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N.M. Al-Ali [1] and A.H. Abu Ibaid [2]

ABSTRACT This survey in primary health-care centres in north Jordan aimed to assess health-care providers' perceptions of their knowledge, skills and preparedness for disaster management. A multistage random sample was used to recruit nurses and physicians from 57 health centres. A total of 207 participants completed the Arabic version of the Disaster Preparedness Evaluation Tool. Participants perceived themselves as having moderate preparation for disaster management [mean score 74.9 (SD 21.6)], moderate knowledge [mean 49.9 (SD 12.3)] and moderate to weak skills in disaster management [mean 35.3 (SD 12.7)]. Significant differences were revealed in participants' perceptions of their disaster preparedness, knowledge and skills according to their sex, specialty and exposure to a real disaster situation. Further education and training courses are needed to enhance providers' preparedness for disaster management in Jordan.

Perception des prestataires de soins de santé en matière de connaissances, de compétences et d'état de préparation à la gestion des catastrophes dans des centres de soins de santé primaires en Jordanie

RÉSUMÉ La présente enquête menée dans des centres de soins de santé primaires au nord de la Jordanie visait à évaluer les perceptions des prestataires de soins de santé quant à leurs connaissances, compétences et état de préparation en matière de gestion des catastrophes. Un échantillon aléatoire à plusieurs degrés a été utilisé pour recruter des membres du personnel infirmier et des médecins dans 57 centres de santé. Au total, 207 participants ont rempli la version en langue arabe de l'outil d'évaluation de l'état de préparation aux catastrophes (Disaster Preparedness Evaluation Tool). Les participants se percevaient comme étant modérément préparés à la gestion d'une catastrophe (score moyen 74,9 [E.T. 21,6]), avec un niveau de connaissances moyen (moyenne 49,9 [E.T. 12,3]) et des compétences moyennes à faibles pour la gestion d'une catastrophe (moyenne 35,3 [E.T. 12,7]). Des différences importantes se sont dégagées dans la perception des participants de leur état de préparation, de leurs connaissances et de leurs compétences en fonction de leur sexe, de leur spécialité et de leur exposition à une véritable situation de catastrophe. Des programmes d'enseignement et de formation sont nécessaires pour améliorer l'état de préparation des prestataires à la gestion des catastrophes en Jordanie.

[1]Community and Mental Health Department, Faculty of Nursing, Jordan University of Science and Technology, Irbid, Jordan (Correspondence to N.M. Al-Ali: nmali@just.edu.jo). [2]Grants and Development Department, St John Eye Hospital Group, Gaza, Palestine.

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Introduction

Disasters—defined as "a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources" (1–3)— are overwhelming to hospital and emergency services. In recent decades more attention has been given to planning the health-care response to natural and man-made disasters (3–7). Health-care providers (HCPs), including nurses and physicians, are critical agents in any disaster management plan, and need to be actively involved and ready to respond to health threats. HCPs are the first line of emergency defence with the goal of delivering an acceptable quality of care while saving as many lives as possible (8). They must also coordinate with public safety and emergency management personnel, legislators and policy-makers. Yet data from recent disasters showed that there is a gap in education and training of HCPs at all levels, at the personal as well as the system level (9–13). Worldwide, the International Council of Nurses and the World Health Organization recognize the urgent need for building capacities of HCPs in

disaster management in order to protect populations, decrease the number of injuries and deaths, and to maintain the overall health of the community and the functioning of health systems (6). Although there are some initiatives from a range of organizations and universities to develop competencies in disaster management for health professionals and other emergency responders (14), little effort has been put into the integration of these competencies across health specialties and professions that have a lead in disaster medicine and public health preparedness. Such competencies need to be set within an educational framework, so that educators can tailor learning objectives and curricula to fit the needs of HCPs in disaster management (15).

Jordan is located in a region that is susceptible to natural and man-made disasters. In 1991 Jordan established the Disaster Risk Reduction Programme aiming to minimize the outcome of natural disasters by preparing to mitigate and respond effectively to the risks. Following terrorist attacks in 2005 that resulted in 57 deaths and 115 injuries (16), Jordan established the National Centre for Security and Crisis management (NCSCM) which became governed by law in 2009. The NCSCM deals with all types of crises by managing a coordinated response and recovery operation (17). In recent years Jordan has been facing an emerging refugee crisis. As of May 2013, Jordan hosts more than 470 000 Syrian refugees displaced as a result of the ongoing conflict in Syria, a number that has increased the demand for essential health services, overwhelming health systems and their institutions and rendering HCPs unable to provide the necessary interventions (18).

As yet, very little is known about what knowledge, skills and facilities or professional competencies in disaster management are needed in Jordan. This information is critical in identifying the competencies needed for all HCPs in times of disaster, and to integrate disaster management competencies into medical and nursing curricula in Jordanian educational programmes. Furthermore, as part of developing effective national response plans, assessing the knowledge and skills of HCPs can help inform continuing education and innovative training and organizational development methods to enhance preparedness and skills and create a culture of organizational readiness among HCPs (19). The purpose of the current study in primary health care centres was to describe HCPs' perception of knowledge, skills and preparedness for disaster management. The study also sought to examine the influence of HCPs' characteristics (specialty, years of experience, exposure to disaster situations and previous training about disasters) on their perceptions of their preparedness for disaster management.

Methods

Study participants

Study participants were recruited from all health care centres located in the Northern region of Jordan. HCPs, including physicians, nurses and midwives were eligible to take part in this study.

At least 1 year experience for all HCPs was required, so that they were familiar with the policies and procedures applied in the practice setting. Physicians, nurses or midwives who were participating in an internship or training were excluded.

Approval from the institutional review board committee in Jordan University of Science and Technology and Scientific Research was obtained. The Ministry of Health was also approached to get permission before data collection.

A multi-stage random technique was used to recruit participants. A sample of 57 health care centres was selected randomly from the total of 124 centres distributed over 5 districts; all are categorized as comprehensive health care centres. After approval was obtained from the centres, the investigator approached the HCPs in the selected health care centres during their working hours. All HCPs who were available and were on duty at the time of data collection were approached. Each HCP was approached individually in their working area; HCPs who agreed to participate were asked to sign a consent form and complete the questionnaire after being given complete instructions about how to complete it. HCPs were then asked to place the completed questionnaire in the collection box in the directors' office. All questionnaires were collected the next day. All data were collected from May to July 2013.

Measures

The Modern Standard Arabic version of the Disaster Preparedness Evaluation Tool (DPET) was used to collect the data from HCPs. The Arabic version of the DPET is a valid and reliable instrument to measure nurses' preparation for disaster management (20). The questionnaire consists of 3 subscales: the pre-disaster preparedness scale consists of 25 items, with response options range from 1 to 6 (strongly disagree to strongly agree). These 25 items are then grouped into 3 categories: knowledge, disaster skills and personal preparedness. The second scale is the mitigation scale, which measures response to disaster and consists of 14 items; response choices also range from 1 to 6 (strongly disagree to strongly agree). The response items are grouped into 2 categories: knowledge and patient management. The third scale is the recovery stage of disaster and measures post-disaster response; it consists of 6 items with response options ranging from 1 to 6 (strongly disagree to strongly agree). The items are also grouped in 2 categories: knowledge and management. The final items are open-ended questions and demographic data, such as sex, age, level of education, years of experience and working hours per week.

The cut-off points used in this study were the same as those used by the original authors (21). Mean scores of items ranging from 1–2.99 reflect a weak perception of preparedness, 3–4.99 a moderate perception and 5–6 a strong perception. The Cronbach alpha for the current study

was 0.95 for the preparedness subscale, 0.87 for the knowledge subscale and 0.92 for the skills subscale.

Data analysis

Statistical analysis, including descriptive statistics (frequencies, measures of central tendency and dispersion) to describe participants' responses were performed for each individual item. Non-parametric tests (Mann–Whitney U-test and Kruskal–Wallis test) were used to assess the differences in responses between participants' demographic and educational variables (sex, specialty, years of experience, level of education, previous exposure to disaster situations and previous training about disasters) and their preparedness for disaster management, with P

Results

Of 281 participants approached, only 207 completed the survey (73.7% response rate). There were 95 nurses (45.9%), 56 physicians (27.1%) and 56 midwives (27.1%). The mean age of participants was 39.8 [standard deviation (SD) 10.8] years, range 22–65 years. Their educational background showed that 30.9% of participants held a bachelor degree in medicine, nursing or midwifery and 3.9% had a master's degree in medicine or nursing; 40.1% had a diploma in nursing and 19.3% a diploma in midwifery. On average participants worked 39 (SD 6.4) hours per week. The mean years of experience of the participants was 14.7 (SD 8.9) years, range 1–35 years (Table 1). When asked about exposure to and participation in a real disaster situation only 10.6% of HCPs reported having experience of a disaster.

The responses on the disaster preparedness subscale indicated that the majority of participants perceived themselves as being moderately prepared for disaster management; the mean of the total scores for each subscale was 74.9 (SD 21.6). The mean score of items ranged from 2.75 to 4.15 (Table 2). The disaster knowledge subscale results indicated that most of the participants perceived themselves as having a moderate knowledge of disaster management [mean 49.9 (SD 12.2)]. The mean scores of items in the knowledge subscale ranged from 3.34 to 4.48 (Table 3). The majority of participants perceived themselves as having moderate to weak skills of disaster management [mean 35.3 (SD 12.7)]. The mean score of items in the skills subscale ranged from 2.80 to 3.84 (Table 4).

Participants were asked about their sources of knowledge about disaster preparedness; 64 (31.0%) received their disaster knowledge and skills training in their undergraduate education, 27 (13.0%) in graduate education, 51 (24.6%) from continuing education courses and 78 (37.7%) through the administration of facility drills.

Table 5 presents HCPs' perceptions of their learning and educational needs in disaster management. The results show that 80.2% of participants wanted additional education about their role, scope of practice and skills in disaster situations and 67.6% needed further education regarding the potential risks in their communities in disaster situations. Moreover, 66.2% needed more education about resources in their communities, such as referral agencies, emergency contacts, chain of command and community shelters. Interestingly, 67.6% of participants expressed a need for disaster education regarding psychological interventions needed during the recovery stage of a disaster, such as managing acute stress disorder, crisis intervention as focused assessment, debriefing strategies and behavioural, cognitive and medication therapies.

We found significant differences between the sexes and their perceptions of preparedness in the 3 subscales (preparedness, skills and knowledge). There were significant differences between males and females in their perceptions of preparedness for disaster management (U = 3526, P = 0.014); male participants (mean rank 192.63) were more likely than female participants (mean rank 97.32) to perceive themselves as being prepared for disaster management. Male and female participants also varied in their perception of their skills (U = 3696, P = 0.043) and knowledge of disaster management (U = 3543, P = 0.016). Males were more likely than females to perceive themselves as having adequate skills and knowledge about disaster management (Table 6).

The results of this study revealed significant differences in participants' previous exposure to a real disaster situation over their career in relation to their perceptions of preparedness to disaster management (U = 1185.5, P = 0.002). Participants who had ever participated in a real disaster situation (mean rank = 135.61) were more likely to perceive themselves as prepared for disaster management than who did not experience a disaster (mean rank = 100.81). However, there were no significant differences in participants' perceptions of their skills (U = 1468.5, P = 0.202) and knowledge (U = 1620.5, P = 0.506). Furthermore, participants who had had training drills in the workplace were more likely than who had not to perceive themselves as well prepared (U = 1722, P

Table 6 presents a comparison of differences between participants' specialty and their perception of disaster preparedness. The Kruskal–Wallis test indicated a statistically significant difference between participants' specialty and their perception of their own disaster preparedness (χ^2 2 = 8.679, P = 0.013) and disaster knowledge (χ^2 2 = 7.462,

P = 0.024). Follow-up tests (Mann–Whitney U) were conducted to evaluate pairwise differences among the 3 groups, controlling for type I error across tests by using the Bonferroni approach.

The results indicated

statistically significant differences between nurses and midwives in their perceptions of knowledge (U = 2028, P = 0.015). Nurses (mean rank 82.65) perceived themselves as having more knowledge than did midwives (mean rank 64.71). The results also revealed significant differences between nurses and physicians (U = 2147, P = 0.04). Physicians (mean rank 85.16) were more likely than nurses (mean rank 70.6) to perceive themselves as prepared for disaster management. However, there were no significant differences between participants' specialty and their perceptions of their disaster skills ($\chi^2_2 = 2.048$, P = 0.359).

Discussion

This survey aimed to identify the degree to which HCPs perceived themselves as having preparedness, knowledge and skills for disaster management and to investigate factors affecting perceptions of preparedness. To our knowledge, this is the first such study in Jordan among HCPs in primary health care centres. The study revealed that participants perceived themselves as being moderately prepared, having moderate knowledge and having moderate to weak skills for disaster management. These results are congruent with previous literature indicating that the majority of HCPs, including nurses and physicians in primary and secondary health care facilities, have moderate to weak perception of their preparedness for disaster management (21–27).

HCPs' perceptions of themselves as being only moderately prepared for disaster management could be linked to the lack of awareness of emergency management plans and operational emergency procedures in their workplaces, lack of experience in assisting disaster victims and lack of disaster training programmes in their practice. A previous study among nurses showed that participants had a low perception of their preparedness for disaster management (28). Hence, for effective disaster training and educational programmes, HCPs' awareness and understanding should be fully explored and described to present a real picture of the current status of their disaster preparedness (29).

The results of this study indicated that HCPs perceived their knowledge of disaster management to be moderate. A similar result was revealed by Al Khalaileh et al. among Jordanian nurses in hospitals (21). It is worth mentioning that disaster management is a new topic of concern within Jordan and some initiatives are just emerging from different organizations to highlight the concern and to start planning for disasters. Educational institutions have recently started to integrate disaster management into their curricula and some universities have launched an emergency medicine programme. Similar results are also reported by other studies in the literature (23,30,31). These results showed that the target

primary health care centres were not equipped with efficient and expert HCPs and this could be due to a lack of interest in the subject of disaster management in primary health care centres and to the absence of documented disaster frameworks and systems to prepare HCPs for disaster management (30).

Participants in this study perceived themselves as having only moderate to weak skills in disaster management, and this finding is congruent with many previous studies in other countries (21,23,28). Feeling incompetent in disaster skills is due to the lack of involvement of HCPs in competency-based training to enhance their skills in managing disasters. In our study, most of the participants considered that training courses on managing all types of disasters and introducing practical guidelines for disaster management was the first priority for introduction in the national curricula. It also reflects a major concern about training needs among participants.

In this study physicians were more likely than nurses to perceive themselves as prepared for disaster management. This result is inconsistent with findings reported by Rassin et al. among HCPs in Israel who found that nurses perceived themselves as having more knowledge and skills than did physicians in managing chemical and biological disasters (26). Our findings may be explained by the more extensive training opportunities for physicians than for nurses and other HCPs in Jordan. The priority for training is for physicians over other HCPs, since all health care centres in Jordan are headed by physicians and the heads of committees for disaster planning are mainly physicians. Continuing education programmes and disaster drills also target only physicians.

The results of our study also revealed that male participants were more likely to perceive themselves as being prepared, having better knowledge and having better skills than did females. This result is consistent with the study of Crane et al. in Texas, United States, who found in a logistic regression model that male participants were 1.32 times more likely to be prepared for managing bioterrorism disasters than were female participants (23). Significant differences between participants who had regular disaster or emergency drills in their workplace and their perceptions of disaster preparedness were also revealed. A similar result was also shown by Crane et al., who found that HCPs who had prior training were 1.33 times more likely to be ready to deal with bioterrorism disasters than those who had not had training (23). Hence, disaster drills and training programmes are an important way to enhance the preparedness of HCPs for managing disasters.

Although this study reported important data regarding HCPs' preparedness in disaster management—a critical concern that is not well researched in Jordan—a few limitations of the study could interfere with the generalizability of the results. Only HCPs in primary health care

centres were involved in the study, and they were not representative of all HCPs, especially midwives and physicians, since nurses comprised the largest proportion of the study participants. Data were collected using a self-reported questionnaire, which might be subjective and could reflect personal bias. Also with such data collection methods, there is no proof of actual competencies in disaster methods and techniques. The unwillingness of HCPs to take part in the study resulted in a response rate only around 74%. Participants had to be reminded frequently to complete the questionnaires, which required the researchers to be physically present and ensure that the questionnaire was completed. Problems in responding to the survey questionnaire may have been due to time constraints.

Conclusions

The purpose of this study was to describe the perceptions of knowledge, skills and preparedness for disaster management of HCPs in primary health care centres in Jordan. The results of this study showed that HCPs perceived themselves as having moderate to weak preparedness, knowledge and skills for disaster management. Significant differences were also revealed between participants' perception of disaster preparedness by sex, specialty and exposure to a real disaster. Participants in this study suggested that further disaster education, training courses and facility drills would enhance their preparedness for disaster management. The majority of participants needed further knowledge about their role in disasters, the risks and resources in their communities, chemical and biological agents, and the required methods and interventions to respond to the psychological impacts of a disaster.

The results of this study highlight the importance of integrating disaster management into educational programmes and the curricula of HCPs in Jordan. Their preparedness for disaster management should be emphasized and incorporated throughout their professional education, during their undergraduate, postgraduate, continuing and in-service training.

The results of this study have many implications for practice, education and research. Assessing the perception of HCPs about their preparedness, knowledge and skills for disaster management is the first step to obtaining baseline data about their capability to respond to disasters in their workplaces. Effective disaster training and education initiatives rely on inputs from the target population before designing the goals and objectives for such initiatives. The findings of this study have determined critical areas of disaster preparedness, disaster training and education to address the needs of HCPs in primary health care settings for efficient and timely disaster response. The results of this study can guide primary health care planners and coordinators in developing emergency plans and guidelines.

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