster citizen science research methods during the disaster recovery and preparation stages. Additionally, it became evident that researchers should adopt an ethical awareness-based attitude when conducting disaster citizen science research for recovery and preparedness from natural disasters. Throughout the entirety of the study, the participants developed support activities that focused on the daily needs of citizens while maintaining a researcher's perspective. Through the utilization of the knowledge gained, they endeavored to resolve local issues. They implemented actions and community improvements and endeavored to disseminate their experiences so that they could be utilized in other regions. As previously mentioned, these attitudes based on ethical awareness are the ethical responses required when conducting disaster research. This kind of situation can also be referred to as citizen science, where scientists themselves become one with citizens, as advocated by the Science Council of Japan.

The preceding analysis indicates that the research method of disaster citizen science, which is citizen-centered research on recovery and preparedness from natural disasters, involves the integration of research and action. It is therefore essential that researchers form partnerships with citizens. In order to promote

disaster citizen research, it is necessary for researchers to adopt ethical attitudes, actions, and awareness. By promoting disaster citizen science research, it becomes possible for citizens to take the initiative in improving their communities and achieving social change toward recovery and preparedness from disasters.

Limitations and strengths

The interviews were conducted using a recall method, which means that any information that the participants were unaware of was not included in the data. Additionally, since this research is based on the narratives of Japanese researchers, the data regarding the involvement of the government and the development of activities related to disaster prevention and reconstruction is influenced by Japan's social system. Therefore, it is necessary to verify whether the results of this study can be used outside Japan.

The behaviors and attitudes of researchers, as indicated by the 13 codes, were considered and practiced autonomously by researchers in different academic fields. Until now, there has been little opportunity for them to be published and shared. This study clarified the integration of research and action and ethical responses in disaster research based on the actual experiences of researchers who carry out support activities during the recovery and preparation periods from an

interdisciplinary perspective. Based on the results of this study, it is possible to explore disaster citizen science research methods.

AUTHOR CONTRIBUTIONS

M.I., N.S., Y.T., and A.S. were responsible for the conceptualization and design of this study. M.I. and A.S. were also responsible for participant recruitment. M.I., N.S., Y.A., Y.T., A.S., and K.H. conducted the interviews; M.I., N.S., Y.A., Y.T., and A.S. performed the Quantitative text analysis and qualitative analysis; K.H. contributed to improving the rigor of KH coder analysis; M.I. drafted the manuscript; N.S., Y.A., Y.T., A.S., and K.H. review the manuscript.

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DISCLOSURE

The authors declare that they have no conflict of interest.

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Table 1 Participant information *(N = 9)*

	n		*n*
Organization		**Disasters mentioned in the interview**	
Japanese University	9	Earthquake	8
Specialty		Tsunami	5
Nursing	5	Radiation	1
Hydrology (Geography)	1	Flood damage	1
Information engineering	1	Typhoon	1
landscape science	1		
Horticulture	1		

Table 2   Phase, Code, Word included in the code, and Illustrative quotes from Key Words in Context

Phases and Codes	Words included in the Codes	Illustrative Quotes from Key Words in Context
Disaster assistance initiation		
①Start supporting the target area with organizations already conducting support activities.	NPO, enter, group or organization, External organization, support	It's difficult to research while building a true partnership, but I think the only way to do it is to put it into practice in that place.
		There was an external organization that I was working with, and they were asked to provide disaster relief. First of all, the organization (external support organization) does not have any medical personnel. When I entered the field, I was invited (as a medical professional) to come with me, and that's how it all started.
② Realize that at the beginning of support, it is important to prioritize listening so that local citizens can speak.	time, talk, come out, at first, together	I told the students going to the field to prioritize listening overworking. I said something along the lines of, ``You don't have to do anything, so if the residents or locals want to talk about something, just stay with them.''
		In the beginning, there were some people who spent a lot of time talking to me about their incredibly painful experiences. So, I don't know how to react anymore. As I continued to think about it, I came to the conclusion that all I had to do was listen to the story. I realized that listening to

people's stories is an important form of support.

Support continuation

③ Thinking about public plans and policies related to disaster prevention and reconstruction, taking into account diversity according to local conditions and needs.	place, evacuation, see, children, community,	I realized that the risk communication that we did in our research is important and that it is really important to think about disaster prevention at the district level while doing it. However, the Cabinet Office is recommending the creation of guidelines for district disaster prevention plans, but they are not yet widespread.
		I wonder if it's a reconstruction project or reconstruction policy. While I sometimes have the perspective of looking at such things, I feel very strongly that the biggest challenge in large-scale projects such as reconstruction projects is the lack of diversity.
④ Be aware of the link between the issues and visions of local citizens and the local government's	women, disaster prevention, plan, important, map, make	Since I was involved in support activities especially targeting women, I started by going around evacuation centers and interviewing them. Since we are midwives, we listen to various stories from women, find out their issues, and provide support in response. As for our relationship, we first started by listening to their various stories, such as their troubles.

disaster prevention plan.		I thought that the mindset of the citizens and the people at the city hall needed to change, so I thought about how the citizens and the city hall staff could work together to get women involved in disaster prevention and to enable women to play an active role.
		It is important that we should draw pictures and plans of what the citizens want to do. Otherwise, especially in places where the population has decreased due to the disaster, the space will become unmanageable. The citizens have to decide. In short, it is extremely important to plan for yourself.
⑤ Engage with local citizens by clarifying the purpose and deadline of the project that researchers are involved in supporting. ⑥ Believe that as reconstruction progresses, local	reconstruction, recovery, project	It's a contract, right? After all, in our mutual contract, I said something like ``I'm going to be involved here for five years for this purpose and this kind of business,'' and if I get rejected, I'll go with the same reaction (according to the reaction). So, it's about keeping your promises.
		I think It's not that we have to do some kind of project or make an implementation plan, but rather that the casual scenes of everyone (residents) have the power to energize the citizens. Therefore, even if it is not created by the government or medical professionals, is it possible for residents to have a sense of value that gives meaning to existing activities? That's how I think and work.

citizens will realize the value of existing local resources and will make positive changes.		I think that various periods coincided with changes in the environment, the recovery period, stabilization of life, and citizens starting to say things like, ``We'll take care of this for you.'' Yes. So, I think that changes in the environment, or rather the progress of reconstruction, may have had a big impact on everyone's acceptance, attitude, and response.
⑦ Through dialogue and exchange with local citizens, try to confirm differences in ideas and opinions and try to reach a compromise.	different, conscious, change	Ultimately, I was thinking about how I could properly rebuild the town and create a space where the people living there would be happy. I guess I tried to keep an equal distance from people in the community who had different opinions.
		The first thing to be aware of is the conscious world of researchers and local citizens. I try to imagine what the conscious world of people living in the area is like. Try to match the researcher's conscious world with the other party's conscious world as much as possible. I think this is important.
		There is a coined word called conscientization in the workshop book I wrote. There are times when citizens have a moment of self-awareness and change. Awakening, or rather, becoming conscious. After all, I think that is the meaning of holding workshops.

		Even if the people or teams change, the place of discussion remains the same, so we can check in with each other. In that sense, I think it's easier for both those who receive support and those who come to support us to come to a mutual understanding because we had a place like this where we all talked about the future.
⑧ Drawing out and enhancing the power of local citizens through providing logistical support for student support activities	me, student, keep, internal, a little	The local citizens are honest with students, so I told them, ``There are so many things that only you can listen to. Just listen carefully and tell me later.''. No matter how much I try to pretend to be a student as a leading teacher, there are some parts where I can pretend that I'm still a researcher. For local citizens, I think having researchers working with students has lowered the hurdles considerably.
		When the students started thinking about things they could do even if they didn't have enough expertise, they came up with the idea of creating an opportunity for students to say "thank you" (to people in the local community). They put a lot of thought into the plan, so even I (as a teacher) was impressed and said, ``Ah, I see.''
		I used to think that healthcare workers had to do something, or that they had to be there, but in reality, there is power and connections that residents have. I think one of the things I've experienced over the past 10 years is that if they just connect things together, or confirm the direction together, they can actually make progress.

| ⑨ Through dialogue with local citizens, notice the gap between the information researchers want to know and the information citizens need, and formulate a research plan to avoid divisions. | know, write, university, research | I had a chance to talk with the citizens and asked them about various things. I was really able to think about collecting information from various places and the future direction of the investigation. Even if we go into the investigation on our own, we do so while interacting with various residents. I think that is the most important thing. As a researcher, we inevitably end up writing a paper first. Then, a division inevitably arises there. |
| | | Researchers feel like they need to investigate all kinds of things right now, but local citizens are asked the same questions over and over again, so they're really tired of doing research. I had heard about this from NPOs as well, so I thought that we should not do that from an ethical standpoint. So, as a nursing profession, we want to understand the background and environment of residents' lives and listen closely to their stories. We want to do some kind of research that is typical of the nursing profession and nursing. That's what I thought, so I think that's how I did it. |

		There is information that researchers need and want to know as part of their research activities, right? This information does not necessarily correspond to the information they want to know in their daily lives. Therefore, I think that in many areas, even though he is a university professor, he probably doesn't really need residents, but they cannot refuse and agree to that. It may sound strange to say, but even if it doesn't match the researchers' goals, it's important to stay close to the residents, and ultimately let the residents do what they want.
⑩ Start, implement, and continue reconstruction activities by utilizing the roles and functions of the government in reconstruction support	accept, government, meeting	For example, as was the case during the Kumamoto Earthquake, NPOs can officially begin providing support if they know that they are collaborating with the Cabinet Office's disaster prevention department. When the Cabinet Office's disaster prevention department contacts the prefectural office and says, ``This NPO (external supporter) is going, it's okay because they're doing everything right,'' and that organization is immediately accepted by the prefectural office. Without this, NPOs will have a hard time connecting with the government.
		In order to continue providing a place for citizens to interact, we intentionally included all of this in the city's various plans. Once the government writes it into the plan, it has to be done. Of course, you have to make a budget, but once you have written it down in the plan, you will have to evaluate it.

⑪ Visit places where information is aggregated, obtain information fairly from people from diverse positions, and understand the situation.	necessity, information, situation, investigate, Public Health Nurse, hard, most	Always get information from various people. By listening to people from a variety of positions, I made sure to be able to see the situation in a particular place from multiple perspectives. If I only get information from one source, you won't know if it's accurate or not. After all, multiple sources of information. I meet a lot of people as sources of information.
		After all, information becomes information because it's there when you need it. No one knows what's going on in this city right now, including me. However, when we gather there once a week or once every two weeks, we can share what everyone is doing, even though it's only a two-hour meeting.
		After all, in terms of activities of local Public Health Nurses, it's assessment, to put it in words. Therefore, the question is how much assessment can be done, how much material is needed for assessment, how much information is needed in the area, whether is it tailored to the situation, and whether is there a point of view or not. I feel like there's a general rule in place.
		In terms of our relationship, we first started by asking them about their troubles and other various stories.
		The childcare worker I was most involved with, was the key informant interview, Mr. A from the city hall, the pediatrician, etc. Therefore, there was no one person who was the most important among the people in the

		area, and it felt like everyone was equally distributed.
⑫ Set long-term and step-by-step goals, and carry out support activities with the aim of proposing, implementing, and continuing the project with local citizens at the center.	understand, citizens, listen, consider, current, activity, come	Instead of asking people, ``Are you having any trouble?'', I always try to give a little push to the local citizens and those involved in what they want to do. The same is true for both volunteer work and professional work. In fact, students are extremely sensitive to such things. Students also have a good idea of what they want students to do.
		Once they can properly handle it locally, I will be done with it.
		First of all, it is important to think about who the stakeholders are, and in particular, what kind of structure the social plan, its society, and the local community have. Who has the power? When working in rural areas, there are many different rural villages, and the power structure has a traditional village history.
		During a disaster, it can be easy to do too many things at once, but I try to consciously restrain myself from thinking about this and that, and think about what is the best way to do it in this moment. I think they were searching for something.

|		One of the specific situations where I felt that a partnership had been formed was when someone asked me, "When are you going to come over next time?" Also, when I talk to someone about ``What should we do next?'' and they start making requests like ``I want to do something like this next time,'' I wonder if we've built a relationship of trust.
Relationship maintenance		
⑬ Based on the researcher's own will, not based on work or a sense of obligation, continue to maintain relationships with local citizens and share the experience of solving problems from a professional perspective	damage, difficult, go there, do, region, relationship, work, researcher	Activities in disaster-stricken areas are, after all, for the disaster-stricken areas and for the citizens. I think it's fine for researchers to be local. After all, problem-solving is local. This is because when it comes to global environmental issues, what is occurring is the relationship between people and nature or society in a specific region. These issues will be resolved in individual regions. It will be accumulated. The idea is to share this information or perform a meta-analysis to connect it to higher-level problems.
		When I start an activity, I have to think about what will happen when the activity ends, but I feel that it is tough to judge this.
		（Nowadays）Since I don't go to the site all that often, I guess it's more like a relationship where we see each other's faces when I go.
		My job now is not only to focus on the disaster-stricken areas but also to communicate the experiences that occurred in the disaster-stricken areas

to the outside world. This will become my (main) job

If I do it out of a sense of duty, I think it will probably get across to the local people. So researchers are going there because they want to go, and I thought we should do something that would be fun for us too.
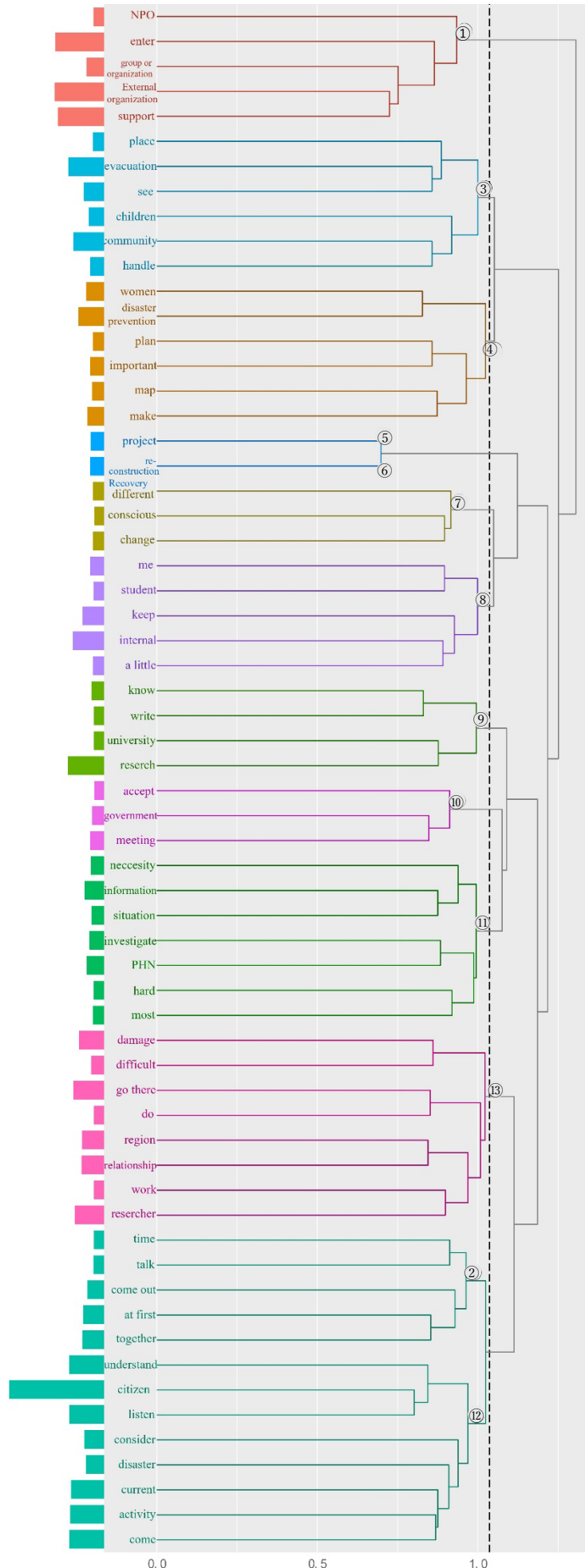
Figure 1 Partnerships between local citizens and supporting researchers toward

recovery, reconstruction, and preparedness from natural disasters

*Method: Ward, Distance: Jaccard

The entire figure represents a tree diagram (cluster analysis results) composed of each word. The cluster analysis method is the Ward method, and the distance measure is the Jaccard coefficient. The minimum number of occurrences of each word is 35. The tree diagram is divided by dissimilarity at the bottom of the figure, and the dotted line in the figure indicates the location of dissimilarity in this diagram. The circled number indicates the code number, and its placement position is the cluster associated with the code.