Health-care providers' perception of knowledge, skills and preparedness for disaster management in primary health-care centres in Jordan

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تصوُّر مقدمي الرعاية الصحية للمعارف والمهارات والاستعدادات الخاصة بإدارة الكوارث في مراكز الرعاية الصحية الأولية في الأردن

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الخلاصة: لقد هدف هذا المسح – الذي أجري في مراكز الرعاية الصحية الأولية في شمال الأردن – إلى تقييم تصورات مقدمي الرعاية الصحية المتعلقة لمعارفهم ومهاراتهم واستعداداتهم الخاصة بإدارة الكوارث. فتم استخدام عينة عشوائية متعددة المراحل لاختيار ممرضات وأطباء من 57 مركزاً صحياً. وقام ما مجموعه 207 مشاركاً بملء النسخة العربية من أداة تقييم الاستعداد للكوارث. فاعتبر المشاركون أنفسهم من ذوي الاستعداد المتوسط لإدارة الكوارث [متوسط الدرجات المحرَزة 74.9 (SD21.6)]، والمعارف المتوسطة [المتوسط: 49.9 (SD12.3)]، والمهارات المتوسطة إلى الضعيفة في مجال إدارة الكوارث [المتوسط: 35.3 (SD12.7)]. وتم الكشف عن وجود اختلافات كبيرة في تصورات المشاركين لاستعدادهم للكوارث ولمعارفهم ومهاراتهم المتعلقة بها وفقاً لجنسهم وتخصصهم وتعرضهم لكارثة حقيقية. هناك حاجة إلى مزيد من الدورات التعليمية والتدريبية من أجل تعزيز استعداد مقدمي الرعاية لإدارة الكوارث في الأردن.

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.

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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 $P < 0.05$ set as the level of statistical significance.

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

Table 1 Demographic characteristics of the study participants (*n* = 207)

Characteristic	No.	%
Sex		
Male	62	30.0
Female	145	70.0
Specialty		
Physician	56	27.0
Nurse	95	45.9
Midwife	56	27.1
Level of education		
Doctoral degree (PhD)	12	5.8
Master's degree	8	3.9
Bachelor degree	64	30.9
Diploma in nursing	83	40.1
Diploma in midwifery	40	19.3
Previous exposure to and participation in a real disaster situation		
Yes	22	10.6
No	185	89.4

Table 2 Health-care providers' (*n* = 207) perceptions of their preparedness for disaster management

Items	Mean (SD) score
I know the limits of my knowledge, skills and authority as a health care provider to act in disaster situations, and I would know when I exceed them	3.92 (1.43)
I can identify possible indicators of mass exposure evidenced by a clustering of patients with similar symptoms	3.97 (1.38)
I can manage the common symptoms and reactions of disaster survivors that are of affective, behavioural, cognitive and physical nature	3.66 (1.40)
I am familiar with psychological interventions, behavioural therapy, cognitive strategies, support groups and incident debriefing for patients who experience emotional or physical trauma	3.64 (1.43)
I am able to describe my role in the response phase of a disaster in the context of my workplace, the general public, media, and personal contacts	3.62 (1.44)
I am familiar with the main groups (A, B, C) of biological weapons (anthrax, plague, botulism, smallpox, etc.), their signs and symptoms, and effective treatments	3.23 (1.53)
I feel confident recognizing differences in health assessments indicating potential exposure to biological or chemical agents	3.13 (1.49)
As a health care provider, I would feel confident in my abilities as a direct care provider and first responder in disaster situations	3.49 (1.37)
As a health care provider, I would feel confident as a manager or coordinator of a shelter	3.12 (1.44)
As a health care provider, I would feel reasonably confident in my abilities to be a member of a decontamination team	3.86 (1.40)
In case of a bioterrorism/biological or chemical attacks, I know how to perform focused health history and assessment, specific to the biological or chemical agents that are used	3.01 (1.40)
As a health care provider, I feel reasonably confident that I can care for patients independently in a disaster situation	3.77 (1.42)
I am familiar with the organizational logistics and roles among local and national agencies in disaster response situations	2.75 (1.38)
I would feel confident implementing emergency plans, evacuation procedures, and similar functions	3.66 (1.46)
I would feel confident providing patient education on stress and abnormal functioning related to trauma	4.15 (1.39)
I would feel confident providing education on coping skills and training for patients who experience traumatic situations so they are able to manage themselves	3.90 (1.37)
I am able to differentiate the signs and symptoms of acute stress disorder and PTSD	3.88 (1.36)
I am familiar with what the scope of my role as a health-care provider in a post-disaster situation would be	3.70 (1.40)
I participate in peer evaluation of skills on disaster preparedness and response	3.43 (1.51)
I am familiar with how to perform focused health assessment for PTSD	3.52 (1.43)
I feel confident managing (caring, evaluating) emotional outcomes for acute stress disorder or PTSD following disaster or trauma in a multi-disciplinary way such as referrals, and follow-ups and I know what to expect in ensuing months	3.49 (1.39)

PTSD = post-traumatic stress disorder; SD = standard deviation.

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

Table 3 Health-care providers' (*n* = 207) perceptions of their knowledge about disaster management

Items	Mean (SD) score
I participate in disaster drills or exercises at my workplace (clinic, hospital, etc.) on a regular basis	4.20 (1.59)
I have participated in emergency plan drafting and emergency planning for disaster situations in my community	3.87 1.58)
I know who to contact (chain of command) in disaster situations in my community	4.48 (1.39)
I participate in one of the following educational activities on a regular basis: continuing education classes, seminars or conferences dealing with disaster preparedness	3.68 (1.67)
I read journal articles related to disaster preparedness	4.04 (1.43)
I am aware of classes about disaster preparedness and management that are offered, for example at my workplace, the university or community	4.02 (1.51)
I would be interested in educational classes on disaster preparedness that relate specifically to my community situation	4.24 (1.39)
I find that the research literature on disaster preparedness and management is easily accessible	2.99 (1.49)
I find that the research literature on disaster preparedness is understandable	3.34 (1.44)
Finding relevant information about disaster preparedness related to my community needs is an obstacle to my level of preparedness	3.65 (1.38)
I know where to find relevant research or information related to disaster preparedness and management to fill in gaps in my knowledge	3.56 (1.49)
I have a list of contacts in the medical or health community in which I practice I know referral contacts in case of a disaster situation (for example, health department)	4.13 (1.50)
In case of a disaster situation I think that there is sufficient support from local officials on the county, region or government level	3.65 (1.56)

SD = standard deviation.

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 < 0.001), having more skills (U = 1304, P < 0.001) and more knowledge (U = 1370, P < 0.001) about disaster management (Table 6).

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 (χ^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.

Table 4 Health-care providers' (*n* = 207) perceptions of their skills in disaster management

Items	Mean (SD) score
I consider myself prepared for the management of disasters	3.17 (1.55)
I participate/have participated in creating new guidelines, emergency plans, or lobbying for improvements on the local or national level	2.80 (1.59)
I would be considered a key leadership figure in my community in a disaster situation	3.43 (1.58)
I am aware of what the potential risks in my community are (e.g. earthquake, floods, terror, etc.)	3.84 (1.50)
In case of a bioterrorism/ biological or chemical attacks, I know how to use personal protective equipment	3.09 (1.61)
In case of a bioterrorism/biological or chemical attacks I know how to execute decontamination procedures	2.91 (1.50)
In a case of bioterrorism/biological or chemical attacks I know how to perform isolation procedures so that I minimize the risks of community exposure	3.00 (1.55)
I am familiar with the local emergency response system for disasters	2.97 (1.49)
I am familiar with accepted triage principles used in disaster situations	3.39 (1.57)
I have personal/family emergency plans in place for disaster situations	3.33 (1.55)
I have an agreement with loved ones and family members on how to execute our personal/family emergency plans	3.33 (1.54)

SD = standard deviation.

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

Table 5 Health-care providers' (*n* = 207) perceptions of their educational needs for disaster management

Items	No.	%
I need education about:		
My role (my scope of practice, skills) as a health-care provider in a disaster situation	166	80.2
What potential risks exist in my community in case of a disaster	140	67.6
Biological and chemical agents and ways to identify their signs and symptoms	141	68.1
Biological and chemical agents and their differential diagnosis and treatments	130	62.8
Resources in my community, such as agencies for referral health departments, emergency contacts, the chain of command and community shelters	137	66.2
Recovery state: acute stress disorder, PTSD and crisis intervention (focused assessment, debriefing strategies, and behavioural, cognitive or medication therapy)	140	67.6
I feel well-prepared for a disaster	34	70.0

PTSD = post-traumatic stress disorder.

Table 6 Analysis of differences in health-care providers' perceptions of their disaster preparedness, skills and knowledge, by sex, previous training and specialty

Variable	No.	Disaster preparedness		Disaster skills		Disaster knowledge	
		Mean rank	Statistical analysis	Mean rank	Statistical analysis	Mean rank	Statistical analysis
Sex							
Male	62	119.63	$U = 3526$, $P = 0.014$	116.89	$U = 3696$, $P = 0.043$	119.35	$U = 3543$, $P = 0.016$
Female	145	97.32		98.49		97.43	
Previous exposure to real disaster							
Yes	22	142.46	$U = 1722$, $P < 0.001$	152.90	$U = 1304$, $P < 0.001$	151.24	$U = 1370$, $P < 0.001$
No	185	93.43		90.90		91.31	
Specialty							
Physician	56	122.12	$\chi^2_2 = 8.679$, $P = 0.013$	107.41	$\chi^2_2 = 2.048$, $P = 0.359$	113.38	$\chi^2_2 = 7.462$, $P = 0.024$
Nurse	95	102.09		107.75		109.35	
Midwife	56	89.12		94.22		85.54	

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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