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BRIEF COMMUNICATION

Nursing Students' Perceived Disaster Preparedness and Response

Pilot study in Oman

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abstract: ***Objectives:*** This study aimed to assess the perceived level of disaster preparedness and response among nursing students in Oman, as the country is disaster prone and experiences disasters every three to five years. ***Methods:*** A descriptive cross-sectional pilot study was conducted from May to June 2019 using a stratified cluster sampling method among nursing students recruited from two government nursing colleges in Muscat, Oman. The Disaster Preparedness Evaluation Tool and Disaster Response Self-Efficacy Scale were used to assess the knowledge, skill, disaster management and self-efficacy in handling disasters. ***Results:*** A total of 51 students participated in this study. Most students (78.4%) had experienced a disaster while at home. Overall, the students had moderate levels of knowledge (3.17 ± 1.49), skill (3.12 ± 1.52), post-disaster management (3.22 ± 1.44) and self efficacy in responding to disaster (2.93 ± 1.16). ***Conclusion:*** Nursing students in Oman have experienced disasters and are willing to respond when called upon though they possess moderate knowledge and confidence in handling disasters.

Keywords: Disasters; Nursing Students; Pilot Study; Oman.

Due to its geographical location in the Arabian Peninsula, Oman has been reportedly experiencing a natural disaster every three to five years, especially earthquakes and tropical cyclones that result in flash floods.[1,2] The National Committee for Civil Defence oversees the management of disasters in Oman; they have also outlined the importance of training, education, public awareness and volunteerism during an emergency.[1]

Nurses constitute the largest group of responders when disasters strike. However, nursing schools have been reported to omit disaster training from their curricula, thereby leaving an untapped workforce of nursing students that can be utilised while dealing with disasters.[3] Studies have documented the lack of knowledge on disaster preparedness and management among nursing students though they possess a positive attitude to volunteering during disasters.[4–6] Disaster education and simulated drills have proven to enhance disaster preparedness and confidence among nursing students.[7–9] The ability of nursing students in Oman to handle disasters is unknown. Therefore, this study aimed to describe the level of disaster preparedness and response among nursing students in Oman as well as their level of perceived confidence in handling disasters. To the best of the authors' knowledge, this is the first study to do so in Oman.

Methods

This pilot study was conducted between May and June 2019, with the target population being nursing students enrolled in a degree program at two government nursing education institutions (Sultan Qaboos University and Oman College of Health Sciences) located in Muscat, Oman. Using a stratified cluster sampling method, with the clusters being the academic or cohort years, a random sample size of 51 students was selected across all the years of study.

The participants responded to a questionnaire containing items related to demographic data, types of disasters experienced, personal and institutional disaster preparedness and willingness to volunteer during a disaster. Other questions were adopted from the Disaster Preparedness Evaluation Tool (DPET) and the Disaster Response Self-Efficacy Scale (DRSES).[10,11] The DPET comprises 47 items assessing disaster preparedness, which are categorised into three subscales (post-disaster management, disaster knowledge and skills) using a 6-point Likert scale (1 is strongly disagree and 6 is strongly agree). The tool was reported to have acceptable validity and high internal consistency with a Cronbach's alpha of 0.90.

The DRSES examines the self-efficacy in disaster response using 19 items that are categorised into four

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Table 1: Characteristics of nursing students, personal and institutional disaster plans and disasters likely to occur in Muscat, Oman (N = 51)

Characteristic	n (%)
Gender	
Male	2 (3.9)
Female	49 (96.1)
Marital status	
Single	49 (96.1)
Married	2 (3.9)
Year of study	
Year 1	6 (11.8)
Year 2	33 (64.7)
Year 3	11 (21.6)
Year 4	1 (2)
Attendance of special courses/education on disaster	
Yes	14 (27.5)
No	37 (72.5)
Attendance of disaster course outside their university/ institution	
Yes	16(31.4%)
No	35(68.6%)
Consider taking another disaster course in the future	
Yes	29 (56.9)
No	11 (21.6)
Undecided	11(21.6)
Knowledge on the disaster preparedness of his/her university	
Yes	22 (43.1)
No	21 (41.1)
Undecided	8 (15.7)
Knowledge on the availability of his/her university's disaster management plan	
Yes	19 (37.3)
No	15 (29.4)
Don't Know	17 (33.3)
Opinion on the need for a structured disaster management plan in the university	
Yes	38 (74.5)
No	5 (9.8)
Don't Know	8 (15.7)
Have specific delineated roles to perform during a disaster	
Yes	6(11.8%)
No	16(31.4%)
Unsure	29(56.9%)
Perceived disaster role based on university disaster plan	
Caregiver	28 (54.9)
Triage	9 (17.6)
Manager	10 (19.6)
Perceived role that could be performed	
yes	13 (25.5%)
No	38 (74.5%)
Role of institution in disaster preparedness	
Provide disaster specific course/education	46 (90.2%)
Others	5 (11.8%)
Personal experience with disaster	
At home	40 (78.4)
At work	3 (5.9)
Travelled to respond to a disaster	3 (5.9)
No	5 (9.8)
Willingness to report to the university as a volunteer during disaster	
Not at all	11 (21.6)
Probably not	4 (7.8)
Possibly	28 (54.9)
Probably	5 (9.8)
Definitely	3 (5.9)
Requirements for being available to report to the university during a disaster*	
Transport	31 (60.8)
Communication	39 (76.5)
Compensation	28 (54.9)
Type of disaster likely to occur*	
Infectious disease outbreaks (severe acute respiratory syndrome/avian flu, tuberculosis)	41 (80.4)
Extreme weather conditions (heat or cold waves)	41 (80.4)
Food poisoning by human causes	41 (80.4)
Drought	43 (84.3)
Typhoon/hurricane/cyclone	45 (88.2)

**Percentages do not add up to 100% as multiple options could be chosen.*

subscales (assessment, on-site rescue, psychological nursing and role quality and adaptation) and uses a 5-point Likert scale (1 is no confidence at all and 5 is complete confidence). The scale was reported to have excellent validity and reliability with a Cronbach's alpha of 0.912. The original English versions of the tools were used in this study. The statistical software

Stata®, Version 13 (Stata Corporation, Texas, USA) was used to generate frequencies, means and standard deviations.

Approval for the study was obtained from the institutional review boards of both institutions (REC 2017-2018/10 and MoH/CSR/18/9479). All participants consented voluntarily with knowledge of the study, protection of their privacy through the use of coded numbers and no foreseeable risks for participating in the study.

Results

A total of 51 students participated in this study. The majority were female (96.1%) and had an average age of 25 years. Most of the participants were single (96.1%) and in their second year of study (64.7%). The majority of the participants (88.2%) reported that hurricanes/typhoons/cyclones were the disasters that were most likely to occur. Most participants (72.5%) had never participated in any course or received education in disaster preparedness. Only 27.5% had ever attended a special course on disaster management and 31.4% had ever attended a disaster course outside their institution. Yet, most were willing to take a course in disaster management (56.9%) if they were given the opportunity and some (43.1%) stated that their institution had information on how to prepare for a disaster. Only 37.3% reported the presence of a disaster management plan in their institution, while 29.4% denied the existence of such a plan; 33.3% were unsure whether their institution had a disaster management plan. Most participants (74.5%) affirmed that their institution needed a structured disaster management plan.

The majority of participants (52.9%) had no information on preparing themselves for a disaster; neither were they (56.9%) even sure of which role they could play in the case of a disaster. However, 54.9% felt that they could perform the role of a caregiver, 17.6% felt that they could perform a triage role and only 19.6% believed that they could perform a managerial role. The majority (74.5%) reported that they were unable to perform any role during a disaster. Almost all participants (90.2%) reported that their institution should offer a disaster-specific course to prepare them for disasters. Most of the participants (70.6%) were willing to report to the university as a volunteer during a disaster. However, 60.8% reported needing transport, while 76.5% reported that they would require communication equipment to stay in touch with their family; 54.9% reported that they would require compensation if they were to volunteer in a disaster response. It was also observed that the majority of the students (78.4%) had experienced a disaster while at home [Table 1].

Table 2: Participants' overall responses to the Disaster Preparedness Evaluation Tool and Disaster Response Self-Efficacy Scale

DPET subscale	Mean ± SD
Post-disaster management	3.22 ± 1.44
Disaster knowledge	3.17 ± 1.49
Disaster skill	3.12 ± 1.52
DPET composite score	3.18 ± 1.48
DRSES subscale	
Disaster assessment competency	2.87 ± 1.08
Disaster emergency rescue competency	2.92 ± 1.15
Disaster psychological nursing competency	2.86 ± 1.19
Disaster role quality and adaptation competency	3.09 ± 1.25
DRSES composite score	2.93 ± 1.16

DPET = Disaster Preparedness Evaluation Tool; SD = standard deviation; DRSES = Disaster Response Self-Efficacy Scale.
Reproduced with permission from Al Khalaileh et al. and Li et al.[10,11]

Overall, the participants had moderate knowledge of disaster management (3.17 ± 1.49), moderate skill in handling disaster management (3.12 ± 1.52) and moderate preparedness of post-disaster management (3.22 ± 1.44). Overall, the level of disaster preparedness and management of the students was at a moderate level (3.18 ± 1.48). All participants had moderate confidence in disaster assessment competency (2.87 ± 1.08), disaster emergency rescue competency (2.92 ± 1.15), disaster psychological nursing competency (2.86 ± 1.19) and disaster role quality and adaption competency (3.09 ± 1.25), which translated into an overall moderate self-efficacy in disaster response (2.93 ± 1.16) [Table 2].

Discussion

The majority of the nursing students in this study had experienced a disaster while at home with cyclones/hurricanes/typhoons being reported as the main disasters experienced, thereby affirming earlier reports that Oman is indeed a disaster-prone area.[1–3] Consequently, almost all students wanted their institution to add a disaster course to their curriculum as reported in another study.[12] Nursing educators have been encouraged to prepare degree nurses with the minimal knowledge and skill appropriate for disaster response by adjusting their curricula and meeting the increased need for education and training in disaster nursing.[7,8,13]

Coincidentally, most of the students reported their willingness to report to the university as volunteers during a disaster as noted in other studies.[4,6,13] Academic and clinical disaster preparedness is critical to enhancing the safety and competence of students, which directly affects their willingness to participate in an emergency. However, over half of the nursing students wanted compensation for volunteering in a disaster. It was found that not all nursing students are willing to respond to chemical, biological or radiological disasters due to fear of personal risk, personal priorities and the unavailability of personal protective equipment, education and prior disaster training.[7,12,13]

Overall, the participants reported having a moderate level of knowledge, skill and preparedness for dealing with disasters and their management, which was similar to a previous study.[14] Specifically, they had low knowledge of emergency planning in their community and low awareness about classes on disaster preparedness and management being offered at their institute; furthermore, they also lacked skills in using the local emergency response systems. Studies have demonstrated the effectiveness of relevant knowledge and skill acquired by nursing students after disaster training, thereby highlighting the need to include it in nursing curricula.[3,7] Most participants denied or were unaware of the presence of an institutional disaster management plan. Subsequently, the nursing students also stated that they did not have a personal/family emergency plan as similarly reported in another study.[10] This combination predisposes the nursing students to a high-risk situation. Information dissemination and plan translation is a significant aspect of disaster planning even for students and this should be emphasised.

Generally, the nursing students had a moderate level of self-efficacy in disaster management; moderate levels of self-efficacy were seen across all three subscales of the DPET. Based on social cognitive theory, previous performances and vicarious experiences in certain tasks such as disaster response are important for gaining a sense of self-confidence.[15] In the current study, a lower rating was expected since most of the participants were in the early years of nursing education and had never personally handled a disaster. Disaster self-efficacy is an important predictor of actual disaster response; thus, measures to increase disaster self-efficacy in nursing students are warranted. Nursing education plays an important role in fostering disaster competence and confidence in responding to emergency and disastrous events by incorporating disaster-related content into the nursing curriculum using simulated disaster drills, first aid and life support training.[3,7,16] In Oman, there is a well-established emergency medical service. However, nursing students can be modelled as future responders by their faculty and clinical preceptors during disaster drills to provide them with an opportunity for self-preparedness. This study may serve as a platform for future research in a nation that is increasingly experiencing natural storms, such as Oman, which was previously ill-prepared to handle the cyclone Gonu that ravaged the country.

Conclusion

Nursing students in Oman have experienced disasters, especially cyclones. Despite this, they have moderate disaster preparedness and confidence to volunteer as responders. Though they are willing to respond, they lack vital information and skills that are not incorporated into their nursing curriculum. It is imperative that nursing students are included in regular disaster drills and simulations to familiarise themselves with institutional and personal disaster preparedness. The practice of volunteering during disasters without the need for compensation in any form should be strongly emphasised during training since nursing is grounded in altruism, compassion and care.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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AUTHORS' CONTRIBUTION

JKK, SA and LLL conceived the original idea of the study, RW performed the computations and analysis of the data. JKK, RW, SA, LLL, AM, SAS and JASA contributed to the discussion of results, provided critical feedback and shaped the final version of the manuscript. JKK supervised the project. All authors approved the final version of the manuscript.

References

1. Al-Shaqsi SZ. Emergency management in the Arabian Peninsula: A case study from the Sultanate of Oman. From: http://pacdaoman.gov.om/images/pdf/research/DrSultan-Al-shaqsi.pdf Accessed: Dec 2020.
2. Al-Shaqsi S. Care or cry: Three years from Cyclone Gonu. What have we learnt? Oman Med J 2010; 25:162–7. https://doi.org/10.5001/omj.2010.50.

3. Achora S, Kamanyire JK. Disaster preparedness: Need for inclusion in undergraduate nursing education. Sultan Qaboos Univ Med J 2016; 16:e15–19. https://doi.org/10.18295/squmj.2016.16.01.004.

4. Yonge O, Rosychuk RJ, Bailey TM, Lake R, Marrie TJ. Willingness of university nursing students to volunteer during a pandemic. Public Health Nurs 2010; 27:174–80. https://doi.org/10.1111/j.1525-1446.2010.00839.x.

5. Schmidt CK, Davis JM, Sanders JL, Chapman LA, Cisco MC, Hady AR. Exploring nursing students' level of preparedness for disaster response. Nurs Educ Perspect 2011; 32:380–3. https://doi.org/10.5480/1536-5026-32.6.380.

6. Özpulat F, Kabasakal E. Knowledge levels of nursing students on disaster nursing and their state of disaster preparedness. Int J Med Res & Health Sci 2018; 7:165–74.

7. Alim S, Kawabata M, Nakazawa M. Evaluation of disaster preparedness training and disaster drills for nursing students. Nurse Educ Today 2015; 35:25–31. https://doi.org/10.1016/j.nedt.2014.04.016.

8. Grochetdreis T, De Jong N, Harenberg N, Görres S, Schröder-Bäck P. Nurses' roles, knowledge and experience in national disaster pre-paredness and emergency response: A literature review. South East Eur J Public Health 2016; 7:1–19. https://doi.org/10.4119/UNIBI/SEEJPH-2016-133.

9. Kalanlar B. Effects of disaster nursing education on nursing students' knowledge and preparedness for disasters. Int J Disaster Risk Reduct 2018; 28:475–80. https://doi.org/10.1016/j.ijdrr.2017.12.008.

10. Al Khalaileh MA, Bond AE, Beckstrand RL, Al-Talafha A. The Disaster Preparedness Evaluation Tool: Psychometric testing of the classical Arabic version. J Adv Nurs 2010; 66:664–72. https://doi.org/10.1111/j.1365-2648.2009.05208.x.

11. Li HL, Bi RX, Zhong QL. The development and psychometric testing of a Disaster Response Self-Efficacy Scale among undergraduate nursing students. Nurse Educ Today 2017; 59:16–20. https://doi.org/10.1016/j.nedt.2017.07.009.

12. Gershon RR, Magda LA, Canton AN, Riley HE, Wiggins F, Young W, et al. Pandemic-related ability and willingness in home healthcare workers. Am J Disaster Med 2010; 5:15–26. https://doi.org/10.5055/ajdm.2010.0002.

13. Liou SR, Liu HC, Lin CC, Tsai HM, Cheng CY. An exploration of motivation for disaster engagement and its related factors among undergraduate nursing students in Taiwan. Int J Environ Res Public Health 2020; 17:3542. https://doi.org/10.3390/ijerph17103542.

14. Cusack L, Arbon P, Ranse J. What is the role of nursing students and schools of nursing during disaster? A discussion paper. Collegian 2010; 17:193–7. https://doi.org/10.1016/j.colegn.2010.09.006.

15. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. Psychol Rev 1977; 84:191–215. https://doi.org/10.1037//0033-295x.84.2.191.

16. Kılıç N, Şimşek N. The effects of psychological first aid training on disaster preparedness perception and self-efficacy. Nurse Educ Today 2019; 83:104203. https://doi.org/10.1016/j.nedt.2019.104203.