

# ASSESSMENT AND EVALUATION OF NURSES TRAINING PROGRAM ON RADIATION

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## INTRODUCTION

Many nurses in hospitals and clinics are concerned about the care of patients diagnosed or treated with radiation. Knowledge about radiation effects and radiological protection was in limited supply among nurses. Some nurses are anxious about the effects of occupational radiation, and they have not appropriately coped with their patients' questions about radiation effects of medical exposure.

We investigated the level of knowledge about radiation among nurses and required knowledge for nurses in hospitals and clinics. Based on the results of the investigation, we designed an education and training program of lectures and practice for nurses in hospitals. After the education and training by our program was done, we evaluated the effects of the education and training with an interview and a questionnaire for each nurse.

## METHODS

Proper knowledge about radiation and radiation effects and the level of knowledge on those among nurses were investigated with questionnaires. A questionnaire with the following three categories of questions was prepared; a) degree of nurses' anxiety about radiation, b) frequently asked questions from patients about radiation and radiation diagnosis/treatment, and c) information about radiation needed for nurses in the clinical field. The questionnaires were distributed to 319 nurses of 17 departments in two university hospitals. A total number of 303 nurses (95.0%) replied to questionnaires. Based on the result, we prepared a program of the education and training for nurses worked in all hospital departments except the department of radiology. A lecture and practice by our program were performed in two hospitals.

## RESULTS

A total number of 214 nurses (70.6%) had experienced taking care of radiological patients. Sixty nurses were registered as radiation workers, and their average annual effective dose in 1994 was only 0.05 (0-0.6) mSv. Two hundred and seventeen nurses (71.6%) had felt anxiety about occupational radiation exposure. Major anxieties about radiation were biological effects such as carcinogenesis and hereditary effects. Two hundred and thirteen (70.3%) nurses had an experience of being questioned by the patients. The frequently asked questions from patients were biological effects such as side effects (60.9%) of the medical exposure.

Based on the results of the investigation with the questionnaire, we planned an education and training program. Matters of interest were listed in Table 1, and these items were arranged to form a lecture and practice as shown in Table 2. The lecture and the practice in our program were applied to 95 nurses and 12 nurses, respectively.

Two weeks after the lecture and the practice, we asked all participants to tell what they had learned from the program. The results of the investigation of the effects of the lectures and

Table 1. Matters of interest

<b>Biological effects</b>	
Relationship between dose and biological effects	(78.8%)
Doses of patients and workers	(46.7%)
<b>Practical protection procedure</b>	
Protection procedure	(40.5%)
Regulation	(40.5%)
Measurement of dose	(23.0%)
<b>Nature of radiation</b>	
Characteristics of radiation	(41.9%)
Physical, chemical and biological action in the body	(25.1%)
<b>Medical use of radiation</b>	
How radiation is used in medicine	(22.7%)
Equipments and apparatuses	(15.5%)

Table 2. Subjects in the lecture and the practice

**Lecture** (90 min.)

Biological effects of radiation  
 exposure doses and dose limits  
 Basic procedure for radiation protection  
 Patient doses and optimization

**Practice** (60 min.)

How to use a survey-meter  
 Measurement of radiation in daily life  
 Relationship between dose and distance  
 Shielding effects of some materials (density, thickness)

practice are shown in Figures 1 and 2. More than 95 % of the nurses understood radiation and radiation effects through the lecture. Among the items of the lecture, the basic procedure of radiation protection was easily understood for nurses while the biological effects of radiation were difficult to understand. The useful items of the lecture for nurses were; understanding the level of occupational exposure (31.4%), practically detailed procedure to reduce external doses (18.6%), basic procedure to reduce external doses (17.1%), and biological effects of radiation (14.3%).

Of the 12 nurses who attended the practice, 7 nurses answered that the experimental practice for the shielding effect of some materials was very interesting. Also, 11 nurses answered that they understood radiation in everyday life such as radiation from luminous clocks and natural radiation.

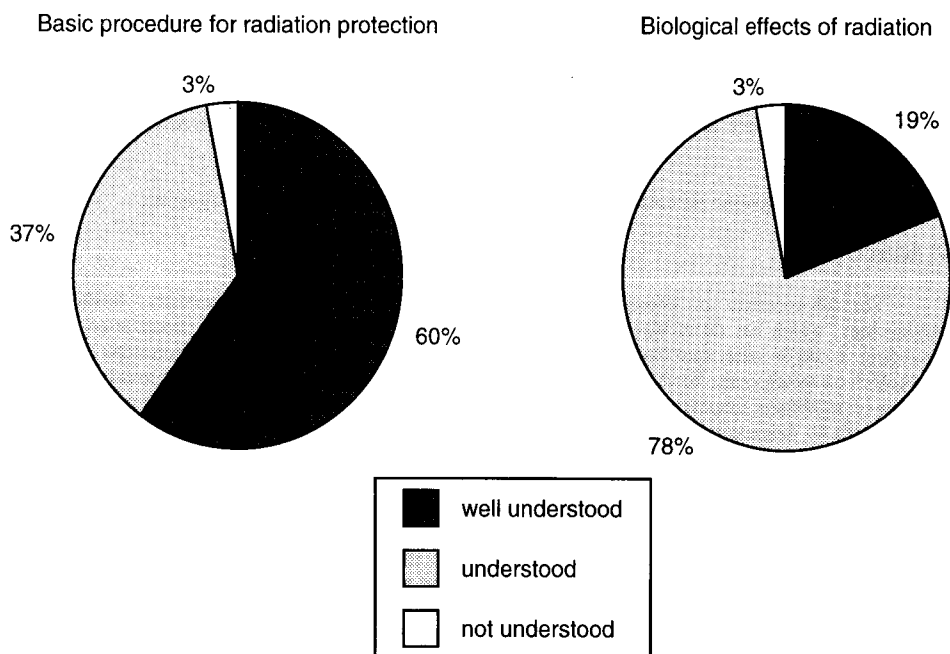


Figure 1. Understanding of the lecture

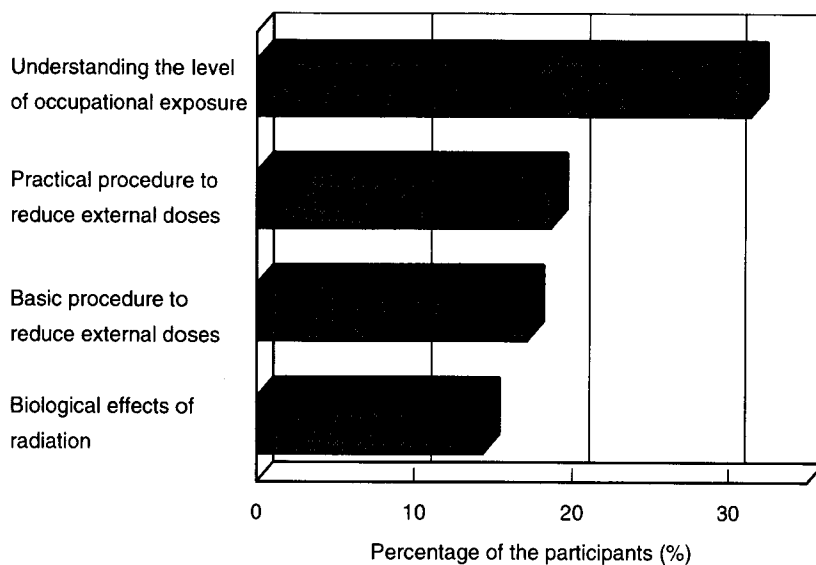


Figure 2. Useful items in the lecture