Nurses' interest in nuclear disaster medicine: future capacity building

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To the editor:

Nearly 8 years have passed since the accident at the Fukushima Daiichi Nuclear Power Station (FDNPS) in 2011. Before the accident, the Japanese government had established a system for nuclear disaster preparedness that included accidents at nuclear power plants. Nevertheless, the accident at FDNPS showed that the system was unable to handle unexpected situations during the emergency, which caused panic in medical settings. In addition, the accident showed that the number of specialists in the field of nuclear disaster medicine was insufficient in Japan.

After the accident, the government reorganized the nuclear disaster preparedness system by nominating four universities as Nuclear Disaster Medical Care/General Support Centers, and four universities and one research institute as Advanced Radiation Emergency Medicine Support Centers. The roles of Nuclear Disaster Medical Care/General Support Centers are to establish regional and national medical radiation networks during non-disaster periods and to coordinate the dispatch of medical teams during a nuclear disaster. The roles of Advanced Radiation Emergency Medicine Support Centers are to advance the education and training of professionals in radiation disaster medicine during non-disaster periods and to provide advanced and specialized medical support to Nuclear Emergency Core Hospitals. Clinical nurses played important roles during the Fukushima accident, and the experience of the FDNPS accident showed that training and educating clinical nurses in nuclear disaster medicine is critical. However, many nurses in Japan are not interested in nuclear disaster medicine. The purpose of this study was to identify the factors associated with an interest in nuclear disaster medicine in order to approach clinical nurses who have a potential interest in this area.

We surveyed 573 clinical nurses working at a hospital nominated as a Nuclear Disaster Medical Care/General Support Center or an Advanced Radiation Emergency Medicine Support Center in Japan. After obtaining informed consent, we gathered information by self-administered questionnaires about their age, years of experience in clinical nursing, experience working in emergency departments, experience working in radiological departments, desire to participate in a training course on nuclear disaster medicine, and experience in support activities during a disaster. We inquired about their interest in nuclear disaster medicine, as well as in disaster and emergency nursing, and we also assessed their basic knowledge of radiation. We then conducted logistic regression analysis to identify the factors independently associated with interest in nuclear disaster medicine. (The parameter estimates in the multivariable logistic regression model may be biased, and the usual tests of significance may not be valid when the ratio of the number of events per variable (EPV) analyzed becomes small. According to Peduzzi *et al.* [1], the minimum number of total events (interest in nuclear disaster medicine) in our logistic regression model is 60. Assuming the proportion of interest in nuclear disaster medicine is 0.20/0.40, the minimum total number of subjects is 300/150. Since there were 573 subjects and 202 events in total, we believe that our results are valid.)

Of the 573 clinical nurses, 202 (35.3%) were interested in nuclear disaster medicine. Logistic regression analysis of these subjects showed that years of experience in clinical nursing [odds ratio (OR): 0.84, $P = 0.004$], interest in disaster and emergency nursing (OR: 4.05, $P < 0.001$), desire to participate in a training course on nuclear disaster medicine (OR: 3.64, $P < 0.001$), and experience in support activities during disasters (OR: 2.42, $P = 0.039$) were

Table 1. Multivariate odds ratios and 95% confidence intervals of factors related to interest in nuclear disaster medicine among clinical nurses

Variable	Numbers	Odds ratio	95% CI	*P*-value
Years of experience in clinical nursing	573	0.84	0.75–0.95	0.004
(for every 5-year increment)				
Experience working in an emergency department				
No	512	1.00		
Yes	61	1.50	082–2.82	0.206
Interest in disaster and emergency nursing				
Low	282	1.00		
High	291	4.05	2.60–6.28	<0.001
Desire to participate in a training course on nuclear disaster medicine				
No	311	1.00		
Yes	262	3.64	2.39–5.56	<0.001
Experience in support activities during disasters				
No	537	1.00		
Yes	36	2.42	1.05–5.61	0.039
Basic knowledge of radiation				
Low score (0–6)	284	1.00		
High score (7, 8)	289	1.17	0.77–1.77	0.455

CI = confidence interval.

independently associated with interest in nuclear disaster medicine (Table 1).

Even before the accident at FDNPS, it was proposed that a nuclear disaster medicine system should be incorporated into existing systems of disaster and emergency medicine. The accident at FDNPS following the 2011 Tohoku earthquake and tsunami highlighted the importance of linking nuclear disaster medicine with disaster and emergency medicine [2, 3]. Bushberg et al. and Dallas et al. pointed out that, during radiation emergencies, patients' medical stabilization and treatment should be prioritized over decontamination and resuscitation, and that stabilization should be emphasized as the most important [4, 5]. To increase the number of nurses interested in nuclear disaster medical care, nurses (especially those with little experience in clinical nursing) working in emergency departments, including intensive care units, should be provided with opportunities to participate in training courses. Also, approaching nurses who belong to Disaster Medical Assistance Teams (DMATs) will be effective for capacity building in the field of nuclear disaster medicine.

CONFLICT OF INTEREST
The authors declare that there are no conflicts of interest.

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