

COVID-19: Disaster Nursing Competence, Anticipatory Disaster Stress, Coping Self-Efficacy as Predictors of Motivation for Disaster Engagement

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Abstract

Background: Disasters occur daily all over the world with different types, shaping extreme public health threats and lead to a huge impact in terms of deaths and injuries, destruction to infrastructure and facilities, and loss of livelihoods. When disaster strikes, nurses play vital roles. They act as first responders, triage officers and caregivers, service coordinators, as well as information or education providers. Thus, nurses must have the fundamental disaster competencies, as well as sufficient self-efficacy to be able to manage and cope with stress levels during disaster. **Aim:** to investigate disaster nursing competence, anticipatory disaster stress, and coping self-efficacy as predictors of motivation for disaster engagement among nurses at Zagazig University Hospitals. **Subjects and Method: Research design:** Descriptive correlational design was used. **Subjects:** 400 staff nurses working at Zagazig University Hospitals. **Tools of data collection:** The Disaster Nursing Competence Questionnaire, Anticipatory Disaster Stress Questionnaire, Motivation for Disaster Engagement Questionnaire, and The Coping Self-Efficacy Scale. **Results:** More than half of the studied nurses (57.30%) have low perception level of disaster nursing competence, nearly half of the studied nurses (50.5 %) have moderate perception level of anticipatory disaster stress. The highest percent of the studied nurses (69.50 %) have low coping self-efficacy level. While, 46.30 % have moderate motivation for disaster engagement. **Conclusion:** disaster nursing competence, anticipatory disaster stress, and coping self-efficacy were significant predictors of motivation for disaster engagement among studied nurses. **Recommendations:** Healthcare administrators should build strong program/courses for disaster preparedness and management including practical training, disaster drills, and simulation to prepare nursing with the necessary knowledge and skills for disaster management.

Key words: Anticipatory Disaster Stress, COVID-19, Coping Self-Efficacy, Disaster Nursing Competence, Motivation for Disaster Engagement, and nursing staff.

Introduction

The COVID-19 disaster is drawing attention to the already overburdened public health systems in many countries, and to the challenges faced in recruiting, deploying, retaining and protecting sufficient well-trained, supported and motivated health workers. It highlights the strong need for sustainable investment in health systems, including in the health workforce, and for decent working conditions, training and equipment, especially in relation to personal protective equipment and occupational safety. Social dialogue is essential to building resilient health systems, and therefore has a critical role both in crisis response and in building a future that is prepared for health emergencies⁽¹⁾.

Natural and man-made disasters are increasing in frequency and severity worldwide over the past decade. The concept of disaster nursing focuses on providing a high level of holistic care during all phases of disasters to populations affected by or at risk of disaster. To achieve the goals of disaster nursing, all nurses must have core competencies in terms of skills, knowledge, leadership and ability to provide holistic care to affected populations⁽²⁾.

Disaster nursing competence has been defined as the application of knowledge, interpersonal decision-making, and psychomotor skills expected for the practice role within the context of public health⁽³⁾. As well, competence defined as a level of performance demonstrating the

effective application of knowledge, skill, and judgment⁽⁴⁾. The concept of disaster nursing concentrates on the systematic and flexible utilization of knowledge, skills, and activities to provide holistic care and decrease health hazards for populations in collaboration with other professional fields during all phases of a disaster⁽⁵⁾.

Nurses worry about the recurrence of the disaster event, their workload and challenges in the disaster field, working in a chaotic situation with scarce resources, availability of protective equipment, individual safety, family concerns, fear of unknown, fear of not being able to perform, and working for an unknown period of time^(6,7). Specifically, nurses with previous disaster response experience expressed that they had a feeling of fear at the moment when waiting for victims to arrive during a disaster situation they described as very emotional and extremely tense. All of these concerns may affect nurses' motivation to attend or remain at the situation site^(8,9).

Stress is an expected hazard of disaster behavioral health response activities based on the fact that a disaster is a traumatic event and staffs are exposed to the survivors' experiences in an in-depth and intimate way. While the program administrators are responsible for the organizational stress management structure, each disaster response staff member is responsible for the implementation of his or her own individual stress management planning. Disaster stress therefore means that individuals are inclined to exhibit psychological problems and distress when involved in disaster events, especially when the required tasks exceed their abilities. The sources of stress may come from the disaster itself, the environment of the situation, and the safety of the nurses themselves and that of others during the disaster event⁽¹⁰⁾. Nurses working during the COVID-19 emergency presented greater emotional reactions

and turned more to problem-focused coping. Emergency workers must have sufficient self-efficacy in terms of their coping skills to be able to manage and cope with stress levels. Self-efficacy in coping appears to be an effective protective factor in relation to stress levels and maladaptive responses. Self-efficacy to cope with traumatic events has been effective in reducing the risk of disaster⁽¹¹⁾.

Motivation is important in human behavior and is the force that causes movement in humans. Motivation explains the start, direction, and perseverance of behavior among individuals involved with adding value to the goals, perceived competence, causal attributions, and emotional reactions. Engagement in disaster relief, and even motivation to engage in it, is a challenge for nurses⁽¹²⁾.

Significance of the Study:

Incidence and severity of natural or man-made disasters is increasing. The consequences of disasters cause many long-term serious environmental disruptions and mental impairment to the survivors in the community. As well, the occurrence of disaster events, particularly when the events cause many casualties or the disasters last for an extended period of time, is often an indicator that the capacity of the nursing workforce in a community or health institution is being overwhelmed. Nurses are the largest group among the healthcare provider workforce and play an important role during the emergent phase of a disaster and throughout the phases of disaster preparedness and recovery.

In addition, Nurses often have to respond to the disaster events and work in the first line. Therefore, disaster competence and preparedness among nurses is necessary to effectively manage unpredictable events. However, relationship between nurses' disaster nursing competence and motivation of disaster engagement was not fully studied So that this study will investigate disaster nursing

competence, anticipatory disaster stress, and coping self-efficacy as predictors of motivation for disaster engagement among nurses.

Aim of the study:

The present study aimed to investigate disaster nursing competence, anticipatory disaster stress, and coping self-efficacy as predictors of motivation for disaster engagement among nurses at Zagazig University Hospitals.

Research questions:

1. What is the perception level of disaster nursing competence among nurses?
2. What is the level of anticipatory disaster stress among nurses?
3. What is the level of coping self-efficacy among nurses?
4. What is the level of motivation for disaster engagement among nurses?
5. Are there relationships among disaster nursing competence, anticipatory disaster stress, coping self-efficacy, and motivation for disaster engagement?
6. Is disaster nursing competence, anticipatory disaster stress, and coping self-efficacy, predictors of motivation for disaster engagement?

Subjects and Method:

Research design:

Descriptive correlational design was used for this study.

Study Setting:

This study was conducted at all Zagazig University Hospitals (Academic hospital), Egypt, which includes two sectors. The Emergency sector and El-Salam sector with total bed capacity 1954 and 2770 staff nurses

Study Subjects:

Staff nurses working at Zagazig University Hospitals

Sampling design:

A proportionate stratified random sample was taken

Sample size:

The total population size was 2770 nurses, sample size was calculated using the following equation $n =$

$$= \frac{N \times p(1-p)}{[(N-1) \times (d^2 + z^2)] + p(1-p)} \quad (13)$$

Where: n: Sample size, N: Population size, z: Confidence level at 95% (1.96), d: Error proportion (0.05), p: Probability (50%).

Accordingly, the required sample size was 400 nurses after adjustment of a dropout rate of 10 %. Then, the required number of nurses from each hospital was calculated with the following formula (number of nurses in each hospital x required sample size / total number of nurses in all hospitals).

Inclusion criteria

The inclusion criteria for this study sample include: full time staff nurses who have at least 1 year of experience.

Tool for data collection:

To fulfill the purpose of this study four tools were used in data collection as follows:

Tool I: The Disaster Nursing Competence Questionnaire (DNCQ).

This questionnaire contained two parts as follows:

Part 1: Personal and job characteristics of staff nurses. This part was developed by the researchers to collect data about: Age, gender, years of experience, educational qualification, and previous training about disaster preparedness.

Part 2: Developed by International Council of Nurses (ICN)⁽¹⁴⁾ to measure nurses' perceived competence level when responding to disaster events. It included 37 items subdivided into eight theoretical dimensions, namely: Preparation and planning (4 items), communication (5 items), Incident management (4 items), safety and security (5 items), assessment (4 items), intervention (7 items), recovery (4 items), and law and ethics (4 items).

Scoring system:

The nurses' responses were measured on a five-point Likert scale ranged from very familiar (5) to not familiar (1). The total score of this tool

ranged from 37–185. Scores ≥ 144 indicated a higher perception level of disaster nursing competence, scores 108 – 143 indicated a moderate level, while scores 37 – 107 indicated a low perception level.

Tool II: Anticipatory Disaster Stress Questionnaire (ADSQ): was developed by Vagni et al. ⁽¹⁵⁾ to measure nurses' anticipation of stressors when encountering disaster events, it consists of 33 items subdivided into six subscales, namely; organizational–relational stress (8 items), physical stress (5 items), Inefficacy Decisional Stress (5 items), Emotional Stress (6 items), cognitive stress (4 items), and covid-19 Stress (5 items).

Scoring system:

The nurses' responses were measured on a five-point Likert scale ranged from very much (0) to not at all (4) The total score of this tool ranged from 0 –132. Scores ≥ 112 indicated that the nurses have higher perception level of stress in facing disaster events, scores 111- ≤ 67 indicated a moderate level, while scores < 66 indicated a low perception level.

Tool III: Motivation for Disaster Engagement Questionnaire (MDEQ). Was developed by Liou et al. ⁽¹⁶⁾ to measure nurses' motivation to engage in disaster events or preparedness activities. It involved 25 items (e.g. I want to be part of the rescue team as a nurse at a disaster site, I like to join disaster relief activities as a nurse, and The job roles I perform at work take advantage of my talents and abilities in a disaster situation).

Scoring system:

The nurses' responses were measured on a five-point Likert scale ranged from strongly disagree (1) strongly agree (5). The total scores of the instrument ranged from 25–125. The nurse's score ≥ 104 indicated a high level of motivation to participate in disaster events, scores 78 – 103 indicated moderate level while scores 25 - 77 indicated a low level.

Tool IV: The Coping Self-Efficacy Scale was developed by Chesney et al ⁽¹⁷⁾ to measure nurses' perceived self-efficacy for coping with challenges and threats, this measure focuses on the changes in individuals' confidence in their ability to cope effectively based on self-efficacy theory. It involved 26-item subdivided into three subscales, namely; Use problem-focused coping (11 items), stop unpleasant emotions and thoughts (9 items), and get support from friends and family (6 items).

Scoring system:

Items were rated on a five-point Likert scale ranged from always (5) to never (1). The total score ranges from 26–130. In this study, a score was considered a high perception if it was ≥ 108 and a moderate perception if it was 81 – 107 and low if it was 26 – 80.

Validity and Reliability:

The questionnaire was translated into Arabic, and then content and face validity were established by panel of three experts from nursing administration department at the faculty of nursing, Zagazig University. According to their opinions, all necessary modifications were done

The reliability of the instruments was estimated in this study using Cronbach's alpha, it was 0.71 for the disaster nursing competence questionnaire, 0.92 for anticipatory disaster stress questionnaire, 0.86 for motivation for disaster engagement questionnaire, and 0.84 for the coping self-efficacy scale.

Field work:

The collection of data took about two months from the beginning of August till the end of September 2021 during morning and afternoon shifts. The preparatory phase was completed by briefly explaining the aim of the study to studied nurses. The time required to reply to each questionnaire ranged from 25 to 35 minutes.

Pilot study:

To verify the clearness of this study tools and to estimate the time needed to complete the questionnaire

sheets for each participant, a pilot study was done on 40 nurses (10% of the sample). The required adjustments were done and nurses who participated in the pilot study were excluded from the main study sample.

Administration and Ethical consideration:

This study was approved by the Ethics Committee of the Faculty of Nursing, Zagazig University. Approval to carry out the study was obtained from the medical and nursing directors of the hospitals and head nurses of different departments after explaining the purpose of the study. Participants were informed about their full voluntary involvement in the research and the cover letter introducing the study addressed the participants' confidentiality. Consent was established with the completion of the questionnaires.

Statistical Analysis:

Data entry and statistical analysis were done using the Statistical Package for Social Science (SPSS), version 20.0. Data were presented using descriptive statistics in the form of frequencies and percentages for categorical variables, and means and standard deviations for continuous variables. Pearson correlation analysis was used for assessment of the interrelationships between total scale scores. Multiple linear inner regression analysis was used to assess the effect of the predictor.

Results:

Table (1) described the characteristics of the 400 nurses in the sample. They were predominantly aged in their 20s (<30 years). 93.75 of them were females. Correspondingly, the majority of respondents were not university graduates, but had diploma degree and had less than 10 years of experience (73.8 % & 76.8 % respectively), so that there may be an issue with future mentoring as a means to attract more university-qualified nurses. The analysis also

showed that, only 12.8% of the respondents received training about disaster nursing preparedness.

Figure (1): showed that more than half of the studied nurses (57.30%) rated their disaster competence level as low. While, only 4.30 % rated their disaster competence level as high.

Figure (2) revealed that, nearly half of the studied nurses (50.5 %) rated their level of anticipatory disaster stress as moderate. While, more than one third of them (39.30 %) have low level and the remaining percentage (10.30 %) had high level of anticipatory disaster stress.

Figure (3) revealed that, the highest percent of the studied nurses (69.50 %) have low coping self-efficacy level. whilst over one-quarter (26.30%) of the studied nurses have a high level.

Figure (4) showed that, 46.30 % of the studied nurses rated their level of motivation for disaster engagement as moderate. Whilst to some extent one quarter of them (26.30 %) have high level and the other one quarter (27.50 %) had a low level.

Table 2 showed a statistically significant positive correlation between motivation for disaster engagement and both of Disaster Nursing Competence and Coping Self-Efficacy ($r= 0.607^{**}$, $P= 0.000$; $r=0.924$, $P= 0.000$, respectively). While, there was a statistically significant negative correlation between Motivation for Disaster Engagement and Anticipatory Disaster Stress ($r= - 0.187^{**}$, $P= 0.000$).

Table (3): showed a significant effect of Copying Self-Efficacy on Motivation for Disaster Engagement. The model's r^2 value was .540, indicating that Copying Self-Efficacy alone explain 54 per cent of the variance on Motivation for Disaster Engagement. Followed by Disaster Nursing Competence which explain 17.8 per cent of the variance on Motivation for Disaster Engagement. Whilst, Anticipatory Disaster Stress explain only 2.7 per cent of the

variance on Motivation for Disaster Engagement. Overall, staff nurses' disaster nursing competence, anticipatory disaster stress, and coping self-efficacy were significant predictors of motivation for disaster engagement among studied nurses.

Discussion:

Disasters occur daily all over the world with different types, shaping extreme public health threats and lead to a huge impact in terms of deaths and injuries, destruction to infrastructure and facilities, and loss of livelihoods. when disaster strikes, nurses play vital roles. They act as first responders, triage officers and caregivers, service coordinators, as well as information or education providers. Thus, nurses must have the fundamental disaster competencies, as well as sufficient self-efficacy to be able to manage and cope with stress levels during disaster ⁽¹⁴⁾. Therefore, the aim of this study was to investigate disaster nursing competence, anticipatory disaster stress, and coping self-efficacy as predictors of motivation for disaster engagement among nurses at Zagazig University Hospitals.

The findings of this study showed that more than half of the studied nurses rated their disaster competence level as low. Indicating that studied nurses may not be ready or confident in their abilities to respond to disaster events. These results may be due to the demographic characteristics of the studied nurses in this study which revealed that, the majority of them were not university graduates, but had diploma degree with less than 10 years of experience. Added to that, the majority of the studied nurses have no previous training about disaster preparedness. All these factors are reasons for the low competency level among the respondents. These explanations were supported by Labrague et al. ⁽¹⁸⁾ who reported that nurses' disaster competencies are strongly associated

with previous disaster care experience(s) and disaster-related training. The results also agree with Jang and Cho ⁽¹⁹⁾ who found that, rural nurses with prior disaster nursing education showed higher disaster nursing competencies than their counterparts without prior education. The results agree also with Jang et al ⁽²⁰⁾ who recommended that, to improve the disaster competency of nurses, it is necessary to develop an education program that considers the factors influencing disaster response readiness. Same results were also reported by Liou et al. ⁽¹⁶⁾ who found that hospital nurses' level of disaster competence was not high in his study.

Regarding anticipatory disaster stress level, the current study findings revealed that, nearly have of the studied nurses rated their level of anticipatory disaster stress as moderate. This may be due to low disaster competence level among the studied nurses which in turn affect their stress level. However, Becher and Krekelberg ⁽²¹⁾ argue that, experiencing some anticipatory stress might be protective and helpful in coping with stressful events in the long run. in general, manageable levels of moderate life stress seems to have a positive impact on how humans' function at a physiological level. This result agrees with Liou et al. ⁽¹⁶⁾ who reported that anticipatory disaster stress among study participants was moderate .

The current study findings revealed that, the highest percent of the studied nurses have low coping self-efficacy level. Indicating that, studied nurses in this study did not have the ability to seek efficient coping strategies on the encountered difficulties during pandemic disaster. According to Cai et al ⁽²²⁾ Self-efficacy is a significant predictor of coping behavior and emotional health, as it reflects one's confidence in one's ability to cope with stress, setbacks, and challenges. Individuals with high levels of coping self-efficacy are

expected to better mediate potential stressors and challenges

Regarding the level of motivation for disaster engagement the current study findings showed that, nearly half of the studied nurses rated their level of motivation for disaster engagement as moderate. Whilst one quarter had a low level. This result may be due to that, almost all of the studied sample were females, who have fear of being incapable of managing disaster consequences and worry about their family and children when they engage in disaster management. Added to that, the inadequate training provided by the hospital to prepare them for disaster management and how remove their stress. Same results were also reported by Liou et al. ⁽¹⁶⁾ who found that, the degree of nurses' motivation for disaster engagement was not high in his study. But disagree with Mcglover ⁽²³⁾ and Liou et al. ⁽²⁴⁾ who found that, motivation for disaster engagement was high among the studied sample .

The findings of the present study showed a statistically significant positive correlation between motivation for disaster engagement and both of Disaster Nursing Competence and Coping Self-Efficacy. These results supported by The Self-Determination Theory which suggests that competence is one of the significant factors influencing individuals' motivation in engagement behaviors ⁽²⁵⁾. Therefore, we argue that, the low disaster competence level and low coping self-efficacy level among the studied nurses were major reasons for the moderate and low level of motivation for disaster engagement among the studied nurses in this study.

While, there was a statistically significant negative correlation between Motivation for Disaster Engagement and Anticipatory Disaster Stress. Same results were reported by Liou et al. ⁽²⁶⁾ who found negative correlation between anticipatory

disaster stress and motivation of disaster engagement.

Overall, the findings of the current study reported that, staff nurses' disaster nursing competence, anticipatory disaster stress, and coping self-efficacy were significant predictors of motivation for disaster engagement among studied nurses. Accordingly, these findings highlight the necessity for stakeholders, nursing managers, and nurse educators to make more focus on prior disaster nursing education. Through the development of disaster nursing preparedness programs to equip nurses as a disaster responder with the necessary knowledge and skills to be competent in managing disaster events as well as training program on disaster stress management.

These results were in the same vein with Liou et al ⁽²⁶⁾ who stated that disaster nursing competence and willingness to join hospital disaster rescue could predict individuals' motivation of disaster engagement. Also, agree with Liou et al. ⁽¹⁶⁾ who mentioned that the degree of disaster competence may impact the motivation for disaster engagement among hospital nurses in Taiwan.

Conclusion:

The present study findings concluded that, there were a statistically significant positive correlation between motivation for disaster engagement and both of Disaster Nursing Competence and Coping Self-Efficacy. While, there was a statistically significant negative correlation between Motivation for Disaster Engagement and Anticipatory Disaster Stress. The results also indicated that disaster nursing competence, anticipatory disaster stress, and coping self-efficacy were significant predictors of motivation for disaster engagement among studied nurses

Recommendation:

1. Based on important findings of the study, the following recommendations were suggested:

1. Healthcare administrators should build strong program/courses for disaster preparedness and management including practical training, disaster drills, and simulation to prepare nursing with the necessary knowledge and skills for disaster management.
2. Nursing colleges and schools should design strong disaster education plans and disaster-related courses and apply innovative teaching/learning strategies in their courses to increase students' leaning interests in disaster nursing
3. Nurse educators should work with healthcare institutions and local government departments to provide students with opportunities to practice disaster care and prepare them for a disaster response.
4. Further research should conduct to investigate other factors that may predict nurses' motivation for disaster engagement

Table (1): Distribution of Personal Characteristics of the Studied nurses (n=400)

Variables	No	%
Age in years		
• <30	307	76.8
• 30-40	93	23.3
Gender		
• Female	375	93.75
• Male	25	6.25
Qualification		
• Diploma	295	73.8
• Bachelor degree	105	26.3
Experience in years		
• <10	307	76.8
• 10-20	93	23.3
Previous Training		
• Yes	51	12.8
• No	349	87.3

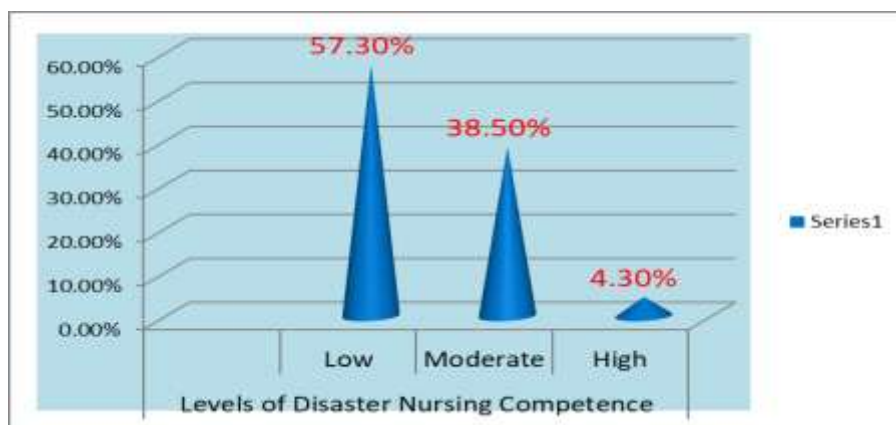


Figure (1): Level of Disaster Nursing Competence among Studied Nurses (n=400)

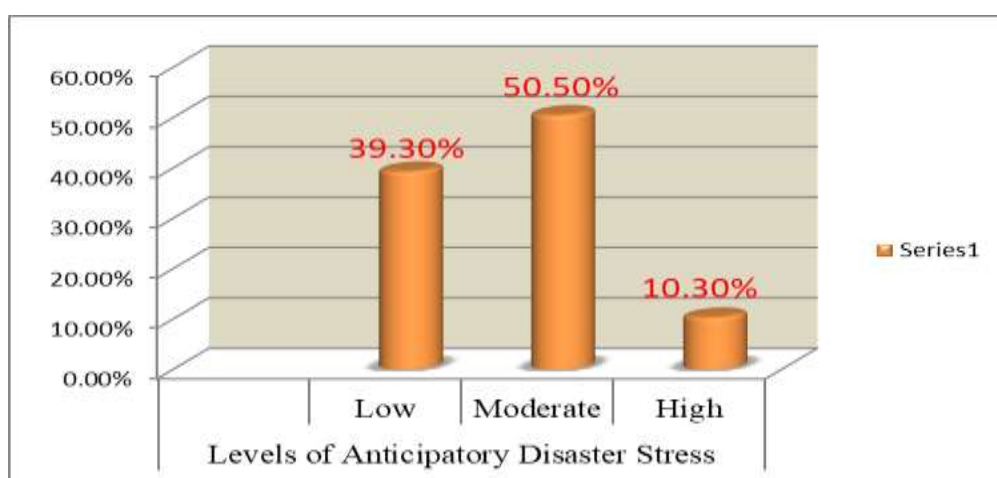


Figure (2): Level of Anticipatory Disaster Stress among Studied Nurses (n=400)

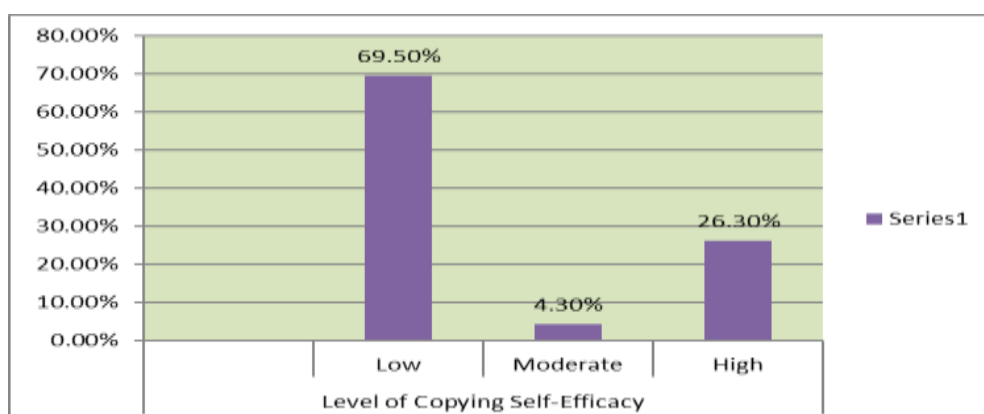


Figure (3): Level of Coping Self-Efficacy among Studied Nurses (n=400)

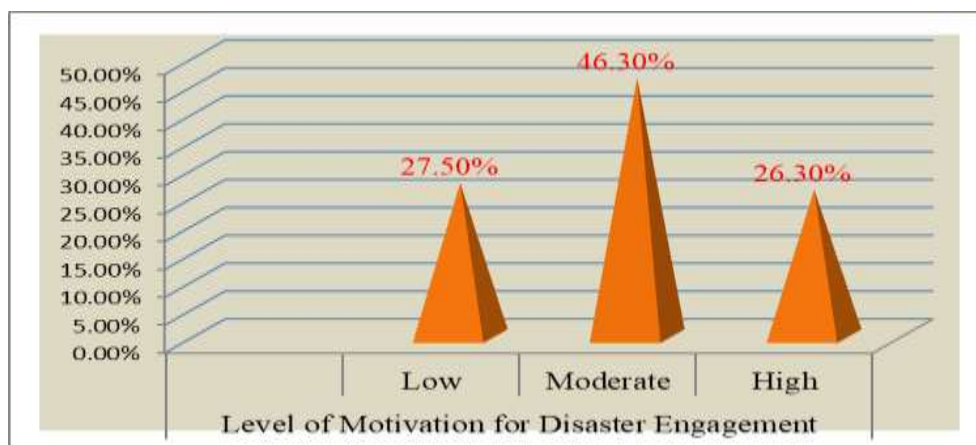


Figure (4): Level of Motivation for Disaster Engagement among Studied Nurses (n=400)

Table (2): Correlation between Disaster Nursing Competence, Anticipatory Disaster Stress, Coping Self-Efficacy, and Motivation for Disaster Engagement (n=400)

Study variables	Anticipatory Disaster Stress		Coping Self-Efficacy		Motivation for Disaster Engagement	
	r	P	r	P	r	P
Disaster Nursing Competence	.830**	.000	.364**	.000	.607**	.000
Anticipatory Disaster Stress	-	-	.178	.000**	-.187**	.000
Coping Self-Efficacy	.178	.000**	-	-	.924**	.000
Motivation for Disaster Engagement	-.187**	.000	.924**	.000	-	-

** Correlation is significant at the 0.01 level (2-tailed).

Table (3): Regression Analysis to Study Disaster Nursing Competence, Anticipatory Disaster Stress, and Coping Self-Efficacy as Predictors of Motivation for Disaster Engagement (n=400)

Variables	R	R ²	Unstandardized Coefficient		T	Sig
			B	Std. Error		
Disaster Nursing Competence	.422	.178	.442	.048	9.280*	.000
Anticipatory Disaster Stress	.165	.027	.100	.030	3.330*	.001
Coping Self-Efficacy	.735	.540	1.382	.064	21.603**	.000

** Correlation is significant at the 0.01 level (2-tailed).

References

1. Sasangohar, F., Jones, S. L., Masud, F. N., Vahidy, F. S., and Kash, B. A.

Provider burnout and fatigue during the COVID-19 pandemic: lessons learned from a high-volume intensive

- care unit. *Anesth. Analg.* 2020, 131, 106–111.
<https://doi.org/10.1213/ANE.00000000000004866>
2. Khan, S.; Kausar, S.; Ghani, M. Knowledge of disaster preparedness among nurses at two tertiary care hospitals in Lahore. *Biomed* 2017, 33, 29–38.
 3. National Council of State Boards of Nursing. Transition to Practice: Newly Licensed Registered Nurse (RN) and Licensed Practical / Vocational Nurse (LPN/VN) Activities. Available online: https://www.ncsbn.org/Vol_22_web.pdf (accessed on 23 February 2020).
 4. International Council of Nurses (ICN). ICN on Regulation: Towards 21st Century Models; International Council of Nurses: Geneva, Switzerland, 2020.
 5. Ozpulat, F.; Kabasakal, E. Knowledge levels of nursing students on disaster nursing and their state of disaster preparedness. *Int. J. Med. Res. Health Sci.* 2018, 7, 165–174.
 6. Pourvakhshoori, N.; Norouzi, K.; Ahmadi, F.; Hosseini, M.; Khankeh, H. Nurse in limbo: A qualitative study of nursing in disasters in Iranian context. *PLoS ONE* 2017, 12, 1–12.
 7. Couig, M.P. Willingness, ability, and intentions of health care workers to respond. *Annu. Rev. Nurs. Res.* 2016, 30, 193–208.
 8. Hammad, K.S.; Arbon, P.; Gebbie, K.; Hutton, A. Nursing in the emergency department (ED) during a disaster: A review of the current literature. *Australas Emerg Nurs J.* 2019, 15, 235–244.
 9. Secor-Turner, M.; O’Boyle, C. Nurses and emergency disasters: What is known. *Am. J. Infect. Control.* 2019, 34, 414–420.
 10. Moghaddam, M.N.; Saeed, S.; Khanjani, N.; Arab, M. Nurses’ requirements for relief and casualty support in disasters: A qualitative study. *Nurs. Midwifery Stud.* 2019, 3, 1–8.
 11. Huang, L., Xu, F. M., and Liu, H. Emotional responses and coping strategies of nurses and nursing college students during COVID-19 outbreak. *MedRxiv [Preprint]*, 2020. <https://doi.org/10.1101/2020.03.05.20031898>
 12. Tohidi, H.; Jabbari, M.M. 2020. The effects of motivation in education. *Procedia Soc. Behav. Sci.*, 31, 820–824.
 13. Thompson, S.K. (1987). Sample Size for Estimating Multinomial Proportions. *The American Statistician*, 41, 42-46.
 14. International Council of Nurses (ICN). Core competencies in disaster nursing version 2.0. 2019 Available online: https://www.icn.ch/sites/default/files/inline-files/ICN_Disaster-Competence-Report_WEB.pdf. Accessed on 23 February 2020.
 15. Vagni, M., Maiorano, T., Giostra, V., & Pajardi, D. Coping With COVID-19: Emergency Stress, Secondary Trauma and Self-Efficacy in Healthcare and Emergency Workers in Italy. *Frontiers in Psychology*, 2020, 11.
 16. Liou SR, Liu H C, Tsai HM, Chu TP, and Cheng CY. Relationships between disaster nursing competence, anticipatory disaster stress and motivation for disaster engagement, *International Journal of Disaster Risk Reduction* (2020a), <https://doi.org/10.1016/j.ijdrr.2020.101545>
 17. Chesney, M.A.; Neilands, T.B.; Chambers, D.B.; Taylor, J.M.; Folkman, S. A validity and reliability study of the coping self-efficacy scale. *Br. J. Health Psychol.* 2006, 11, 421–437.
 18. Labrague, L.J., Hammad, K., Gloe, D.S. et al. Disaster preparedness among nurses: a systematic review of literature. *International Nursing Review*, 2018. 65 (1), 41–53
 19. Jang S J and Cho S. Disaster nursing competencies of rural nurses during COVID-19: A cross-sectional study, *Collegian*, September 27, 2022;, <https://doi.org/10.1016/j.colegn.2022.09.007>
 20. Jang, I., Kim, J. S., Lee, J., & Seo, Y. Educational needs and disaster response readiness: A cross-sectional study of clinical nurses. *Journal of Advanced Nursing*, 2021, 77 (1), 189–197. <https://doi.org/10.1111/jan.14570>
 21. Becher E and Krekelberg E. Anticipatory Stress. JULY 30, 2022. Retrieved from: <https://oneop.org/2022/07/30/anticipatory-stress>. At 14 December, 2022
 22. Cai L, Mei Z , Fan T , Li Q , Yao Y, Yan H , Lu D. Impact of Risk

- Perception about COVID-19 on the Coping Behavior of the Elderly: Mediating Role of Self-Efficacy Psychosomatic Medicine Research | June 2021 | vol. 3 | no 2, 61. <https://doi.org/10.12032/psmr2021-0620-044>
23. Mcglover CA. Stress Levels and Work Performance among Employees during the COVID-19 Pandemic. PhD Thesis, La Jolla, California February 2021
 24. Liou SR, Liu HC, Lin CC, Tsai HM, Cheng CY. An Exploration of Motivation for Disaster Engagement and Its Related Factors among Undergraduate Nursing Students in Taiwan. Int J Environ Res Public Health. 2020b May 19;17(10):3542. <https://doi.org/10.3390/ijerph17103542>
 25. Ryan RM, Deci EL. Self-Determination Theory and the facilitation of intrinsic motivation, 403 social development, and well-being. Am Psychol. 2000;55: 68-78.
 26. Liou SR, Liu HC, Tsai H, Chu T and Cheng C. Relationships disaster nursing competence, organizational climate, anticipatory disaster stress and motivation of disaster engagement of hospital nurses. J Nurs Care 2019, Volume 8