Asian Journal of

HUMAN SERVICES

Printed 2018.1030 ISSN2188-059X
Published by Asian Society of Human Services

October 2018
VOL. 15

Asian Society of Human Services

Human Services

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

ORIGINAL ARTICLE

Using Videos to Analyze the Effectiveness of START Education for Japanese Nursing Students

Kazuyuki AKINAGA[1)] Kaoru SHIBAYAMA[1)] Koichi TAKAHASHI[1)] Setsuko UMEZAKI[2)] Kazue NONAKA[1)] Norihito NOGUCHI[3)] Koichi SHINCHI[1)]

1) Graduate School of Medical Sciences, Saga University, Japan
2) Department of Nursing, School of Health and Medical Sciences, Junshin Gakuen University, Japan
3) Department of Nursing, School of Medical Education, National Defense Medical College, Japan

ABSTRACT

This study aims to evaluate the effectiveness of teaching START (Simple Triage and Rapid Treatment) to nursing students using videos. To this end, we conducted a study from October 1, 2016 to March 31, 2018, instructing nursing students to view a video of 30 simulated cases and to perform triage exercises both before and after START training. Subjects included 57 freshmen and 56 seniors. We calculated the accuracy rate for each case and examined those where students were most likely to make mistakes. We found that after START training, both freshmen and senior students did significantly better on the triage exercises. Before the training, seniors treated an average (± standard error (SE)) of 23.5 ± 0.7 out of 30 patients correctly, while after the training, this number increased to 29.3 ± 0.2 ($p < 0.001$). For freshmen, the increase was even more drastic, increasing from 17.4 ± 0.6 correct before the training to 29.1 ± 0.3 after ($p < 0.001$). While freshmen initially answered far fewer questions correctly, after the training, there was no significant difference in the performance of freshmen and seniors: both groups had an overall accuracy rate of 95% or higher. The drastic performance increase even of freshmen with little medical knowledge suggests that this program may even be effective for the general public, making our results relevant for developing better disaster medical care in the future.

Received
April 22, 2018

Revised
June 8, 2018

Accepted
June 27, 2018

Published
October 30, 2018

＜Key-words＞
disaster, education, nursing student, START

Corresponding author: shinchik@cc.saga-u.ac.jp (Koichi SHINCHI; Japan)
Asian J Human Services, 2018, 15:1-12.

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

I. Introduction

Japan frequently suffers from natural disasters, including the 1995 Great Hanshin-Awaji Earthquake, the 2011 Great East Japan Earthquake, and the 2016 Kumamoto Earthquake. In all of these cases, while nurses helped medically treat those injured after the disaster, there was a shortage in both medical manpower and resources like medicine and supplies, especially during the first 72 hours. Triage, therefore, is a vital tool to prioritize victims' treatment and hospitalization, help the greatest number of patients possible. In cases such as the above example, the lack of doctors means that nurses are often responsible for triage (Fukuyama, Shinchi, Shinchi et al., 2006; Furukawa, Shinchi, Fukuyama et al., 2007; Ishibashi, Fukuyama, Nonaka et al., 2017; Noguchi, Inoue, Shimanoe et al., 2016). Nursing curriculum, therefore, should include triage education (Akinaga, Takahashi, Sakamoto et al., 2012; Matsunaga, Akinaga, Umezaki et al., 2013; Matsunaga, Shinchi, Akinaga et al., 2013).

Triage derives from a French word meaning "sorting" and "choosing." In medical terms, it is a technique to maximize the number of survivors after a disaster by categorizing the injured based on the severity of their wounds and prioritizing treatment and hospitalization accordingly (Donatelli & Somes, 2012; Good, 2008; Somes & Donatelli, 2014). Studies on triage have reported the need for regular training (Akinaga, Takahashi, Sakamoto et al., 2012; Howard & Foley, 2014; Powers, 2007) to teach medical professionals how to engage in triage effectively.

The increased number of natural disasters makes it vital for nurses to be taught the principles of triage in disaster situations (Evans & Baumberger-Henry, 2014); this teaching is most effective when begun through simulations during their ongoing education (Brannigan, Witwer, Rudel et al., 2006; Duarte & Haynes, 2006; Foronda, Shubeck, Swoboda et al., 2016).

To this end, Japanese nursing colleges today provide triage education to their students. However, there are as of now few studies that examine the most effective educational methods for this training (Akinaga, Takahashi, Sakamoto et al., 2012). This study attempts to answer some of those remaining questions. Specifically, we evaluate the effectiveness of using videos to teach the START (Simple Triage and Rapid Treatment) method of triage to nursing students. This triage method was developed in 1983 by the Hoag Hospital and Newport Beach Fire Department in California and is now widely used in the United States (Benson, Koening & Schultz, 1996; United States Department of Health and Human Services, 2018). It is a tool used by first responders to quickly classify victims during a mass casualty incident (MCI) based on the severity of their injury.

Our findings have implications for future human resource development in disaster medical care.

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

II. Methods

We showed two groups of nursing students—a group of freshmen and a group of seniors—a video with 30 simulated cases and provided an accompanying lecture (Kawahara & Ishida, 2008). We also asked the students to perform a triage exercise both before and after START training.

The training started with the lecture by a medical professor and doctor experienced in disaster medical treatment. Prior to beginning START training, both freshmen and seniors were told only about the basic concept and definition of triage (Sakai & Kikuchi, 2016) and then shown the accompanying video. After the video, the professor described the START method in detail and, two hours later, students were asked to perform triage on patients with the same symptoms as in the video. Students used an answer sheet to describe the triage category of each patient using the START classification, and the answer sheets were collected after the lecture was over.

Table 1 provides details regarding the 30 simulated cases students viewed on the video and were later asked to triage. Information provided included age, gender, ability to walk on their own, whether they were breathing on their own, number of breaths per minute, capillary refilling time (nail blanch test), whether they were capable of following simple commands, heart rate, and diagnosis.

Because of the course curriculum, the lecture was given on a different day for freshmen and seniors. However, the contents of the lecture were the same for both groups and included information on the purpose of triage, situations that require triage, and how to prioritize patients. Students were also given information about the START method specifically, which involves providing each patient with a colored tag based on their triage classification: minor (green), delayed (yellow), immediate (red), or deceased (black). This classification is made based on whether a patient is capable of walking by themselves, is breathing by themselves, their respiration rate, level of consciousness, and the palpation of radial artery or capillary refilling time of the nail (CRT).

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

<Table 1> Characteristics of the 30 cases included in the video

	Age	Sex	Diagnosis	Triage category	Walk	Breathing	Ventilatory frequency	capillary refilling time	Verbal contact	Heart rate
1	Infant	female	Dead	Black	×	×	0	×	×	0
2	82	male	Cut on the ear	Green	○	○	23	○	○	75
3	43	female	Epidermal burn	Green	○	○	22	○	○	56
4	25	male	Intestinal tract hernia	Red	×	○	23	×	○	92
5	19	female	Blow to the head	Green	○	○	28	○	○	96
6	54	female	Previous head abrasion	Green	○	○	20	○	○	82
7	45	female	Right cheek abrasion	Green	○	○	24	○	○	97
8	36	male	Left leg abrasion	Green	○	○	21	×	○	82
9	67	male	Myocardial infarction	Red	×	○	40	○	○	116
10	64	male	Radial artery damage	Green	○	○	29	○	○	104
11	8	male	Fall	Green	○	○	28	○	○	116
12	40	male	facial burn	Green	○	○	24	×	○	106
13	32	male	Crash syndrome	Red	×	○	32	○	△	84
14	32	female	Nose fracture	Green	○	○	20	○	○	80
15	52	male	Head wound	Green	○	○	20	×	○	80
16	23	male	Pelvis fracture	Red	×	○	36	○	○	120
17	67	male	Finger cutting	Green	○	○	28	○	○	72
18	72	male	Upper body burns	Yellow	×	○	28	○	○	112
19	36	female	Cervical sprain	Green	○	○	24	○	○	78
20	71	male	Eye puncture	Green	○	○	24	○	○	78
21	43	male	Left leg open fracture	Yellow	×	○	28	○	○	116
22	60	female	Right second finger extensor tendon tear	Green	○	○	23	○	○	92
23	25	male	Left leg second-degree burn	Yellow	×	○	28	○	○	96
24	28	female	Pregnant, Water broke	Yellow	×	○	24	○	○	64
25	21	female	Left wrist fracture	Green	○	○	25	○	○	82
26	35	female	Glass puncture wound	Green	○	○	29	○	○	104
27	2	male	Right forearm second-degree burn	Yellow	×	○	28	○	○	92
28	51	female	Blow to back of the head	Green	○	○	22	○	○	86
29	10	male	Wrist burns	Green	○	○	27	○	○	94
30	78	male	Intraoral injury	Green	○	○	24	○	○	74

[1]black = deceased, red = immediate, yellow = delayed, green = minor
[2] ○ = can walk, × = cannot walk, [3] ○ = can breathe by oneself, × = cannot breathe
[4] times/min, [5] ○ = < 2 seconds, × = > 2 seconds, [6] ○ = yes, × = no, [7] times/min
Source: Kawahara K, et al. Disaster triage simulation education material (DVD), Tokyo Metropolitan University and Benesse Corporation (2008).

1. Subjects

We collected data between October 1, 2016 and March 31, 2018. Subjects included 56 senior (1 male, 55 females) and 57 freshmen (2 males, 55 females) nursing students at the Saga Medical School Faculty of Medicine. The average age of the students (± standard deviation (SD)) was 18.9 ± 0.2 for freshmen and 21.6 ± 0.1 for seniors. The participation and valid response rate were 100%.

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

For senior students, we taught the START method as part of a lecture on disaster nursing. For freshmen students, we included our curriculum as part of a public health lecture related to disaster nursing. This occurred six months after the students were admitted, before many had attended a medical or nursing lecture.

2. Ethical Consideration

The study passed Saga University Faculty of Medicine's ethical review (approval number: 28-38). We did not require students to include personal information, such as their name or student number, on the answer sheets. We explained the purpose of the study to the students and assured them that refusing to participate or discontinuing halfway through would not adversely affect their grades. All students agreed to participation by submitting their answer sheet for the triage classification exercises.

3. Data Analysis

We analyzed the answers to the triage exercises both before and after START training based on students' age, gender, and number of questions correct (out of 30) using SPSS statistics 23.

There was no standard normal distribution of correct answers for either freshmen or seniors. We compared the distribution of scores before and after START training using the Wilcoxon signed-ranks test. We also used the Mann-Whitney U test to compare the distributions of scores in the same period between freshmen and seniors.

Most studies would make comparisons based on median scores, since these are nonparametric tests. However, we decided to primarily use mean scores, which are easier to understand, and reflect the fact that our data are based on the number of correct answers, and show the median scores in parentheses.

We also calculated the number of students who answered each question correctly and the accuracy rate for each question by class standing before and after the training, examining the examples in which students tended to make mistakes.

III. Results

Table 2 compares the mean and median scores of freshmen and seniors on the triage exercise both before and after START education. We found that seniors had a mean (median) score of 23.5 (24) ± 0.7 (out of a perfect score of 30) before the lecture and 29.3 (30) ± 0.2 after the lecture, a significant increase (p = 0.0001). Likewise, freshman students had a mean (median) score of 17.4 (18) ± 0.6 before the lecture and 29.1 (30) ± 0.3 after (p = 0.0001). In other words, we observed a remarkable change in both groups. Moreover, this marked improvement was more drastic among freshmen than among seniors: while the average number of correct answers increased by 5.8 among seniors, the average among freshmen increased by 11.7 points.

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

<Table 2> Comparison of mean/median score before and after START education in the two groups using Wilcoxon signed-rank test

	Before START education		After START education		
	Mean ± SE	Median	Mean ± SE	Median	p-value
Seniors	23.5 ± 0.7	24	29.3 ± 0.2	30	0.0001
Freshmen	17.4 ± 0.6	18	29.1 ± 0.3	30	0.0001

<Table 3> Comparing students' triage ability before and after START education using Mann-Whitney's U test

	Seniors		Freshmen		
	Mean ± SE	Median	Mean ± SE	Median	p-value
Before education	23.5 ± 0.7	24	17.4 ± 0.6	18	0.0001
After education	29.3 ± 0.2	30	29.1 ± 0.3	30	not significant

Table 3 compares freshmen and seniors' number of correct answers before and after START training. Before the training, the mean (median) ± SE was 17.4 (18) ± 0.6 for freshmen and 23.5 (24) ± 0.7 for seniors, showing that seniors did significantly better p = 0.0001). After the training, the mean (median) ± SE was 29.1 (30) ± 0.3 for freshmen and 29.3 (30) ± 0.2 for seniors; there was no significant difference.

Table 4 shows the number of students who answered each question correctly and the accuracy rate for triage cases before and after the training for both freshmen and seniors. Before START education, both freshmen and seniors had less than a 50% accuracy rate for both Cases 10 ("radial artery damage") and 12 ("facial burn"). After the training, the accuracy for these cases increased to 95% or higher for both classes. Other cases did not have as steep of an increase in accuracy. For example, the accuracy rate for Case 4 ("abdominal injury with intestinal tract hernia") remained at 88% for freshmen and 86% for seniors even after the training. Freshmen also had a low accuracy rate (86%) for Case 24 ("Pregnant, water broke"), even after the training. However, overall, both freshmen and seniors had a total accuracy rate of 95% or higher after START education.

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

<Table 4> Student accuracy rate before and after START education

Case	Freshmen students (n = 57)		Senior students (n = 56)	
	Before START education	After START education	Before START education	After START education
	Correct answers n (%)	Correct answers n (%)	Correct answers n (%)	Correct answers n (%)
1	48 (84)	57 (100)	44 (79)	53 (95)
2	30 (53)	56 (98)	49 (88)	56 (100)
3	45 (79)	57 (100)	47 (84)	55 (98)
4	51 (89)	50 (88)	47 (84)	48 (86)
5	36 (63)	56 (98)	46 (82)	56 (100)
6	27 (47)	57 (100)	45 (80)	55 (98)
7	53 (93)	57 (100)	50 (89)	56 (100)
8	53 (93)	57 (100)	54 (96)	56 (100)
9	47 (82)	55 (96)	44 (79)	55 (98)
10	14 (25)	54 (95)	26 (46)	53 (95)
11	33 (58)	57 (100)	45 (80)	56 (100)
12	2 (4)	55 (96)	25 (45)	55 (98)
13	53 (93)	56 (98)	56 (100)	56 (100)
14	41 (72)	56 (98)	51 (91)	56 (100)
15	7 (12)	54 (95)	34 (61)	56 (100)
16	38 (67)	56 (98)	28 (50)	53 (95)
17	21 (37)	56 (98)	34 (61)	54 (96)
18	40 (70)	51 (89)	44 (79)	53 (95)
19	38 (67)	56 (98)	48 (86)	55 (98)
20	6 (11)	55 (96)	35 (63)	55 (98)
21	30 (53)	54 (95)	42 (75)	53 (95)
22	47 (82)	55 (96)	49 (88)	56 (100)
23	43 (75)	56 (98)	48 (86)	56 (100)
24	26 (46)	50 (88)	37 (66)	53 (95)
25	45 (79)	56 (98)	51 (91)	55 (98)
26	9 (16)	55 (96)	35 (63)	53 (95)
27	36 (63)	54 (95)	47 (84)	53 (95)
28	30 (53)	56 (98)	50 (89)	56 (100)
29	45 (79)	56 (98)	47 (84)	56 (100)
30	49 (86)	56 (98)	52 (93)	56 (100)

Note: %; Accuracy rate.

IV. Discussion

Our use of videos in START training was very effective, as shown by the increased total scores among both freshmen and seniors after the training. As expected, seniors' initial scores were higher: this makes sense, since they have accumulated nursing knowledge over three years that the freshmen, who have only been in college for about six months, do not have. However, it is interesting that the accuracy rate of both groups improved to almost 100% after the training. This implies that teaching the START method to nursing students was so effective that it could enable freshmen, who have almost no knowledge of medicine and nursing, to achieve an almost perfect score. In other words, using videos and

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

presenting simulated patient cases is an effective method of triage education, perhaps because it is easier for students to imagine patients' conditions.

We also examined the problems that students tended to get wrong even after the training. Cases 10 and 12, both of which had an accuracy rate of 50% or lower among freshmen and seniors before the training, are similar in many ways. Both were medical conditions that looked worse than they were: while bleeding and a burned face may initially appear to be severe, both of these patients had stable vital signs. As noticed in our previous studies (Aknaga, Shibayama, Takahashi et al., 2017), freshmen may tend to over-triage, classifying the case based on appearances rather than vitals and other observations. However, this tendency decreased after the training: the accuracy rate for Case 10 increased to 95% among both freshmen and seniors, and that of Case 12 increased to 96% for freshmen and 98% for seniors.

Other cases remained difficult even after the training, even as the overall accuracy rate reached 95% or higher. (For a detailed qualitative study of the cases in which students continue to make mistakes, please see our other article, Aknaga, Shibayama, Takahashi et al., 2017.) For example, the accuracy rate of Case 4 was 88% for freshmen and 86% for seniors after the training. This case may have been slightly difficult because the injury—abdominal injury with intestinal hernia—required the consideration of multiple vital signs when making a judgment. This was an example that even a doctor might have struggled with, so it makes sense that this was a difficult triage classification for nursing students. That said, many nursing students correctly triaged the above case; therefore, the START method has the potential to enable nursing students to correctly triage even the most difficult cases. This also implies that teaching START methods can dramatically improve the triaging ability even of those with little knowledge of medicine and nursing.

This study does have some limitations. First, our study only included 113 nursing students at the Saga University Faculty of Medicine, resulting in a relatively small sample size. Future studies should collect and analyze data from other nursing colleges. In addition, one doctor experienced in disaster medical care was responsible for all lectures and teaching in our study; future research may wish to compare curricula conducted by multiple faculty members, nursing teachers, etc.

There is also a concern that simulation-based education (i.e., video education) may be more limited in effect than practical training that includes actors who simulate triage victims, allowing students to engage in real-life physical examinations. However, such methods are time-consuming and expensive, and realistically, videos are much more likely to be used in such situations. In addition, studies have found that virtual simulations (i.e., videos) can be as effective as practical training in helping students improve their triage skills (Ingrassia, Ragazzoni, Carenzo et al., 2015).

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

Our findings are in line with others that find the START method to be useful among nursing students. Sapp, Brice, Myers et al. (2010) studied the triage accuracy of freshmen students using the START method and found them to be as accurate as emergency physicians and nurses. However, Sapp's study does not compare accuracy rates before and after START education. Claudius, Kaji, Santillanes et al. (2015) also reported on the usefulness of JumpSTART for medical students. Our study is also the first to quantitatively evaluate the effectiveness of START education among nursing students, especially using videos.

We found that the START method, an internationally standardized simple triage method, has the potential to greatly improve prehospital care. In Japan, where large natural disasters occur frequently, triage education for nursing students is important to save as many lives as possible after a disaster and should be included as early as possible in the college curriculum. In addition, our results suggest that this method may also be effective for the general public or for others with less medical knowledge. Educating the public as to the START method may therefore also help a community in the aftermath of a large natural disaster.

V. Conclusion

Our study demonstrates that teaching the START method to nursing students can dramatically improve their ability to triage. Using videos and simulated patients is an effective educational tool. After START education, even freshmen with very limited medical knowledge, increased their accuracy rate to 95% or more, and the cases that were often missed were those that were difficult even for doctors. Our results suggest that this method may also be effective for the general public and for others with less medical knowledge.

Acknowledgments

We would like to express our deepest gratitude to the students for participating in this study. We also thank Prof. Masahiro Nakano (Junshin Gakuen University) for his kind advice regarding statistical analysis, and Editage (www.editage,jp) for English language editing. This work was supported in part by a Grant-in-Aid for Scientific Research (C) (No.16K11946) from Japan's Ministry of Education, Culture, Sports, Science, and Technology. The authors have no financial conflicts of interest to declare.

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

References

1) Kazuyuki AKINAGA, Masaru TAKAHASHI, Akiko SAKAMOTO, Setsuko UMEZAKI, Hitomi MATSUNG, & Koichi SHINCHI (2012) Educational Effect of the Triage Training and Keeping Knowledge of the Education After One Year. *Journal of Biomedical Fuzzy Systems Association,* 14(2), 7-13. doi: 10.24466/jbfsa.14.2_7.

2) Kazuyuki AKINAGA, Kaoru SHIBAYAMA, Koichi TAKAHASHI, Setsuko UMESAKI, & Koichi SHINCHI (2017) Study on Triage Education for Nursing Students: Analysis of Their Errors in Triage. *Asian Journal of Human Services*, 13, 10-22. doi: 10.14391/ajhs.13.10.

3) Mark BENSON, Kristi L. KOENING, & Carl H. SCHULTZ (1996) Disaster Triage: START, Then SAVE—A New Method of Dynamic Triage for Victims of a Catastrophic Earthquake. *Prehospital Disaster Medicine,* 11(2), 117-124. doi: 10.1017/S1049023X0004276X.

4) Laura BRANNIGAN, Stephanie WITWER, Piper RUDEL, & Alisa YOUNG (2006) Simulation Education in Mass-Casualty Incident Preparedness, *Clinical Simulation in Nursing Education*, 2, e69-e74. doi: 10.1016/j.ecns.2009.05.027.

5) Ilene CLAUDIUS, Amy H. KAJI, Genevieve SANTILLANES, Mark X. CICERO, J. Joelle DONOFRIO, Marianne GAUSCHE-HILL, et al.(2015) Accuracy, Efficiency, and Inappropriate Actions Using JumpSTART Triage in MCI Simulations. *Prehospital Disaster Medicine*, 30(5), 457-460. doi: 10.1017/S1049023X15005002.

6) Nancy Stephens DONATELLI & Joan SOMES (2012) Disaster Planning Considerations Involving the Geriatric Patient: Part II. *Journal of Emergency Nursing,* 38, 563-567. doi: 10.1016/j.jen.2012.07.016.

7) Victor DUARTE & Linda C. HAYNES (2006) Disaster Preparedness: "As Common As CPR." *Clinical Simulation in Nursing Education*, 2, e53-e57. doi: 10.1016/j.ecns.2009.05.022.

8) Cathleen A. EVANS & Mary BAUMBERGER-HENRY (2014) Readiness: How Prepared Are You? *Journal of Emergency Nursing*, 40, 448-452. doi: 10.1016/j.jen.2014.03.006.

9) Cynthia L. FORONDA, Keith SHUBECK, Sandra M. SWOBODA, Krysia Warren HUDSON, Chakra BUDHATHOKI, Nancy SULLIVAN, et al. (2016) Impact of Virtual Simulation to Teach Concepts of Disaster Triage. *Clinical Simulation in Nursing*, 12, 137-144. doi: 10.1016/j.ecns.2016.02.004.

10) Yumi FUKUYAMA, Koichi SHINCHI, Toyoka SHINCHI, Yumi MATAUZAKI, Mamiko FURUKAWA, Masashi TAKAMURA, et al. (2006) The Role of Nurses in International Disaster Relief Operations: Survey among Participants. *Journal of International Health,* 21(3), 169-175.

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

11) Mamiko FURUKAWA, Koichi SHINCHI, Yumi FUKUYAMA, Toyoka SHINCHI, Masashi TAKAMURA, Koki KAKU, et al. (2007) The Role of Nurses in lnternational Disaster Relief Operations: Survey Among Japanese Doctors and Nurses. *Japanese Journal of Disaster Medicine*, 12, 152-159.

12) Linda GOOD (2008) Ethical Decision Making in Disaster Triage. *Journal of Emergency Nursing,* 34, 112-115. doi: 10.1016/j.jen.2007.04.014.

13) Patricia Kunz HOWARD & Andi L. FOLEY (2014) Disaster Triage—Are You Ready? *Journal of Emergency Nursing*, 40, 515-517. doi: 10.1016/j.jen.2014.05.010.

14) Pier Luigi INGRASSIA, Luca RAGAZZONI, Luca CARENZO, Davide COLOMBO, Alba Ripoll GALLARDO, & Francesco Della CORTE (2015) Virtual Reality and Live Simulation: A Comparison between Two Simulation Tools for Assessing Mass Casualty Triage Skills. *European Journal of Emergency Medicine,* 22(2), 121-127. doi: 10.1097/MEJ.0000000000000132.

15) Akina ISHIBASHI, Yumi FUKUYAMA, Kazue NONAKA, & Koichi SHINCHI (2017), The Role of Surgical Nurses in International Disaster Response in Japan: Recognition of Medical Workers with Experience in IDR. *Asian Journal of Human Services*, 13, 23-35. doi: 10.14391/ajhs.13.23.

16) Kayoko KAWAHARA & Chie ISHIDA (2008) Disaster Triage Simulation Education Manual (DVD), Tokyo Metropolitan University, Benesse Cooperation.

17) Hitomi MATSUNAGA, Kazuyuki AKINAGA, Setsuko UMEZAKI, & Koichi SHINCHI (2013) Required Condition, Information, and Knowledge for Participating in Disaster Relief Activities. *Journal of Biomedical Fuzzy Systems Association,* 15(1), 1-6.

18) Hitomi MATSUNAGA, Koichi SHINCHI, Kazuyuki AKINAGA, & Setsuko UMEZAKI (2013) Recognition of the Necessity of Practical Disaster Nursing Education among Nursing Teachers in Japan. *Asian Journal of Human Services,* 4, 30-39.

19) Norihito NOGUCHI, Satoshi INOUE, Chisato SHIMANOE, Shibayama KAORU, & Koichi SHINCHI (2016) Factors Associated with Nursing Activities in Humanitarian Aid and Disaster Relief. *PLoS One*, 11(3), doi: 10.1371/journal.pone.0151170.

20) Norihito NOGUCHI, Satoshi INOUE, Chisato SHIMANOE, Kazuyuki AKINAGA, Miki UENO, Haruna TAKAHASHI, et al.(2017) Deployment-related Difficulties of Japanese Disaster Relief Workers by Mission Duration: A Cross-Sectional Study. *Health Emergency and Disaster Nursing*, 1(8), doi: 10.24298/hedn.2016-0019

21) Matthew F. POWERS (2007) Evaluation of Hospital-Based Disaster Education. *Journal of Emergency Nursing*, 33, 79-82. doi: 10.1016/j.jen.2006.10.008.

22) Akiko SAKAI & Shizuko KIKUCHI (2016) Triage (p. 152-172 in *Disaster Nursing*) Nankodo Co: Tokyo, Japan (in Japanese).

DOI:http://doi.org/10.14391/ajhs.15.1
Asian Journal of Human Services, VOL.15 1-12

23) Robert F. SAPP, Jane H. BRICE, J. Brent MYERS, & Paul R. HINCHEY (2010) Triage Performance of First-Year Medical Students Using a Multiple-Casualty Scenario, Paper Exercise. *Prehospital Disaster Medicine*, 25(3), 239-245. doi: 10.1017/S1049023X00008104.

24) Joan SOMES & Nancy Stephens DONATELLI (2014) Ethics and Disaster Involving Geriatric Patients. *Journal of Emergency Nursing*, 40, 493-496. doi: 10.1016/j.jen.2014.05.013.

25) U.S. Department of Health and Human Services(2018) START Adult Triage Algorithm. Radiation Emergency Medical Management: REMM. http://www.remm.nlm.gov/startadult.htm (Accessed on March 18, 2018).

Asian Journal of HUMAN SERVICES
Asian Society of HUMAN SERVICES

Asian Journal of Human Services
VOL.15 Ocober 2018

Editor-in-Chief Masahiro KOHZUKI
Presidents Masahiro KOHZUKI・Sunwoo LEE
Publisher Asian Society of Human Services
Faculty of Education, University of the Ryukyus, 1 Senbaru, Nishihara, Nakagami, Okinawa, Japan
FAX: +81-098-895-8420 E-mail: ashs201091@gmail.com
Production Asian Society of Human Services Press
Faculty of Education, University of the Ryukyus, 1 Senbaru, Nishihara, Nakagami, Okinawa, Japan
FAX: +81-098-895-8420 E-mail: ashs201091@gmail.com

Asian Journal of Human Services
VOL.15 October 2018

CONTENTS

ORIGINAL ARTICLES

SHORT PAPERS

REVIEW ARTICLES

Published by
Asian Society of Human Services
Okinawa, Japan