Case Study: Nurses' Preparedness for Disasters in a Crisis-Stricken Country: A Case Study in Afghanistan, in 2020

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ABSTRACT

Background: Nurses play an essential role in the hospital's response to accidents and disasters. Assessing nurses' preparedness is the starting point to improve and increase their preparedness for disasters. Therefore, this study aimed to investigate the preparedness of nurses of a 650-bed district hospital in Herat, Afghanistan in the face of disasters in 2020.

Materials and Methods: This was a cross-sectional study, and the study subjects included all nurses working in a 650-bed district hospital in Herat Province. The data collection tool was a standard questionnaire to determine the level of preparedness of nurses against accidents and disasters, which was localized. This questionnaire included three areas of knowledge, attitude, and performance. The maximum score in each of the domains was 100. To analyze the data, descriptive indicators, such as mean, median, standard deviation, and quartiles, and analytical methods such as independent t-test, 1-way analysis of variance, the Mann-Whitney and Friedman nonparametric tests, and the Spearman correlation coefficient-test were used.

Results: The Mean±SD scores obtained by the participants in each of the areas of knowledge, attitude, and performance (behavior) were 30±12, 81±12, and 40±7, respectively. The study's findings showed a statistically significant relationship between knowledge score and the duration of disaster education and management history. Also, a statistically significant association was observed between performance and variables of age, gender, marital status, education level, work experience, management history, duration of training received on disasters, and history of previous disaster exposure.

Conclusion: Considering that the preparedness of nurses participating in this study was lower than average in two of the three areas, the level of preparedness of nurses for disasters is low and undesirable and requires measures, such as holding regular theoretical and practical training courses to increase it.

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1. Introduction

Disaster causes the dysfunction of a society that leads to widespread human, economic or environmental damage. Coping with a disaster is beyond the ability of the affected community to use its available resources [1]. A review of data recorded by the World Center for Disaster Epidemiology Research shows that the number of disasters and their consequences has increased in recent years [2]. Disasters, regardless of whether they occur gradually or suddenly, have a devastating effect on the human and non-human components of society, leading to the loss of lives and properties [1, 3]. Research has shown that about 88% of all disaster deaths are related to natural disasters, and 83% of them occur in Asia, part of which is Afghanistan [4].

Although hazards are inevitable, by taking preventive measures, the negative consequences of hazards can be significantly reduced [5]. In at-risk societies, measures related to prevention, preparedness, and response at the level of health service providers, especially hospitals, are of particular importance [6]. At the hospital level, nurses, as the main body of the medical staff, play an essential role in the hospital's preparation and effective response to disasters [7-9]. Nurses' preparedness for catastrophe has always been one of the main components of all types of hospital disaster preparedness programs. The timely and effective response of the hospital to disasters depends on the preparedness of hospital staff, especially nurses, more than the medical and non-medical supplies and equipment needed for the response [10-12]. Nurses are at the forefront of caring for victims of accidents and disasters in hospitals and are the main providers of primary medical and emergency care services, such as triage and resuscitation [13-16]. Therefore, examining the level of disaster preparedness of nurses can be the starting point of any planning and design to improve and increase their disaster preparedness.

Although the research showed that no study in the field of disaster preparedness in Afghanistan, studies in this field had been conducted abroad. In one of these studies, Nakhaei et al. investigated the effect of an educational intervention on the preparedness of nurses in Birjand hospitals in Iran against accidents and disasters in 2018 [7]. This study showed that the mean score of nurses' preparedness immediately and one month after the intervention was significantly higher than before the intervention, and the mean score of attitude one month after the intervention was significantly higher than before the intervention. The researchers suggested that nursing managers hold continuous training courses with maneuvers to improve the preparedness of nursing staff. Other studies in this field include the study of Farajzadeh and associates [17]. This study was performed in two hospitals of Imam Khomeini and Social Security in Saqez City, Iran. This cross-sectional study was conducted on 257 nurses. This study showed that the level of nurses' preparedness was moderate. Considering the importance of nurses' preparedness for disasters and the lack of a study that examined the preparedness of nurses in hospitals in Afghanistan, we decided to assess the preparedness of nurses in a 650-bed district hospital in Herat in the face of accidents and disasters and related factors in 2020.

2. Materials and Methods

Afghanistan is a resilient but vulnerable country to disasters, and the probability of natural disasters in this country is very high. The most threatening Afghanistan disasters include natural and man-made disasters. Natural disasters include earthquakes, floods, avalanches, landslides and droughts, and man-made disasters, such as fires and deliberate explosions [18]. Afghanistan has 34 provinces, of which Herat is the largest province, after Helmand. This province is one of the areas with a high risk of natural and man-made disasters. Herat District Hospital is the highest level of referral for health services in Western Afghanistan. It is responsible for providing emergency medical services to the victims of various natural and man-made disasters in Herat City, 19 cities of Barat Province, and referrals from neighboring provinces [19].

The present research was a cross-sectional and descriptive-analytical study. The study subjects were nurses working in the clinical wards of a 650-bed district hospital in Herat in 2020. The study subjects consisted of all nurses of the hospital. Finally, 257 nurses were recruited who met the inclusion criterion, i.e., having at least one year of work experience. The exclusion criterion was the unwillingness to participate in the study.

In this study, to collect data, a questionnaire was used to determine nurses' preparedness for accidents and disasters. The validity and reliability of the questionnaire have already been proven in previous studies, including the study of Farajzadeh et al., which was performed on nurses of several hospitals in Iran [17]. Because the official language of Iran and Afghanistan is the same, the translation stage was removed from the localization process of this questionnaire, and only terminology edit was performed by a person who was familiar with the common idioms of two dialects of Persian (Persian and

Dari Persian). To ensure the validity of the questionnaire in Afghanistan, five health experts in emergencies and disasters in Afghanistan assessed and approved the validity of the questionnaire. The instrument's reliability was evaluated using a test-retest method among 20 participants. Based on the intraclass correlation coefficient of 0.91, the tool's reliability was also proven.

This questionnaire consisted of four parts. In the first part, the demographic characteristics of the study participants were measured. In the second part, their knowledge of accidents, disasters, and the crisis management cycle was measured, which included 20 questions. The maximum score in this section was 80. The third part was to determine the level of attitudes of the nurses about disasters and disaster preparedness programs, which included 20 questions scored on a 4-point Likert scale. The maximum score in this section was 80. The fourth section determined the occurrence or non-occurrence of necessary behaviors and actions and performance by the nurses to prepare, which included 2-choice (yes/no) questions. There were 25 questions in this section, and the maximum score was 100. For ease and possibility of comparison, at the time of data analysis, the maximum scores of the knowledge and attitude section, which was 80, were standardized and calculated based on the maximum score of 100.

Initially, descriptive statistical methods such as quartile, percentage, mean and median were used to describe the data. Then the data were analyzed using parametric statistical tests of independent t-test, 1-way analysis of variance, and the Pearson correlation coefficient-test. The nonparametric statistical tests included Mann-Whitney and Spearman correlation tests. SPSS software version 19 was used for data analysis.

3. Results

The demographic characteristics of the participants in the study are presented in Table 1.

Table 1 indicates that more than half of the study participants were men (56%). Most participants were mar-

Table 1. Demographic characteristics of the study participants

Variables		Mean±SD/ Median [Third Quarter - First Quarter]/ No.(%)
Age (y)		29.03±6.37 [25-32] 28
Work experience (y)		6.63±5.21 [3-9] 5
Duration of training received on disasters (h)		7.95±3.11 [0-0] 0
Gender	Male	144(56)
	Female	113(44)
Marital status	Single	74(29)
	Married	181(71)
Level of education	12th grade or community nurse graduate	15(6)
	Excellent nurse	181(70)
	Nurse - Midwife	61(24)
History of previous disasters	Yes	132(52)
	No	122(48)
Management experience	Yes	86(33.5)
	No	171(66.5)

Table 2. Relationships between demographic variables of nurses participating in the study with knowledge dimension

Variable		Correlation Coefficient*	Test Result (P)
Age (y)		0.042	0.501
Work experience (y)		0.042	0.501
Duration of training received on disasters (hours)		0.139	0.026
		Mean±SD	
Gender	Male	30.87±12.93	0.571#
	Female	30.00±11.15	
Marital status	Single	29.30±10.52	0.297#
	Married	31.05±12.72	
History of previous disasters	Yes	31.65±13.35	0.122#
	No	29.28±10.79	
Management history	Yes	33.09±13.50	0.014#*
	No	29.17±11.24	
Education level	12th grade or community nurse graduate	16.35±30.25	0.862$
	Excellent nurse	12.38±30.25	
	Nurse-midwife	31.22±10.40	

* The Spearman correlation coefficient; #The Independent t-test; $One-way analysis of variance.

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ried (71%), and in terms of education, most of them (70%) were excellent nurses. More than half (52%) of the respondents stated that they have dealt with disasters before.The Mean±SD scores obtained by nurses participating in the study in each of the dimensions of knowledge, attitude, performance, and total (overall preparedness) were 12.16±30.48, 12.95±81.12, 7.24±40.60, and 6.50±49.95, respectively. As can be seen, among the various dimensions, the highest score was related to the dimension of attitude and the lowest to knowledge. In addition, the mean total preparedness score of the study participants was less than half of the highest score (49 out of 100), which could indicate a lower than average level of nurses' disaster preparedness.

Table 2 presents the results of examining the relationships between demographic variables of participants in the study with the score obtained in the knowledge dimension.

As seen in Table 2, based on the Spearman test, there was a statistically significant direct relationship between the number of disaster training hours received and the knowledge score. Also, based on the independent t-test, there was a significant difference between the two groups of nurses with management experience and without it in terms of disaster preparedness knowledge score. The average score of nurses with management experience was higher than those without experience.

Table 3 presents the relationships between the demographic variables of the participants in the study with the score obtained in the attitude dimension.

Based on the findings of Table 3, no statistically significant relationship was observed between demographic variables and attitude dimension score.

Table 4 presents the study results between the demographic variables of the participants in the study with the performance dimension score.

As shown in Table 4, based on the Spearman correlation coefficient-test, there was a direct relationship between performance dimension score with age and work experience. Still, there was a statistically significant inverse relationship with the duration of training received. According to the results of the Mann-Whitney test, there

Table 3. Relationships between demographic variables of nurses participating in the study with attitude dimension

Variables		Correlation coefficient*	Test Result (P)
Age (y)		-0.017	0.787
Work experience (y)		0.065	0.300
Duration of training received on disasters (h)		0.001	0984
		Mean±SD	
Gender	Male	80.77±13.50	0.620#
	Female	81.58±12.24	
Marital status	Single	79.05±13.31	0.121#
	Married	81.82±12.72	
History of previous disasters	Yes	81.25±12.36	0.945#
	No	81.14±13.64	
Management history	Yes	81.95±10.94	0.473#
	No	80.72±13.86	
Education level	12th grade or community nurse graduate	78.83±16.48	0.762$
	Excellent Nurse	81.37±12.93	
	Nurse-Midwife	80.96±12.19	

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was a statistically significant difference between women and men in terms of performance scores, so the average score of women was higher than men. Also, the average score of married nurses compared to single ones and those who had a history of previous disasters was significantly higher than those who did not. In addition, those with management experience scored higher in terms of performance than those without (Table 4). According to the results of the Friedman test, the performance score was different between nurses with varying levels of education (P≤0.013).

4. Discussion

The present study's findings showed that the Mean±SD score of knowledge obtained by nurses participating in the study was lower than average (30±12 out of 100), which can be said to be poor. In this respect, the present study's findings are consistent with the results of the Nasr and Baslim [20]. They assessed the knowledge, attitude, and preparedness of disaster healthcare workers. The researchers used an online questionnaire to evaluate the knowledge, attitude, and overall preparedness of 531 employees of the Yemeni public health sector as a self-declaration. The findings of their study showed that, in general, the study participants lacked sufficient knowledge about disaster preparedness and were weak in this regard. One of the main reasons for the lack of knowledge can be the absence or weakness of specialized training for health workers.

Contrary to knowledge, the mean attitude score was significantly higher than average (80 out of 100), which indicates a positive attitude towards disaster preparedness. The present study's findings are consistent with the study of Al-Zahrani and Kyrasis [21]. Their study aimed to evaluate the knowledge and attitude of emergency nurses of four public hospitals in Mecca, Saudi Arabia, about their preparedness to respond to emergencies. In this study, 106 responding nurses self-reportedly expressed their knowledge and attitudes toward preparing for emergencies in mass gatherings. The findings of this study showed the participants' positive attitude about preparedness for emergencies.

In terms of performance and, in other words, the occurrence of disaster preparedness behaviors, the present study's findings showed that the participants are gener-

Table 4. Relationships between demographic variables of nurses participating in the study with performance dimension

Variables		Correlation Coefficient*	Test Result (P)
Age (y)		0.134	0.032
Work experience (y)		0.199	0.001
Duration of training received about disasters (h)		0.195-	0.002
		Mean±SD	
Gender	Male	7.16±39.81	0.04#
	Female	7.26±41.61	
Marital status	Single	7.49±39.21	0.049#
	Married	7.09±41.11	
History of previous disasters	No	6.66±39.37	0.002#
	Yes	7.41±42.14	
Management history	No	6.75±39.31	0.027#
	Yes	7.40±41.25	
Education level	12th grade or community nurse graduate	7.48±38.73	0.013$
	Excellent Nurse	7.20±39.99	
	Nurse-Midwife	6.94±42.87	

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ally weak in this area. This result was consistent with the Jorvand et al. study [11]. In their study, they examined the level of preparedness in three areas of knowledge, attitude, and performance among employees of a healthcare network in a city in southwestern Iran. They assessed the performance of the health network staff as poor.

The present study's findings showed a significant direct relationship between the number of hours of training received on disasters with the score of knowledge and performance. The study results by Amberson et al. also confirmed the present study's findings [22]. Their study aimed to evaluate the effect of an educational intervention on the level of nursing preparedness in an intensive care hospital in the United States. The findings of this study showed that those who had previously received disaster education had a higher level of preparedness.

There was a significant direct relationship between age and disaster preparedness performance in this study. The present study's findings are consistent with the study of Batacharia and associates [23]. Their findings showed an association between age and disaster preparedness score of Indian emergency medical personnel. However, the present study's findings were inconsistent with the Berahno et al. study [24]. Their study was conducted to assess the preparedness of 377 health workers working in health centers and hospitals in Ethiopia. In their study, no relationship was observed between age and level of preparedness for disasters. The difference in the research environment and the study time can be the reason for the discrepancy between the results of these two studies.

The present study's findings showed a significant relationship between work experience and performance. The results of Berahno et al. showed a significant difference in terms of disaster preparedness between three different groups of employees: people with less than one year of work experience, one to five years, and six years and more [24]. Among these three groups, the group with less than one year of work experience had the lowest level of preparedness, and the group with six or more years of work experience had the highest level of preparedness.

Based on the study findings in terms of performance, the score of those who had a history of previous disasters was significantly higher than those who did not. The findings of the Taskiran and Baikal study, which was

performed to assess nurses' disaster preparedness and competencies, confirmed the results of the present study [25]. In this study, the preparedness of 406 nurses from a large 1800-bed hospital in Turkey (selected by available sampling method) was evaluated. The study findings showed that the average score of nurses who had previously experienced disasters was higher than those who did not have such experience in two sub-components of competencies and skills. The present study's findings showed that the mean scores of those with management experience were significantly higher than those without it in the two areas of knowledge and performance. These results were consistent with the findings of Farajzadeh and associates [17].

It can be said that people with management experience often have a higher age and work experience than others. As mentioned above, both of these factors, age and work experience, were directly related to the two areas of knowledge and performance.

The present study's findings showed that the preparedness of women participating in the study was significantly higher than men in terms of performance. The results of Jung et al.'s study were consistent with the present study in this respect [26]. Their study aimed to compare Canadian immigrants and natives living in Canada regarding disaster risk perception and disaster preparedness. The findings of this study showed that the level of performance and incidence of disaster preparedness behaviors in women were significantly higher than in men. The researchers concluded that variables such as education, language, gender, and age compared to citizenship status (Canadian-born or immigrant) are stronger justifications and predictors of disaster preparedness. Women are more aware than men of the risk of disasters and the consequences. This knowledge can be the reason for their higher preparedness [26].

The main limitation of the present study was its confinement to one hospital. Still, as stated in the methods section, the studied hospital was the largest and only public hospital in Herat, the capital of one of the largest provinces in Afghanistan. This hospital, which is considered large in terms of the number of beds, can well represent the rest of the district government hospitals and the provincial center, and its findings can be at least generalizable to other large government hospitals in Afghanistan. Another limitation of the present study was the tools used to measure preparedness in terms of behavior and performance. This tool was based on self-reporting and self-declaration, so the findings in this section may be slightly higher than the actual value. In this regard, it should be noted that most of the currently available tools to measure nurses' preparedness (for disasters) in particular and other healthcare workers, in general, are based on self-reporting.

5. Conclusion

Although the overall preparedness score of the nurses of the 650-bed district hospital in Herat in the face of disasters was average, due to the overestimation of the preparedness, the nurses' preparedness was low, and appropriate measures must be taken to improve it.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of Mashhad University of Medical Sciences (Code: IR.MUMS.REC.1399.321). During the research, ethical issues such as obtaining informed consent to participate in the study, keeping the personal information of the participants confidential were observed.

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Authors' contributions

Conceptualization and supervision: Hamidreza Shabanikiya; Methodology: Hamidreza Shabanikiya and Vahid Ghavami; Investigation, writing – original draft, and writing – review & editing: Hamidreza Shabanikiya and Vahid Ghavami; Data collection: Ahmad Zia Ahmadi; Data analysis: Vahid Ghavami.

Conflict of interest

The authors declared no conflict of interest.

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