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Original Research

Impact of weather-related disasters on medical student rural placements: Implications for clinicians and medical schools

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ABSTRACT

Objectives: To investigate the experiences of medical students during and after a flooding disaster, focusing on the impacts on their rural placements and the support they need from their medical schools.
Study design: Qualitive interview study.
Methods: We conducted a qualitative study of 43 third-year medical students on full-year rural clinical placements in regional Australia through the University Centre for Rural Health, who experienced two major flooding events in 2022. Focus groups and a survey were conducted two-to-six weeks after the flood. Data were deductively analysed using the five categories of fundamental needs described in Maslow's hierarchical model of human needs.
Results: Of the 43 students in the cohort, 36 participated in focus groups, 34 of whom completed the survey (response rates of 84 % and 79 %, respectively). They reported that the floods not only led to disruptions in their education, but impacted on their personal lives through a loss of access to necessities like food, water, fuel and shelter, having to evacuate their accommodation and/or having their property damaged. The experience heightened students' awareness of their own health needs, the importance of self-care, and their sense of community belonging. It also increased their awareness of social vulnerability and health inequity, and led some to consider the type of doctor they aspire to be.
Conclusions: When such disasters affect students on clinical placements, wide-ranging academic and personal supports become crucial. As climate change drives more frequent and severe weather-related disasters, all medical educators and medical schools should be developing and implementing plans to address these impacts. This includes providing appropriate support systems for students on placements and strengthening preparedness for both students and clinicians.

1. Introduction

Medical students on placement in communities affected by weather-related disasters experience many of the direct and indirect impacts faced by other residents of these communities.[1–7] They may, for example, experience reactions such as confusion, stress, anxiety, poor concentration and the development of post-traumatic stress disorder,[2,4,6] all of which could potentially impact their academic performance. Nonetheless, the nature of their studies and personal circumstances, where many are distant from their usual social and family supports, and peer group, means their experience of the events may differ from others in these communities. Clinicians and other staff have a key role to play in providing teaching and support to students on placements affected by weather-related disasters.

We posit that Maslow's Hierarchy of Needs[8] (herein referred to as 'Maslow's Hierarchy') provides a useful framework for analysing medical students' experiences of weather-related disasters. This theory outlines five fundamental categories of needs – physiological, safety, love and belonging, esteem, and self-actualisation – represented as hierarchical levels in a pyramid. According to this hierarchy, lower level physiological and safety needs must be fulfilled before addressing the higher-level needs. Prior research has highlighted the relevance of

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Maslow's Hierarchy to medical education, as emphasised during the COVID-19 pandemic.[9–11] Maslow's Hierarchy is also relevant to students during weather-related disasters, as any disruption to fulfilling their fundamental needs will significantly impact on their ability to succeed in an academic environment.

The flood-prone Northern Rivers region in New South Wales (NSW),[12] experienced two catastrophic floods in February and March 2022.[13] The first peaked at 2 m above previous levels, resulting in widespread damage and displacement. Infrastructure and property damage was extensive and severely affected access to basic amenities, such as water, food, fuel and communication networks.[14–17] The 43 medical students undertaking rural placements in the region through the University Centre for Rural Health (UCRH) were also greatly disrupted by the floods.[5,17] Educational support systems were impacted, with almost one in five UCRH staff members losing their homes or being affected by substantial property damage, and clinical educators having to prioritise their clinical practice over teaching. We have previously reported on students' mental health and their associated feelings of being terrified, helpless and hopeless during the flooding events.[17] However, despite the stresses, students exhibited high levels of prosocial behaviour and volunteered in a variety of roles.[17]

Given the growing climate crisis,[1] understanding medical students' needs during and following weather-related disasters is crucial for developing appropriate support systems and preparing the future medical workforce.[18] Considering the lack of literature of public health research on the experiences of medical students confronted with such disasters,[6,18,19] and impacts on their education and subsequent careers, this paper highlights the implications for clinicians and medical schools in providing support and education to students on placement in the post-disaster context. Specifically, this study aims to investigate the experiences of medical students during and after a flooding disaster, focusing on the impacts on their placements and the support they need from their medical schools.

2. Methods

2.1. Study design

This qualitative study drew on data from focus groups and free-text responses to a survey, and used Maslow's Hierarchy as the framework for guiding the analysis. The methods used for data collection have been reported elsewhere and are summarised below.[17] Our reporting was guided by the Consolidated Criteria for Reporting Qualitative Research Guidelines[20] (Supplementary file 1).

2.2. Participants and recruitment

Study invitations were sent to all 43 medical students who experienced the two catastrophic flooding events in 2022 during their full-year rural placement through the UCRH in their third year of training. Seven students did not participate. No one explicitly declined but we were unable to find a suitable time for some to participate.

2.3. Data collection

Focus groups were conducted 6–10 weeks after the initial flood and 2–6 weeks following the second flood. The survey was accessible to medical students for five weeks over each period.

The focus group topic guide covered medical students' experiences of the flood events (Supplementary file 2). All questions were open-ended, and prompts were used to generate a deeper understanding of students' views. Due to COVID-19 restrictions on physical meetings, four focus groups were conducted by videoconference, while one was held in person. Each lasted 1–1.5 h, generating 6 h and 20 min of audio recordings. There were 5–8 participants per group.

An online survey, using REDCap software hosted by The University of Sydney,[21] was used to gather data on students' socio-demographic characteristics, including age, gender and rural background. The survey included free-text items that explored students' experiences of the flooding events (Supplementary file 3).

2.4. Data analysis

Qualitative data from the focus groups and free text survey responses were coded and analysed using framework analysis.[22] Guided by Gale and colleagues,[22] HI initially open coded the data. JB followed the same procedure and independently coded approximately 70 % of the data. Together, HI and JB then reviewed the open codes and combined them into themes, drawing on the lens of Maslow's Hierarchy of Needs framework, and identified illustrative quotations. The process was highly iterative and entailed multiple reflective discussions between HI and JB over several months. A refinement of the analysis and interpretation occurred through collaborative writing with all authors (Supplementary file 3). Quantitative survey data were analysed using summary statistics to describe student characteristics.

3. Results

Of the 43 medical students who were invited to participate, 36 took part in a focus group, 34 of whom completed the online survey (response rates of 84 % and 79 % respectively). Characteristics of the participating students are presented in Table 1.

The findings are presented below according to Maslow's Hierarchy starting with basic needs. Themes are summarised in Table 2, and exemplar quotes provided.

3.1. Basic needs

3.1.1. Physiological needs

3.1.1.1. Finding food and water. Students related how the floods disrupted their access to food and clean water. Some described having to wade through floodwaters to access food, while others relied on provisions from the UCRH or their parent medical school. After the flood waters receded many students described food shortages at shops. For those students who waded through flood waters to access food, they expressed anxiety about further flooding and reported stockpiling

Table 1
Characteristics of medical students who participated in the online survey.

Characteristics	Number of responses		Percentage	
Gender				
Male	13		38 %	
Female	20		59 %	
Other	1		3 %	
Previous degree				
Yes	21		62 %	
No	13		38 %	
Undertaken a previous rural placement				
Yes	12		35 %	
No	22		65 %	
Type of accommodation while on placement				
University provided	19		56 %	
Market rental	13		38 %	
Family or friends	2		6 %	
Placement type	**February 2022 flood**		**March 2022 flood**	
	Number	Percentage	Number	Percentage
Aboriginal health	2	6 %	4	12 %
General practice	6	18 %	6	18 %
Haematology	2	6 %	1	3 %
MD research block	13	38 %	13	38 %
Mental health	4	12 %	5	15 %
Oncology	2	6 %	2	6 %
Surgery	5	15 %	2	9 %

Table 2
Schematic model for the themes identified based on Maslow's Hierarchy of Needs.

Maslow's Hierarchy of Needs		Themes identified in this study	Exemplar quotes
1. Basic needs	*1.1 Physiological needs* (e.g. air, food, water, shelter, clothing, sleep)	1.1.1 Finding food and water	*"Food became an issue for us and not knowing whether we could drink the water, whether it was clean or not, and obviously not having the power to boil it or anything … [we decided that] all right, we just have to go and forage for resources and try and find something and we just walked through wastewater for an hour …"* (Participant 6, Focus Group 1) *'… my mind goes into overdrive of planning now of making sure we have bottled water making sure everything's charged, the battery packs are charged and sandbags nearby. We have canned food all the time ready, just in case anything happens … and it's just always at the forefront of mine now.'* (Participant 3, Focus Group 1)
		1.1.2 Securing shelter	*"I was worried that, if we left, the water would sit in our house … Because of the damage, it'd be unliveable and we'd have to move out and obviously, there's the biggest housing crisis around here … So that was a longer term danger that was playing into the decision."* (Participant 7, Focus Group 1)
	1.2 Safety needs (e.g. health, employment, property)	1.2.1 Self-awareness of health needs and self-care	*"A few weeks after the flood I felt like I experienced a lot of anxiety and realised I had been traumatised by this event and its aftermath."* (Survey Response # 23) *"For me it was more kind of like the mental effects of seeing, of like the shock of, the flood. I feel like I really had quite significant brain fog, I guess for weeks afterwards, which I felt like really made it hard for me to focus on like actually doing the project. I was really unproductive and getting like frustrated and stressed."* (Participant 3, Focus Group 2)
		1.2.2 Support and information for decision-making	*"The hardest part was not knowing … not having a good source of information if you didn't have power … We didn't know [even] if we should … get water out of the house as quickly as we could."* (Participant 7, Focus Group 1)
2. Psychological needs	*2.1 Love and belonging needs* (e.g. friendship, family, sense of connection, intimacy)	2.1.1 Navigating placement disruptions with others	*"I was only affected mentally, since I was not in a life-threatening scenario and I did not lose any property. However, it still had a substantial impact on me and I don't think this was understood by academics in [medical school name] – they thought that since it was over we should be fine."* (Survey response # 9) *"For a couple of days we had the communications down and then I remember running out of petrol."* (Focus group participant, Focus Group 3) *"Due to the flood, we weren't able to be in contact with one of our placement supervisors during our placement and also weren't able to complete some of the activities."* (Survey response # 24)
		2.1.2 Sense of belonging and cohesion	*"It [the flood] kind of instilled a sense of community in me, in a weird way as well, and made me feel connected to them a bit."* (Participant 1, Focus Group 2) *"One of the more positive experiences was one night that the East Ballina house had us all over for dinner … in the aftermath of the floods – and we all just … had a chat and a yarn with everyone and caught up. It was the first time seeing [students in] the other houses in a few weeks and I found that to be really sort of beneficial and gave us a strong sense of community and that we're all in it together."* (Participant 7, Focus Group 1)
	2.2 Esteem (e.g. confidence, achievement, respect of others, self-worth)	2.2.1Acknowledging the psychological needs of self and others	*"It would be an opportunity … for the next crop of med students coming up … If they're interested in that, it would be a good place for them to experience … providing mental health counselling services."* (Participant 1, Focus Group 4) *"I've gotta say from our teaching that I would still feel unprepared to deal with trauma or natural disasters."* (Participant 6, Focus Group 2)
3. Self-fulfillment	*3.1 Self-actualisation* (e.g. morality, creativity, spontaneity, experience purpose, acceptance, inner potential)	3.1.1 Honing a professional identity	*"We [now] have a lot of experience in interactions with people and [the] values that we get from … being around different types of people, different pace of life, and … it's something that I want to bring back with me wherever I go. So I think that's what is really valuable about living out here."* (Participant 2, Focus Group 2)
		3.1.2 Shaping students' thoughts on their future	*"Whether it's fire or flood or COVID … I think it's just something that I feel kind of hopeful in some sense that I'm in … a career that can change things and hopefully make things better for some people, but these are inevitable events that are going to keep happening."* (Focus Group 3)

canned foods in case of further floods.

3.1.1.2. Securing shelter. Despite evacuation orders, several students chose to stay in their accommodation. This decision was often driven by the pre-existing regional housing crisis, which exacerbated students' concerns over finding alternative accommodation.

Several students had their homes inundated by floodwater. One student house became totally uninhabitable, and the students had to seek alternative accommodation for the remaining two months of their placement. They resorted to staying with other students as alternative accommodation was in such short supply. The consequent crowded conditions placed additional pressure on everyone in the house.

In other accommodation where the ground floor was inundated, the students felt they had no option but to remain in the property for their placement, despite the damp conditions. A student whose bedroom was impacted by floodwater resorted to using a stairwell alcove for sleeping and studying.

3.1.2. Safety needs

3.1.2.1. Self-awareness of health needs and self-care. Students were concerned about risks to health and safety, especially those who had to wade through floodwaters. They were worried about the possibility of contracting infections or sustaining injuries while cleaning out their houses or volunteering to help others.

Most students described their experience of the flood events as impacting on their mental health, identifying feelings of stress, anxiety, trauma and helplessness. Their shared self-awareness culminated in them realising they needed self-care and coping mechanisms.

Students described experiencing mental fatigue and a loss of concentration that impeded their ability to recommence their placements. This in turn increased their worries about meeting academic and placement requirements.

3.1.2.2. Support and information for decision-making. While many students expressed their appreciation of the support and information they received from UCRH staff and placement supervisors, they also identified a lack of dependable news sources and updates to assist them in their decision-making processes, especially with regard to evacuations. This was compounded by generally poor access to power and internet, and that UCRH staff and placement supervisors were also compromised by the same disaster.

3.2. Psychological needs

3.2.1. Love and belonging needs

3.2.1.1. Navigating placement disruptions with others. Many students expressed gratitude towards the UCRH and their medical schools for supporting them in coping with the mental health impacts of the flooding events, and appreciated being individually contacted by UCRH staff to enquire about their welfare. However, some felt unsupported by staff at their medical schools as, not being 'on the ground', they did not appear to understand the gravity of the situation, nor how badly it was affecting students and the subsequent impact on their placements.

The flooding events not only impeded the students' access to their placements – with obstructed roads, inundated facilities and loss of power and internet – but also resulted in the unavailability of supervisors. Many reported the negative impact this had on their education, including altered deadlines, deferred assignments, rescheduled classes and exams, and an overall heightened academic load. Consequently, some students missed out on placement activities, while others faced increased academic pressure, leading to significant emotional and academic performance challenges.

With most local fuel stations affected by flood water contaminating their storage tanks, or students being unable to get to fuel stations due to road closures, few were able to get petrol for their vehicles, which further hindered their ability to reach their placement location. Additionally, power outages meant fuel stations and shops could not process payments electronically for an extended period, which left students struggling to access cash to pay for necessities.

Floods also impacted their academic progression as they missed important information on their assignments and placement requirements, resulting in difficulties and uncertainty. The situation was exacerbated by the loss of communication, which further hampered their ability to stay on track academically.

3.2.1.2. Sense of belonging and cohesion. Despite the challenges, most students reported feeling an increased sense of belonging to the local community and of a sense of 'place'. Stronger community connections were reported by those who volunteered to support the immediate response and recovery efforts, such as in evacuation centres and assisting people with cleaning up their homes.

Students also experienced stronger cohesion among their cohort. They emphasised, for example, that the strong bonds they developed during the crisis provided them with practical support, such as being able to stay at each other's homes when evacuated, as well as peer support and emotional care. Several reported that self-organised social activities with fellow students had been beneficial in developing and strengthening a sense of cohesion.

3.2.2. Esteem needs

3.2.2.1. Acknowledging the psychological needs of self and others. Students were exposed to mental health impacts caused by the trauma of the floods, both personally and in relation to the impact on the local community. They found themselves providing emotional support to each other, to community members and to patients on their clinical placements. Many described these interactions as providing them with valuable learning experiences and skill development in mental health first aid and counselling, which boosted their self-esteem and recognition within the community.

However, some also spoke about the need for further education in disaster medicine and how best to provide psychological support to people, particularly in the context of working within a world impacted by climate change.

3.3. Self-fulfilment needs

3.3.1. Self - actualisation needs

3.3.1.1. Honing a professional identity. Students reflected on their social responsibility to contribute time and expertise to volunteering activities following the flood events, and how this gave them a sense of purpose and usefulness. The floods made them more aware of existing societal inequities, such as homelessness and inequitable access to health care, which meant that those impacted worst by the floods were usually the most socially vulnerable with the fewest resources. Their first-hand experience and recognition of these inequities served as a point of inspiration for many in terms of how they could ameliorate this inequity as future doctors, reinforcing their sense of social responsibility.

Students also reflected on the importance of working in multidisciplinary teams during and after the floods, including both in non-government and government organisations. Most identified that their volunteer work had provided them with an opportunity for professional identity formation by allowing them to apply their medical knowledge in real-life situations.

3.3.1.2. Shaping students' thoughts on their future. Many students emphasised how the flood disaster had shaped their thoughts on their future. For some, it solidified a desire to practise in rural areas, which they linked to the greater sense of belonging and community connection that resulted from their involvement in the flood events.

Others highlighted the inevitability and gravity of future disasters, as they viewed the severity and unprecedented nature of the flood events as resulting from a warming climate. They voiced feelings of anxiety and uncertainty about how they will manage with more climate-induced disasters, subsequent disruptions to health systems, and management of compounding trauma. However, they also described the sense of hope they felt in their capacity as medical practitioners to affect positive change in communities facing future disasters.

4. Discussion

This study documents how the catastrophic 2022 flood events in the Northern Rivers of NSW impacted medical students' personal lives and disrupted their education by hindering their progress and productivity. Maslow's Hierarchy of Needs provides a meaningful framework for identifying the effects of these events on students and guiding responses to them. Students lost access to necessities like food, water, fuel and shelter, with some having to evacuate their accommodation and/or cope with damaged properties. Consequently, they became more aware of their personal health needs, the importance of self-care, and their professional role and responsibility in the context of increasing climate-related threats to health. Weather and other disasters offer clinician supervisors and medical schools an opportunity to teach students about medical care in disaster-affected communities, however students require support so they can meet their academic and personal needs.

The stress experienced by students following the flood events is consistent with international research on direct and indirect disruptions caused by disasters, such as loss of access to health and social care, internet, fuel, food and water, and being linked to poor mental health outcomes.[23–25] Literature on 'near-miss experiences' following traumatic events also suggests that people who barely escape disasters tend to think about what might have been and the misfortune experienced by others, which may reinforce intrusive thoughts and raise the likelihood of developing post-traumatic stress disorder (PTSD) symptoms.[26]

This group of medical students reported a range of peritraumatic responses to the flood events.[17] Such responses among our broader community to previous floods have been associated with PTSD.[13] Our findings highlight the need to ensure that all students who experience such events have access to mental health support and resilience-building opportunities provided by professionals with expertise and experience in prevention and management of PTSD.[27] However, the management of PTSD is a specialised area of care, with limited availability of qualified professionals to provide support, especially in rural areas such as the Northern Rivers.[13] As research shows that social connectedness and feelings of belonging are associated with positive recovery following floods,[28] there may be potential for group-based approaches to care.

On the positive side, living through the floods enhanced the students' sense of place, community belonging and group cohesion, and increased their awareness of social vulnerability and health inequity. Their experiences led them to a closer emotional connection with each other, and deeper feelings of connection to the broader community in which they were based. These positive developments are consistent with the phenomenon of post-traumatic growth.[2,6] It also brought home to them the increasingly complex world in which they will be practising, with an alarming rise in climate change-related health issues. This led some to express concern about their role as future health professionals and others to consider the type of doctor they aspire to be, thus helping them to shape their professional identity.[29]

Our findings are in line with previous studies of medical students' experiences of working and volunteering during the COVID-19 pandemic,[30–33] and the role of such catalysts in professional identity formation. Similarly, medical students involved in caring for survivors of Japan's 2011 Fukushima Daichi earthquake experienced positive post-traumatic growth.[2,6] They identified this time as a defining moment in their careers, one that broadened their areas of study within medicine and, for some, solidified medicine as their chosen career.[2,6]

An opportunity exists for clinicians supervising medical students during disasters to educate them experientially about disaster medicine, drawing on principles of trauma-informed medical education[34,35] to promote understanding of how trauma affects the health and wellbeing of patients, learners and providers. Supervised placements during disasters enable students to develop their clinical skills in an authentic context while providing assistance to the community. However, students in our study felt inadequately prepared for their placements in a flood-prone area, and unsure of what to do during the floods and their aftermath. Nevertheless, most were able to provide support to community members, including by volunteering in evacuation centres.

As the climate warms, weather-related disasters will increase.[36] Thus, the potential for medical students to be impacted by disasters while on placement should not be underestimated. Efforts invested now in preparing them to navigate and learn from these experiences will benefit generations of people whose health will be impacted by climate change.[19,34,35] Teherani and Basu issue a call to action to those teaching medical students to lean into the important role they play in addressing the climate and health crisis.[18] Drawing on our findings, Table 3 proposes strategies to enhance the ways in which clinicians and medical schools can prepare for and support medical students before, during and after a disaster.

Given the likelihood of increasingly frequent and severe weather-related disasters, further research should be conducted to build this area of research,[37] including longitudinal studies on the impact of disasters on students' career trajectories.

4.1. Strengths and limitations

Data was collected for this study within 2–6 weeks after the flood events. While this meant the disaster was still fresh in the minds of students, it may not have allowed sufficient time for them to process their experiences. Our qualitative approach enabled strong participation and response rates, and a nuanced examination of medical students' experiences. While weather-related disasters may represent shared experiences for some, there are large differences in the way people interpret and process them, even if they witness the same event.[2]

4.2. Conclusion

The 2022 flooding events in the Northern Rivers of NSW severely disrupted the medical education of students on placements and had a major impact on their lives. This indicates that a range of academic and personal support is needed from medical educators and medical schools when students are affected by weather and other disasters while on clinical placements. The flooding events were also a catalyst that enabled professional identity formation students. All medical educators and medical schools should be developing and implementing plans to address the increasing frequency and severity of weather-related disasters. Our findings help to identify entry points at which clinicians and medical schools can intervene to minimise placement disruption resulting from disasters, and maximise learning and professional growth related to students' experience.

Author statements

Ethical approval

Ethics approval was granted by The University of Sydney Human Research Ethics Committee (Ethics ID: #2016/457 and #2020/475) and Western Sydney University Human Research Ethics Committee (Ethics

Table 3
Proposed strategies to prepare for and support students experiencing a weather-related disaster, by timing, and responsible party.

Responsible party	Prevention – Prior to placement	Prevention – During Placement	During & After Disaster
Medical Schools (home institutions)	• Ensure students are aware of the possible short- and long-term physical and mental impacts of weather-related disasters on all those likely to be either directly or indirectly exposed. • Incorporate disaster and climate change impacts into curricula. • Highlight the impacts on health workforce and preparing students both as future professionals and as current participants in the health care system.	• Provide training in mental health first aid with reference to trauma literature relevant to disaster contexts.	• If needed, specialised professional advice and assistance should be available to medical school staff and clinicians so they can be alert to any signs and symptoms of PTSD among students who were directly and indirectly impacted by the disaster. • During and when the students' placements end, the home medical school should take steps to ensure that their staff understand and acknowledge the experience of students involved in the disaster and allow for adjustments to their assessments where necessary.
Placement sites/ local facilitation	• Discuss with students the potential impacts of weather-related disasters specific to their placement location. • Provide students with information on emergency response, highlight potential personal impacts, and outline mitigation strategies using case studies, vignettes, and real-world examples.	• Provide a disaster plan and kit (including a physical first aid kit, drinking water supply, torch, etc.), and possibly a power bank for charging phones and enabling access to local Emergency Radio. • Provide training on impact of disasters, adapted to the potential disaster context of their host campus, both for self-care and care of others. • Facilitate development of alternative and effective support networks for students on their arrival at their new placement.	• Plans should be in place for staff to maintain communication with students during and in the aftermath of a disaster. • Staff need to keep in regular contact and check on students' physical safety in the immediate aftermath of a disaster and on their mental state for the duration of their placement. • The use of systematic screening or assessment of mental health should be undertaken where appropriate – this monitoring may be necessary for more than six months. • Provide educational coaching and reflection sessions for students, both as a debrief mechanism (individually, group or small group) and to expand transformative learning opportunities, and continue these in the long-term – possibly even after students have left the region.
Clinical staff (supervisors/ host clinicians)	• Understand potential impacts on students and communities. • Provide clinicians with information on emergency responses, covering personal impacts, effects on supervision, support and clinical care, and self-care strategies, illustrated through case studies, vignettes, and real-world examples.	• Reinforce preparedness through supervision and support.	• While providing clinical care to communities affected by disasters, clinical staff could supervise medical students who want to assist and educate them about the effects of the disaster on patients' mental and physical health, and ways in which to approach their care.
Shared responsibility	• Students will more likely survive and thrive if they feel they are prepared to respond, both to their personal needs and to those of their host community, when disaster strikes. • Undertake research and evaluation to inform continuous improvements in preparedness prior to placement. • Adopt a health systems approach to preparedness, ensuring inclusion of all levels of the health system, including medical students.	• Support staff with resources to recognise signs of PTSD in students • Conduct research and evaluation to enhance preparedness and guide response strategies during student placements.	• Appropriate and evidence-based treatment for students needs to be available after the disaster. • Post-placement research and evaluation to assess effectiveness, identify gaps, and guide improvements in preparedness, response, and recovery. Longitudinal studies are particularly important to understand the longer-term impacts on students, including career trajectories, and to strengthen future interventions.

ID: #H9989). Informed consent was obtained from all participants prior to data collection.

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Competing interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Availability of data and materials

The datasets generated for this study are available on reasonable request to the corresponding author.

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Appendix A. Supplementary data

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