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Disaster Preparedness: Attitude And Self-Perceived Competence Of Undergraduates Of A Nursing School In Rural Bengal

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Abstract:
Background: *Disasters cause horrifying mass casualty overwhelming local medical resources, preventing them from delivering comprehensive medical care. Preparedness involves planning and preparation beforehand. Nurses and nursing students, a significant population in healthcare system, qualify to combat any emergency and rescue life of maximum victims. Thus, the study aims to determine attitude, assess self-perceived competence and find out relationship between attitude and perceived competence among the nursing students.*
Materials and Methods: *An observational cross-sectional study design and complete enumeration sampling technique was adopted to conduct the study in a rural setting of West Bengal among 190 nursing undergraduates of a Nursing school chosen by purposive sampling. Quantitative data was collected by using pre-designed pre-tested self-administered structured questionnaire (Cronbach's alpha-0.8), and data analysis was done using MS Excel and SPSS ver. 16.*
Results: *The mean age of the participants was 23. All were female. 53.7% had completed their graduation before joining ANM course. Around 33.7% felt that 'infectious disease outbreak' was likely to occur in the area they live-in. 44.7% had experienced a disaster in the past. 92.1% felt their health school needed a structured disaster management plan. 55.8% of the students had favorable attitude towards disaster preparedness and 53.2% perceived themselves to be confident for disaster situation. Logistic analysis showed that in relation to students with unfavourable attitude, the odds of self-perceived competence was 4.4 times higher among students with favourable attitude. A significant positive correlation was also found between the outcome variables.*
Conclusion: *Students' attitude and competence towards disaster preparedness is moderate. Conducting more disaster related training to enhance awareness of importance of disaster preparedness may be appropriate and can potentially save more lives.*
Keywords: *Disaster, Disaster preparedness, Nursing, Attitude, Competence*

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I. Introduction

Disaster represents a critical public health issue that impacts various facets of society, including socio-economic, political, and cultural dimensions within the affected region. Disaster refers to an event or situation that is of greater magnitude than an emergency that disrupts essential services such as housing, transportation, communications, sanitation, water, and health care.[1] Rapid urbanization and global population growth have increased the number of natural and manmade disasters that can occur on a daily basis. Many of the disasters are accelerated due to global warming and a change in the natural environment.

The World Health Organization (WHO) defines a disaster as 'a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses that exceed the ability of the affected community or society to cope using its resources' [2]. Disasters can be considered an outcome of the risks involved in any process due to multiple hazards and insufficient preparedness to prevent their occurrences. In the last decade, more than 2.6 billion people have been affected by natural phenomena such as earthquakes, tsunamis, landslides, cyclones, heat waves, floods, or severe cold weather. These disasters lead to mass casualty (e.g., blunt trauma, crush-related injuries, drowning) that can overwhelm local medical resources and prevent them from delivering comprehensive and definitive medical care. The WHO SAC program, together with its partners, has worked towards disaster preparedness and response by creating the WHO Disaster Management Guidelines: Emergency Surgical Care in Disaster Situations, a comprehensive manual that details management of common injuries encountered in disaster situations.[3]

Asia is often hit with disasters which comprise of 40.7% of all natural disasters and 90% of the total global disaster victims. Out of world's reported natural disasters between 2004 and 2013, 41.2% or 1,690 incidences occurred in the Asia-Pacific region. [4] Hospital is at high risk to face disaster which can cause serious problems to the patients such as severe injury and death.

According to NIDM (National Institute of Disaster Management 2012 data, [5] a fire accident in a major city of India resulted in the death of 85 bedridden inpatients along with 4 staff members, as authority was unable to evacuate them immediately. A deadly explosion in a supposedly ill-maintained ambulance killed an one-day old neonate in Santacruz, Mumbai. [6] Another finding was in Chennai, Tamil Nadu where a major flood affected a tertiary hospital causing 18 patients admitted in Intensive Care Unit to die as a result of basic support system failure such as monitors, ventilators and lack of oxygen supply. [7] Disasters create unique challenge for every health care facility in terms of manpower, capability, infrastructure and preparedness.

Disaster preparedness activities mainly aim to save the maximum number of lives and livelihoods possible in any disaster situation, ensuring the affected population gets back to normal flow of life as soon as possible. Disaster preparedness involves planning and preparation to effectively respond to any disaster situation, including implementing capacity development; coordinating the participation of responsible organizations, individuals, and volunteers; and ensuring that all personnel are equipped to respond. [8]

Building a workforce capable of dealing with various calamities enhances the speed of response to crises with minimal losses. Their knowledge, attitude, and readiness to practice must be assessed to show the need to train healthcare personnel to deal with disasters. [9] Disaster preparedness and response planning have always been an important aspect of clinical nursing practice.

Florence Nightingale demonstrated her role as a disaster management nurse by playing a crucial role during the Crimean war and showed the world the important responsibilities that nurses play on the front lines as a health care worker [10]. Since nurses constitute the largest group within the healthcare team, it is essential to provide them with comprehensive training to ensure they possess the necessary competencies to effectively respond to disasters. This preparation enables them to rescue lives and protect the health of those affected. Nurses must be well prepared to efficiently manage disasters and help reduce potential damage.[11] though International Council for Nurses (ICN) alerts all nursing staffs to be well prepared with adequate knowledge to respond to disaster events effectively, yet previous studies have found that nurses are not well prepared to respond to disaster events. [12]

II. Materials And Methods

An institute based cross-sectional study was conducted in a nursing school in Singur, a rural block of Hooghly district in West Bengal, India with prior permission from school authority. The school was chosen by purposive sampling. From a previous study in 2017 [13] conducted among nurses working in a paediatric setting of a hospital in South India, 85.1 % were found to have moderate perception. Simple random sampling was used, and sample size for this study was calculated taking p =0.85, confidence interval=95%, z-value=1.96 and absolute error of precision 6%, using the standard Cochran's formula. Taking 10% non-response rate, final sample size came to be 151. Complete enumeration of all consenting final year ANM undergraduates i.e., 190 was done.

The study-period was from July, 2023 to December,2023. Pre-designed pre-tested self-administered structured questionnaire, comprising demographic details, attitude and perceived competence related questions on disaster preparedness was adopted. The validity of the tool was reviewed by experts of the Department of Preventive and Social Medicine of the institute and also by head of the Nursing School to assess its clarity, feasibility, and applicability. The questionnaire had three parts as following:

1. Personal details such as age, gender, educational qualification, academic year, marital status, etc; and general questions related to disaster
2. Attitudes toward disaster preparedness: There were 12 statements in all for the 3-point Likert scale questions with 2 points for agreeing, 1 point for neutral, and 0 point for disagreeing students. The total score for all the questions in this segment was 24. Those who scored ≥ mean/median were considered to have a favourable attitude; rest those who fell below the mean/median value were deemed to have an unfavourable attitude. Internal consistency measured through Cronbach's alpha for the attitude toward disaster preparedness related questions in this study was 0.73.
3. Self-perceived competence regarding disaster preparedness: This included 4 domains (Readiness Behaviours, Response and Assistance, Reassurance and Compassion, Ethics and Conduct) with 16 statements in total for a 3-point Likert scale, with 2 points for feeling confident, 1 point for neutral, and 0 point for being not confident against each statement. The total score was 32. Students who scored ≥ mean/median were considered to perceive themselves competent, whereas those with scores < mean/median deemed to perceive less competent. Cronbach's alpha for self-perceived competence related questions on disaster preparedness in this study was 0.74.

The study procedure was explained to the Nursing School authority of the concerning ANM students before obtaining written permission. The study procedure was also explained to the students and written informed consent was obtained from the participants. Questionnaires were distributed to the students on the data collection day, and they were asked to fill it individually without consulting among themselves.

Quantitative data was analysed using Microsoft Excel 2016 and Statistical package for Social Sciences software (version 16). Descriptive statistics was calculated for predictor variables and outcome variables and was shown by frequency, mean, median and inter-quartile range. $P < 0.05$ was taken as statistically significant. The multivariable models included the significant predictors in the respective univariate analysis. Association between the outcome variables was then seen by test of significance at 95% confidence interval in Univariate Regression Model.

III. Results

The demographic profile of the study participants revealed their median age was 23 and all were female nursing students. Majority (44.2%) belonged to 22 to 25 years, were Hindu (73.2%), belonged to 'Others' (37.4%) in caste, were unmarried (85.8 %), had completed graduation (53.7%) before joining this ANM course, and were in their final year (100 %). (see Table 1)

Table 1: Distribution of study participants according to demographic characteristics (n=190)

Parameters	Count (%)	
Age (in completed years)		
≤ 21	62 (32.6)	Median (Q1, Q3); IQR = 23 (21,25); 4
22 – 25	84 (44.2)	
≥ 26	44 (23.2)	
Religion		
Hindu	139 (73.2)	
Muslim	39 (20.5)	
Others	12 (6.3)	
Caste		
OBC	60 (31.6)	
SC	47 (24.7)	
ST	12 (6.3)	
Others	71 (37.4)	
Educational Qualification		
Below graduation	88 (46.3)	
Graduation and above	102 (53.7)	
Marital Status		
Currently Married	27 (14.2)	
Unmarried	163 (85.8)	

The study findings also showed that around 33.7% felt that 'infectious disease outbreak' was likely to occur in the area they lived-in followed by 'major transport accidents' (31.1%); 44.7% had experienced a disaster in the past, 82.1% were aware of their institute having information on disaster preparedness, 41% agreed that their institute conducted drills to practice responses to disaster situations, and 92.1% felt their health school needed a structured disaster management plan. (see Table 2)

Table 2: Distribution of study participants according to disaster related general details (n=190)

Items	Count (%)
Likelihood of Disaster in the area of living (natural or man-made)	
Infectious Disease Outbreaks	64 (33.7)
Major Transport Incidents	59 (31.1)
Floods	30 (15.8)
Extreme Weather Conditions	27 (14.2)
Drought	6 (3.2)
Earthquake	2 (1.1)
Cyclone	2 (1.1)
Have you personally experienced a disaster in the past?	
Yes	85 (44.7)
No	105 (55.3)
Institute related disaster information	
Do you know if your nursing school has any information on how it can prepare for a disaster? (such as emergency routes, meeting points, emergency contacts, emergency food supplies, etc)	
Yes	156 (82.1)
No	34 (17.9)

Has your institute conducted drills among you to practice responses to various disaster scenarios?	
Yes	78 (41.0)
No	112 (59.0)
Do you think your health school needs a structured disaster management plan? (such as disaster management committee, evacuation plans, meetings for awareness among teachers and students, special provision for handicapped, SoP & training for disaster response, etc)	
Yes	175 (92.1)
No	15 (7.9)

Although more than half (55.8%) of the students had favorable attitude yet around 44% had unfavourable attitude towards disaster preparedness. Similarly, 53.2% perceived themselves to be confident for disaster situation while 46.8% had less confidence to tackle disaster situations. (see Figure 1)

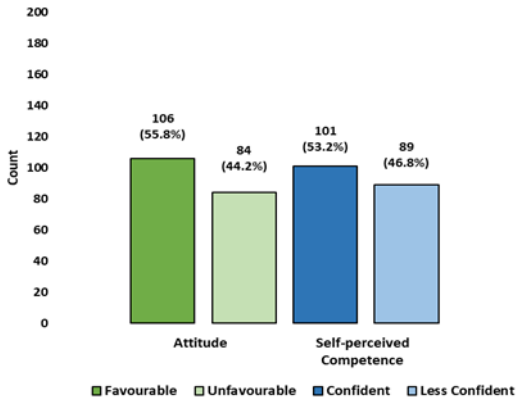

Figure 1: Clustered column chart showing the distribution of study participants according to Attitude and Self-perceived competence on Disaster Preparedness (n=190)

61.3% of study participants who had favorable attitude were aged 21 years and younger. Conversely, 65.9% of those who perceived themselves as confident were aged 26 years and older. Also, 64% and 57% of those below graduation level revealed favorable attitude and felt confident in disaster preparedness respectively. Among married participants, approximately 63% had a favorable attitude and felt confident in their disaster preparedness. Furthermore, among those who had previously experienced a disaster, 64.7% had a favorable attitude and 58.8% felt confident in their disaster preparedness. (see Table 3) Relative to students who had not experienced any disaster, the odds of having favourable attitude towards disaster preparedness were 1.9 times higher among those with experience of disaster event in past (p-value < 0.05). This finding is evident from the logistic analysis in Table 3.

Table 3: Factors associated with Favourable Attitude and Confident Perception towards Disaster Preparedness - a multivariable logistic regression analysis (n=190)

Parameters		Attitude (Favourable) Count (%)	Adjusted OR (95% CI)	Self-perceived Competence (Confident) Count (%)	Adjusted OR (95% CI)
Age	≤ 21 (*ref*)	38 (61.3)	1 (reference)	33 (53.2)	1 (reference)
	22 – 25	45 (53.6)	0.7 (0.4-1.4)	39 (46.4)	0.7 (0.4-1.5)
	≥26	23(52.3)	0.7 (0.3-1.5)	29 (65.9)	1.7 (0.8-3.7)
Educational Qualification	Below graduation (*ref*)	56 (63.6)	1 (reference)	50 (56.8)	1 (reference)
	Graduation and above	50 (49.0)	0.5 (0.3-0.9)	51 (50.0)	0.7 (0.4-1.3)
Marital Status	Unmarried (*ref*)	50 (49.0)	1 (reference)	84 (51.5)	1 (reference)
	Married	56 (63.6)	2.0 (0.8-4.6)	17 (63.0)	0.6 (0.2-1.4)
Experience of disaster in past	No (*ref*)	51 (48.6)	1 (reference)	51 (48.6)	1 (reference)
	Yes	55 (64.7)	1.9 (1.0-3.4)	50 (58.8)	1.5 (0.8-2.6)

 # ref = reference. *p-value < 0.05 taken as statistically significant*

The association of the outcomes have been shown below in Table 4. It was found that 68.9 % of the ANM students who had favourable attitude towards disaster preparedness, perceived themselves to be confident in tackling disaster situation. Another 33.3 % of the students, despite having unfavourable attitude also reported to feel confident on their disaster preparedness.

Table 4: Association between Attitude and Perceived Competence towards Disaster Preparedness - a univariate logistic regression analysis (n=190)

		Perceived Competence (Confident) Count (%)	Adjusted OR (95% CI)
Attitude	Unfavourable (*ref*)	28 (33.3)	1 (reference)
	Favourable	73 (68.9)	4.4 (2.4-8.2)

 # ref = reference. *p-value < 0.05 taken as statistically significant*

The univariate logistic regression model showed that in reference to students with unfavourable attitude, students with favourable attitude had 4.4 times higher odds of perceiving themselves confident on disaster preparedness (p-value < 0.05).

A scatter diagram to find correlation between Attitude and Self-perceived Competence of ANM undergraduates on Disaster Preparedness yielded a Spearman's Correlation coefficient value of 0.407 (p-value < 0.05), indicating presence of a *moderate positive correlation* between the variables.

IV. Discussion

In today's world, every community faces the threat of disasters stemming from various hazards, significantly impacting healthcare systems. Nurses play a pivotal role in responding to and managing these crises. As integral members of healthcare teams, it is crucial for nursing students and nurses alike to prioritize disaster preparedness (DP). [14] This preparedness ensures they can effectively collaborate and respond in any circumstance.

In our study it was aimed to determine attitude, assess self-perceived competence and find out relationship between attitude and perceived competence among the ANM nursing undergraduates of a Nursing School in a rural setting of Hooghly district in Bengal. To the best of our knowledge, this is the first study to focus on the disaster preparedness of ANM students at a nursing school in rural Bengal. The study findings indicated that more than half of the students had favourable attitude and perceived themselves confident toward disaster preparedness, with 44.7% of students having experience of disaster event in past being one of the contributing factors. Hence, the results of the current study provide evidence on nursing students' attitude and perception regarding disaster preparedness in a sample of Indian nursing undergraduate students that might help in the modification of educational policies for disaster preparedness in nursing students.

Concerning their attitude towards disaster preparedness, findings indicated that more than half had favourable attitude about disaster preparedness, with median attitude score 16 out of total score of 24. Moreover majority (92.1%) of the students agreed that their health school needed a structured disaster management plan such as disaster management committee, evacuation plans, meetings for awareness among teachers and students, special provision for handicapped, SoP & training for disaster response, etc. These findings could be explained by the fact that participants' sufficient knowledge about DP likely led to a positive attitude toward it. Similar findings were present in a study by Mohamed et al where most of the Saudi nursing students had positive attitude toward DP, with mean attitude score 7.67 (SD = 2.19) out of 11, which reflected positive attitude. [15] Regarding attitude, another Indian study by Mariappan et al observed that majority of staff nurses (92%) held favourable attitudes, with 8% expressing neutrality, while among nursing students, 98% exhibited favourable attitudes, with 2% showing neutrality. The study concluded that staff nurses demonstrated superior knowledge compared to nursing students, whereas nursing students exhibited more positive attitudes towards disaster preparedness compared to staff nurses.[16] Similarly, Aurelio et al. conducted a study in the Philippines and found that nursing students exhibited a positive attitude toward disaster preparedness. [17] This finding was however incongruent with an interventional study by Abdel Sattar et al. (2016) on nursing students in Egypt, where they found that only about 20% of the students had a positive attitude toward disaster preparedness before conducting the educational intervention. [18]

In terms of self-perceived competence towards disaster preparedness, it was observed that more than half had scored themselves confident, which highlighted their level of preparedness to respond to disaster events, with median perceived competence score 27 out of total score of 32. This might be owing to their favourable attitude about disaster preparedness. On the contrary a study by Baack et al suggested that most nurses indicated they feel moderately competent or less prepared to respond effectively to a major disaster event. [19] Similar findings of nurses perceiving themselves prepared inadequately for emergencies were found in previous few studies as well. [20,21,22]

The current study results also showed a statistically significant association (p-value < 0.05) between attitude and perceived competence among the study participants regarding DP. This was comparable to the findings by Park et al where attitude among nursing students had significant correlation with their level of preparedness for disaster nursing ($r = 0.176$, $p < 0.001$). [23]

These findings suggest that emphasizing risk assessment and disaster preparedness training for nursing students is essential for further enhancing their attitude and competence in disaster preparedness. Additionally,

integrating disaster preparedness as a part of undergraduate academic curriculum is necessary. These steps can yield positive outcomes by enhancing students' preparedness and response capabilities in disaster situations.

V. Conclusion

Ongoing education and training for nursing students in disaster preparedness are crucial to enhance their overall management of any potential disasters. This will prepare them to confidently handle and manage potential disasters or risks within their communities as competent nurses. As future integral members of the healthcare team, it's important for undergraduate nursing students to receive comprehensive training in disaster preparedness. This should be incorporated into their educational programs.

The study's findings offer valuable evidence to support the formulation of educational policies focused on disaster preparedness for nursing students. These policies can aim to ensure that nurses are well-prepared and capable of effectively responding to disasters, thereby contributing to community safety and healthcare resilience.

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