

Knowledge, Attitudes, and Practices Regarding Disaster Management among MBBS Students: A Cross-sectional Study from Punjab, India

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ABSTRACT

Introduction: Disasters pose significant threats to healthcare systems and communities. Medical professionals, particularly future physicians, require adequate preparedness training to respond effectively to disaster situations. Assessing Knowledge, Attitudes, and Practices (KAP) among medical students is essential to identify training gaps and strengthen curriculum development.

Aim: To assess knowledge, attitudes, and practices regarding disaster management among undergraduate MBBS students in a tertiary care hospital.

Materials and Methods: The present cross-sectional descriptive study was conducted at Government Medical College, Patiala, Punjab, India, from November 2024 to April 2025, among 463 MBBS students. Data was collected using a pre-validated, semi-structured Google forms questionnaire covering sociodemographic characteristics and disaster management KAP (10 items on knowledge, 10 items on attitude and 7 items

on practice). Categorical variables, including sociodemographic characteristics and KAP levels, were expressed as frequencies and percentages. Continuous variables were presented as Mean±Standard Deviation (SD).

Results: The mean age of participants was 19.36±3.21 years, with 286 (61.8%) being female and 364 (78.6%) belonging to Class I socioeconomic status. Only 209 (45.1%) had prior exposure to the disaster topic and 162 (35.0%) were aware of disaster planning. Significant knowledge gaps existed regarding post-disaster infection management {114 (24.6%)}, triage (102 i.e., 22.0%) and local emergency response systems {130 (28.1%)}. Although 343 (74.1%) supported mandatory training, only 127 (27.4%) felt confident in their ability to manage a crisis. Only 109 (23.5%) had experienced a disaster, and 72 (15.6%) had participated in preparedness activities.

Conclusion: Although MBBS students had favourable opinions of disaster training, there were clear deficiencies in both practical exposure and fundamental disaster management skills.

Keywords: Bachelor of medicine bachelor of surgery, Capacity building, Education, Medical students, Planning disaster

INTRODUCTION

Disasters are unpredictable events that pose serious threats to life, property, and healthcare systems. According to the World Health Organisation (WHO), a disaster is defined as a serious disruption of the functioning of a community or society causing widespread human, material, economic, or environmental losses that exceed the affected community's capacity to cope using available resources. In the Indian context, 75% of districts are vulnerable to extreme weather events, with over 600 million people facing varying degrees of disaster risk [1,2].

The rising disaster burden in India due to the combined effects of climate change and rapid urbanisation, as evidenced by recent disasters such as the 2024 floods that affected millions, necessitates a paradigm shift in medical education and training to ensure that healthcare professionals are trained in disaster management competencies. Despite widespread acknowledgement of the critical role future physicians play during health crises, global evidence demonstrates that structured disaster medicine training remains poorly represented or entirely absent from standard undergraduate medical curricula [2].

Medical students represent a critical population for disaster preparedness training. MBBS graduates, as fast learners with capacity to process complex information, can effectively respond to challenging situations. Despite their clinical capabilities, a lack of formal crisis preparation means these students are highly susceptible to disaster impacts, making them a priority focus for comprehensive disaster education [3-5]. In countries like the Philippines, students who participated in formal disaster risk reduction training and seminars demonstrated enhanced preparedness levels, indicating the substantial impact of structured educational interventions [6].

Although it is recognised that disaster management is important in medical education, gaps exist in evidence from the Indian context, including no previous study quantifying KAP deficits among MBBS students in a single institution using validated regression models, which limits the ability of policymakers and educators to make informed decisions about the integration of this subject into the curriculum in the high-risk context of rising disaster frequency in India [7].

Therefore, the present study aimed to comprehensively assess disaster management knowledge, attitudes, and practices among undergraduate MBBS students at a tertiary care hospital in Patiala.

MATERIALS AND METHODS

The present cross-sectional descriptive study was conducted at Government Medical College, Patiala, Punjab, India, from November 2024 to April 2025. Prior to data collection, ethical approval was obtained from the Institutional Ethics Committee with reference number Trg.9(310)2024/32863-65. All participants provided written informed consent before data collection.

Sample size calculation: The required sample size was calculated using the formula $n = Z_{1-\alpha/2}^2 \times p(1-p)/d^2$ [8], where $Z_{1-\alpha/2} = 1.96$, $p = 51\%$ (prevalence of knowledge from previous study [9]), and d (precision) = 5%. The calculated sample size was 384. Accounting for a 15% non-response rate, a target of 452 participants was determined. Ultimately, 463 participants were included.

Inclusion and Exclusion criteria: Inclusion criteria comprised undergraduate MBBS students enrolled at Government Medical College, Patiala, who were present and reachable during the study period and willing to participate, and those who provided informed consent and completed the online questionnaire. Exclusion criteria

included interns, residents, faculty members, MBBS students absent during data collection, and those with incomplete or duplicate questionnaire responses.

Study Procedure

The study instrument was a semi-structured, pre-validated questionnaire adapted from established disaster medicine preparedness tools used by Hassan Gillani A et al., [8]. Modifications for the Indian context included alignment with the National Medical Commission (NMC) Competency-Based Undergraduate Curriculum and the integration of protocols from the Indian Disaster Management Act (2005) [10]. A pilot study was conducted among 30 MBBS students (approximately 7% of the calculated sample) to assess linguistic clarity and feasibility. Based on pilot feedback, minor phrasing adjustments were made to ensure comprehension; consequently, these 30 pilot participants were excluded from the final analysis to maintain data integrity. Face and content validity were confirmed by a panel of five subject matter experts. Internal consistency was robust, with an overall Cronbach's alpha of 0.70.

The final questionnaire comprised four sections: Sociodemographic Information (4 items), Knowledge (10 items): Assessed via multiple-

choice questions (1 mark for correct, 0 for incorrect/unsure), Attitudes (10 items): Evaluated using a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree), Practices (7 items): Measured using a 5-point Likert scale (1=Never to 5=Always), Following modified Bloom's criteria, a score of $\geq 70\%$ was considered adequate (Knowledge) or positive (Attitude/Practice), while scores $< 70\%$ were categorised as insufficient or negative [11]. Socioeconomic status was classified using the updated Modified BG Prasad Scale 2024 [12].

STATISTICAL ANALYSIS

Data were entered into MS Excel 2021 and analysed using IBM Statistical Package for Social Sciences (SPSS) v26. Statistical analysis was limited to descriptive statistics. Categorical variables, including sociodemographic characteristics and KAP levels, were expressed as frequencies and percentages. Continuous variables were presented as Mean \pm SD.

RESULTS

Among 463 participants, the mean age was 19.36 \pm 3.21 years (18 to 25 years). Majority were female, 286 (61.8%) and belonged to Hindu religion 310 (67%) [Table/Fig-1].

Regarding knowledge- 415 (89.6%) respondents knew what a disaster is, however, only 209 (45.1%) had previous exposure to the topic and 162 (35.0%) were aware of disaster planning. The mean knowledge score was 3.42 \pm 2.15 (out of a maximum 10). As per the Bloom's criteria to the knowledge domain, it was seen that only 26.8% (n=124) of the participants possessed adequate knowledge regarding disaster management, whereas a significant majority of 339 participants (73.2%) exhibited insufficient knowledge [Table/Fig-2].

Regarding attitudes: A majority supported mandatory training (343, 74.1%) and felt a disaster plan would increase preparedness (325, 70.2%). However, only 127 (27.4%) felt confident managing a crisis. The mean attitude score was 12.84 \pm 3.12 (out of a maximum of 20; each of the 10 items scored 0-2: 0= disagree, 1= not sure, 2= agree, with one reverse-scored item), with 223 participants (48.2%) demonstrating a positive attitude ($\geq 70\%$ score) [Table/Fig-3].

Variables	Category	Frequency	Percent (%)
Gender	Female	286	61.8
	Male	177	38.2
Religion	Hindu	310	67
	Sikh	145	31.3
	Any Other	8	1.7
Socioeconomic Status (SES)	Class I: \geq 9499	364	78.6
	Class II: 4750 - 9498	57	12.3
	Class III: 2850 - 4749	17	3.7
	Class IV: 1425 - 2849	21	4.5
	Class V: \leq 1424	4	0.9
Admission batch	Batch 2021	69	14.9
	Batch 2023	173	37.4
	Batch 2024	221	47.7

[Table/Fig-1]: Demographic distribution of participants.

Question	Yes (%)	No (%)	Not Sure (%)
Do you know what a disaster is?	415 (89.6)	23 (5.0)	25 (5.4)
Have you ever had any previous exposure to this topic?	209 (45.1)	204 (44.1)	50 (10.8)
Have you ever been involved in disaster response?	107 (23.1)	313 (67.6)	43 (9.3)
Do you know what a disaster plan is?	162 (35.0)	212 (45.8)	89 (19.2)
Are you aware of any disaster management program in your workplace/ community?	68 (14.7)	321 (69.3)	74 (16.0)
Have you ever read journals regarding this topic?	114 (24.6)	298 (64.4)	51 (11.0)
Do you know about triage?	102 (22.0)	319 (68.9)	42 (9.1)
Are you aware of potential risk emergencies in your country?	174 (37.6)	181 (39.1)	108 (23.3)
Are you aware of the local emergency response system?	130 (28.1)	238 (51.4)	95 (20.5)
Are you aware of handling post-disaster infection?	114 (24.6)	248 (53.6)	101 (21.8)

[Table/Fig-2]: Distribution of knowledge and awareness on disaster management.

Question	Agree (%)	Disagree (%)	Not Sure (%)
I feel confident in my ability to handle a disaster situation.	127 (27.4)	110 (23.8)	226 (48.8)
Having a disaster plan makes me feel more prepared.	325 (70.2)	30 (6.5)	108 (23.3)
I have a personal/family emergency plan.	104 (22.5)	163 (35.2)	196 (42.3)
Cause of disaster should be identified and dealt with.	331 (71.5)	24 (5.2)	108 (23.3)
Disasters are unlikely to happen in our hospital.	70 (15.1)	230 (49.7)	163 (35.2)
Disaster management programs should be conducted for UG students.	326 (70.4)	32 (6.9)	105 (22.7)
Training should be essential for all healthcare workers.	343 (74.1)	25 (5.4)	95 (20.5)
I feel confident our hospital has enough equipment and medicine for disasters.	161 (34.8)	92 (19.9)	210 (45.4)

Having an outdated disaster plan won't significantly impact my ability to handle a disaster.	147 (31.7)	150 (32.4)	166 (35.9)
I would be willing to be a future member of a disaster management team.	251 (54.2)	42 (9.1)	170 (36.7)

[Table/Fig-3]: Attitudes toward disaster preparedness and management.

In [Table/Fig-4], regarding practices, only 109 (23.5%) had experienced a disaster; 72 (15.6%) had participated in preparedness activities such as drills or evacuation planning and 83 (17.9%) had applied first aid in emergencies.

Question	Yes	Not Sure	No
Have you experienced any disaster	109 (23.5%)	70 (15.1%)	284 (61.3%)
In the past, have you participated in any disaster preparedness activities, such as drills, evacuation planning, or assembling an emergency kit?	72 (15.6%)	90 (19.4%)	301 (65.0%)
Have you ever applied first aid to someone in an emergency situation	83 (17.9%)	87 (18.8%)	293 (63.3%)
Have you ever been to triage ward at your hospital	56 (12.1%)	108 (23.3%)	299 (64.6%)
Have you ever experienced any post disaster complications	49 (10.6%)	95 (20.5%)	319 (68.9%)
Have you ever been a part of any health care response team	36 (7.8%)	90 (19.4%)	337 (72.8%)
Did you follow government guidelines during COVID-19	354 (76.5%)	80 (17.3%)	29 (6.3%)

[Table/Fig-4]: Distribution of participants' experience and engagement in disaster preparedness and response.

DISCUSSION

The current study revealed a mean knowledge score of 3.42 ± 2.15 , indicating generally low baseline disaster management preparedness. These findings align with studies from Yemen and Ethiopia highlighting the lack of formal training as a critical barrier to disaster preparedness [13]. Similarly, medical students in China [14] demonstrated minimal disaster management knowledge, suggesting a global pattern. In a US study, most participants possessed limited recent prior disaster training and drill experience. Most interestingly, the majority consistently believed throughout the study that disaster preparedness training should be a medical license mandate [15].

Despite knowledge gaps, positive attitudes predominated: 74.1% supported mandatory training and 70.2% believed disaster plans enhanced preparedness. This aligns with studies from Yemen (82% eager for disaster education) and earlier research showing 88% openness to customised disaster medicine courses [13].

The present study demonstrated how inadequate undergraduate medical students' preparedness and mitigation strategies are. This is consistent with research done in Pakistan that revealed that the majority of participants were unaware of the practice of disaster preparedness training, 69.2% of respondents were unaware that their hospital conducts disaster drills, and only 2.6 % were aware of the type of drill that is held there [16]. According to a related study by Singhal Y et al., all respondents agreed that disaster training ought to be taught in schools; however, only 1.1% of respondents were aware that their institution practices drills, and nobody knew what kind of drills were carried out [17]. A study conducted in Malaysia demonstrated a significant difference in practice levels between emergency nurses and community health nurses. Adequate practice was reported by 56.1% of emergency nurses compared to 30.7% of community health nurses. This difference was statistically significant (χ^2 test, $p < 0.001$) [18]. The present study findings underscore the urgent need for experiential learning - including mock drills, simulated scenarios, orientation seminars, and other hands-on exercises - to bridge the knowledge-practice divide.

This research fills a significant void in future doctors' preparedness for disasters by offering a thorough KAP evaluation that systematically assesses knowledge, attitudes, and practices.

Limitation(s)

Since this study is cross-sectional, it only collects data at one particular moment in time, which restricts its capacity to identify causal links between attitudes, practices, and knowledge. The use of self-reported data raises the risk of social desirability bias, in which respondents may exaggerate their level of readiness. Furthermore, because the study was limited to a single institution and used a non-random sampling technique, the results' generalisability is limited. In addition, perceptions may be influenced by cultural and regional factors, which would increase the results' localisability. A final limitation of the study is the absence of a standardised assessment instrument for gauging attitudes and behaviours, which could affect evaluation consistency.

CONCLUSION(S)

Although MBBS students had largely positive attitudes toward disaster management training, they had significant competency gaps that underscore the immediate need for structured integration into the curriculum. The results strongly suggest that disaster medicine modules should be included in the undergraduate medical curricula as soon as possible, with experiential learning, using mock drills and simulated scenarios.

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