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Original Article

Expectation and Awareness of Hospital Staff about External Disaster Management Plan at Diarb Negm Central Hospital

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ABSTRACT

Background: Disasters have altered Earth and its inhabitants from the dawn of humankind. An external disaster affects the entire facility or only a portion of the facility. **Aim**: Assessed expectations and awareness of hospital staff about the external disaster management plan at Diarb Negm Central Hospital. **Methods**: A descriptive design was utilized, including all 200 available hospital staff. Data collection tools consisted of the Disaster Expectation Questionnaire and Disaster Awareness Questionnaire. **Results**: The majority of studied participants had a low total level of external disaster expectations. Also, more than half of them reported low awareness of the total external disaster preparedness plan. **Conclusion:** The majority of study participants had low external disaster expectations and awareness. **Recommendations**: Give continuous courses about disaster precautions. Provide training and educational endeavors for hospital staff' about awareness of disaster preparedness plans through orientation and on-the-job training courses.

Keywords: *Awareness, Disaster, External disaster, Expectation, Hospital staff.*

Introduction:

Disaster is a serious, dangerous, and intolerable phenomenon frequently occurring on the planet earth. Thousands of people die in a moment. Thousands of people may become homeless and parentless within a day. Huge infrastructures get damaged within a few seconds or minutes. In addition to catastrophic events, disasters are very sad and depressing events that shock the whole world. These unexpected incidents also affect life and life support systems (Ripoll, 2015).

Disasters affecting healthcare facilities can be categorized into internal and external. Internal hospital disasters have the potential to endanger patients, staff, and visitors and to undermine the integrity of the facility as a steward of public health and safety such as power outages fires, floods, internal fire, internal flood, structural damage, power failure, water loss, loss of medical gasses, elevator failure, chemical spill, radiation accident, and terrorist attack. It's typically limited to hospitals or healthcare facilities (Dameff, Killeen &Chan, 2020).

While an external disaster is an occurrence or incident outside the hospital in which the hospital is expected to assist. An external disaster can contribute to unexpected influxes of both surgical and non-surgical patients (Tasantab, 2019).

Both types of disasters may have components that are natural in origin or man-made. Uncontrollably occurring natural catastrophes may result in fatalities or property damage, and they usually leave behind some economic harm, the extent of which is based on the infrastructure and resilience of the impacted people. Natural catastrophes have a significant impact on a number of the victims' physical and psychological issues. Natural disasters include earthquakes, floods, volcanic eruptions, hurricanes, wildfires, epidemics, tornadoes, and outbreaks of diseases linked to climate change (Gould, Garcia, & Remes, 2016).

Humans may generate man-made catastrophes on purpose or accidentally due to carelessness, inattention, fluctuating interests, or distressing emotions. War, bomb explosions, chemical spills, rioting, sewage backups, and arson are examples of man-made calamities. A third kind of catastrophe is also on the rise and is shown in a complex alongside the first two primary categories (Ainehvand, Raeissi, Ravaghi & Maleki, 2019).

Hospitals serve as the front lines of emergency response for healthcare systems, which work to aid in the recovery of individuals and communities after natural disasters. An organization's reaction to unanticipated occurrences that negatively impact people or resources and

threaten the organization's ability to continue operating is known as disaster management (Kotani & Yokomatsu, 2016).

In order to reduce a catastrophe's overall effects, disaster management requires complete preparation in terms of resource availability, professional participation, communication, organizational readiness, and coordination among all parties. In order to lessen the effects of catastrophes and improve recovery, disaster management should be founded on a well-defined strategy, readiness, and cooperative and successful efforts on the side of the community and the many responding organizations (Labrague & Hammad, 2018). Written copies of the disaster management plan must be distributed to every member of the hospital personnel. The pre-disaster and post-disaster stages will be represented by complete, implementable plans for disaster preparation, response, and recovery (Nofal, Alfayyad, Khan & Abu-Shaheen, 2018).

Hospitals are essential to the infrastructure of healthcare. The main duty of hospitals is to save lives. The public views them as an essential resource for diagnosis, treatment, and follow-up for both medical and psychological care since they also provide emergency care services. Since hospitals are essential to delivering emergency treatment, society looks to them to provide emergency medical care on time during a crisis. (Tavakoli, Yarmohammadian, Safdari & Keyvanara, 2017).

Significance of the Study

Hospitals play a crucial role in disaster response, but they may also be negatively impacted by them, leading to infrastructural damage that compromises patient care. Therefore, the hospital's employees, institutional resources, and organizational structures are best prepared for successful performance in various external or internal crisis circumstances through a disaster management plan. Thus, the current research evaluated hospital staff members' expectations and knowledge about external catastrophe management preparations.

Aim of the study

This study aimed to assess the expectations and awareness of hospital staff about the external disaster management plan at Diarb Negm Central Hospital.

Research questions: -

H1: Are Diarb Negm Hospital Staff not expecting an external disaster management plan?

H2: Are Diarb Negm Hospital Staff not being aware of external disaster management plans?

Methods:

Research design:

It was conducted using a descriptive research design.

The study setting:

The study was conducted at Diarb Negm Central Hospital. The hospital is affiliated to the Ministry of Health.

Participants of the study:

It included 200 hospital staff recruited from all categories of the hospital manpower as physicians, nurses and nursing staff, administrative employees, technicians, security, and housekeepers.

Tools of data collection-:

Data collection was conducted using two tools: the Disaster Expectation Questionnaire and the Disaster Awareness Questionnaire

Tool I: Disaster Expectation Questionnaire:

The researcher developed this tool based on the review of pertinent literature (Mekky, 2009; Mustafa, 2009 and Soliman, 2017). It consisted of the following two parts as

Part 1: Personal characteristics of the participants such as name (optional), age, gender, marital status, educational qualification, job type, experience years, and attendance of training courses related to disaster management.

Tool II: **Disaster Expectation Questionnaire**;

To elicit the respondents' opinions about their expectations regarding the occurrence of possible external disasters. It included 17 items divided into two subgroups: natural disasters (9 items) and man-made disasters (8 items). The response was measured on a 3-point Likert scale as; high, moderate, and low.

Scoring system:

If the percentage was 60% or over, the cut-off point expectation was considered high; if it was less than 60%, it was considered low.

Part III: **Disaster Awareness Questionnaire**:

The researcher created this tool after reviewing relevant literature(Mekky, 2009; Mustafa,2009 and Soliman, 2017) to assess the hospital staff awareness regarding the external disaster preparedness plan at Diarb Negm Central Hospital as; It included 63 items distributed as follows; designing external disaster preparedness plan(16items), role of nursing department personnel in external disaster preparedness plan (6 items),recording system for external disaster victims (7items), training plan for hospital staff in external disasters(11items), hospital resources available in external disasters (9 items), ambulance preparedness(7items), traffic plan (7). The response was measured on a 3-point Likert scale as; yes, no, not applicable.

Scoring system:

The awareness of the plan via the cut-off point was considered high if the percentage was 60% or higher and low if less than 60%.

Validity and reliability:

The tools (I-II) were presented in their preliminary form for face and content validation via a panel of five experts. These included two professors and one assistant professor in Nursing Administration, one assistant professor in Community Health Nursing from the Faculty of Nursing at Mansoura University, and one assistant professor in Nursing Administration at Fayoum University. They review the tool for clarity, comprehensiveness, relevance, and accuracy of the tools. No recommendation was made. The reliability of the study tools was assessed using the Cronbach Alpha coefficient test in the statistical package for Social Science (SPSS) version 20. External natural disaster expectation, external man-made disaster expectation, external natural disaster awareness, and external man-made disaster awareness were 0.78, 0.80, 0.83, and 0.79, respectively.

Pilot study:

In order to test the tools'clarity, completeness, and feasibility, a pilot study was conducted on a randomly selected 10% of participants(20).The time needed to complete the questions was also determined by it. Approximately 20-30 minutes were required to complete each participant sheet. Participants in the pilot study were excluded from the study's sample as a whole. Using the pilot study as a guide, the necessary modifications were made by clarifying and rephrasing.

Data collection:

The actual data collection took about three months, from the 1st of January 2021 to the end of Mars 2021. After securing official permissions, the researcher visited the setting and met with the medical and nursing directors to explain the aim of the study and its procedures. Then, with the help of the nursing director, the researcher met with the participants, explained the study's aim and procedures, and invited them to participate. It took about 20-30 minutes to fill out the morning and evening shift questionnaire.

Ethical consideration:

A research ethics committee at the Faculty of Nursing at Mansoura University approved the project. Before receiving verbal informed permission, the researcher gave each participant a rundown of the study's objectives and guaranteed their freedom to accept, decline, or withdraw from it at any moment. Complete secrecy, anonymity, and privacy of the information gathered were maintained.

Data analysis:

This study was conducted using SPSS 20.0 for data input and statistical analysis. Descriptive statistics were used to display the data. As a result, qualitative variables were analyzed using frequencies and percentages, while quantitative variables were analyzed using means, standard deviations, and medians. A chi-square test was used to compare qualitative category variables. Fisher's exact test was used instead of other tests in a 2x2 table when one or more predicted values were less than 5. Quantitative and ranked variables were correlated using Spearman rank correlation. External disaster awareness scores were determined with multiple linear regression analyses. A p-value < 0.05 was considered statistically significant in this study.

Results:

Table (1): Illustrated personal characteristics of studied participants of hospital staff (43.5%) of studied staff aged from 30-40 years, with Mean ±SD 34.9±8.5, most of them (63.0%) were females. The majority (81.0%) of the studied participants were married, (43.0%) of them have more than 40 years of experience with Mean ±SD 9.2±6.1and great majority (91.0%) have not trained in disaster courses.

Table (2): Demonstrated number and percentage of qualifications/job positions of the various categories of studied participants. The highest percentage of physicians (42.5%) were specialists. As for nurses, more than half (55.0%) had a bachelor's degree. The majority (100.0%, 95.0%, 94.0%, and 90.0%) were for security staff, housekeeper workers, administrative employees, and technicians' qualifications.

Table (3): Concerning participants' expectation levels of external disasters, this table shows that a high percentage (93.0%) of participants had low expectations level about man-made external disasters, and (41.0%) of them had high expectations level toward natural external disasters. The majority (83.5%) of studied participants had low total levels of external disaster expectations.

Table (4): Illustrated awareness levels of external disaster preparedness plan among studied participants. High percentages (90.0%) of high awareness were reported by studied participants for ambulance preparedness, and high percentage (93.0%) of low awareness were reported by them for hospital resources available in external disasters. In addition, (57.5%) of the studied participants reported low awareness of the total external disaster preparedness plan.

Table (5): Shows the correlation between participants' expectation and awareness scores and their age and experience years. It shows that study participants'

Age had statistically significant positive correlations with their scores of awareness of external (r=0.167) and total disasters (r=0.228).

Table (6): Illustrated correlation between the independent variable (age, job category, and attendance of training courses) and dependent variable (participants' awareness of external disasters plan). This table shows a statistically significant positive correlation between participants' awareness of external disaster plans and their age and job category. On the other hand, there was a statistically significant negative correlation between participants' awareness of external disaster plans and their attendance of training courses

Table 1: Personal characteristics of studied participants of hospital staff (n=200)

Personal characteristics of participants	No.	%
Age:		
<30	56	28.0
30-	87	**43.5**
40+	57	28.5
Mean ±SD	34.9±8.5	
Gender:		
Male	74	37.0
Female	126	**63.0**
Marital status:		
Unmarried	38	19.0
Married	162	**81.0**
Experience years:		
<30	56	28.0
30-	58	29.0
40+	86	**43.0**
Mean ±SD	9.2±6.1	
Had training courses in disaster:		
No	182	**91.0**
Yes	18	9.0

Table 2: Number and percentage of qualification/job positions of various categories of the studied participants (n=200)

Qualification/job positions of various categories of the participants	No.	%
Qualification (physician):		
General practitioner	11	27.5
Specialist	17	**42.5**
Consultant	10	25.0
Head of a department	2	5.0
Qualification (nurse):		
Nursing school diploma	10	16.7
Specialty diploma	1	1.7
Technical institute	14	23.3
Bachelor	33	**55.0**
Master	2	3.3
Qualification (technicians):		
Technician	27	**90.0**
Specialist	2	6.7
Head of a department	1	3.3
Qualification (administrator employees):		
Employee	33	**94.3**
Head of a department	2	5.7
Qualification (Security)		
Staff	15	**100.0**
Qualification (housekeeper):		
Worker	19	**95.0**
Head of a department	1	5.0

Table 3: Expectations levels of external disasters among studied participants (n=200)

External disasters	Expectation Levels			
	High levels (60%+)		Low levels of less than 60%	
	No.	%	No.	%
External disaster expectations:				
Natural disaster	83	**41.5**	117	58.5
Man-made disaster	14	7.0	186	**93.0**
Total external disaster expectations	33	16.5	167	**83.5**

Table 4: Awareness levels of external disaster preparedness plan among studied participants (n=200)

External disaster preparedness plan	Levels of awareness			
	High levels (60%+)		Low levels less than 60%	
	No.	%	No.	%
- Designing an external disaster preparedness plan	119	59.5	81	46.0
- Roles of nursing department personnel in external disaster preparedness plan	41	20.5	159	79.5
- Recording system for external disasters	42	21.0	158	79.0
- Training plan for hospital staff in external disasters	116	58.0	84	42.0
- Hospital resources available in external disasters	13	6.5	187	**93.5**
- Ambulance preparedness	180	**90.0**	20	10.0
- Traffic plan	151	75.5	49	29.5
Total	85	42.5	115	**57.5**

Table5: Correlation between participants' expectation and awareness scores and their age and experience years

Participants' expectation and awareness scores and their age and experience years	Spearman's rank correlation coefficient		
	Expectations	Awareness (external)	Awareness (total)
Age	-.009	**.167***	**.228****
Experience years	.078	.046	.100

(*) Statistically significant at p<0.05 (**) Statistically significant at p<0.01

Table 6: Best fitting multiple linear regression model for the score of awareness of external disaster plan

Score of awareness of external disaster plan	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	95% Confidence Interval for B	
	B	Std. Error				Lower	Upper
Constant	44.83	3.73		12.012	<0.001	37.47	52.20
Age	0.35	0.10	0.23	3.329	0.001	0.14	0.55
Job category (reference: nurse)	1.93	0.71	0.19	2.711	0.007	0.52	3.33
Training courses	-6.30	3.06	-0.14	-2.059	0.041	-12.34	-0.26

r-square=0.11 Model ANOVA: F=9.50, p<0.001

Discussion:

Everywhere around the globe, disasters strike, taking lives and leaving billions of dollars in damage. Compared to developed nations, less developed nations typically experience worsening consequential harm, significant ecological disturbance, and ongoing psychological harm to disaster survivors due to inadequate public health organizations and a lack of health professionals. (Demilew, Mekonen, Aemro, Sewnet & Hailu, 2022).

The present study assessed hospital staff members' expectations and understanding of the external disaster at Diarb Negm Central.

Regarding participants' expectations levels of external disasters, most studied participants had low expectations. This might be ascribed to a lack of information and awareness regarding disaster management resources and their needs, leading to low catastrophe anticipation. This conclusion may also explain the success of training courses in giving sufficient information about disaster management requirements.

Tassew et al., (2022) reported that more than half of healthcare professionals had low expectations about external disasters, consistent with the current study's findings assessing the knowledge, attitude, and practice of health professionals working in emergency units in south Gondar zone hospitals. Because of their fear of becoming sick and transmitting an infectious disease to their families, many health professionals refused to work during an epidemic of infectious diseases.

It is consistent with the findings of Elzagh, Shazly, Abd Elrahman, & Thabet (2021), who developed a disaster management plan for the emergency department of Minia University Hospital in Egypt and implemented an educational program. A majority of the participants in the study did not expect a large amount of disaster in the future. As a result, disaster expectations have decreased due to insufficient knowledge and awareness about the lack of resources and their requirements.

In contrast, it disagreed with the study of Hussein & Mahmoud (2016), who examined emergency preparedness and perceived competence of healthcare providers in disasters at the emergency department in Alexandria Main University Hospital and concluded that less than two-thirds of the studied samples had high total expectations level of man-made and natural external disaster. This may be due to training disaster courses that are given to staff by the hospital.

The present study demonstrated that high percentages of studied participants have high awareness levels reported by ambulance preparedness. This comes from their general awareness of hospital facilities they may use daily. In contrast, this study affirmed that they reported low awareness of hospital resources available for external disasters.

Furthermore, more than half of the participants in the study reported having little knowledge of the overall external catastrophe preparation strategy. This could indicate a real shortage of hospital resources or that health care providers are not using them, a lack of in-service disaster management training, and the absence of a disaster management plan in a hospital or, if present, that it is kept in drawers and hospital staff are not familiar with it.

The present study supported the study done by Labrague, Yboa, McEnroe-Petitte, Lobrino & Brennan, (2016) about disaster preparedness in Philippine nurses. It showed that more than half of the studied sample had poor awareness level of the total external disaster preparedness plan. This could be due to deficient disaster nursing education and training given to staff by the hospital.

Furthermore, Rahman, Chaklader, and Muhamad's (2018) study evaluated medical professionals' knowledge and awareness of disaster management in a particular public and private medical college hospital in Dhaka, Bangladesh, and discovered that over 75% of the sample had low awareness of hospital resources available in external disasters. This might be because the majority of research participants had never attended a disaster management course.

In line with the study conducted by Daniels, (2014) about steps toward a national disaster plan for obstetrics in California, United States, most nurses had low awareness of the disaster preparedness plan in hospital units.

On the other hand, this finding contradicted a study performed by Aurelio, et al., (2021), who assessed the knowledge, attitude, and practices of nursing students on disaster preparedness in the Philippines and reported that most of the studied

sample had extremely aware of the total external disaster preparedness plan. This might be due to the absence of continuous education and training workshops about disaster preparedness.

The present study revealed that participants' age had statistically significant positive correlations with awareness of external and total disasters, so disaster awareness increased in hospital staff with age increase. This can confirm that older participants had more experience dealing with disasters than young participants, which can be one of the reasons for the increase in disaster preparedness plans as the age increases.

Similarly, Cevik & Kasapoglu's research from Turkey in 2022 on the connections between nurses' anxiety, health-protective behaviors, and knowledge levels during a catastrophe at work revealed a strong positive correlation between nurses' age and their awareness and understanding of disasters.

However, Shabbir, Afzal, Sarwer, Gilani, and Waqas (2017) evaluated the knowledge and practices of nurses in Pakistan concerning disaster management and emergency preparedness. They found no statistically significant relationship between the participants' age and their awareness of external disaster plans.

Also, the current study showed a statistically significant positive correlation between participants' awareness of external disaster plans and their age and job category. This may be because older and more qualified participants had more knowledge and awareness about external disaster preparedness plans.

The current investigation aligns with the findings of Azizpour, Mehri, and Soola (2022), who evaluated the knowledge of disaster preparedness and its connection to triage decision-making among Iranian hospital and pre-hospital emergency nurses. Their findings indicated a noteworthy positive correlation between the participants' disaster awareness, age, and job category.

On the other side, Jiang, He & Zhou, (2015), in Emergency Logistics in a Large-Scale Disaster Context (Achievements and Challenges), stated that studied participants' awareness of disaster management had no statistically significant socio-demographic variables.

Conclusion:

Most study participants had a low total level of external disaster expectations, and more than half of them reported low awareness of the total disaster preparedness plan.

Recommendations:

1- Give continuous courses about disaster precautions.

2- Provide orientation training and educational endeavors of hospital staff' about awareness of disaster preparedness plans through orientation and on-the-job training courses.

3- Conducted disaster drills for hospital staff periodically to improve their abilities and skills to deal with any external disaster.

4- Developed a plan for disaster management knowledge and skills for the hospital staff in the hospital

Reference:

Ainehvand, S., Raeissi, P., Ravaghi, H., & Maleki, M. (2019). Natural Disasters and Challenges toward Achieving Food Security Response in Iran. Journal of Education Health, 8(1), 58.

Aurelio, H., Bautista, B., Casimiro, R., Dichoso, N., Endaya, R., Ignacio, S., & Mallari, C. (2021). Knowledge, Attitude, and Practices of Nursing Students on Disaster Preparedness. Proceedings Series on Health & Medical Sciences, 2, 13-20.

Azizpour, I., Mehri, S., & Soola, H. (2022). Disaster Preparedness Knowledge and Its Relationship with Triage Decision-making among Hospital and Pre-hospital Emergency Nurses - Ardabil, Iran. BMC Health Services Research, 22(1), 934.

Cevik, A., & Kasapoglu, E. (2022). The Relationships Between Knowledge Levels, Health-Protective Practices, and Anxiety in Nurses in The Workplace During The COVID-19 Pandemic. Work, 73(3), 809-818.

Dameff, C., Killeen, J., & Chan, T. (2020). Cyber Disaster Medicine: A New Frontier for Emergency Medicine. Annals of Emergency Medicine, 75(5), 642-647.

Daniels, K. (2014). Steps toward a National Disaster Plan for Obstetrics. Journal of Obstetrics & Gynecology, 124(1), 154-8.

Demilew, B. C., Mekonen, A., Aemro, A., Sewnet, N., & Hailu, B. A. (2022). Knowledge, Attitude, and Practice of Health Professionals for Oxygen Therapy Working in South Gondar Zone Hospitals, Multicenter Cross-Sectional Study. BMC Health Services Research, 22(1), 600.

Elzagh, D., Shazly, M., Abd Elrahman, S., & Thabet, M.(2021).Developing a Disaster ManagementPlanandImplementingEducatio nal Program at Emergency Unit. Minia Scientific Nursing Journal,10(1),87-97.

Gould, K. A., Garcia, M. M. & Remes, J. A. (2016). Beyond Natural-Disasters-Are-Not-Natural: The Work of State and Nature after the 2010 Earthquake in Chile. Journal of Political Ecology, 23(1), 93-114.

Hussein, A., & Mahmoud, N. (2016). Emergency Preparedness and Perceived Competence of Health Care Providers in Disaster: An Egyptian study. Alexandria Scientific Nursing Journal,18(2), 1-14.

Jiang, L., He, H., & Zhou, W. (2015). Knowledge, Attitudes and Competence in Nursing Practice of Typhoon Disaster Relief Work among Chinese Nurses: A questionnaire survey. International Journal of Nursing Practice; 21, 60-69.

Kotani, H., & Yokomatsu, M. (2016). Natural Disasters and Dynamics of "a Paradise Built in Hell": a social network approach. Natural Hazards, 84(1), 309-333.

Labrague, L., Yboa, B., McEnroe-Petitte, D., Lobrino, L., & Brennan, M. (2016). Disaster Preparedness in Philippine Nurses. Journal Nursing Scholarship, 48(1), 98–105.

Labrague, L., Hammad K (2018): Disaster Preparedness among Nurses: A Systematic Review of li Lorenzo-Alonso Alberto. Earth Observation Actionable Information Supporting Disaster Risk Reduction Efforts in a Sustainable Development Framework. International Journal of Nursing Review, 65 (1), 41-53.

Mekky, W. (2009). Designing and Validating a Disaster Plan for Nursing Department at Al-Quds hospital. Doctoral thesis. Ain Shams University. P.P. 125-140.

Mostafa, H. (2009). Designing and validating an Internal Disaster Plan for the Emergency Hospital at Ain Shams University. Doctoral thesis. Ain Shams University. P.P. 145-158.

Nofal, A., Alfayyad, I., Khan, A., & Abu-Shaheen, A. (2018). Knowledge, Attitudes, and Practices of Emergency Department Staff towards Disaster and Emergency Preparedness at Tertiary Health Care Hospital in Central Saudi Arabia. Saudi Medical Journal, 39(11), 1123-1129.

Rahman, A., Chaklader, M., & Muhamad, F. (2018). Knowledge and Awareness on Disaster Management among Medical Professionals of a Selected Public and Private Medical College Hospital. International Journal of Advances in Medicine, 5(6), 1.

Ripoll, G. A. (2015). Core Competencies in Disaster Management and Humanitarian Assistance: A Systematic Review. Disaster Medicine and Public Health Preparedness, 9(4), 430-39.

Shabbir, R., Afzal, M., Sarwer, H., Gilani, S., & Waqas, A. (2017). Nurses' Knowledge and Practices Regarding Disasters Management and Emergency Preparedness. Saudi Journal of Medical and Pharmaceutical Sciences, 3(6), 464-476.

Soliman, S. (2017). Designing and Validating a Disaster Plan for Zagazig University Emergency Hospital. Doctoral thesis. Zagazig University. P.P.140-149.

Tasantab, J. C. (2019). Beyond The Plan: How Land Use Control Practices Influence Flood Risk in Sekondi-Takoradi. Journal of Disaster Risk Studies, 11(1), 638.

Tassew, S., Chanie, E., Birle, T., Amare, A., Kerebih, G., Nega, T., & Feleke, D. (2022). Knowledge, Attitude, and Practice of Health Professionals Working in Emergency Units towards Dsaster and Emergency Preparedness in South Gondar Zone hospitals, Ethiopia. The Pan African Medical Journal, 41, 314.

Tavakoli, N., Yarmohammadian, M., Safdari, R., & Keyvanara, M. (2017). Patient Tracking in Earthquake Emergency Response in Iran. World Journal of Emergency Medicine, 8(2), 91-98