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Emergency Nurses Readiness for Disaster Response-An Explorative Study

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Abstract: The role of nurses on disasters has expanded simply caring for the sick and injured and ability to react to during the disaster. Emergency nurse plays a critical role in all disaster phases starting from the mitigation phase and continue throughout the disaster cycle, preparedness' response and recovery. Nurses are the frontline workers to provide effective care during disaster and crisis situation. Nurses need to have adequate knowledge and skills for effective approach to respond to the critical situation.

Objectives: To assess level of knowledge on disaster readiness among emergency nurses and to assess the role of the emergency Nurses on disaster response and to associated the demographic variables with level of readiness among the emergency nurses.

Material and Method: The research design adopted for this study was non-experimental explorative design. The study was conducted at selected hospitals in najran with 200 sample size. The samples that met the inclusion criteria were selected by using non probability purposive sampling technique. The tool used for the data collection was demographic variable, Knowledge questionnaire on disaster preparedness, questionnaire on emergency nurses role in disaster response and Emergency Preparedness Information Questionnaire (EPIQ).

Result: Majority of the nurses delivered the acceptable knowledge on readiness for disaster response. Most of the emergency nurses had moderate knowledge 55% and 33% had adequate knowledge on disaster preparedness.

Conclusion: The emergency nurses had acceptable level of knowledge on disaster preparedness and neutral familiarity in emergency preparedness. The emergency nurses aware about their leading role and responsibility during disaster response and provides effective nursing care for the client who was suffering with trauma / injury during the disaster.

Keywords: disaster, readiness, response, emergency Nurses

INTRODUCTION

Natural and human-made disasters have been on the rise in the recent past across the world. According to Jiang et al (2015), disasters take place every day somewhere in the globe causing devastating impacts on individuals, families, communities and countries at large. According to the World Disasters Report 2014 states that disasters have been rise in the past decade with the magnitude of their impacts also reaching alarming levels. The number of disasters reported on 2004 to 2013 increased by 60% worldwide with 523 disasters being reported to 2013 alone. The death toll was also reported to increase from a sharp rate (600,000 to more than 1.4 million people)

with the total number of people affected by disasters rising to more than 270 million from 230 million people, which translates into 17% increase. Hospital is at high risk to face disaster which can cause serious problems with the patients such as severe injury and death. Disasters pose unique challenge to every medical care facility in terms of infrastructure, capacity and preparedness. From the hospital's point of view, disaster exists when the patient load far exceed of the capabilities of an emergency department to provide emergency care and the hospital is forced to apply additional resources for providing care to large number of victims.

Disaster preparedness which also encompasses risk assessment and adoption of multidisciplinary management strategies are instrumental to the delivery of operational responses to the health needs of the population struck by a disaster. Emergency preparedness which involves identification of a disaster planning, knowledge, capabilities and infrastructure, as well as training the relevant work forces are essentials in maintaining a high -level of preparedness. The ICN Framework of Disaster Nursing Competencies are recognized an accelerated to present need to build capacities of nurses at all levels in order to "safeguard the populations with limited injuries prevention and reduce the number of deaths, and maintain health system functioning and promoting the community well-being, in the midst of continued health threats of disasters" (ICN 2012).

Nurses deliver the highest level of functioning among the health care team. Nurses need to understand the disaster management process, without nursing integration the clients lose a critical part of the prevention network, in the multidisciplinary response team. Worldwide, eleven million nurses are the frontline health care workers that are in direct contact with the individuals, families, and communities (Garfield2011). The role of nurses during disasters has expanded from caring for the sick and injured to recovery and evaluation phase. Nurses need to have adequate knowledge and skills to deliver effective approach to respond to disaster and to manage the critical situation (Reissman 2010).

Emergency nursing interventions plays a vital role such as prevention, preparedness, response and recovery to reduce the effects that occurs during disaster. In early response stage it is necessary to save many lives. However, 80% of US hospital nurses were under-prepared before responding to a disaster event (Chapmanetal.,2008). World Health Organization emphasizes on the preparedness of health care workers in a disaster situation. Nurses are the largest manpower group of the health care team they need to be trained to equip themselves with required competencies during disasters to rescue life and safeguard the health victims.

Fuad Alzahrani, (2018) conducted a study on Emergency nurse disaster preparedness during mass gatherings, across-sectional survey of emergency nurses' perceptions of hospitals in Mecca, Saudi Arabia. Non-probability purposive sample technique was adopted for the study. The sample size was 106 registered nurses in from emergency departments. The results revealed that emergency nurses' clinical role awareness in disaster response was reported to be high, nurses reported limited knowledge and awareness of the wider emergency and disaster preparedness.

Gladston (2017) conducted a study on disaster preparedness among nurses working in a pediatric acute care setting of a tertiary hospital. A descriptive design and convenience sampling technique was adopted. The study revealed that 24.5% had adequate knowledge, 51.1% moderately adequate knowledge, and 24.5% inadequate knowledge. Most (85.1%) of the nurses had moderate perception on disaster preparedness. There was no statistically significant correlation (r = .186, p = .072) between the perception and the knowledge of the participants. There was an association with the qualification of the nurses and the perception (X2= 32.182, p = .000).

Lei Zhoua, Xianhua (2017) conducted a study on methodological prospective study on Emergency decision making for natural disasters. The overview was provided for the EDM theory and methods of natural disasters from the methodological perspective. He concluded that emergency decision making (EDM) for natural disasters plays a significant role in improving the capability to respond disasters.

In the recent Saudi Arabia has been hit by a number of disasters such as the Jeddah city floods of 2009, and the fire from haj and other disasters, which nurses and other stakeholders did not respond to with the swiftness and expertise anticipated from them (Rundle & Turcotte, 2015; Abosuliman, Kumar, & Alam, 2013). More over the southern region is undergoing many manmade disasters and crises situations from 2015 onwards. None of the research studies had reported on the disaster and its consequences. Hence the researcher focused on this topic to bring the positive change in their knowledge. The nursing profession plays a significant role to prepare for disaster, as well as respond to disasters. International Council for Nurses (ICN) alerts that all nurses to be prepared for adequate knowledge in order to respond to disaster events effectively. Florence Nightingale demonstrated her role through delivering care in the Crimean war and showed the world that the important responsibilities of the nurse as a front line health care worker. Hence the study aimed to explore the readiness of the emergency nurses responds disaster events effectively.

METHODS AND MATERIALS

Study Design

The research design adopted for this study was non-experimental explorative study design.

Setting

The study was conducted at Ministry of health hospitals in Najran Saudi Arabia. Najran was purposefully selected as the southern border there by potential risk of the disaster.

Study Population

The study populations participated in the research was the entire emergency nurses from various hospitals affiliated to the Ministry of Health in Najran Saudi Arabia. The samples that met the inclusion criteria were selected by using purposive sampling technique. The inclusion and exclusion criteria were as follows. The study participants working at emergency department, willing to participate, with different age group and registered nurses with fluent English and Arabic language both genders were included. The staffs were on vacation, maternity leave during the period of data collection and the staffs those who has undergone for the disaster training programme, nurse managerial level and nursing aids were excluded. The aim of the study was explained to the study participants and consent was obtained from them. There was no consequences loss for their regular work and all the staffs continued their routine work.

TOOLS FOR DATA COLLECTION

Four different tools were used to collect data which includes socio - demographic variable, Knowledge Questionnaire on disaster preparedness, Emergency Nurses Role on disaster response, and Emergency Preparedness Information Questionnaire (EPIQ).

Tool I: Demographics Information

Age, gender, department, years of experience, clinical position, educational level ,current years of experience in emergency department, number disaster attended to the current year.

Tool II: Knowledge Questionnaire on Disaster Preparedness

It consists of 25 objective questions. Total score was 25, the score was interpreted as follows: 1-9 inadequate knowledge, 10 -17 Moderate Knowledge and 18-25 adequate knowledge. Each question categorized as correct =1 and incorrect 0

Tool III: Emergency Preparedness Information Questionnaire (EPIQ)

It was standardized tool used to measure the emergency preparedness. The emergency preparedness includes 45 responses and 11 subsets. The subsets were includes the familiarity with emergency preparedness terms and activities composed of 7 questions, the incident command system 8 questions, ethical issues in triage 4 questions, epidemiology and surveillance 4 questions, Isolation/quarantine 2 questions, documentation 3 questions, communication, 7 questions psychological issues 4 questions, special populations 2 questions, critical resource's 3.The score was interpreted based on the score. The score was interpreted as follows 1-12 – slightly familiar, 13-24 familiar Neutral, 25-36 somewhat familiar, 37-48 Very familiar based on the score the familiarity was interpreted. Section two includes about the learning course, training format, and access to electronic training /educational information.

Tool IV: Emergency Nurses Role on Disaster response

The respondents domains of role as early responding, preventing the damage to the patients, triage, first aid, resuscitation, mobilization and evacuation

DATA COLLECTION PROCEDURE

The importance of the study was explained to the authorities of the hospitals and obtained permission to conduct the study. The research purpose was explained to the Emergency nurses and obtained oral consent from them. They were assured that the information collected from them would be kept confidential

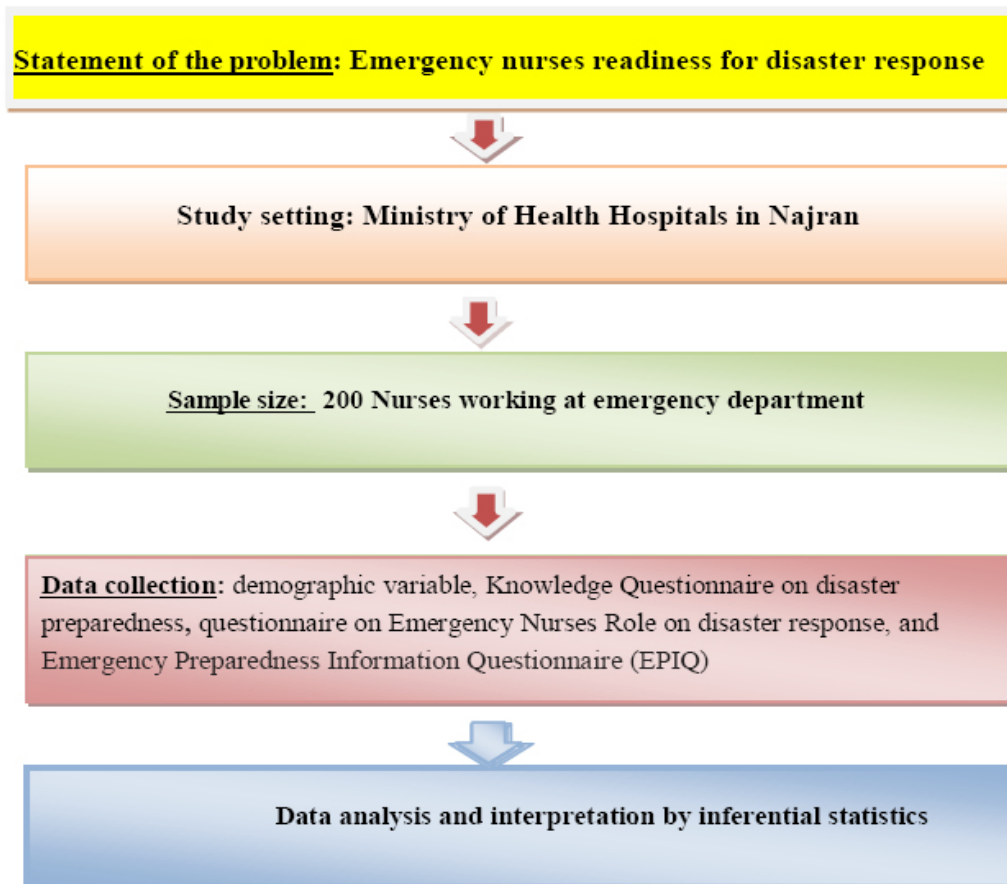## The data was collected in the following phases

Phase I: First session all the nurses working in the emergency department were assembled and made the sample frame for 200 staff nurses. The sample size calculated by using master software –single proportions test for power of 80% and error 5%. The calculated size was 200. Considering attrition of 10% was increased so the sample size was 220 in each expected drop out was 10%, and incomplete data was 10% and finally the sample size was round in 200. Based on the inclusion criteria the purpose of the study was explained to the study participants. Demographic variable, Knowledge Questionnaire on disaster preparedness, was administered. They were made in to 5 groups and each group consists of 10 members to complete the questionnaire and their doubts were clarified.

Phase II: The next day the study participants were gathered in the lecture hall and administered the questionnaire on Emergency Nurses Role on disaster response includes early responding, preventing the damage to the patients, triage, first aid, resuscitation, mobilization and evacuation and Emergency Preparedness Information Questionnaire (EPIQ) questionnaire .They were not distracted from their regular routine work. They were assured that the information will be maintained confidentially and research purpose only. Each session took 40 – 60 minutes to complete the questionnaire.

STATISTICAL METHODS

The data from 200 participants were coded and entered in the Microsoft excel sheets. The data were analyzed by using descriptive and inferential statistics. Frequency and percentage distribution was used to describe the demographic variables and level of Knowledge (SPSS.USA) statistical package was used.

SCHEMATIC REPRESENTATION OF RESEARCH PLAN

Statement of the problem: Emergency nurses readiness for disaster response

Study setting: Ministry of Health Hospitals in Najran

Sample size: 200 Nurses working at emergency department

Data collection: demographic variable, Knowledge Questionnaire on disaster preparedness, questionnaire on Emergency Nurses Role on disaster response, and Emergency Preparedness Information Questionnaire (EPIQ)

Data analysis and interpretation by inferential statistics

RESULTS

Distribution of Demographic Variables

In this study 200 emergency nurses were participated. The majority of the samples belong to the age group of 20 to 30 years. There were more female nurses 66% than the male nurses belongs to 34%. Most of the nurses educational level were Bachelor's in nursing 78% and 21% belongs to diploma level. Regarding the work experience majority of them had 1to 5 years of experience and 6 to 10 year experience was 49%and 33%. Regarding the current work experience in the emergency 56% had 1-5 years' experience and 33% had 6-10 years of experience. Most of the participated attended the no of disaster in their hospital belongs to 1 and 3 was 44% respectively 4 -6 belongs to 33% shown in Table1

Table1. *Distribution of the demographic variables of the participant*

S.NO	Variables	Description	Frequency	Percentage
1	Age	20-30	88	44
		31-40	74	37
		41-50	32	16
		51-60	06	3
2	Gender	Female	132	66
		Male	68	34

3	Educational Level	Diploma	42	21
		Bachelor	156	78
		Masters	2	1
4	Work experiance	01-5 Years	98	49
		06-10 Years	66	33
		11-15 Years	24	12
		16-20 Years	12	6
5	Years of Experiance in the Emergency department	01-5 Years	112	56
		06-10 Years	64	32
		11-15 Years	14	7
		16-20 Years	10	5
6	No of disater attented in the hospital	01-03	88	44
		04-06	66	33
		07-10	46	23

Emergency Nurses Knowledge Level on Disaster Preparedness

Table2 shows the level knowledge regarding the disaster preparedness among the emergency nurses. Most of the emergency nurses had moderate knowledge 55% and 33% had adequate knowledge and 6% of the emergency nurses had inadequate knowledge. The findings reported that nurses had moderate knowledge on disaster preparedness.

Table2. *Level of knowledge regarding disaster preparedness among nurses (n=200)*

Knowledge level	Score	Frequency	Percentage
Adequate Knowledge	01-09	78	39%
Moderate Knowledge	10-17	110	55%
Inadequate Knowledge	18-25	12	6%

Emergency Preparedness Information Questionnaire (EPIQ)

Table3 shows the level of familiarity response rate of with emergency preparedness. The results revealed that majority of the participants were very familiar to somewhat familiar and familiar neutral respectively the results as follows. The percentage of familiarity emergency preparedness terms and activities were (33%, 37%, 21%, 5.5%, 3.5%). For the incident command system and role of (27%, 39%, 16.5%, 11%, 5.5%). With regard for ethical issues in triage and epidemiological surveillance were (44%, 28%, 14%, 9.5% 4.5% and 22%, 34.5%, 27%, 10% 6.5%).The familiarity obtained for the Isolation/quarantine were (46%, 33%, 14%, 4% 3%). For Decontamination and communication connectivity was (39%, 44%, 11%, 3.5% 2.5% and 29%, 33%, 24%, 8.5% 5.5%). Regarding the psychological issues (37%, 41%, 14%, 5.5% 2.5%) and for special populations and accessing critical resources were (33%, 44%, 7.5%, 9% 6.5% and 36%, 35%, 16%, 6% 7%) total. The overall total EPQI response was ranged from somewhat familiar, familiar neutral was (39% and 34%) and somewhat not familiar was 11.5% and not familiar was 8.5%. The total familiarity for EPIQ very familiar was 7.5%.

Table3. *Nurses familiarity response rate in emergency disaster (n=20)*

S.No	Responses rate familiarity response rate of emergency preparedness	Very familiar		Somewhat familiar		Not familiar		Somewhat not familiar		Familiar to neutral	
1	Emergency Preparedness Termsand activities	66	33	74	37	42	21	11	5.5	3.5	07

2	Incident Command System (ICS) and your role within it	54	27	78	39	33	16.5	24	12	5.5	11
3	Ethical issues in Triage	88	44	56	28	28	14	19	9.5	4.5	09
4	Epidemiology and Surveillance	44	22	69	34.5	54	27	20	10	6.5	13
5	Isolation /Quarantine	92	46	66	33	28	14	08	4	3	06
6	Decontamination	78	39	88	44	22	11	07	3.5	2.5	05
7	Communication/ connectivity	58	29	66	33	48	24	17	8.5	5.5	11
8	Psychological Issues	74	37	82	41	28	14	11	5.5	2.5	05
9	Special Populations	66	33	88	44	15	7.5	18	9	6.5	13
10	Critical Resource's	72	36	70	35	32	16	12	6	7	14
11	Over all Familiarity	69	34.5	73	36.5	33	16.5	14	7	3.5	9
12	Total EPIQ	14	7.5	78	39	68	34	23	11.5	8.5	17

Learning and Training Preference

Most of the nurses need face to face training 64.8% and only few on them preferred the online training course 12% with regarding amount of time spent preference's in training most of the participants reported attended one day workshop and the percentage of electronic training/educational information majority of them were access to the computer at work and access to the internet.

Role of the Emergency Nurses on disaster response

Table4 shows the role of the emergency nurses on disaster response. Their role in providing early responding was 32% followed by preventing the damage to the patient was 34%. The percentage of triaging was 35% and the First aid was 33% and for the resuscitation was 34%. Whereas for mobilization and evacuation was 31% and 34%. Most of the emergency nurses were confident and has adequate knowledge about their role in the disaster response.

Table4. *Role of Emergency Nurse on Disaster Response*

S.NO	Emergency Nurses Role	The participants who gave the correct answer Frequency	The participants who gave the correct answer Percentage
1	Early Responding	64	32
2	Preventing The Damage To The Patients	68	34
3	Triage,	77	35
4	First Aid,	66	33
5	Resuscitation	68	34
6	Mobilization	62	31
7	Evacuation	68	34

DISCUSSION

Increasing the frequent global disaster is the treats for human life. It is a state of readiness to respond to a disaster and other emergency situation involves the community's potential disaster risks, vulnerabilities, and the likelihood for a disaster to occur. In order to optimize the response to any emergencies we should have adequate knowledge and awareness about disaster preparedness and response. Nurse plays a critical role in all

disaster phases starting from the mitigation phase and continue throughout the disaster cycle, preparedness' response and recovery. Nurses are the frontline workers to provide effective care during disaster and crisis situation.

The present study was aim to investigate the Emergency Nurses readiness for disaster response. The present study findings reported that over all knowledge level on disaster preparedness among the emergency nurses. Most of the emergency nurses had moderate knowledge 55% and 33% had adequate knowledge and 6% of the emergency nurses had inadequate knowledge. The findings reported that nurses had moderate knowledge on disaster preparedness. This study was supported by wen-Chi etal (2016) conducted a study on readiness of the hospital nurses for disaster response in Taiwan. A cross sectional study was carried out with 311 registered nurses. The results revealed that majority of the nurse's demonstrated poor response for disaster. He concluded that disaster related training is essential for nurses to improve their knowledge. Many Knowledge, Attitude and skill studies were conducted on nurse's disaster response. Many studies reported that training and education on disaster training and drills need to be included in day to day practice.

The present study findings revealed that over all familiarity with Emergency preparedness and information questionnaire. The results revealed that majority of the participants were very familiar to somewhat familiar and familiar neutral respectively. The overall total EPQI response was ranged from somewhat familiar, familiar neutral was (39% and 34%) and somewhat not familiar was 11.5% and not familiar was 8.5%.The total familiarity for EPIQ very familiar were 7.5 % and the regarding the learning and training performances' were most of the nurses need face to face training 64.8% and only few on them preferred the online training 12% with regarding amount of time spent preference's in training most of the participants reported attended one day workshop and the percentage of electronic training/educational information majority of them were access to the computer at work and access to the internet. The study was supported by fatma Abdelalim (2014) conducted a study on Nurses Knowledge, attitude, Practice and familiarity regarding disaster and emergency preparedness in Saudi Arabia. A cross sectional descriptive survey design with 252 nursing students participated in that study. The results revealed that the knowledge level was 21.2 a highly significant difference was found for the attitude and practice. Regarding the disaster familiarity there was positive significant familiarity was reported. The study concluded that Disaster and emergency preparedness into nursing curriculum.

The present study findings reported emergency nurses role in disaster response providing early responding was 32% followed by preventing the damage to the patient was 34%. The percentage of triaging was 35% and the First aid was 33% and for the resuscitation was 34%. whereas for mobilization and evacuation was 31% and 34%. Most of the emergency nurses were confident and had adequate knowledge about their role in the disaster response. The findings of the study was supported by Fuad Alzahrani, (2018) conducted a study on Emergency nurse disaster preparedness during mass gatherings, a cross-sectional survey of emergency nurses' perceptions of hospitals in Mecca, Saudi Arabia. Non-probability purposive sample technique was adopted for the study. The sample size was 106 registered nurses in from emergency departments. The results revealed that emergency nurses' clinical role awareness in disaster response was reported to be high, nurses reported limited knowledge and awareness of the wider emergency and disaster preparedness.

Conclusion

Based on present study results it can be concluded that emergency nurses play a vital role in disaster. The emergency nurses had acceptable level of knowledge on disaster preparedness and neutral familiarity in emergency preparedness. The emergency nurses aware about their leading role and responsibility on disaster response and provides effective nursing care for the client who was suffering with trauma/injury during the disaster. Nurses need continuous education on disaster. Training and drills can make more familiar with disaster response. Furthermore interventional research can be carried out on interventional studies and qualitative studies focus on the same topic.

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