

Material:

WBF-2019 Core Research Cluster of Disaster Science Planning Session as Disaster Preparedness: Participation in a Training Program for Conductor-Type Disaster Healthcare Personnel

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Introduction: Health professionals and support staff need to be prepared for disasters and know how to respond. This study aimed to examine a one-day “Conductor-type disaster healthcare management personnel” training course and its effect among healthcare professionals. Tohoku University and Fukushima Medical University are experienced in disaster response preparedness and they conducted the one-day course comprising multiple sessions at the World Bosai Forum-2019 (WBF-2019). **Method:** The course introduced the recent activities of four groups: the Practical Disaster Risk Reduction Research Group; the Natural Science Research Group; the Disaster Humanities Research Group; and the Disaster Medicine Research Group. Unifying four scientific areas based on the theory of the disaster cycle, the research field “disaster science” has been created through interdisciplinary cooperation. The participants completed reports, which were then analyzed using the KJ method. **Discussion:** The program participants wanted to gain practical knowledge about disasters and have a multifaceted perspective on disaster response. Participants who attended other sessions had an interest in comparing their training with the training provided by other sessions on disaster preparedness. Comparisons included determining the effectiveness of high-level disaster medical preparations from a multilateral viewpoint and involving an interdisciplinary research team in disaster medical preparations to prepare for future disaster events. **Conclusion:** The participants identified that interdisciplinary activities lead to an improvement in knowledge, skills, or attitudes toward disaster preparedness. There needs to be a greater focus on disaster medicine care teams, including research on both past and future

disasters.

Keywords: disaster preparedness, disaster medicine, training program, Core Research Cluster of Disaster Science planning session, World Bosai Forum-2019

1. Introduction

The number of natural disasters has been increasing worldwide [1], and their impacts are worsening. Disasters can affect the development of the healthcare sector. Therefore, the provision of medication and health services should be ensured throughout the medical supply chain; thus, efficient procurement and proper supply management are necessary. However, natural disasters (fires, hurricanes, floods, and earthquakes) threaten the distribution of supplies, medication, and normal functions. Unfortunately, disasters can occur at any place and at any time, resulting in system malfunction and impairment of the country's economy.

Japan is susceptible to natural disasters. The Great East Japan Earthquake on March 11, 2011, registered a 9.0 on the moment magnitude scale and was the largest in Japan since 1875 [2]. The earthquake generated a tsunami with wave heights up to 38.9 m [3], which was responsible for the majority of casualties, a large portion of the physical damage, and 20,000 fatalities [4]. The earthquake and tsunami also caused the worst nuclear emergency since Chernobyl [5]. Similarly, several hospitals in Kumamoto were severely damaged by the 2016 Kumamoto Earthquakes, which were a series of earthquakes that included a foreshock earthquake (magnitude 6.2) on April 14 and a main shock (magnitude 7.0) on April 16, 2016 [6]. In



addition, typhoons cause enormous damage every year. For example, Typhoon Habigis made a landfall at the Izu Peninsula of Shizuoka Prefecture, Japan, on October 12, 2019, had widespread impacts and caused at least 80 deaths: 135,000 people were affected, 68,000 houses were inundated, and 10,000 buildings were damaged [7].

Given the inclination toward natural disasters, Japan should include preparedness in disaster management training. This would help to increase the available workforce to deal with calamities. Based on the Great East Japan Earthquake experience, Tohoku University and Fukushima Medical University collaborated to provide “Conductor-type disaster health care management personnel” training to those who need practical disaster response skills.

To date, few studies have evaluated disaster medicine preparedness. Given the increasing number of disaster events in Japan, an appropriate evaluation is required. However, previously assessed preparedness levels were found to be insufficient in many countries. For example, a study carried out with medical students in America found that just 47% of interns received formal disaster preparedness training during medical school; 64% of those training programs included some type of simulation. Therefore, there is a need to improve disaster preparedness training in medical schools [8]. Similarly, emergency department doctors and nurses in Hong Kong revealed a lack of training in disaster management, emergency communication, psychological first aid, public health interventions, disaster law and ethics, media handling, and humanitarian aid in an overseas setting [9]. Given the current gap and need for increased disaster preparedness training, disaster medical staff may benefit from developing a core-competency-based training that targets under-trained areas, improves staff confidence in the workplace, and removes barriers against staff who are willing to respond.

Future healthcare experts, policymakers, educators, doctors, nurses, and pharmacists should be taught about disasters. In addition, they should be appropriately trained in disaster management and preparedness, as previous studies indicated that current disaster responses are inadequate. “Conductor-type disaster healthcare management personnel” trainees who belong to a general hospital are usually considered to have specific and cutting-edge knowledge of this subject. Disaster medical preparedness courses offer assistance in guiding the healthcare workforce so that it can deal with disaster victims. To date, the number of studies evaluating the programs of future healthcare professionals specifically for disaster medicine preparedness is limited. Therefore, in accordance with the importance of this issue, this study aims to assess the disaster medicine preparedness program for the “Conductor-type disaster healthcare management personnel” by assessing and evaluating reports shared at the “Core Research Cluster of Disaster Science Planning Session” at the WBF-2019 for disaster medicine preparedness.

2. Materials and Methods

2.1. Study Design

This study used a qualitative design to gather ethnographic data based on the Kawakita Jiro (KJ) method [10–12]. Self-report questionnaires were distributed to session attendees at the one-day “Conductor-type,” training session held during the “Core Research Cluster of Disaster Science Planning Session” at the World Bosai Forum-2019 (WBF-2019) on November 10, 2019.

2.2. Ethical Considerations

The study design was approved by the ethics committee of the International Research Institute of Disaster Science (IRIDeS) (Ethical approval number: 2020-01). Participants were assured that all of the data gathered would be handled with full confidentiality and would be used solely for research purposes. They were informed that they could withdraw from the study at any time. No names were identified in the analysis data. The researchers only used coding text on the report and in the analysis; thus, the data could not be linked to the participants.

All of the 11 participants gave permission to use their data for research and signed a consent form.

2.3. Study Participants and Sample Size

In the 2018 Ministry of Education, Culture, Sports, Science and Technology (MEXT) grant project “Problem-Solving Advanced Medical Personnel Development Program,” Tohoku University and Fukushima Medical University, with their unprecedented experience in disaster response, planned to collaborate to equip “Conductor-type disaster healthcare management personnel” with practical disaster response skills. Leveraging the strengths of both universities, the project aims to develop personnel who can respond to natural disasters, chemical, biological, radiological, nuclear, and explosive (CBRNE) disasters, and multiple disasters combined, and who have the ability to work together as a team and collaborate with other organizations to respond to both acute and chronic conditions.

The “No. 12 International Disaster Cooperation Seminar at Sendai” was held on November 10, 2019, to learn about international cooperation in times of disaster through participation at the WBF-2019. Participants (hereinafter called trainees) included 10 session attendees. The sample was comprised of one surgeon, three dentists, a nurse ($n = 5$), one pharmacist, and one radiologist who participated on the first day of the WBF-2019.

On the first day, November 10, 2019, there were 18 session programs designated as a part of the “Core Research Cluster of Disaster Science Planning Session.” There were 47 themes at the poster session venue. Trainees for the “Conductor-type disaster healthcare management personnel” program participated on the first day of the WBF-2019; all trainees were included in this study.

2.4. “Core Research Cluster of Disaster Science Planning Session” by the WBF-2019

This session presented the research activities, results, and progress of the Core Research Cluster of Disaster Science at Tohoku University. This cluster adopted a multidisciplinary approach to disaster studies, linking natural science, engineering, medical science, and the social sciences and humanities [13]. The town of Shichigahama in Miyagi, on Japan’s northeastern coast, was severely inundated by the tsunami following the Great East Japan Earthquake in 2011. This session reported the results of the town’s two-year disaster-related activities as well as the prospects drawn from a recent workshop in September 2019.

The session began with an overview of the project, followed by presentations from the disaster medicine research group and the disaster social sciences and humanities research group, which were based on field studies in Shichigahama and which consider the relationship between local culture and health. The natural hazard science research group and the applied disaster risk reduction research group discussed both past and future regional risk environment evaluation efforts, and which factors caused social damages after the 2011 disaster. After the presentations, we intended to gather feedback from our overseas collaborative partners from the APRU network, Indonesia, and the United Kingdom regarding further investigations that would enhance disaster preparedness. This session aimed to guide cross-cutting research on climate change, natural disasters, survival, health, and culture.

2.5. Data Collection

A self-report survey collected data from the students of the selected colleges. A representative of each individual college/university was appointed to approach respondents to increase the participation rate.

2.6. Data Analysis

The descriptions of the participants’ impressions were divided into sentences and analyzed using the KJ method for categorization [14]. The normality of the results was checked by the coauthors.

3. Results

The sessions where trainees participated and submitted their reports are shown in **Table 1**.

The session that gathered the most reports is described below.

3.1. “Core Research Cluster of Disaster Science Planning Session” by the WBF-2019

First, Prof. Hideo Ohno, President of Tohoku University, introduced the Designated National University, Core

Research Cluster of Disaster Science. Their work unifies four scientific areas based on the theory of the disaster cycle. This research cluster created the research field “disaster science” through interdisciplinary cooperation at Tohoku University. The cluster is also developing existing disaster studies networks and organizations such as the Association of Pacific Rim Universities (APRU). Moreover, it aims to systematize “disaster science” by strengthening international research collaboration, holding international conferences, and establishing a leading international research journal.

Then, Dr. Christopher Tremewan, APRU’s fourth Secretary General, introduced the current APRU activities and collaboration with Tohoku University, mentioning the opinions and expectations of the Core Research Cluster of Disaster Science.

After that, Prof. Fumihiko Imamura of the Practical Disaster Risk Reduction Research Group presented the results of the Core Research Cluster’s two-year activities and future directions (**Fig. 1(a)**). Prof. Hiroki Takakura, of the Disaster Humanities Research Group, moderated the panel and introduced four research areas (**Fig. 1(b)**).

3.1.1. Results of the Core Research Cluster’s Two-Year Activities and Future Directions (Presentation by Imamura/Practical Disaster Risk Reduction Research Group)

Recently, natural disasters including the 2011 Tohoku earthquake and tsunami have caused widespread damage and disruption all over the world, and disaster risk reduction (DRR) has become a global priority. Tohoku University established the core research cluster to create a new area of “disaster science” that consolidates four different research areas: practical, natural sciences, humanities, and the social sciences by adopting the disaster management cycle concept. It takes an inventory of the research needs for science and technology applications in DRR and serves as a platform for strengthening multidisciplinary research in disaster science. The papers introduced the main idea, project origins, and strategies to contribute to the existing academic science and international collaboration [15].

The symposium kicked off with a series of programs and activities organized at the World Bosai Forum (WBF) in November 2017 to achieve these goals. It assesses the research needs for science and technology applications in DRR and serves as a platform for discussions on strengthening multidisciplinary research in disaster science.

The purpose of the session at the WBF-2019 was to introduce recent activities from the past two years and discuss its future role. Unifying or bringing together four scientific areas based on the theory of the disaster cycle, we created the research field “disaster science” through interdisciplinary cooperation. We are developing existing disaster studies networks and organizations such as the APRU. We also aim to systematize “disaster science” by strengthening international research collaboration, holding international conferences such as the WBF and establishing a leading international research journal called

Table 1. Sessions attended by trainees.

Session No.	World Bosai Forum-2019 sessions on November 10, 2019		
	Title	Organizer	Number of participants
O1-1	Great East Japan Earthquake Memorial Symposium: Passing Down Disaster Experience – Its True Meaning and Reality	Disaster-Resilient and Environment-Friendly City Promotion Office, City Planning Policy Bureau, City of Sendai	6
O1-2	Disaster Risk Reduction and Women’s Leadership	Gender Equal Opportunity Section, City of Sendai, Sendai Gender Equal Opportunity Foundation	5
O1-3	Accelerating the formulation of local DRR plans toward the next 10 years of their implementation – How to achieve the Global Target of the Sendai Framework	Japan International Cooperation Agency	1
O1-4	3.11 DENSHO ROAD to Pass on the Lessons of the Great East Japan Earthquake ~ Activities of Memorializing the Earthquake in Industry-academia government-citizen Collaborations ~	Tohoku Regional Bureau MLIT, Aomori Prefecture, Iwate Prefecture, Miyagi prefecture, Fukushima Prefecture, Sendai City	3
O1-6	“Moving Hearts” with Experiences and Lessons ~ Connecting Stories to Specific Disaster Prevention Measures	Miyagi Prefectural Government	6
O1-7	Cross-cutting the Disaster-Related Sciences: Challenges of a Multidisciplinary Team at Tohoku University	The Core Research Cluster of Disaster Science	10
O1-8	Thinking about Disaster Storytelling: How to Use Oral Narratives to Prevent Future Fatalities	The Kahoku Shimpō	1
O1-9	Media and Bosai: A Crucial Combination for Saving Lives	NHK World-Japan	2
O1-10	Disaster Risk Reduction and Women’s Leadership	Gender Equal Opportunity Section, City of Sendai, Sendai Gender Equal Opportunity Foundation	2
O1-12	Teachers’ Capacity Development for Enhancing Disaster Risk Reduction at School	Miyagi University of Education	3
O1-17	Creating a disaster resilient society through industry-academia collaboration	Tohoku University – IRIDeS + Tokio Marine & Nichido Fire Insurance Co., Ltd.	4

Program participants were allowed to participate in as many sessions as they wanted. Descriptions of the sessions in which trainees participated and submitted their report. These sessions were held on November 10 at the WBF-2019.

Progress in Disaster Science and Elsevier publication started in May 2019. Using the theory of the disaster response cycle, we united four different research fields to pioneer the creation of an interdisciplinary research group.

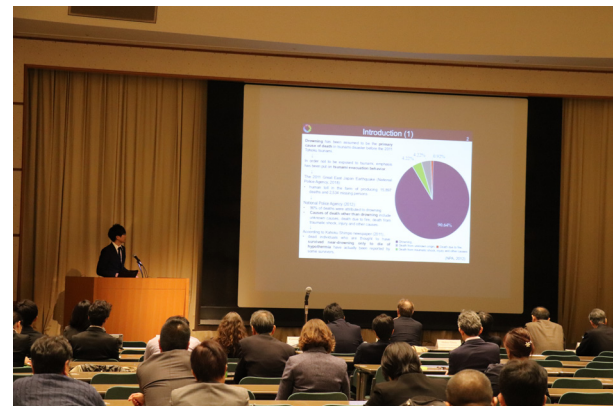
3.1.2. Moderator and Introduction of Four Research Areas (Presentation by Takakura/Disaster Humanities Research Group)

Research on disaster risk management is conducted through either disciplinary or interdisciplinary approaches. Leading scientists may intentionally organize the latter, or it may coincidentally be formed under various conditions. Tohoku University, which is one of the closest institutes from the epicenter of the 2011 Japan Earthquake and Tsunami, organized a unique disaster research team targeting tsunami victims, health, cultural heritage, and the environment in 2016. In terms of disciplines, tsunami engineers, disaster medical scientists, an-

thropologists, religious studies historians, and geologists-meteorologists worked together. There were two arguments in this presentation. First, we ethnographically described our team’s two years of ongoing collaboration. Our challenge was one of the sample cases in which the research university that suffered the mega-disaster correspondingly managed the interdisciplinary disaster research program. The key to success might be a regularized meeting and collaborative events with mutual support. Second, we addressed the prospect of disaster risk management. For example, we understand the periodic frequency of earthquakes and tsunamis in a specific space by combining geological and historical knowledge. Furthermore, by combining the research results of tsunami victims, we can better assess the disaster risk in an area, which may contribute to the community building plan. Research on cultural heritage uncovers the historical identity of the affected community and social capital as a resource for collaboration against disasters. This knowl-



(a) Fumihiko Imamura, head, Practical Disaster Risk Reduction Research Group, professor at the International Research Institute of Disaster Science



(a) Shuji Seto, Practical Disaster Risk Reduction Research Group, assistant professor at the International Research Institute of Disaster Science



(b) Hiroki Takakura, vice-head, Disaster Humanities Research Group, professor of Center for Northeast Asian Studies



(b) Toru Matsuzawa, vice-head, Natural Science Research Group, professor at the Natural Science Research Group

Fig. 1. Introduced about two years' worth of activities from the Designated National University, Core Research Cluster of Disaster Science.

Fig. 2. Introduced two years of activities from the Practical Disaster Risk Reduction Research Group and Natural Science Research Group.

edge should be connected with the evaluation of community health and well-being. Our tentative prospect expands the importance of disaster recovery and prevention from a long-term perspective or the sustainability of multiple generations in DRM, in particular, paying attention to a certain area. Last, we referred to our new collaboration with local municipalities in order to consider practical application possibilities.

3.1.3. Analyzing the Data of Those Who Died in the 2011 Tohoku Tsunami Provided by the Miyagi Prefectural Police (Presentation by Seto/Practical Disaster Risk Reduction Research Group) (Fig. 2(a))

Approximately 20,000 people died in the Great East Japan Earthquake tsunami that occurred in 2011. According to the National Police Agency [16], 90% of those who died in the Iwate, Miyagi, and Fukushima prefectures drowned. Aoki et al. [17] reported that the results of questionnaires from physicians who examined the affected areas showed that the statistical result for the cause of death reported by the National Police Agency was reasonable.

In addition, some physicians claimed that labeling these deaths as drownings was problematic. This suggests that people killed during the tsunami died from causes other than drowning. Survivors witnessed people who died of symptoms such as hypothermia after exposure to the tsunami. However, the cause of death excluding drowning has not yet been elucidated. Seto et al. [4] classified the causes of death in the 2011 Great East Japan Earthquake tsunami using the data of the deceased provided by the Miyagi Prefecture Police. As a result, the cause of death was classified into the following 12 groups: head injuries, neck injuries, thorax injuries, unspecified multiple injuries, traumatic shock, aspiration (not drowning), drowning, death due to fire, hypothermia, heart disease and death from an unknown origin. Furthermore, they showed the proportion of each cause of death in Miyagi prefecture. The proportion in each city needs to be clarified in more detail. Seto et al. [4] analyzed the location data related to the deceased provided by the Miyagi Prefecture Police. The data included residential address, location of the deceased, and type of location (such as on land, at sea, and in debris).

They showed the characteristics of each location in the Miyagi prefecture. Today, I report a summary of the above studies.

3.1.4. Are Natural Sciences Useful in Mitigating Future Natural Disasters? (Presentation by Matsuzawa/Natural Science Research Group) (Fig. 2(b))

Until the occurrence of the 2011 Tohoku-oki earthquake, it is probable that no researchers believed that M9 earthquakes could occur in the Tohoku district. Before the Tohoku-oki earthquake, the largest earthquake that occurred there was estimated to be M8.4. This meant that the researchers completely underestimated the largest earthquake. Based on a reflection of this underestimation, seismologists made this argument after the Tohoku-oki earthquake, “if the researchers underestimate the risk, the evaluation of the ‘largest earthquake’ will be not useful, but harmful and they should not make such a long-term forecast.” However, if researchers do nothing, people will always underestimate the risks because they estimate the future based on their experiences from their grandparents’ generations at best. Even if the researchers underestimate the risks, they have more knowledge than the general public, and their research can only provide advice to residents for “future disasters that they have never experienced.”

From this viewpoint, the “Natural Science Research Group” members are now trying to clarify and model the process leading to the occurrence of huge natural phenomena such as earthquakes and eruptions, which can cause hazards. We believe that forecasts based on such research will be helpful in disaster mitigation. Even though the forecasts are always probabilistic and their probability of increasing is very slow compared to human activity, researchers can show people that disasters are approaching. Our estimated magnitudes, frequencies, and styles of dangerous natural phenomena will be important to other research groups in the Core Research Cluster of Disaster Science. Information from other research groups, on the other hand, will be very useful. Historical documents about huge earthquakes, for example, provided by the Disaster Humanities Research Group, provide extremely important information on the recurrence intervals, styles, and magnitudes of such events. We are now planning to promote joint research with them.

3.1.5. Does Culture Matter in the Revitalization of Post-Disaster Society? (Presentation by Fukuda/Disaster Humanities Research Group) (Fig. 3(a))

This presentation aimed to introduce the research project of the Disaster Humanities Group concerning the work of the core research cluster of disaster science [18]. Our project attempted to clarify the role of intangible cultural heritage (ICH) in the revitalization of a tsunami-affected community. The project consists of three interconnected subprojects. First, this project attempts to construct a database of the props used for ICHs using three-dimensional measurements. Second, the project conducts



(a) Yu Fukuda, Disaster Humanities Research Group, assistant Professor, Center for Northeast Asian Studies



(b) Junko Okuyama, Disaster Medicine Research Group, assistant professor, Tohoku University Hospital

Fig. 3. Discussed about two years’ worth of activities from the Disaster Humanities Research Group and Disaster Medicine Research Group.

a survey to determine whether ICH, such as festivals and folk performing arts in tsunami-affected communities, resumed after 2011. Third, the project examines the relationship between the ICH and the community’s state of health. By integrating the outcomes of these three projects, we will try to suggest the importance of ICH in disaster-prone communities. Here, I focused on the first project that safeguards ICH using 3D measurement technology.

Various traditional festivals have been performed in each community of the coastal areas of the Tohoku region before the 2011 Great East Japan Earthquake. Recent studies show that the revival of festivals plays a crucial role in the reconstruction of community life in tsunami-affected areas. Despite the importance of intangible cultural properties, the outfits and crafts used during festivals were swept away by the 2011 tsunami. Against this background, this study attempted to record the three-dimensional data of the materials used in festivals and folk performing arts. This project aims to construct a database of the props used for intangible cultural properties and offered three-dimensional data on the disaster-affected area

to rebuild their community life. Another goal of this explorative project is to create a methodology for 3D measurement in the field of disaster humanity science.

3.1.6. Disaster Medicine Research Can Provide a Solid Foundation for Disaster Risk Reduction and Post-Disaster Recovery (Presentation by Okuyama/Disaster Medicine Research Group) (Fig. 3(b))

Our mission as a member of the Disaster Medicine Research Group is to research multiple fields in the natural and social sciences and humanities to stimulate multidisciplinary studies for disaster response and preparedness utilizing accumulated data. We are constructing a database that consists of medical, psychological, and personal information collected through cohort studies.

Since the Great East Japan Earthquake, we have been involved in multiple surveys to evaluate the impact on health conditions and psychosocial aspects of affected survivors who have experienced natural disasters. For example, one study examined their effect on high-school-aged youth for three years (2012–2014) [19,20]. It focused on the high schools in Natori city, Miyagi prefecture, near the earthquake and tsunami epicenter. Even three years after the disaster, the proportion of high school students who corresponded to the psychological high-risk group did not change. A large number of school counselors were introduced to high schools in Miyagi Prefecture after the disaster, but their presence was effective only for high school students' depression and post-traumatic stress reaction, but not anxiety.

We are currently studying how to recover physically and psychologically after the disaster. For example, we created and distributed a booklet about post-disaster care based on research results. We plan to create and distribute booklets tailored not only for general Japanese victims but also for overseas victims, children, adolescents, and older adult victims. We would also like to suggest lifestyle habits to be implemented after the disaster. For example, we expect that exercising after a disaster will help with physical and psychological recovery.

We are planning a project that uses machine learning to predict when and which medical care will be provided for possible future disasters in collaboration with experts from other fields.

3.1.7. Panel Discussion with Foreign Guests

We had a panel discussion with invited guests from overseas: Professor David Alexander from University College London and Professor Fatma Lestari from the University of Indonesia. Invitees from abroad were particularly interested in the extent of disaster science that extends to the ICH of the Disaster Humanities Research Group. Finally, all members talked about their aspirations for the development of disaster science through international collaboration.

3.2. Qualitative Analysis of Reports

Impressions were obtained from all the 11 participants. The impressions were divided into sentences and the same contents were summarized using the KJ method, and they were divided into six categories (Table 2). The most frequently described category was the "Importance of various fields."

The category with the second-highest description was the "Importance of collaboration."

4. Discussion

In this study, we evaluated participation at the WBF-2019 in the "Conductor-type disaster health care management personnel" training course regarding disaster medical preparedness. Our findings indicated that, in general, trainees who participated gained a new perspective. The trainee reports showed new viewpoints among disaster medical professionals, especially for multi-collaboration. Thus, there is a need for disaster medical professionals to be educated from various perspectives.

Globally, training in disaster preparedness is considered necessary for all healthcare workers, especially those in emergency settings, and should be incorporated into educational curricula, such as the American Medical College [21–23]. A lack of specific training in disaster preparedness threatens the health of the general population as well as patient care providers [24]. There are different educational strategies and a wide variety of training programs globally. Disasters are complex events involving many patients and environmental factors that are difficult to reproduce inside a classroom. In the UK, facilitating and participating in mass fatality exercises serve as continuous professional development for those who are ultimately engaged in responding to mass incidents [25].

Recent reviews suggest that healthcare worker programs lack clarity, objectivity, competency-driven goals, scientific rigor, prospective validation, and consistency across medical specialties [21,26]. The purpose of this training is to improve knowledge and skills for an informed disaster response.

The "Conductor-type disaster health care management personnel" course involves not only knowledge and skills improvement, but also the ability to demonstrate leadership in a disaster medical field. Leadership education is necessary in addition to traditional disaster medical training. For this reason, WBF-2019 participation was incorporated into the program. Based on the trainees' report, two points were found: 1) awareness of multilateral analysis and collaboration among multiple fields and several countries and 2) the importance of capturing disaster data.

These lessons are necessary for leaders in disaster medical practice. Therefore, this program was evaluated as useful.

Table 2. Impressions of the Core Research Cluster of Disaster Science Planning Session summarized using the KJ method.

Category name	Applicable number	Impression
Importance of various fields	6	<p>1) It made me think that not only infrastructure, but also cultural preservation is important in disasters. Until now, I had a fresh perspective because I only had a perspective on disaster victims and infrastructure development.</p> <p>2) The fact that disasters have affected people's lives in both tangible and intangible ways can be studied not only in terms of science, but also how they have affected aspects of local culture and thought. There are also hints for disaster mitigation.</p> <p>3) There was a commentary on the collaboration between APRU and Tohoku University (Importance of cooperation). The presentations by researchers from various fields (behavioral science, natural science, disaster humanities, disaster mental science) were very interesting from a unique perspective.</p> <p>Especially interesting was the presentation of 3D scanning of intangible cultural heritage and crafts, which seemed to be useful for the preservation of historic heritage.</p> <p>4) In addition, Dr. Okumura talked about disaster medicine, and I sympathized with the fact that not only medical care at the time of a disaster, but also cooperation with other fields, is essential for research.</p> <p>5) A multifaceted analysis was conducted based on cultural anthropology and natural sciences.</p> <p>6) A report on activities in various fields at Tohoku University was conducted. I was able to attend activities other than medical care. I was able to understand that they managed to deal with a wide variety of issues across the board.</p>
Importance of collaboration	5	<p>1) I was particularly interested in the importance of collaboration such as industry-academia-government collaboration, international cooperation, and technology.</p> <p>2) At APRU, it was said that efforts to reduce disaster risk in environmental design were needed, and it was important to communicate the roles and work together to support each other.</p> <p>3) I thought that it was necessary for various organizations of industry, government, academia, and citizens to work closely together.</p> <p>4) Database-based surveys and ground subsidence and ascent due to earthquakes in collaboration with the Miyagi Prefectural Police.</p> <p>5) However, disasters do not disappear and will continue to occur in the future. I felt that industry-government-academia, government, and international cooperation are necessary to reduce the damage as much as possible.</p>
What is disaster science?	2	<p>1) I was very interested in the concept that Professor Imamura explained that disaster management requires science and that it will be constructed as a field of disaster science.</p>
Rediscovering the Great East Japan Earthquake	1	<p>1) The results of the analysis of victims after the Great East Japan Earthquake (Miyagi Prefectural Police prosecution) are still shocking. 90% of the deceased drowned, followed by those who were burned to death. I want to remember the people who were burned to death in a car; the Kadowaki Elementary School in Ishinomaki was blamed for this incident.</p>
New disaster prevention innovation	1	<p>1) Conventionally, we have responded to statements such as "we have come so far since the previous tsunami," but there is no guarantee that more will not come in the future, and we believe that it is necessary not only to accumulate experience but also to develop new disaster prevention ideas.</p>
How to apply the national budget	1	<p>1) The current situation is that the national budget is devoted to fossil fuels and the military, and the environment becomes thin. In the long run, we believe that funding should be an important issue for investment, as it will lead to survival problems such as species survival.</p>

4.1. Limitations and Strengths of the Study

This study had a few limitations. One limitation was that the results relied on a small survey size and self-reported data, which might have caused bias. The results were expressed based on a small number of participants in one forum, which may differ from that of other evaluators. Therefore, the findings might not be suitable for generalization to other disaster medicine training programs.

However, the "Conductor-type disaster health care management personnel" training course focused on conductor training in disaster medicine. Therefore, this study contributes an important perspective regarding training professional leaders in disaster medicine.

4.2. Recommendations and Implications

To train disaster medical professionals, the evaluation of this study can be used by hospitals, universities, research centers, policymakers, and the healthcare field. Training and education are fundamental factors for efficient disaster medical professionals. Countries, particularly those experiencing many natural disasters, such as Japan, need disaster medical professionals who can deal with various types of disasters. The disaster medical program must provide disaster medical information according to the variety of disasters. Therefore, disaster medicine preparedness should update disaster information.

5. Conclusions

Here, we present the evaluation of the one-day disaster medical professional training course at the WBF-2019, including the results of session participation and self-reported surveys. To our knowledge, this is the first published qualitative evaluation of this method. A larger-scale study is needed to study the effect of this program further. For further information regarding the program, please visit <https://www.dcmd.hosp.tohoku.ac.jp/>.

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Selected Publications:
• "Longitudinal Characteristics of Resilience Among Adolescents: A High School Student Cohort Study to Assess the Psychological Impact of the Great East Japan Earthquake," *Psychiatry and Clinical Neurosciences*, Vol.72, Issue 11, pp. 821-835, 2018.

Academic Societies & Scientific Organizations:
• Japanese Society of Psychiatry and Neurology (JSPN)
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Selected Publications:
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Academic Societies & Scientific Organizations:
• Japan Society of Civil Engineers (JSCE)
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Selected Publications:
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Academic Societies & Scientific Organizations:
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Selected Publications:
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• Y. Fukuda and S. P. Boret, "Theodicy of Tsunami: A Study of Commemoration in Aceh, Indonesia," N. C-K. Lin (Ed.), "Exploring Religio-cultural Pluralism in Southeast Asia: Intercommunion, Localization, Syncretisation and Conflict," Center for Multi-Cultural Studies, National Cheng Kung University, pp. 227-242, 2019.
• "Transition of Rituals in the Nagasaki City Atomic Bomb Memorial Ceremony," *Int. J. of Japanese Sociology*, Vol.24, Issue 1, pp. 78-91, 2015.

Academic Societies & Scientific Organizations:
• Japan Sociological Society (JSS)
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Selected Publications:

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Academic Societies & Scientific Organizations:

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Selected Publications:

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Academic Societies & Scientific Organizations:

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Selected Publications:

- "In situ androgen and estrogen biosynthesis in endometrial cancer: focus on androgen actions and intratumoral production," Endocrine-Related Cancer, Vol.23, Issue 7, pp. R323-R335, 2016.

Academic Societies & Scientific Organizations:

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Selected Publications:

- T. Izumi, V. Sukhwani, A. Surjan, and R. Shaw, "Managing and responding to pandemics in higher educational institutions: initial learning from COVID-19," Int. J. of Disaster Resilience in the Built Environment, doi: 10.1108/IJDRBE-06-2020-0054, 2020.
- T. Izumi, R. Shaw, R. Djalante, M. Ishiwatari, and T. Komino, "Disaster risk reduction and innovations," Progress in Disaster Science, Vol.2, 100033, doi: 10.1016/j.pdisas.2019.100033, 2019.

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Selected Publications:

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• H. Takakura, "Local Agricultural Knowledge as Time Manipulation:
Paddy Field Farmers after the Great East Japan Earthquake of 2011,"
Asian Ethnology, Vol.77. Nos.1-2, pp. 257-284, 2018.

• T. Hiyama and H. Takakura (Eds.), "Global Warming and
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Academic Societies & Scientific Organizations:

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Selected Publications:

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Japan Earthquake and Tsunami: Reconstruction and Restoration – Insights
and Assessment after 5 Years," pp. 435-448, Springer, ISBN:
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• A. Suppasri, N. Leelawat, P. Latcharote, V. Roeber, K. Yamashita, A.
Hayashi, H. Ohira, K. Fukui, A. Hisamatsu, D. Nguyen, and F. Imamura,
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and recommendations for tsunami disaster risk reduction Article
reference," Int. J. of Disaster Risk Reduction, Vol.21, pp. 323-330, doi:
10.1016/j.ijdr.2016.12.016, 2017.

• A. Muhari, I. Charvet, F. Tsuyoshi, A. Suppasri, and F. Imamura,
"Assessment of tsunami hazards in ports and their impact on marine
vessels derived from tsunami models and the observed damage data,"
Natural Hazards, Vol.78, Issue 2, pp. 1309-1328, doi:
10.1007/s11069-015-1772-0, 2015.

Academic Societies & Scientific Organizations:

- Japan Society of Civil Engineers (JSCE)
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Selected Publications:

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Academic Societies & Scientific Organizations:

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