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Knowledge, perceptions, attitudes and willingness to report to work in an earthquake: A pilot study comparing Canadian versus Israeli hospital nursing staff

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ABSTRACT

Background: Health practitioners are expected to respond effectively to an earthquake event and provide lifesaving treatment to an influx of casualties. Understanding the factors that may influence nurses' willingness to report (WTR) in different social contexts and preparedness approaches is crucial for improving preparedness of medical facilities.
Methods: A questionnaire based on a previously validated methodology was used to assess demographic characteristics, knowledge, perceptions, attitudes and WTR of nurses after an earthquake. The questionnaire was disseminated among a sample of 56 Israeli and 127 Canadian nurses, from two tertiary care hospitals, located in risk regions.
Results: WTR was generally higher among Canadian versus Israeli nurses (74% vs. 64%). Knowledge and perceptions of organizational-efficacy were generally higher among Israeli nurses. 'Concern for family's well-being' and 'professional commitment to care' were reported by the largest proportion of nurses as factors that might influence WTR. A common significant predictor of WTR among both samples was the belief that 'colleagues will also report to work'.
Conclusion: Although different preparedness approaches or emergency experience in Canada and Israel may cause differences in nurses' preparedness, some factors seem to be cross-cultural and may play a key role in increasing nurses' willingness to report after an earthquake.

1. Introduction

Canada and Israel are located in active seismic regions. Parts of Canada – mainly British Columbia (including the capital Victoria and the Vancouver metropolitan area which are densely populated areas), are located in a high seismic risk area (Natural Resources Canada, 2013). Similarly, Israel is situated along the Dead Sea Transform which, due to the country's relatively small size and high population density, poses a major threat to its population (Levi et al., 2010). Although severe earthquakes have not occurred in these regions in the last few decades, the threat of such a hazard is considered a potential and even inevitable scenario that may materialize in the imminent future (Allen et al., 2012; Insurance Bureau of Canada, 2013). Healthcare workers in both regions are expected to effectively manage such an event and provide life-saving medical services to an influx of casualties, despite a possible shortage of resources such as staff and supplies (Adini et al., 2006; American College of Emergency Physicians, 2005). The nursing staff has a crucial role in implementing the hospital's response plan and providing treatment for disaster victims (Hammad et al., 2011). Nevertheless, despite being frontline health practitioners both in routine and during emergencies, evidence suggests that nurses' preparedness levels are not optimal (Chapman and Arbon, 2008; Gebbie and Qureshi, 2002) due to lack of specific competencies such as knowledge and skills relevant to an effective emergency response (Hsu et al., 2006). These competencies serve as the foundation of disaster preparedness training, designed to improve an organization's preparedness and response capabilities (Collander et al., 2008).

The potential influx of patients during a disastrous earthquake scenario raises the key issue of absenteeism among essential workers

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such as healthcare workers, among them nurses. Nurses may be unable or unwilling to report to duty due to various reasons and causes, which might hinder the hospital's ability to provide patient-care surge capacity (Kaji et al., 2006). A better understanding of the mechanisms that formulate the basis of these concepts may contribute to reduced absenteeism in future disasters (Connor, 2014). Previous studies indicated that along with knowledge and skills, the perception of efficacy may also be related to WTR (Balicer et al., 2010, 2011). This can be explained by the basic premises of Bandura's theoretical model, which states that self-efficacy can positively influence peoples' expectations and behaviors. According to this theory, high self-efficacy affects one's ability to successfully cope and persist when confronting a threat and can be derived from four principal sources: successful performance; the experience of others; verbal persuasion; and physiological and emotional states (Bandura, 1997). Despite several recent studies that dealt with healthcare workers' WTR (Balicer et al., 2010; Cone and Cummings, 2006; Gershon et al., 2010; Goodhue et al., 2012; Masterson et al., 2009; Qureshi et al., 2005), few were specifically related to earthquakes (Ben Natan et al., 2014; Cone and Cummings, 2006).

Canada has experienced several large-scale emergency situations in recent years but most of the focus in disaster and emergency planning was towards man-made or technological disaster scenarios and not for natural disasters (Gomez et al., 2011; Lund et al., 2011). Similarly, the state of Israel gained extensive experience dealing with large-scale emergencies, but mostly in terrorism-related or armed conflicts events and not in natural disasters (Adini and Peleg, 2013; Adini et al., 2012). This may leave Canadian and Israeli healthcare workers inadequately prepared for an earthquake event. In addition, the implemented approaches to emergency preparedness in both countries may differ as they reflect past experiences and scenarios relevant to each region (Adini and Peleg, 2013; Adini et al., 2012; Gomez et al., 2011; Lund et al., 2011). Furthermore, the effect of cultural factors in the context of crisis management is unclear and needs to be addressed. Therefore, evaluating earthquake preparedness among nursing staff in Canada and Israel may facilitate identification of differences and similarities, and illustrate the complexity of this issue.

The aims of this study were: (1) to assess knowledge, perceptions, attitudes and WTR of nurses in Canada and Israel concerning earthquakes; and (2) to evaluate the relationship between these factors and willingness to report to work.

2. Materials and methods

2.1. Survey instrument and key measures

A structured, self-administered questionnaire was designed to assess nurses' demographic characteristics, knowledge, perceptions, attitudes and WTR in an earthquake scenario. The questionnaire was a modified version of a validated tool used to measure preparedness components concerning other emergency scenarios (Rokach et al., 2010; Schwartz et al., 2014; Soffer et al., 2011). The instrument's "face validity" was established through a literature review which focused on identifying relevant factors for each part of the questionnaire (e.g. knowledge items relevant to earthquake response) and by conducting an expert panel from the field of emergency management and response both in Canada and in Israel. The review encompassed both academic publications and emergency plans used by medical facilities to prepare for earthquakes. Information regarding demographics included gender, age, marital status, number of children residing at home, and professional seniority. The questionnaire was anonymous. Knowledge regarding different components of hospital response to an earthquake was measured through twelve multiple-choice questions, based on the comprehensive literature review and validated in both countries by emergency management professionals. Perceptions concerning an earthquake scenario were assessed through seven questions ($\alpha = 0.85$) regarding self-efficacy (three items, $\alpha = 0.71$) and organizational-efficacy (four items, $\alpha = 0.81$), using a 7-point Likert-type scale, ranging from 1 (I strongly disagree) to 7 (I strongly agree). A mean collective efficacy score was calculated for all seven items. In the last section, participants were asked about their WTR following an earthquake, their perceptions concerning the willingness of colleagues to report to work, and possible barriers (three items) and facilitators to WTR (two items). All seven questions in this section used a 7-point Likert-type scale. A mean collective score was calculated for each of these measures (barriers score and facilitators score). The questionnaire was pre-tested and piloted with a sample of 26 Israeli nurses, who were similar in their characteristics to the study population. Based on the participants' recommendations, minor modifications were integrated in order to improve the final version.

2.2. Study population and data collection

This study was conducted from December 2013 through March 2014 in two medical facilities, one in Canada and one in Israel. Inclusion criteria were: located in an area that will need facilities to admit and treat casualties should an earthquake occur, offer tertiary services, level 1 trauma centers, and have over 800 inpatient beds.

The Israeli sample was obtained through surveyors distributing the questionnaire according to a predefined list of ten wards. The questionnaires were delivered to the head nurse in each ward that distributed it to all nurses in the department; upon completion of the survey they were returned to the head nurse and to the study surveyors. The Canadian sample was obtained by distributing an online version of the questionnaire via email to hospital nurses. A minimum of 50 participants was required from each hospital.

The Institutional Review Board (IRB) of Ben-Gurion University of the Negev approved the study protocol and the final version of the questionnaire.

2.3. Statistical analysis

Bivariate analysis using Pearson correlation, t-test and chi-square tests were conducted to assess correlations, differences and similarities between the two hospital populations regarding each section of the questionnaire. Variables assessed by a 7-point Likert-type scale were categorized into either 'high' (5–7), 'moderate' (4) and low (1–3). Further analysis was conducted to assess the association between nurses' WTR, which was defined as the main dependent variable and other questions, in each group separately (Canadian and Israeli). Following this analysis, two separate, multivariable linear regression models were developed for each sample, in order to identify associations with selected predictors and WTR. The variables included in each model were determined by the preliminary analysis described above; variables significantly correlated to WTR (P-value < 0.05) were entered into the models. To avoid multicollinearity, the correlations between variables in the model were examined to ensure $r < 0.7$.

SPSS software package, version 20.0 (SPSS Inc., Chicago, IL) was used to perform the analyses.

3. Results

The questionnaire was distributed to 500 Canadian nurses and 150 Israeli nurses. A total of 56 Israeli and 127 Canadian nurses completed and returned the questionnaire (response rate of 25% among Canadians and 37% among Israelis). The demographic characteristics of both samples are presented in Table 1. The majority in both samples were female and married. Canadian nurses' mean age was 41 (SD = 10.5) years, 64% had no children, and they had a mean of 15 years of professional experience (SD = 10.9 years). Israeli nurses'