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Developing a disaster nursing educational program based on the experiential learning theory

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Introduction

A certain nursing school was requested to assist in routine disaster drills by a disaster core hospital in Hyogo Prefecture. Determining that this would be an excellent opportunity for disaster nursing education, the nursing school experimented with an experiential learning theory-based educational program, in which educational intervention would be made both before and after the disaster drills. This paper provides records of the experiment and the results of a questionnaire survey and group sessions, and then examines the effectiveness of this educational program.

1. Background

1) The present state of disaster nursing education as a part of basic nursing education

In order to respond appropriately to the kinds of unprecedented disasters that have frequently occurred in recent years and mitigate any resultant damage, it is essential to make provisions during normal times.¹ With the introduction of disaster nursing education to all basic nursing education curricula imminent in 2009, it has become urgent to develop an adequate and effective disaster nursing program into these curricula. In relation to this, the necessity of an experience-based learning program on the occasion of routine disaster drills, in particular, has been pointed out.²

Even in 2004, nearly a decade after the Great Hanshin-Awaji Earthquake, only five percent of the curricula in basic nursing education had a course in “disaster nursing,” and barely more than twenty percent offered such a course as a part of some other course. The course is seldom included in general curricula outside of those designed by the Japanese Red Cross Society.³ Reports have been made on studies aimed at developing a curriculum for disaster nursing^{4, 5} and on practical examples in which triage training is incorporated into an educational program;⁶⁻²⁰ in those cases,

students are given the experience of playing the roles of patients and their families,⁷⁻¹⁵ as well as nurses and members of a rescue crew or medical team.^{9, 13, 14}

Students who participated in these programs gave positive feedback overall, saying that they “gained a better idea of the state of disaster and how patients would behave at such a time”;^{8, 19} the program “provided motivation to study and a strong desire to learn, completely changing the atmosphere of the class”;^{11, 14-6} and the program helped students to “learn efficiently.”^{8, 15} On the other hand, some pointed out that “experiential learning requires a well thought out plan,”⁵ and “students may learn different things depending on what role they played.”⁸ Still others suggested that improvements be made by “having students acquire fundamental knowledge on disaster nursing and prepare for the drills beforehand so as to enhance the effects of the drills”;^{7, 10} “having them participate from their first year”;¹⁵ and “ensuring ex post facto approaches by instructors and offering opportunities for the students to share what they learned with their peers.”^{12, 14, 16}

2) Experiential learning and the jigsaw classroom

Experiential learning is often used for adult education in the United States²¹ and higher education in the United Kingdom.²² In nursing education as well, the significance and effects of educational programs based on the experiential learning theory have been widely recognized.²³ According to the experiential learning theory,^{22, 24} experiences help learners to grow and develop as they learn while following the four-stage cycle of “concrete experiences -> group reflection -> theorization and conceptualization based on literary documents -> concrete experiments (-> concrete experiences ->...).” Following this theory, a disaster nursing educational program in which disaster drills are incorporated should preferably include these four stages. This approach provides the basis for the authors’ on-going attempt to develop an effective educational program for nursing students.

Students are given opportunities to play the roles of patients and their families in a triage drill given at a hospital. The authors wished to discover whether such opportunities could be used to enhance students’ interest in disaster nursing and if what they have learned and noticed through their experiences could be fed back to subsequent basic education in nursing more generally and, if such a process is possible, how it can be conducted effectively. In order to give these issues proper

consideration, the authors have developed and duly implemented a disaster nursing educational program which incorporates triage drills at a disaster core hospital.

Through experiential learning,²² learners may broaden and deepen their experience in a group session for reflection, by comparing their own experiences with others' and then seeing them in a new light in response to questions from instructors. It would not be enough for learners to simply put their own experiences in writing or report them. The most important element here is having discussions with others who have shared the same experiences, with the instructor serving as a facilitator.

Unfortunately, there is a risk that playing the role of a patient and his or her family can have adverse effects on students.⁸ In order to prevent this from happening, and to ensure that students will not form a one-sided view of disaster nursing from any fragmentary information that they have acquired from a drill that is both extraordinary and difficult to organize frequently, it would be necessary to have them be exposed to many different perspectives, share their experiences with all of the other students, and take action that will assist them in their subsequent learning and development. In more concrete terms, during group reflection of their experiences from a disaster drill, having students who have played the same role conduct a discussion can deepen their experiences, but at the same time create the risk of having their views become one-sided. The concept of a jigsaw classroom,²⁵ which is adopted in primary and secondary education, is considered one such action to prevent this.²⁶ Introducing the jigsaw classroom into the reflection stage could help students broaden, deepen, integrate, and synthesize their understanding of the various experiences that they underwent during a disaster drill. Based on this assumption, it was decided to introduce the jigsaw classroom method into the ex post facto learning of a disaster nursing educational program for nursing students, out of consideration of the psychological impact that the disaster drill might have on participating students.

2. Development of educational / training programs

1) Status of the disaster nursing educational program

For nurses to be able to act appropriately in the time of a disaster, postgraduate education alone is insufficient, and so something must be done from the early stages of basic nursing education. It would be effective for students to learn about disaster

nursing from classroom lectures and literary documents and then participate in a drill, playing the roles of patients and their families, or medical staff. Such experience will help them to better understand those whom they nurse (the state of mind that patients and their family members are in, changes in patients' symptoms and health conditions) and also the role that the nursing profession is expected to play (the role of nurses, patient-nurse relationships, the function of nurses in a medical team).

For these reasons, it has been deemed essential to develop and put forward an educational program based on the experiential learning theory, so that students' experiences will be of better use in basic nursing education.

2) Development of a program based on the experiential learning theory

Gibbs (1988) cited the following seven requirements for successful experiential learning:²²

- (1) Learner's "initiative" to learn actively based on his or her own ideas and assumptions (guaranteeing spontaneity)
- (2) Learner's selective reflection on his or her experience "from a critical perspective"
- (3) Learner's "commitment" to the process of exploring his or her experience and learning
- (4) Securing of a margin for the learner to exercise some "independence" by devising appropriate experiences for the learner
- (5) Guarantee of "methodicalness" that takes into account the structure wherein learning takes place
- (6) Development of conditions for the learner to feel a "sense of fulfillment"
- (7) "Selection of teaching methods" for each stage of the cyclical sequence of experiential learning

In Figure 1, the educational program that the authors have developed is correlated to the learning cycle of the experiential learning theory. If this educational program were to be explained according to the four stages of experiential learning described earlier, it would be comprised of the following:

- (1) "Preparatory learning," consisting of the acquisition of knowledge and concepts through books and lectures, and drill orientation

- (2) “Preparation” for the drill
- (3) Actual “drill”
- (4) “Reflection” following the drill

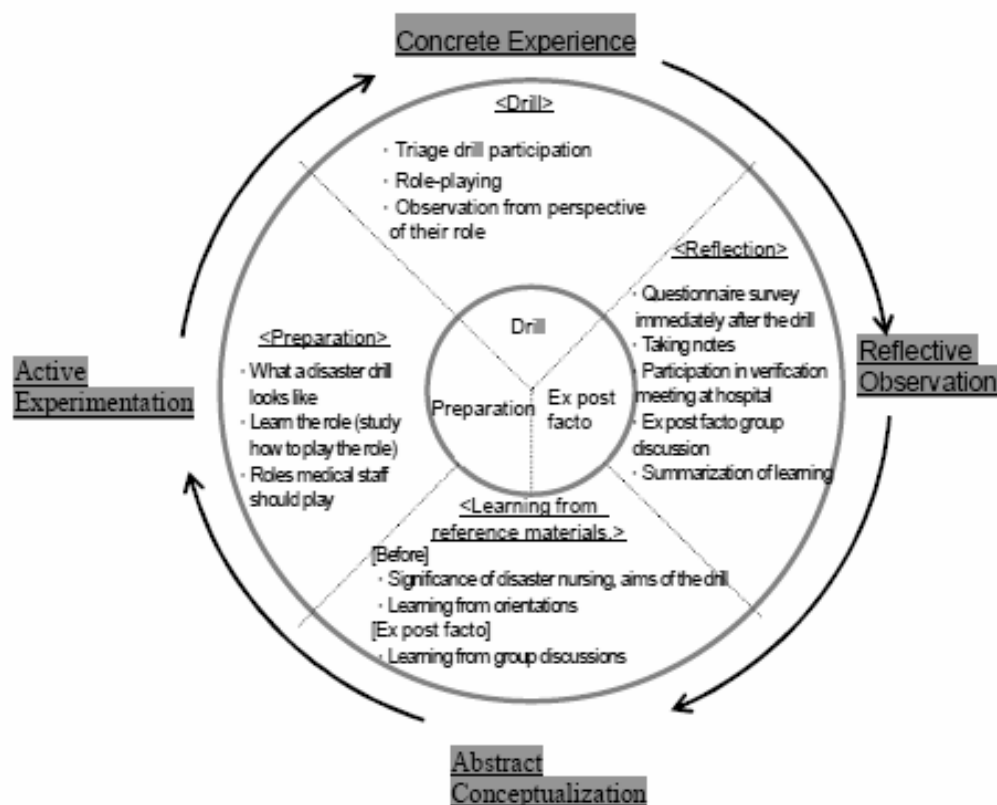


Fig. 1 Educational program cycle throughout the entire disaster drill process

Fig.1 Educational program cycle throughout the entire disaster drill process

Preparatory learning

Students are given lectures on topics such as the definitions and types of disasters, the basics and methodology of triage, and the roles of nursing in the time of a disaster, and also watch videos of triage drills, thus encouraging them to develop a picture of what such a drill would be like. At this time, students will have already been assigned the roles of patients in mild, moderate, or serious condition,

or their family members. In order to ensure that students may actively learn about the medical condition of the patient and the state of mind of the family member whose role they have been assigned, and that the students will not receive the drill with only the partial view on disaster nursing that they have formed from books and lectures, they are taught a carefully-selected set of specific knowledge, allowed a margin for self-learning, and guaranteed the opportunity for independent learning. Students are also briefed on the drill planning so that they can develop an overall picture of the drill program.

Preparation for the drill

Students are encouraged to attempt to conceive beforehand the state of mind that a patient would be in and the emotions that would arise in the patient. They are also encouraged to develop a plan concerning how they will play the role of a patient or family member and what kind of action they will take if assigned the role of a nurse, so that they are able to actively participate in the drill. The students are then grouped by role, and they present their plans to the group members for discussion. Meanwhile, the instructors concentrate on their role as facilitator so that the students can feel a sense of fulfillment through voluntary participation, ensuring that interaction within a group is fully taken advantage of.

Drill

At the beginning, instructors tell students to “concentrate and role-play as they have thought out beforehand,” so as to ease their tension and relax them before the drill. Instructors will keep their involvement to a minimum in order to draw out students’ initiative and independence, but still closely observe student behavior with attention being paid to students’ state of mind throughout the session.

Reflection

Students are requested to answer questions concerning their impressions of the drill. They are then asked to develop a process record which describes the behaviors of the members of a medical team, their own behaviors, and the emotions that have been aroused within them, so that their experiences in various situations of the drill will not escape their memory. They are also requested to take

notes on such issues as how they have come to understand the state of mind of a patient and a nurse through their own experience, what they felt was important about a nurse's involvement in the time of a disaster, and what types of nurse behaviors made them comfortable or made them uneasy.

Between one and two months after the drill is completed, a group discussion is organized for reflection by referring to the process record and notes that the students made immediately following the drill. The jigsaw classroom method is used here to prevent students from forming a biased view.

Throughout each of the stages, an overall plan is presented to students so as to invite their active and spontaneous participation. In every stage after the beginning of the program, instructors ensure students' commitment by continuously motivating students with comments such as, "Treasure your experience," "Value the emotions that arise within you," "Attach meaning to your experience," and "Simply write down whatever you see, hear, and feel."

3) Ex post facto learning using the jigsaw classroom method

Jigsaw learning is a method for group learning developed by Aronson, et al. in the early 1970s. Split into small groups, students work on an assignment individually assigned to them, and then present the knowledge and experience they have gained to a group of students to whom different assignments were given and to another group who played the same role as theirs. By relativizing what students are expected to learn, this group learning method ensures that every student understands the learning targets. Because each piece of knowledge and experience that students contribute all come together like the pieces of a puzzle, this method is referred to as the jigsaw classroom.²⁵ In nursing education as well, this is one of the methods of group learning which has been designed to provide students with opportunities to make use of such critical skills as analysis, reflection, integration, and reconstruction.²⁶ Reports have been made on its application at an intramural nursing practicum and its effectiveness.^{27, 28}

According to Aronson, the effects of the jigsaw classroom are two-fold: teaching materials may be learned by making use of effective techniques, and individual students play an important role in each learning process. Aronson stated that

common learning is achieved as students mutually rely on others who play a role different from their own and feel empathy with them as they listen to their reports, while at the same time he mentions that due attention must be paid to the fact that learning may not reach the desired depth depending upon how the groups are structured and the competence of individual members.

What follows is an account of the actual application of a reflection program to which the jigsaw classroom has been incorporated with this view in mind. The program consists of an introduction, two group sessions, and a summary (Table 1). In the introduction, after the basic structure of the program is presented, an archive video of a disaster drill is shown in order to give the students an overview of the entire drill. Watching videos is believed to be effective in reflective practice, since it allows viewers to speak about whatever comes to their mind spontaneously.²³

Next there is “tension relaxation,” which is designed to stimulate student discussions. In the two group sessions, a jigsaw classroom approach is taken. In Group Session #1, the students are grouped by role, namely, patients in mild, moderate, or serious condition or their family members, while in Group Session #2 students who played different roles are placed into the same group.

Table 1 Program Structure

Chart 1 Program Structure

Stage	Time	Description
Introduction	25 minutes	○ Explain class plan (define contents and aims) ○ Have students develop an overall idea of the drill (view videos of disaster drills) ○ Ensure that students understand the discussion procedure
Reporting drill results	10 minutes	○ Report on the drill by using descriptions students have produced before and after the drill, so that they can better gain an overall picture <report made by full-time instructor>
Group Session #1	30 minutes	○ Reflection in groups by role ○ Discussions in four groups of patients (serious, moderate, mild condition) and their family members
Preparation	10 minutes	○ Review experiences during the drill by referring to the descriptions of their experiences which they made during preparations for the drill and immediately after the drill ○ Have students share their experiences by reading descriptions of other members in the same group
Group discussion	15 minutes	○ Have students share their experiences in their roles with other members of the group ○ Have students deepen what they learned through discussions with others who played the same role
Break (10 minutes)		
Group Session #2	110 minutes	○ Group discussions with other students who played different roles ○ Each group consists of students who played the roles of patients (serious, moderate, mild condition) and their family members
Briefing on the procedures	2 minutes	○ Present viewpoints and discussion methods
Group discussion	88 minutes	○ All members individually share their experiences in having played their roles ○ Have students understand and share the experience of playing roles different from their own
Presentations	15 minutes	○ Give breakdown of discussions from given viewpoints
Summary	5 minutes	○ Highlight the significance of sharing different kinds of awareness and things learned ○ Ask students to reflect on their experiences individually

Prior to Group Session #1, students are encouraged to explore through discussion what they all felt empathically, what they hoped to share with others, and what they would like to ask from those who played other roles. In order to facilitate their reflection, the notes and questionnaire responses which the students made in the preparatory stage and immediately after the drill are returned to them. The results of the discussions are then summarized for each group. In Group Session #2, students are encouraged to discuss four different aspects, namely, what they have learned, what they can do as a nursing student in the time of a disaster, the roles nurses are expected to play in the time of a disaster, and what they need to learn to become a nurse who is capable of fulfilling those roles. Between the two group sessions, the instructors briefly explain the purpose and significance of the drill, as

well as its overall flow, as they quote the results of a preliminary questionnaire. The entire program is 180 minutes long, with a ten-minute break.

3. Trial implementation and evaluation

1) Methodology

(1) Subjects

Thirty-two first-year students of a nurse training school (three-year course) (average age: 19.5, SD: 3.1)

(2) Duration

From November 2005 through February 2006

(3) Outline of the drill

This was the first triage drill given at a public hospital which is designated by the Hyogo Prefectural Government as a disaster core hospital (beds: 303, doctors: 32, nurses: 242). The drill was conducted on the assumption that a large number of sick and wounded was generated by a major accident on the expressway and transported to a disaster core hospital. At the request of the public hospital, the nurse training school asked its students to play the roles of patients and their family members. Twenty-two students played the roles of patients (3 patients in serious condition, 5 in moderate condition, and 14 in mild condition), and ten students played the roles of their family members.

(4) Data gathering

- ① A questionnaire survey was conducted regarding six items concerning the significance of the drill (the necessity of disaster drills, whether the drill will be useful in future learning, satisfaction with the drill and reasons why, whether they have taken an interest in disaster nursing, whether they wish to participate in the next drill). Aside from the questions where the students were asked to give reasons, the item concerning whether they wish to participate in the next drill was assessed in two-grades, with “1” being positive (would like to) and “2” being negative (would not like to), while the other items were assessed in three-grades, with “1” being the most positive (very much), “2”

being generally positive (reasonably), and “3” being negative (not at all).

- ② Evaluation of the program that has been developed: The program was conducted two months after the drill. In order to verify the effects of the reflections made in a jigsaw classroom environment, discussions were held in Group Sessions #1 and #2, at the end of which students were asked to itemize on paper the things that came to their attention. In Group Session #1, students were divided into four groups by role (3, 5, 14, and 10 students), and in Group Session #2, three groups were formed in which at least one student was present for each role (10, 11, and 11 students).

(5) Analysis method

For each group session, the list of what came to students' attention was classified into the four categories of “patients and their families,” “nurses and members of the medical team,” “situation of the hospital,” and “general.” Then the things that came to the students' attention and what they learned were classified into the four sub-categories of “knowledge,” “skills,” “attitudes and emotions,” and “action.” The above categories and sub-categories were established based on those used by Ohara.²⁹

(6) Ethical considerations

Students were informed that the drill would be a part of extracurricular activities, and were briefed on the entire scope of the program which included what would happen both before and after the drill. Then the purpose and significance of this study was explained so as to seek cooperation from the students. Students were also informed that it would be left to their discretion whether or not they would participate in the drill or cooperate with the study; that they could quit anytime; that non-participation would not negatively affect their grades; and that, even if they chose not to participate, they could still share learning with other participants in a post-drill portion of the program. Finally, it was explained that the privacy of the gathered data would be protected and that the data would not be used for any purposes other than this study. All thirty-two of the first-year students agreed to participate.

2) Findings

(1) Evaluation of the disaster drill

In the questionnaire conducted immediately following the drill, the majority of the students gave a positive response to their experiences in the drill, with 16 (50.0%) stating they were “very much satisfied” and 14 (43.8%) “reasonably satisfied.” When asked about the necessity of the drill, 28 (87.5%) students said that they “felt the necessity more strongly than [they] did before the drill” and 22 (68.8%) answered that “the drill would be of great use for future learning.” Some of the reasons for their satisfaction included: “by acting a patient, my emotions welled up inside of me, and I was able to better understand how they might feel” and “the nursing experience in a very realistic setting was highly educational.” Among those who were not satisfied, one student felt “displeasure and pain because no one took notice of what state [he or she] was in.” Being asked whether their attitudes toward nursing have changed, as many as 26 (81.3%) students said “yes,” but six (18.7%) students said “no.” Twenty-three (71.9%) students “had very much interest” in disaster nursing. Concerning whether or not they hoped to participate in the next drill, 27 (84.4%) students were affirmative, but four (12.5%) – three of whom played the role of patients in serious condition and one of a family member – were negative.

Those who played roles other than that of a patient in serious condition gave a largely positive response to the disaster drill. Four out of 10, eight out of 14, and one out of five students who played the roles of a family member, patient in mild condition, and patient in moderate condition, respectively, gave the most positive response, marking “1” for all items in the questionnaire conducted immediately after the drill. Likewise, all of the three students who played the role of a patient in serious condition gave a largely positive evaluation, but their response to the question concerning their intention to participate in future drills is clearly different than that of other students. In more concrete terms, with the exception of one student, all 29 students condition who played roles other than that of a patient in serious answered that they “would like to participate again,” but all three students who played the role of a patient in serious condition answered negative.

(2) Group session results

When totalizing the lists of things that came to the students’ attention, which the members of each group were asked to itemize at the end of each session, a total of 40

matters were reported in Group Session #1 (five from “patients in serious condition,” nine from “patients in moderate condition,” 15 from “patients in mild condition” and 11 from “family members”). In Group Session #2, a total of 74 matters were reported, with Groups 1, 2, and 3 each contributing 28, 23, and 23, respectively. When the responses gathered in Group Session #1 were categorized (Table 2), those categorized into “patients and their family members” were the most numerous with 16 (40.0%) responses, 14 (35.0%) being classified into “nurses and members of the medical team,” nine (22.5%) into the “situation of the hospital,” and one (2.5%) into “general.” For Group Session #2, three (4.1%) were categorized into “patients and their family members,” 39 (52.7%) into “nurses and members of the medical team,” 11 (14.9%) into the “situation of the hospital,” and 21 (28.4%) into “general.”

Table 2 Responses in each Category for Group Sessions #1 & #2

Chart 2 Responses in each Category for Group Sessions #1 & #2										
Category		Session #1					Session #2			
		Serious	Moderate	Mild	Family	Total	Group 1	Group2	Group 3	Total
Patients and their family members	Knowledge	2				2	1	1	1	3
	Attitudes, emotions	1	2	4	5	12				
	Action			1	1	2				
	Subtotal	3	2	5	6	16	1	1	1	3
Nurses and members of the medical team	Knowledge						3	2	1	6
	Skills		2	1	2	5	7	7	5	19
	Attitudes		2	2	1	5	2	1	1	4
	Action		1	2	1	4	4	3	3	10
	Subtotal		5	5	4	14	16	13	10	39
Situation of the hospital	Knowledge	1	2	5	1	9	2	3	3	8
	Skills								1	1
	Action						1		1	2
	Subtotal	1	2	5	1	9	3	3	5	11
General	Knowledge						3	3	2	8
	Skills						3	1	3	7
	Attitudes	1				1	1	1	1	3
	Action						1	1	1	3
	Subtotal	1				1	8	6	7	21
Total		5	9	15	11	40	28	23	23	74

In every group, feelings of “anxiety and relief” from the perspective of patients and their family members were commonly observed, some of the comments describing how they “became uneasy, feeling always unattended” ; “felt anxious, not knowing

where [they] would be taken”; and “felt relieved to see [their] family.” Divided by role, the things that came to the attention of students who played the role of a patient in a serious condition were categorized either into “knowledge” about patients and their families (“because members of the medical team did not explain what was going on to a patient in serious condition who was losing consciousness”), or “attitudes” which include their anxieties and irritation about what was going on at the hospital (“wasn’t aware that there were many medical staff members around me”).

Groups of students who played roles other than that of a patient in serious condition shared comments concerning “waiting time” (“being left alone for long periods, I felt unattended”). Groups of students who played the roles of patients in moderate or mild condition said that they felt feelings of “friendship and closeness” with nurses and members of the medical team (“The very existence of a nurse who was always by my side and concerned about me made me feel so secure”; “Nurses approached me kindly and were always with me.”). Groups of students who played the roles of a patient in moderate condition and family member said that they became aware of care from nurses and members of the medical team. The groups of students who played the roles of a patient in a mild condition and family members also asked how others felt (“What experience made you feel unpleasant?” and “How did you find the medical professionals’ treatment of family members?”). Such awareness indicating interest and concern for other groups (roles) was observed throughout all of the groups of students with different roles.

Furthermore, they said that something needed to be done with “information management” (“Asked the same question by several members of the medical team”; “Felt they should share the medical records”; “Hard to identify a patient with names only. Patients’ characteristics should be made use of as well.”).

(3) Group Session #2

A close look at the categories assigned to output from each group shows that, from the perspective of patients and their family members, all groups produced output that could be categorized into “needs for nursing” under the “knowledge” segment (“Patients and their family members feel lonely by themselves, and so they want someone to be by their side”; “If you’re completely conscious, such as when you play

the role of a patient in mild condition, you feel a lot of anxiety and stress”; etc.). From this point of view, nothing came to students’ attention concerning “skills,” “attitudes and emotions,” or “action.” (Table 3)

Table 3 What Students Became Aware of and Learned in Group Session #2

Chart 3 What Students Became Aware of and Learned in Group Session #2

Viewpoint	Segment	Category	Group 1	Group 2	Group 3
Patients and their family members	Knowledge	Needs for nursing	☐	☐	☐
Nurses and members of the medical team	Knowledge	Care skills	☐	☐	☐
		Nursing plan	☐	☐	
		Needs for nursing	☐		
	Skills	Care skills	☐	☐	☐
		Psychological care	☐	☐	☐
		Specific care	☐	☐	☐
		Information management	☐	☐	☐
		Physical care	☐	☐	☐
		Observation, monitoring		☐	☐
		Quality of care		☐	
		Assistance of treatment	☐		
		Explanations	☐		
	Attitudes	Attitudes of the medical staff	☐		☐
		Response to key persons	☐	☐	
	Action	Calm manner	☐	☐	☐
		Calm judgment and response	☐	☐	☐
		Teamwork	☐	☐	
		Quality of care	☐		☐
Situation of the hospital	Knowledge	Drill in general		☐	☐
		Information management	☐	☐	
		Psychological care	☐		
		Physical care			☐
		Medical system		☐	
		Quality of medical care			☐
	Skills	Needs for medical care			☐
	Action	General action	☐		☐
Significance of disaster drills	Knowledge	Drill in general	☐		
		Learning needs		☐	
		Attitudes toward learning	☐		
General	Knowledge	Attitudes toward the drill		☐	☐
		Tasks and goals for learning	☐	☐	☐
	Skills	General skills	☐		☐
		Care skills	☐		☐
		Observation, monitoring		☐	
		Medical care assistance			☐
		Specific care (careful response)	☐		
	Attitudes	Willingness to learn	☐	☐	☐
	Action	Willingness to learn		☐	
		Tasks and goals for learning	☐		☐

From the viewpoint of nurses and members of the medical team, students from every group said that, under the “knowledge” segment, they became aware of “care

skills” (“relaxing patients by touching them”); under the “skills” segment, they took notice of “psychological care” (“providing psychological care by staying close, speaking, and touching”), “specific care” (“being close to the family members of a patient to listen to what they have to say” and “dealing with people with a warm attitude”) and “information management” (for “facilitating communications so as not to keep patients waiting for testing when there is so much conflicting information” and “guiding and leading the way for patients and their family members”); and under the “action” segment, they became aware of a “calm manner” (“not overwhelmed by patients, always being able to act with composure”) and “calm and prompt judgment” (“ability to keep everything under control,” “dealing with patients calmly,” etc.). Students from two of the three groups said that they became aware of a “nursing plan” (knowledge); “physical care” and “observation, monitoring” (skills); “attitudes of the medical staff” (attitudes); and “teamwork” and “quality of care” (action).

Concerning the “situation of the hospital,” students from two of the three groups said that they were made aware of matters concerning “information management (e.g., “appropriate response to mass media”)” and “general action (e.g., “things would be much more terrible in a real situation”; “obviously this is not an everyday happening, and the surrounding atmosphere was clearly different”).

From the “general” viewpoint, students from all three groups said that they became aware of the “tasks and goals for learning” (knowledge) (“necessary to acquire knowledge on illness”; “important to understand everything about our own physical and psychological aspects and become capable of dealing with them”; “necessary to have an observer’s perspective”) and “willingness to learn” (attitude) (“necessary to make a habit of communicating information to patients appropriately so that [one] can do so even at busy times,” and “always be conscious of what to do in the time of a disaster”). Students from two of the three groups said that they learned about “attitudes toward the drill” (knowledge), “general skills” and “care skills” (skills), and the “tasks and goals for learning” (action).

3) Consideration

(1) Student participation

According to the nursing instructors who provided supervision and guidance during the disaster drill and ex post facto learning, all of the students actively participated in

both preparatory and ex post facto learning sessions with good concentration, and played their roles seriously during the disaster drill. While listing what came to their attention during the ex post facto learning, and then itemizing the same in individual group sessions, every student worked together until the time had elapsed completely. A student who played the role of a patient in a serious condition, who answered in a questionnaire that she would not like to participate in the next drill, said in the ex post facto learning, "I didn't realize there were so many people around me at that time" as she watched a video of the drill, and, when she heard a phone ring, said to herself, "That's the sound I heard then," apparently trying to connect her experiences.

(2) Significance and effects of disaster drill experience

Although it has been indicated that a disaster drill can evoke negative emotions in some participants,⁸ it may be inferred that the majority of the participants in this disaster drill did not react to their experience in any emotionally problematic manner. Rather, they gave largely positive ratings to the questions regarding necessity, usefulness, satisfaction, effects, and willingness to participate. On the other hand, students who played the role of a patient in serious condition responded negatively to the question regarding their willingness to participate in future drills, unlike those who played other roles. Obviously, their impression of experiencing triage was such that for some time after the disaster drill was over they became reluctant to undergo any similar experience again, the drill being still fresh in their memory.

(3) Significance of Group Session #1

It has been reported that students participating in a disaster drill may become aware of and learn different things depending on their role (patient, etc.).¹⁵ The results of Group Session #1 support this statement. In other words, the things that were noticed and learned by students who played the roles of patients in serious, moderate, and mild conditions were unique to each respective role group. Meanwhile, students from all groups showed a high interest in the experiences of students of groups that played roles different from their own. This testifies the significance of organizing group sessions with students who played different roles, as well as among students who played the same role.

Research into the social comparison theory has revealed that people who have shared the same experiences and circumstances develop a desire for amicability.³⁰

Those who experience the stressful role of a patient in serious condition during a disaster drill can become uneasy, running the risk of them being unable to continue subsequent disaster studies in a positive manner. Should this be the case, it would be meaningful to organize group sessions among people who shared a similar experience, and encourage them to express and compare each other's emotions and thoughts. According to the experiential learning theory, it is important to guide students toward relativizing their experiences in a group session with those who shared the same experience so that these experiences can be deepened further.²²

According to Garcia and Lindsay, when students study disaster nursing it would be useful to do so in a controlled environment, since organizing opportunities to learn at an actual site of nursing, like other types of practical training, can cause excessive learning or, under some circumstances, can even be dangerous.³¹ It is safe to say that Group Session #1, which was conducted as a part of this research program, is an attempt to provide students with a “controlled” learning environment by incorporating two elements into the program, namely, support for students who have had a negative experience, and experiential learning among students who played the same role. In this sense, the importance of having students who played the same role discuss with each other and summarize what came to their attention at Group Session #1 is certainly not insignificant.

(4) Significance of Group Session #2

When the results of the two group sessions were compared, both the number of matters that came to students' attention and the variety of sub-categories were shown to increase from 40 to 74 and from eight to 11 for Group Session #1 and Group Session #2, respectively. It does not seem that the instructions before each session significantly affected the number of items that came to students' attention, as the instructors only told them to “listen to what others experienced while telling them about your own experiences.” Rather, it is inferred that the structure of the groups had a significant impact on the results.

The number of items that came to students' attention in the “patients and their family members” category decreased from 16 to three, but that in the “nurses and members of the medical team” increased from 14 to 39 between the two group sessions, evidence that Group Session #2 encouraged the focus of students' awareness

to shift from the perspective of patients and their family members to that of nurses and members of the medical team.

In the subcategories of “patients and their family members,” 12 responses under “attitudes and emotions” were yielded in Group Session #1, but none in Group Session #2. On the other hand, while only the group of students who played the role of a patient in serious condition produced responses in the “knowledge” subcategory in Group Session #1, all of the groups did so in Group Session #2. For the “nurses and members of the medical team” category, Group Session #1 did not produce any responses that could be categorized into “Knowledge,” but all of the groups produced such responses in Group Session #2. From this, it may be gathered that Group Session #2 brought about a change in the nature of students’ responses from subjective, personal ones based on individual experiences and perspectives according to the roles assigned to them, to more objective, specialized ones based on a common awareness of issues.

In the “general” category, only one response was produced in Group Session #1, whereas a total of 21 responses were given in Group Session #2 (eight, six, and seven from Groups 1, 2, and 3, respectively). This suggests that Group Session #2 made students of all the groups become aware of matters that are necessary to make the most of their experiences during the disaster drill in their lives and studies in the future.

4. Discussions

1) Experiential learning and reflection

In experiential learning, reflection should be made among groups of students who have shared the same experience.²² In this educational program, students were organized into small groups and encouraged to share their experiences with other participants while reflecting on those experiences, so that they can recognize common and individual features of what came to their attention during the disaster drill and reach more profound awareness. How efficiently group dynamics can be tapped into is essential to the success of experiential learning, which is also the case for this educational program. As the results suggest, the students rated highly and strengthened the things that came to their attention during the disaster drill. From these findings, it is safe to say that this educational program has successfully made

use of group dynamics.

2) Effects of the jigsaw classroom

It is assumed that the jigsaw classroom, which was used in conjunction with group discussions, helped to enhance such group dynamics. It is believed that the jigsaw classroom will enhance students' capability to acquire the role assigned to them and make it possible for them to think from the logical and emotional perspectives of others, while at the same time having positive effects on their behavior and emotions by having them learn in a small group environment while cooperating with other members.²⁵

Group Session #2 increased the width and depth of student responses that had not been achieved in Group Session #1. This might suggest that there is good reason for having students who played different roles reflect on their experiences, as well as organizing group sessions with students who played the same role.

3) Follow-up

Continuous follow-up is being conducted for students who played the role of a patient in serious condition and gave negative responses to some questions in the questionnaire survey following the drill. The significance of disaster drills and ex post facto learning that includes follow-up needs to be investigated over the long term and, as such, will be reported on as the opportunity arises.

This paper discussed a triage drill conducted immediately after the occurrence of disaster. Whether or not the educational program introduced here can be applied to other types of disasters requires further verification.

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Developing a disaster nursing educational program based on the experiential learning theory

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The purpose of this study was to develop an educational program of disaster nursing on the basis of Kolb's experiential learning theory. The jigsaw learning method was adopted in the discussion session in order to make students' views comprehensive, integrated and unified. 32 students of a nurse's school participated in this action study program. After they learned basic conceptions about triage in disaster situation, they participated in a TT in a hospital, role-playing patients and their families. Two month later, they wrote about their experience and discussed these experiences in two group session. In the first group session, the students of the same role made groups to discuss together, and in the second group session, the students of the different role made groups to discuss together. As the results, it was found that the participants were not only satisfied with the program, but also motivated into learning to become good nurses, broadened and deepened their understanding of triage in disaster by reflecting their experiences through the group process. The group session was also effective in consoling the stress of the participants who had had negative experiences through role- playing patients of serious illness as they were abandoned in the TT.