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Beyond radiation anxiety and country borders: applying health literacy in the field after the Fukushima nuclear disaster

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Abstract–The 2011 Fukushima nuclear disaster placed health professionals and the public in the centre of an 'infodemic'. We introduced health literacy training for health professionals to improve communication skills when facing a health crisis. By 2019, one in four public health nurses – our gatekeepers of community health – had been trained in Fukushima. Follow-up evaluations showed that the trained nurses applied their newly learned skills in practice, with more positive attitudes toward – and increased confidence in – their interactions with community residents. We also found that older residents and those unfamiliar with health services were more likely to notice improvements in written health information from the trained health workers. Health literacy training enhances communication between professionals and the public and makes health information more equitably accessible. This training has been incorporated into medical and nursing education, and also into primary school education, with participatory health-related activities for children in Fukushima and beyond. Our health literacy initiative covers the two arcs of health literacy: health professionals' ability to communicate health information and people's (including children's) ability to use the information.

Keywords: Health literacy; Fukushima

1. NEED FOR HEALTH LITERACY PROMOTION

Two arcs of health literacy are health professionals' ability to communicate health information and people's ability to use the information. An 'infodemic' that emerged after Fukushima's 2011 nuclear disaster affected both arcs. This dual impact came to light in a previous study that analysed the voices of mothers in parenting counselling and those of public health nurses (PHNs), who are the gatekeepers of community health in Japan (Goto et al., 2014). Mothers asked PHNs about technical issues, including radiation measurement procedures, e.g. 'What does it mean to measure a parent's exposure level? Another city introduced a machine that a child can get into (and be measured directly)'. In response, PHNs showed a strong concern about explaining scientific and medical information, recognising that it was not only a matter of improving access to information, but also about taking its psychological impact into

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account: 'I understood how to read the (thyroid cancer) screening results, but I am not confident in explaining them to residents'. This paper summarises our past achievements in implementing health literacy training for health professionals and how our health literacy initiative has reached out to younger generations in Fukushima and beyond.

2. HEALTH LITERACY TRAINING FOR HEALTH PROFESSIONALS

Table 1 summarises the achievements of our health literacy promotion activities among health professionals, using a 'logframe' (logical framework) evaluation model (Armstrong and Barsion, 2006). Initially, we prepared front-line PHNs by adapting an American health literacy training model to the Japanese language and context (Goto et al., 2015, 2018). By 2019, one in four PHNs in Fukushima had been trained (Honda et al., 2022). Post-training evaluations showed that: nearly half had applied their newly learned skills within a month (Goto et al., 2015); they showed more positive attitudes toward feedback from community residents (Yumiya et al., 2020); and self-evaluation of risk communication competencies improved (Honda et al., 2022). We also found that older residents and those not seeing doctors regularly were more likely to notice improvements in written health information from the trained health workers (Goto et al., 2021). These data show that health literacy training enhances communication between professionals and the public and makes health information more equitably accessible.

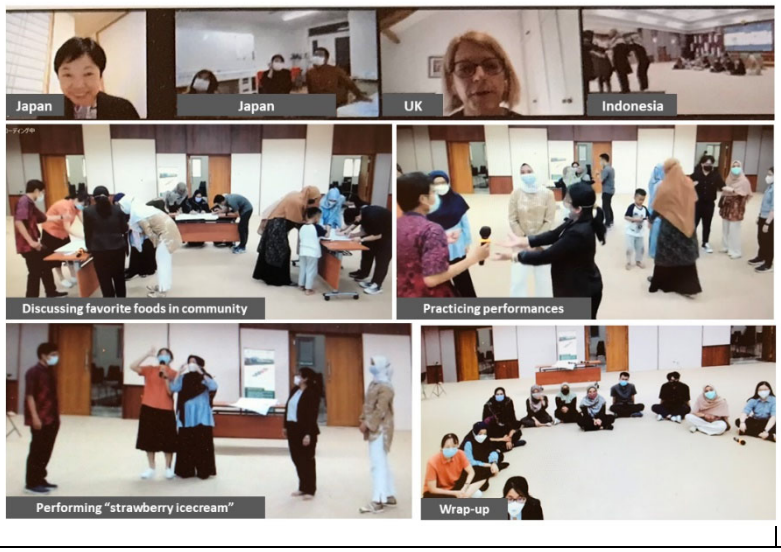
Table 1. Achievements of health literacy training.

Project goal levels	**Achievements**	**References**
Impacts	• The training was incorporated into medical and nursing education within and outside Fukushima.	Murakami and Goto (2019)
	• In-class exercises showed that among university students, data shown with a pictogram was preferred and trusted more than with a bar graph.	Machida et al. (2022)
Outcomes	• Trained PHNs showed more positive attitudes toward feedback from community residents.	Yumiya et al. (2020)
	• Trained PHNs' self-evaluation of risk communication competencies (responding to residents' concerns, alleviating residents' distress, building trust, supporting health-related self-efficacy) improved.	Honda et al. (2022)
	• From the intended audience's perspective, older residents and those not seeing doctors regularly were more likely to notice improvements in written health information from the trained health workers.	Goto et al. (2021)
Outputs	• One in four PHNs in Fukushima were trained.	Honda et al. (2022)
	• Nearly half of trained PHNs had applied their newly learned skills within a month, and nearly 70% in a year.	Goto et al. (2015, 2016)
Inputs	• American health literacy training was adapted to a Japanese public health setting and implemented mainly for PHNs.	Goto et al. (2015, 2018)
	• Subsequently, a health literacy toolkit, in booklet form, was developed for teaching.	

This health literacy training has been incorporated into medical and nursing curricula at Fukushima Medical University (FMU) (Murakami and Goto, 2019). For example, medical students at FMU have collected data from their peers to compare how risk perception depends on the style of presentation graphics. Subsequent analysis showed that data presented in pictogram form, in contrast to a traditional bar graph, was preferred in general and trusted more among those with a lower health literacy level (Machida et al., 2022). Requests from other schools and universities within and outside the prefecture, including those serving international students, have led us to modify sessions to meet specific needs while continuing to be highly interactive with exercises, group discussions, and presentations.

3. HEALTH LITERACY PROMOTION FOR THE NEXT GENERATION IN COMMUNITY

More recently, our 'Creative Health' project for elementary school students facilitates their scientific and creative thinking, working in teams, presenting, and expressing their opinions (Goto et al., 2021). The project consists of three workshops: BODY, FOOD, and ACT. In the BODY workshop, students share simple statements of what they know about their body, continue by presenting scripted storyboards about medical discoveries, and then create a histogram from their own heart rate measurements. In the FOOD workshop, students learn through cooking, quizzes, and drawing how their body depends on what they eat and how their community produces or otherwise provides the food they eat. In the ACT workshop, students use participatory theatre methods to express their ideas about food and health in their local community (Lloyd Williams and Goto, 2022). Participating children appreciated presenting, measuring, connecting new topics, and working collaboratively with peers. Teachers have learned ways to promote children's creativity and capacity to express their opinions. Beyond Fukushima, we are partnering with teachers in Indonesia, Cambodia, and Rwanda. Under travel constraints due to the COVID-19 pandemic, we conducted online training for local facilitators including medical school faculty and students, NPO staff, and primary school teachers. Fig. 1 shows an online training session for the Indonesian team and representative opinions from students, parents, and teachers after implementation at local schools (Muniroh, 2022). Similar to our Japanese experience, teachers in other countries learned to accept students' opinions and recognise their abilities. This 'Creative Health' approach may enhance children's autonomy as agents of change in their community.



Student
'The activities were fun. We learned about drama and how to make food.'

Parent
'My kid was very happy when telling me about this activity in school.'

Teachers
'Learn to accept various opinions that will be conveyed by students.'
'Children can know their inner abilities.'

Fig. 1. Online facilitator training and opinions collected after implementation at a local school.

4. CONCLUSION

In summary, health literacy training – developed for health professionals after the Fukushima nuclear disaster – has been adapted to educate university students and engage children in communities, thus covering two arcs of health literacy and outreaching to the next generation within and outside Japan. The evolution of our health literacy initiatives serves as a 'build back better' model after a major crisis.

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