

ORIGINAL ARTICLE

Educational needs concerning disaster preparedness and response: A comparison of undergraduate nursing students from Istanbul, Turkey, and Miyazaki, Japan

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Abstract

Aim: To compare 4 year undergraduate nursing students' educational needs concerning disaster preparedness and response in Istanbul and Miyazaki.

Methods: This was a 13 question descriptive/comparative survey.

Results: Females, aged 18–22 years, and in their second year of their nursing programs, rarely participate in disaster preparedness and response courses at their universities (75.2%) or outside (89.8%). Educational needs of Miyazaki's students who had already participated in these courses (85%) were higher than in Istanbul's (67.2%). Of those whose educational needs had not been met, 55.9% were considering taking another lecture/course in one of the following years (Istanbul, 47.4%; Miyazaki, 71.4%). The majority of students from Istanbul reported some knowledge about disaster preparedness and response from courses at their universities while Miyazaki's students showed less. Effective teaching methods/resources were mock drills. Nursing interventions in disaster situations in "response competencies" were preferred issues to be included in course content (Istanbul, 90.4%; Miyazaki, 93.1%). Most student nurses had no expectations on skills that could be gained from a disaster preparedness and response course/culture of disaster lecture (Istanbul, 48.7%; Miyazaki, 34.5%).

Conclusion: Nursing students in both cities seem more likely to participate in disaster preparedness and response courses/lectures. The present study also addresses the need to incorporate mass casualty care and disaster management skills into undergraduate curricula. Core contents for nursing curricula in both cities need to be continued. Outcome competencies must be identified and validated through further research.

Key words: disaster, educational needs, preparedness, response, undergraduate nursing students.

INTRODUCTION

Training and education have long been accepted by researchers in disaster response as an essential part of disaster preparedness (Chapman & Arbon, 2008). Unfortunately, nursing programs offer limited content

on delivering care under extreme conditions, and few continuing education programs are available to practicing nurses (Tillman, 2011). It is accepted that any event resulting in mass casualties will exceed the number of healthcare workers who will be able to supply care (Ünlü, Kapucu, & Şahin, 2010).

Nurses comprise a large part of the healthcare workforce, but many are unprepared to respond because of the lack of knowledge or skills (Arbon *et al.*, 2006; Fung, Lai, & Loke, 2009). Student nurses are an additional group of people who would increase the capacity of that workforce during times of emergency. The

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content they receive in their beginning nursing education should include basic disaster content (Caudill, 2011; Cusack, Arbon, & Ranse, 2010). As stated by the World Health Organization:

With the increased demands on curriculum, the lack of standard competencies to underpin curriculum development, a lack of teaching tools, inadequate budgets, limited disaster experience and few champions, disaster nursing education has not been a priority. There is also a lack of confidence among faculty who feel unprepared to teach disaster nursing. Research, and therefore the evidence base for disaster nursing, is sparse. These factors contribute to the lack of inclusion of disaster education in nursing curricula (World Health Organization & International Council of Nurses, 2009; p. 30).

Existing deficits create a nursing workforce that requires additional hours of formal disaster care instruction to be able to respond effectively in the event of a disaster. Thus, all nurses should have sufficient knowledge and skills to recognize trauma, injury or illnesses that are disaster-related, intervene appropriately, and conduct basic assessment and triage in emergency situations (Rains, 2013; Romig, 2013). One way to overcome such obstacles is to find out what undergraduate nursing students (UNS) already know about disaster preparedness and how they wish to learn about this subject.

Since the earthquakes in 2011 in northern Japan (International Affairs Division, Miyagi Prefectural Government, 2011) and Turkey (Ünlü *et al.*, 2010), there is a greater need for increased awareness by all nurses in both countries about nursing responses to mass casualty events and natural disasters. These educational demands are challenging, particularly in a healthcare environment already operating at or above capacity.

The information found in the published work consists primarily of qualitative, non-experimental, descriptive research. Considering that disaster nursing has only recently become a prevalent topic in the nursing profession, limited research of any type is difficult to find (James & Duarte, 2006; Tillman, 2011).

The impact of disasters may confront UNS to provide nursing support to affected disaster victims (Yin, He, Arbon, & Zhu, 2011), as was seen in the loss of nurses in Japan during the Great East Japan Earthquake and Tsunami on 11 March 2011.

Undergraduate nursing students are future health professionals who will be required to be aware of and understand particular aspects of disaster planning, mitigation/recovery and evaluation in order to help

injured persons due to disasters throughout the world. UNS may be able to describe core concepts or skills when asked about disasters, but most have limits to apply this knowledge.

Four major themes were identified based on features most frequently reviewed in research: (i) nurse education (including UNS) and experience in disaster response; (ii) nursing issues (including UNS), concerns and attitudes surrounding disaster response, including perceived preparedness for disaster; (iii) disaster planning in acute settings; and (iv) surge capacity of acute settings. Although there is little understanding of the concept of disaster among nurses (Fung *et al.*, 2009), there is no international comparative research on educational needs (EN) of disaster preparedness and response (DP&R) among UNS.

METHODS

Aim

The aim of this study was to explore and compare the EN of UNS in Istanbul and Miyazaki, and their participation status in the courses on DP&R in or outside of their universities to engage pre-licensure nursing students as volunteers to jump start this process in both cities. Specific study objectives were: (i) to explore UNS participation in and considerations of EN about DP&R lectures/courses; (ii) to compare UNS knowledge levels about DP&R and lectures/courses taken by them; (iii) to explore teaching methods and resources UNS prefer to use in course content in DP&R courses/lectures; (iv) to explore UNS considerations of issues that could be included in DP&R courses/lectures; and (v) to identify expected skills of UN gained from a DP&R course/lecture.

Design

A descriptive/comparative convenience survey design was used.

Subjects and settings

Targeted participants were UNS in first to fourth year classes at three state universities: two state universities in Istanbul from October to November of 2011, and one state university in Miyazaki in 2011.

Survey development and content

The survey was conceived through a review of the published work (Fung *et al.*, 2009; Jennings-Sanders,

Frisch, & Wing, 2005) and developed by the two primary investigators.

Survey domains focused on two sections. Section 1 included five questions directed at demographic characteristics and knowledge status on DP&R. Section 2 included three questions on disaster perceptions, and six questions directed at students' perceptions of their schools' disaster preparedness, opinions on DP&R courses/lectures in content and EN of the participants on DP&R.

To ensure survey reliability and validity across the two countries' different languages, the back-translation method was used in the construction of the survey.

Experts in the field of translation tested the Turkish and Japanese versions of the tool, while a panel of disaster nursing experts in the respective countries tested the content validity. Both groups suggested slight modifications for clarity in Turkish and in Japanese. A pilot study with a group of 30 UNS from outside the prefecture of Miyazaki and 30 UNS from Istanbul was then conducted to determine if the Turkish and Japanese versions were comprehensible. Again, slight modifications in wording were made based on feedback from the pilot group.

Data collection

Following the pilot study, the survey was distributed to all UNS who were currently in first through fourth year classes receiving basic nursing education in Istanbul and Miyazaki. Oral permission was requested for all UNS and the class teachers. The UNS were then informed that all information written in the survey would be stored confidentially and would only be used for scientific purposes. Following the explanation of the aim and specific objectives of the study, UNS were assured their participation was voluntary and no penalty would be incurred for not participating. The researchers, who were/were not involved in the teaching of these UNS, distributed the surveys. Upon completion, either the researchers or the teachers present in the room collected the surveys. Return of completed surveys was considered as implied consent to the study.

Ethical perspective

Ethical and humans rights were observed. Written permissions were taken from the directors of the three state universities' nursing schools, and ethical approvals were obtained from the same three universities' ethical committees. All aspects of the study were exempted by their respective university's institutional review boards and

their nursing university's ethics board and adhere to the tenants of the Declaration of Helsinki.

Data analysis

Data obtained in the study were evaluated using IBM SPSS for Windows ver. 10.0 program (SPSS, Chicago, IL, USA) and MS Excel 2003 (Microsoft, Redmond, WA, USA). Descriptive statistics (frequency of categorical values, numerical values, mean and standard deviation) were used in the evaluation of data at a 95% confidence interval. Comparisons among responses of UNS were made with Pearson χ^2 -test with $P < 0.05$ considered statistically significant. Categories for replies of open-ended questions were established by means of comparing notes between the researchers.

RESULTS

Out of a total of 1400 UNS from all three universities, 1031 consented to and completed the survey. Main reasons for UNS exclusion from this study were incomplete/incomprehensible answers or absence on the day of the survey. The return rate was 73.6%.

A demographic profile of the UNS showed a female majority, aged 18–22 years, with a high proportion being in their second year in both cities (Table 1).

Of all the UNS in the study, 89.8% had not participated in any external DP&R lectures/courses and 75.2% had not participated in any DP&R courses/lectures at their university. This was seen as statistically significant ($P < 0.05$) (Table 2).

Of the UNS who had lectures/courses on DP&R at their university, 85% of the EN of the UNS in Miyazaki were met while Istanbul's was 67.2%. This difference was seen as statistically significant ($P < 0.05$) (Table 2).

Of the UNS whose EN were not met by lectures/courses on DP&R at their universities, 55.9% considered taking another lecture/course in one of the following years (Istanbul, 47.4%; Miyazaki, 71.4%). No significant difference was found in this response between the UNS in both cities ($P > 0.05$) (Table 2).

The majority of UNS who had taken lectures/courses on DP&R at/or outside of their universities in both cities reported that they had some knowledge about DP&R. UNS in Istanbul who had taken lectures or courses at/outside their universities reported more knowledge than those from Miyazaki, which showed a significant difference ($P < 0.05$) (Table 3).

The methods of learning that the UNS would like to use, along with resources in a DP&R course/lecture, are seen in Figure 1. Preferred learning methods scored the

Table 1 Nursing students' demographics ($n = 1031$)

Characteristics	Istanbul, N = 740		Miyazaki, N = 291		Total, N = 1031	
	Mean	SD	Mean	SD	Mean	SD
Age (mean [years] \pm SD)	21.07	1.78	20.28	1.42	20.85	1.72
Age groups (years)						
	N	%	N	%	N	%
18–22	606	81.9	286	98.3	892	86.5
≥ 23	134	18.1	5	1.7	139	13.5
Sex						
Female	599	80.9	267	91.8	866	84.0
Male	141	19.1	24	8.2	165	16.0
Year at the university						
1st	176	23.8	76	26.1	252	24.4
2nd	226	30.5	96	33.0	322	31.2
3rd	170	23.0	79	27.1	249	24.2
4th	168	22.7	40	13.7	208	20.2

SD, standard deviation.

highest in mock drills with “video” ranking second. Teaching methods, such as lecture styles, self-learning texts, and website sources scored low in students from both cities.

Results of UNS open-ended opinions on types of issues needed to be included in the content of DP&R courses/lectures are shown in Figure 2. The majority of responses from both cities were on “nursing interventions in disaster situations”. Most other responses were from Istanbul, such as “identifying the psychosocial consequences of disaster”, “risk and vulnerability analysis”, and “hazard impact”, while these and all others were low for Miyazaki student responses.

Results of UNS open-ended answers on expectations of skills that could be gained from a disaster lecture/course are shown in Figure 3. The highest scores cumulated in two issue areas: “basic first aid and health care” and “problem solving and ability to handle crisis”. Skills marked low ($\leq 6.5\%$) by UNS in both cities were “disaster relief training and emergency drills”, “support to disaster victims”, “cooperation and collaboration”, and “epidemiologic assessment”. The majority of UNS stated having no expectations of skills that could be gained.

DISCUSSION

The demographics of the UNS were not out of the ordinary for UNS: basically, females aged 18–22 years, and evenly dispersed in their grade levels with second year UNS the largest group. Specific characteristics point to an awareness of the importance of nursing care roles

in disaster events and content in emergency care and triage (Table 1), yet their participation in lectures/courses at or outside of their university, in regards to DP&R, was low (Table 2). In other words, the universities are doing a good job training UNS for things that are necessary for natural disasters, but not as a package stamped “Information needed for DP&R”. James and Duarte (2006) found a similar pattern in their study with 96% of the respondents surveyed stating little or no training in disaster nursing, but possessing certain skills that can be applied to disaster situations.

Having said this, Miyazaki UNS participated in more courses/lectures that would help them with disaster nursing along with their EN being met than the UNS in Istanbul. On the positive side, the majority of the above-mentioned UNS in both cities whose EN had not been met by lectures/courses at/outside their universities intended to take other lectures/courses in following educational years (Table 2). Similar findings by Pang, Chan, and Cheng (2010) expressed that most UNS had developed an interest and would continue updating their knowledge in the field of disaster nursing.

Table 3 shows that the majority of Istanbul's UNS reported some knowledge of DP&R from courses at their universities while Miyazaki's UNS showed less. Further results show “some knowledge” from courses reported by UNS in their courses at their university and outside of their university as useful in content, but again Miyazaki's UNS scored lower. Obviously, UNS from Miyazaki, who participate more in DP&R courses/lectures than the Turkish UNS did, found such courses/content to be lacking. One possible explanation could be

Table 2 Comparison of students' participation in and considerations of educational needs about disaster preparedness and response course/culture of disaster lecture

Students' participation to and considerations on educational needs about course/lecture	Istanbul, N = 740				Miyazaki, N = 291				Total, N = 1031				χ^2 P
	Yes		No		Yes		No		Yes		No		
	N	%	N	%	N	%	N	%	N	%	N	%	
Have students ever had any lectures/courses on disaster preparedness and response outside of their university? ** (n = 1031)	48	6.5	692	93.5	57	19.6	234	80.4	105	10.2	926	89.8	$\chi^2 = 39.92^*$ P = 0.000
Have students ever had any lectures/courses on disaster preparedness and response at their university? ** (n = 1031)	116	15.7	624	84.3	140	48.1	151	51.9	256	24.8	775	75.2	$\chi^2 = 117.720^*$ P = 0.000
Did the course/lecture at university meet students' educational needs about disaster preparedness and response? ** (n = 256)	78	67.2	38	32.8	119	85.0	21	15.0	197	77.0	59	23.0	$\chi^2 = 11.280^*$ P = 0.001
Did the students consider taking another course on disaster preparedness and response in one of the following years if educational needs had not been met by the courses at university? ** (n = 59)	18	47.4	20	52.6	15	71.4	6	28.6	33	55.9	26	44.1	$\chi^2 = 3.177^*$ P = 0.075

*Pearson χ^2 -test. **Percentages are given according to the number of responses.

that the standard one-way communication from teacher to student that is prevalent in all educational settings in Japan is disliked by Miyazaki's UNS. Perhaps changing to mock drills would not only suit the students, but would be more meaningful to them (Fig. 1).

Nurses in Japan and Turkey have had good reasons for participating in DP&R following the numerous earthquakes in 2011, which generally relates to a perceived need for more professional abilities in disaster-response situations (Chapman & Arbon, 2008). The researchers believe that fears of inadequacy replaced with knowledge can help nurses respond to disaster requirements the same way as knowledge and skills in other nursing situations have shown to be of great importance as reported by other researchers (Chapman

& Arbon, 2008). Results imply that many UNS may develop similar interests and continue to update their knowledge in DP&R, but the mode of transmitting this information to students should be changed to acquire maximum effects of learning.

A lack of content on DP&R within other lectures/courses in both Istanbul and Miyazaki is proving inadequate to synthesize disaster nursing principles in an organized/systematic way. If basic disaster preparedness content was included in the Introduction to Nursing class at every nursing school in the nation, then first year students, as well as graduates, would have at least a basic overview of the key concepts of emergency preparedness prior to entering the workforce and definitely before being needed for a disaster as reported earlier

Table 3 Comparison of students’ knowledge level and taken lecture/course on disaster preparedness and response/culture of disaster by students at/outside of the university

Lecture/course taken by student at/outside of university	Knowledge about disaster preparedness and response											
	Istanbul, N = 740				Miyazaki, N = 291				Total, N = 1031			
	Some		Not much		Some		Not much		Some		Not much	
	N	%	N	%	N	%	N	%	N	%	N	%
Lecture/course taken on disaster preparedness and response at their university												
Yes	105	90.5	11	9.5	83	59.3	57	40.7	188	73.4	68	26.6
No	372	59.6	252	40.4	50	33.1	101	66.9	422	54.5	353	45.5
χ^2, P	$\chi^2 = 40.773^* P = 0.000$				$\chi^2 = 20.054^* P = 0.000$				$\chi^2 = 28.711^* P = 0.000$			
Lecture/course taken on disaster preparedness and response outside of their university												
Yes	46	95.8	2	4.2	39	68.4	18	31.6	85	81.0	20	19.0
No	431	62.3	261	37.7	94	40.2	140	59.8	525	56.7	401	43.3
χ^2, P	$\chi^2 = 22.054^* P = 0.000$				$\chi^2 = 14.741^* P = 0.000$				$\chi^2 = 22.968^* P = 0.000$			
Total	477	64.5	263	35.5	133	45.7	158	54.3	610	59.2	421	40.8

*Pearson χ^2 -test.

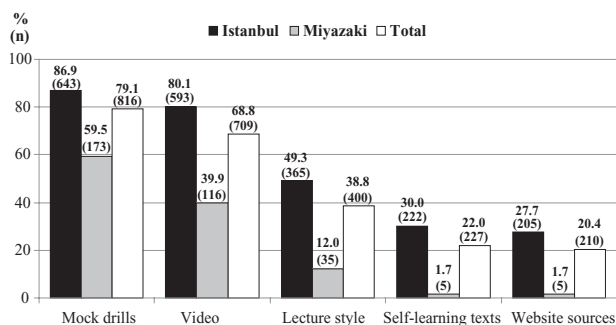


Figure 1 Teaching methods and resources used to supplement content in disaster preparedness and response course/culture of disaster lecture.

(Caudill, 2011; Smith, 2007). One other possible explanation is that short content lectures are not specifically tied to DP&R classes and therefore students do not associate them as such. DP&R courses/lectures may prove more useful if a required semester-long course is provided (Jennings-Sanders *et al.*, 2005; Pang *et al.*, 2010) and again changing from lectures to mock drills for maximal impact in content and time duration.

Early studies (Morrison & Catanzaro, 2010; Pelaccia *et al.*, 2009) reported resources and teaching methods as supplementary course content in DP&R education. Jennings-Sanders *et al.* (2005) reported the lack of importance of having mock disaster drills. Chapman and Arbon (2008) reported mock disaster drills and videos as a third preference for disaster nursing curriculum content and supplementary course content in disaster preparedness by nurses.

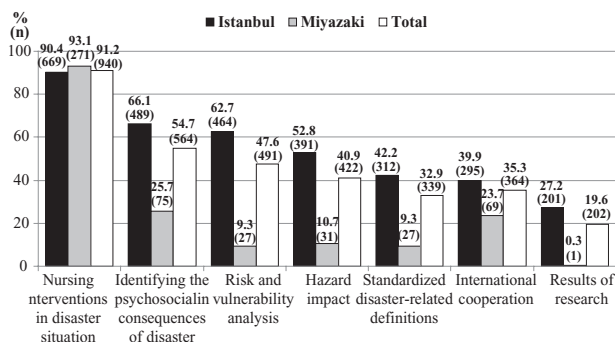


Figure 2 Students’ considerations of types of issues needed to be included in the content of a disaster preparedness and response course/culture of disaster lecture. Multiple choices are marked.

In this study, mock drills were preferred by all UNS as the first means of educational teaching format about disaster with video as number two in Istanbul (Fig. 1). Lecture style was number three, and “website sources” had low results in both Istanbul and Miyazaki, whereas “websites” were the number one choice used to supplement course content in disaster preparedness in a study by Chapman and Arbon (2008). This points to the difference in ways of transmitting content from one country to another. The need for implementing effective teaching methods and resources first needs to be established before the teaching starts. A pre-course planning questionnaire may reveal better ways to transmit information rather than the one-way lectures that are not popular with UNS in Istanbul and Miyazaki.

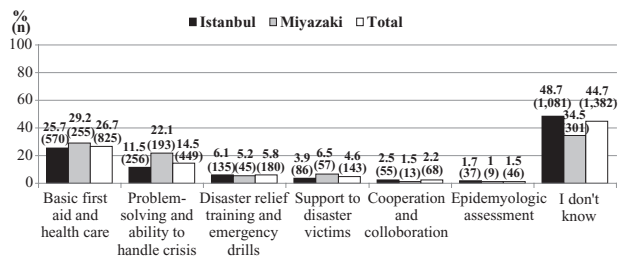


Figure 3 Nursing students' expectations on gaining skills from disaster preparedness and response course/culture of disaster lecture. Multiple responses were given by the students (Istanbul, 2220 responses; Miyazaki, 873 responses; total, 3093 responses). Percentages were measured according to the number of responses.

Pang *et al.* (2010) reported World Health Organization and International Council of Nurses (2009) competencies that clarify roles of nurses in disasters as well as guiding the development of disaster training and education. In this study, nursing interventions in disaster situations covered in “response competencies” were highly preferred issues to be included in course content in both cities (Fig. 2). However, the majority of responses from Istanbul and Miyazaki showed low percentages in areas that were related to issues covered in “preparedness competencies”. It is therefore understood that the importance of disaster preparedness needs to have a stronger focus in the nursing curricula in both cities.

Nursing skills become a major priority during the reconstruction phase of disaster response. These nursing skill sets include patient health assessments, dispensing medications, administrating immunizations, and basic community nursing (Yin *et al.*, 2011). It was reported that specific teaching methods based on pattern recognition skill development that can help UNS to improve their performances in triage during disaster events is a key element in the context of mass casualty incident planning (Pelaccia *et al.*, 2009). In this study, nearly half of the UNS had no expectations of gaining skills from DP&R courses/lectures (Fig. 3). Of those who did, nearly one-quarter of them had some expectations of gaining skills related to first aid and health care in general. Nearly one-fifth of Miyazaki UNS had more expectations of gaining skills in problem solving and the ability to handle crisis situations than those in Istanbul. Hands-on training instead of lectures and videos may provide a better impetus to increase UNS skill levels in disaster response in both Istanbul and Miyazaki.

Morrison and Catanzaro (2010) reported the need for critical thinking skills to provide safe nursing care during potentially chaotic public health emergencies by describing a public health emergency simulation exercise with UNS seniors enrolled in a public health clinical course. Results of this survey showed the UNS realizing the importance of participating in emergency preparedness and recognizing their abilities to apply nursing skills learned in previous courses. These courses seemed to emphasize the knowledge and skills needed to fulfill nurses' role during a critical event (Yin *et al.*, 2011).

It is now generally understood that UNS must be given opportunities to understand the importance of nursing skills for disaster care and be prepared to respond to disasters as effectively as possible. These nursing skills will have more impact if educators know how UNS wish to learn, and to some extent, what they wish to learn. Inclusion of DP&R into nursing curricula will increase UNS knowledge levels and hopefully provide a stimulus to work in this specialized area of nursing after graduation.

Nursing students in Istanbul and Miyazaki seem more likely to participate in a DP&R course/lecture if it organized into one component of the curriculum rather than core concepts being dispersed throughout numerous other classes, have some say in how they are taught, and can specifically ask for more education in certain areas of DP&R.

Courses/lectures focusing on DP&R content that are currently available in Istanbul and Miyazaki may be missing their mark. Core contents for nursing curricula in Istanbul and Miyazaki need to continue to be delineated and outcome competencies must be identified and then validated through further research.

Research needs to be coordinated internationally with the aim of establishing standards in delivery and content of disaster preparedness education and training, yet have flexibility to put across local ideas of UNS learning styles and areas they feel they need help with. Positive effects on UNS educational requirements in disaster response should focus on effective teaching methods as well as focusing on regional disaster concerns and more UNS input. Inclusion of updated disaster nursing education for UNS at universities will lead to a more competent workforce of nurses ready for disaster events in the future.

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CONFLICT OF INTEREST

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