ORIGINAL RESEARCH

An exploratory study on the challenges faced and coping strategies used by preclinical medical students during the COVID-19 crisis

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Purpose: The impact of the coronavirus disease 2019 crisis on medical education includes reduced clinical training, a significant loss of learning time and a probable decline in confidence of being a doctor. These recent changes will have significant effect on the well-being of medical students and interventional support needs to be given early. This study explores the challenges faced and coping strategies used by preclinical medical students during the crisis.

Methods: A qualitative study involving 13 preclinical medical students was conducted between August and September 2020 at a medical school in Malaysia. An in-depth individual interview via Microsoft Teams (Microsoft Corp.) with semi-structured questions was conducted. The recorded interview data were thematically analyzed using the six phases of Braun and Clarke's Thematic Analysis.

Results: The challenges faced were identified under three themes: psychosocial impact of lockdown, significant lifestyle changes, and impact on professional progression. Meanwhile, four themes emerged in coping strategies that include behavioral strategies, re-appraisal of the uncertainties of situation, active coping mechanisms, and regulation of emotion with coping reserve. There are indications that personality traits determine strategies to cope with challenges faced during the crisis which may either lead to resilience building or experiencing burnout.

Conclusion: The findings of the study highlighted the urgent need to develop early preventive and intervention strategies to address the mental health of medical students to mitigate stress and promote positive well-being in times of crisis.

Key Words: Coping strategies, Preclinical medical student, Crisis, Challenges

Introduction

The purpose of a medical school is to produce caring, emotionally strong, and competent healthcare professionals. If medical students experience challenges consistently throughout their study in medical school, it may obstruct their overall professional development and personal well-being. According to de La Rosa-Rojas et al. [1], medical school poses more challenges for students compared to other disciplines like law and psychology. Nevertheless, the nature of the medical curriculum and demands of the profession have created intense pressure, leading to the prevalence of stress and its effects on

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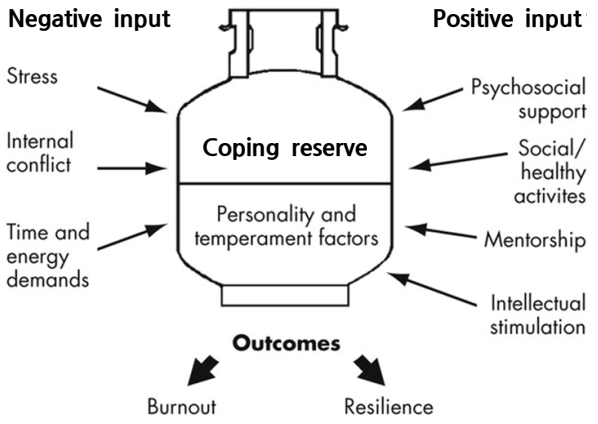
students' life and academic performance [2]. High levels of stress among medical students, were due to either competition in academic performance, academic related problems, demands on time, difficulties in managing personal, financial, and/or relationship issues [2,3]. The overall prevalence of stress in medical students was approximately around 50% to 70% in several countries [4,5], making stress and stressors cause for concerns. The demands of the medical curriculum have placed medical students under heavy stress at the beginning of their studies. Early detection of medical students who suffer from psychological effects is important to prevent burnout at the later phases of the study. The concerns are expected to further exacerbate with coronavirus disease 2019 (COVID-19) crisis as the ongoing uncertainties and health impact are additional stressors and causes for anxiety for medical students [6,7]. Recent reports on medical education during COVID-19 crisis, show that students are either not able to practice clinical skills with patients or have these interactions drastically reduced. The consequence of reduced clinical training would lead to a significant loss of learning time and a probable decline in confidence of being a doctor [8]. Studies also reported the negative impact of the COVID-19 crisis on medical students' health and well-being [7,9].

The discovery of stressors might be useful to help medical students prevent anxiety and depression. Methodologically, quantitative studies rely more on preconceived notions such as questionnaires and might not enable in-depth exploration of other stressors and coping strategies. Numerical calculations have their limitation extended further as they may not consider contextual differences within or between learning environments. Nonetheless, studies exploring medical students' experiences of the challenges faced and coping strategies during a COVID-19 crisis are still limited in depth and diversity. This is because the impact of COVID-19 varies from country to country, affecting various societal demographics differently including education systems and students' maturity [10]. The conceptual model of medical student well-being can be used as a lens to explore medical students' well-being during a crisis [11]. The model depicts the extent of negative and positive input experienced during medical school, combined with the components, the reservoir, which are an individual's coping reserve, personality and temperament leading to either resilience or burnout (Fig. 1). The resilience building or distress and burnout depends on how students respond to the challenges and the coping strategies they have used.

While the COVID-19 crisis will have added stress in the personal and study life of medical students, the extent of the impact depends on the context of the student, the stage in medical school, healthcare system and national situation. Hence, it is important to explore experiences of both local and international students who may be physically separated from their families due to COVID-19. Medical education literature will benefit from the diverse context of the crisis as it brings up a variety of challenges together with lessons or support systems to overcome them. Therefore, there is still a need to explore the challenges faced and coping strategies used by preclinical

Fig. 1. A Conceptual Model of Medical Student Well-Being: Promoting Resilience and Preventing Burn Out



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medical students during COVID-19 crisis. Identifying challenges early in medical school through an explorative approach can help identify resources and support systems which will also help build resilience in later years. Our study aimed to answer the following research questions; "what are the challenges faced by preclinical year medical students during the COVID-19 crisis?" and "how do preclinical year medical students cope with the challenges during the COVID-19 crisis?"

Methods

1. Study design

We used basic qualitative design with semi structured interviews to explore preclinical medical students' experiences of challenges faced and coping strategies during COVID-19 crisis. The interviews allowed in-depth information gathering on individual student's experiences and of the challenges and coping strategies.

2. Study context, participants, and sampling method

We conducted our study at the International Medical University (IMU) in Kuala Lumpur, Malaysia from August 2020 to September 2020. During this period, Malaysia had already implemented the COVID-19 Movement Control Order (MCO) since March 2020. The learning activities conducted face to face before the COVID-19 crisis either on or off campus were converted to fully online with minimal and or no hands-on experience during MCO. The medical program is a 5-year outcome-based program delivered in two phases: preclinical and clinical. The preclinical phase is 2.5 years, with a focus on biomedical sciences subjects, integrated with organ systems and clinical skills. The learning activities includes lectures, problem-based learning, clinical and communication skills (CSSC) learning, anatomy with hospital or clinic visit.

A total of 13 preclinical medical students consisting of nine local and four international, five males and eight females' students consented to take part in this study. The participants' age ranged from 18 to 25 years. Recruitment through purposive sampling and interviews were conducted simultaneously until we achieved data saturation. The inclusion criteria included preclinical year medical students who are enrolled full-time in the medical program at the university from August 2020 to September 2020.

3. Procedure

Recruitment and the data collection process started after approval by the IMU Joint-Committee on Research & Ethics (approval no., MHPE I-2020 [03]). Participants were recruited via email based on the inclusion criteria. Semi-structured interview questions which include "what are the challenges you faced during pandemic," "how do you feel about the challenges," "how do you cope with the challenges" and "what kind of support do you need from the school to cope with current pandemic situation" were asked. The interview was conducted with written consent from the participants. In this study, the researcher was the interviewer and preclinical medical students were the interviewees. A one-time online interview was conducted for each participant in a quiet and private room. Each interview took approximately 30 minutes to 1 hour. The interviews were audio-recorded via Microsoft Teams (Microsoft Corp., Redmond, USA) and interview data was used for transcription until we reached data saturation.

4. Data analysis

We analyzed data using six-phase thematic analysis of Braun and Clarke [12] as it is a useful framework to find

out the meaning of participants' experiences from the interview transcript. The framework of Braun and Clarke [12] includes six steps: (1) data familiarization, (2) identification of codes, (3) finding themes, (4) reviewing of themes, (5) definition and naming of themes, and (6) report production. In step 1, the data from the transcription were identified and familiarized. The process of "data familiarizing" were repeated to enhance the familiarity with each data before the coding process was done. In step 2, initial codes were identified for challenges faced during the pandemic, namely "dealing with uncertainties and complexity," "psychosocial effects," and "academic challenges" during the pandemic. Subsequently, initial codes for coping strategies used during pandemic such as "psychosocial support," "intrinsic motivation," and "extrinsic motivation." In step 3, the ongoing process to examine the codes and organized it into broader themes continued. The initial codes identified were further reviewed and led to the emergence of preliminary themes such as "psychosocial impact of lockdown," "significant lifestyles changes," and "adapting through behavioral strategies." In step 4, the preliminary themes identified through data coding and represented the context of challenges faced and coping strategies within the entire data set were reviewed and refined. In step 5, final themes and subthemes were defined and named. As a result, a total of three themes for challenges faced and four themes for coping strategies were established. Finally in step 6, results based on the established themes were written.

5. Research rigor

To ensure the research rigor, two criteria were adopted for this study. Firstly, credibility through member checking. Member checking was done by sending a copy of the interview transcript to each participant for review and verification that it reflected their sharing during the interview. All participants responded through email and validated the sharing. Secondly, we kept an audit trail record that listed the process starting from obtaining ethic approval until completion of the study. It served as a degree of confirmability with the findings of the study and making sure that it is based on the collected data and not on personal belief or interest.

Results

1. Challenges faced during pandemic

Three themes were identified for challenges faced by preclinical medical students during the crisis.

1) Psychosocial impact of lockdown

Lockdown has impacted students' relationships, education, and health. Generally, they agreed of having more time with their family due to the lockdown. However, being confined at home created conflict and tension with family, affecting relationship with family members. On the other hand, students who were away from their family felt lonely, homesick, and missed them during lockdown. Apart from that, international students were also confused about the changing travel rules which prevented them to book flights to go back home.

"… people are spending more time together, there are more chances for us to have arguments with one another… So, I guess it did put a strain on some relationships…" (9.62-66)

"… This is the longest I've been away from home. By the time I'll be going back it will be 1 year. For me, it's devastating to know that I'm going home after 1 year." (10.455-457)

"Every other now and then they would have a different rule for different things. And that was very confusing. I was able to maybe book a flight to Pakistan. I know back then… IMU is like don't travel. And then a few weeks

later… you can travel… So, they kept telling international students to change plans…" (10.126-132)

Students also highlighted that lockdown impacted their education because it affected their ability to self-manage and being demotivated to study due to factors such as non-conducive learning environment.

"… our lectures are online. So, this will be slightly harder to concentrate, because it's a different environment compared to face-to-face lectures." (4.46-49)

Medical students also expressed health concerns about the possibility of contracting COVID-19 when they return to campus as well as during hospital posting after the lockdown.

"… it was pretty scary because like once I sat down there were people like coughing and it is scary when you have to go to the hospital." (3.208-210)

2) Significant lifestyle changes

Students experienced significant lifestyle changes as a result from the crisis. Due to social distancing policy or procedures, they experienced changes in daily lifestyle, and this was predominantly felt by students who stayed at hostels and away from their families. For example, students found it difficult to get food and groceries for daily meals. Although they understood the importance of practicing the standard precaution, they found it inconvenient and uncomfortable to adhere to the precaution.

"… I keep forgetting the rest of social distance. So, like in the supermarket or something walk now realize, oh, we are too close to this person. So, I have to back off." (5.241-243)

University closure due to the lockdown caused changes in the learning pattern from face to face to fully online. Students found it difficult to adapt to fully online learning for skills-based learning and assessment.

"… adapting to this whole syllabus of you know, going online, getting your notes and then like this whole Microsoft Teams and everything, adapting to that was initially a bit difficult…" (5.68-72)

3) Impact on professional progression

Students expressed their worries about their professional progression especially in the area of clinical skills competencies. As preclinical medical students, they have sessions related to history taking, physical examination and procedures in clinical skills and simulation center. Online teaching may not be effective in learning clinical skills as hands-on experience is needed. Students were anxious about the lack of clinical competencies when they approach patients in future clinical settings.

"… I was worried a bit about competency, because without clinical skills will be a bit hard when we actually move to a clinical school whereby clinical is actually the number one top priority in this case." (4.162-164)

Students, although still at preclinical phase were equally uncertain of what to happen next in terms of their professional progression as well as the career pathway.

"There was a news that they might postpone our semester for about 9 months and then That actually worries me because … the 9 months delay, you might end up postponing my graduation and also further on the future as well." (4.164-167)

2. Coping strategies used during pandemic

Four themes emerged for strategies used by preclinical medical students in coping with the challenges.

1) Adapting through behavioral strategies

One of the strategies was altering the way they study. For instance, students mentioned searching for online resources such as YouTube and using blogs to replace face to face teaching sessions.

> "Usually, I look at YouTube videos of from different people of how they do their examinations, take notes from it and I'll try to compare it with the CSSC notes read that we have and see it matches and … if I'm learning the right stuff or not." (3.82-84)

As students stayed at home most of the time during pandemic, they took the opportunity to develop an interest to learn life skills, became involved in healthy activities instead of using negative coping strategies to overcome challenges and stress.

> "I've been doing a lot of sewing, things like bags, like I've made my own clothes and I've been doing a lot of that because of the time I had, actually I gotten pretty good at it …" (6.186-188)

2) Reappraise the uncertainties of situation

Although medical students were uncertain about the future and the situations seems beyond their control, they reappraised their current situation. Reappraisal led to perceiving themselves as being part of the future healthcare professionals. This mindset helped them to overcome the challenges during the crisis.

> "… how the front liners are made risking their lives. At the same time, it made me proud because although you're deferring your life, but when you look at the people who are saluting the front liners, you feel like your hard work pays off." (2.222-224)

3) Adoption of active coping mechanisms

Personality traits are depicted as complementary influences of students' coping strategies and it is part of active coping mechanism. In this study, when students faced challenges and if their personality is being positive, they were found to try to resolve problems instead of reacting to them.

> "Yeah, because I am not that I'm not an introvert. I'm kind of extrovert then, uh… I had to take a lot of responsibility, getting food for the house being there for my sister and also keeping my head straight and not deviating from my studies and so many people I know like people just are depressed at home but then I keep myself positive and get myself active…" (7.214-217)
>
> "Oh, so I think for me it's taking everything in my side and move along. So, I don't really kind of hang hang around the problem by tried to find a solution." (9.225-226)
>
> "Oh… during the pandemic, during the pandemic, I think I was more reserved, more like, shy and very quiet. You know, and then until that, until you are forced to do things that would require you to not be quiet, then only you know the sort of change?" (13.177-179)

Students seek constant connection with family and friends through online platform. Adoption of this strategy served as a stress relieving factor.

> "Because we've been isolated … I talked to my friend more frequently … because I don't want to feel alone. And I also preferred their company." (6.219-221)

In addition, they sought support from within the

institutions such as faculty, students, and other services, indicating the importance of multisource of support.

> "… lecturers are always willing to help out if I have any concerns. My mentor always kind of like checking up and she's like, the mother figure in the university, you know. So, it feels nice to have her around." (9.164-167)

4) Regulation of emotion

Students regulated their emotions to create a greater sense of meaning and faith in their own capabilities of managing challenging situation. Journaling, meditation, and prayers enabled students to reflect and regulate their feelings and emotions.

> "… I've started journaling. So, whenever something happens after journal it out, it makes me feel a lot better. Maybe that is one coping strategy that worked for me." (9. 226-228)

Discussion

Reports have indicated that circumstances of living in unpredictable situations are emotionally draining [13]. However, there is a need to acknowledge that individuals will experience and tolerate stress in different ways. It has been repeatedly reported that medical students face stress and other related mental health issues during their studies. These problems put students at personal and professional risk if they are not addressed in a timely and relevant manner. The COVID-19 crisis adds to these risks and may cause disruption to their physical and mental health. This study identified challenges faced and coping strategies used by preclinical medical students. The findings are valuable as it brings to attention issues faced by preclinical students, who are sometimes assumed to be less impacted by the pandemic because their teaching and learning activities are orientated to basic medical sciences with lesser focus on the clinical environment. There is also an assumption that they can catch up later in the clinical years. Additionally, the context offered in this study includes perspectives of both local and international students.

1. Challenges faced by medical student during the crisis

The findings showed that being in lockdown situation has brought about negative psychosocial impact on medical students' well-being. The lockdown was introduced as a public health preventive measure and enforced across the country to reduce infection from those who are asymptomatic and potentially exposed to COVID-19 [14]. Students articulated frustration, boredom, loneliness, home sickness, and other forms of conflict directly related to lockdown. The reason may be due to the demands and expectations from family members, thus, contributing to their stress [15]. It has been reported that the crisis indirectly affects family functionality due to financial difficulties, health concerns, demands from work and studies and this context can increase tensions and stress within a family [16]. The financial implication may lead to students asking for deferments or withdrawal from the course as they are unable to pay the tuition fees. Interestingly, the above-mentioned challenges impacted both local and international students; however, international students faced additional uncertainties and stress due to international travel restrictions.

Even prior to the COVID-19 crisis, it was reported that medical students face challenges of time constraints and balancing work-life requirements [17]. Our findings suggest students felt demotivated to study in the non-conducive home environment and struggled with time management, which may in turn affect students' per-

formance in obtaining better grades.

Additionally, students reported on the struggles of being alone and away from peers and the university social environment. A prolonged period of staying at the home impacts social connection with peers and creates a feeling of helplessness due to lack of peer support [18]. Examples of peer support range from having meals together, to having group study and practice sessions, and the absence of these activities may contribute further to the stress. Seeking connections with each other for emotional support through chats or phone calls are perceived to be an important stress-relieving factor. While the effective use of social media during the crisis can also help students to relieve stress [19], prolonged or uncontrollable use of social media leads to addiction that may influence students' academic performance and well-being [20]. Another interesting finding from being in prolonged lockdown is students' concern about the possibility of contracting COVID-19 when they return to campus for teaching sessions or being posted to the hospital for clinical rotation. Providing a safe environment, which strictly adhere to risk management and preventive measures such as vaccination and compliance to campus or clinic safety protocols are strongly recommended to address students' concern.

Students also reported significant lifestyle changes due to the crisis. While the crisis has increased the use of online shopping with home deliveries, delivery areas, costs and choices covered by these companies may not reach or be suited for students' budgets. It is therefore crucial that food facilities at campus remain open with the necessary safety precautions during any campus closure. The other lifestyle change faced by students is related to their learning patterns. This is because the transition from mainly face to face learning (lectures, problem based and clinical skills learning) to fully online learning is viewed as a hurdle for students. Quality of teaching material is an important element in online learning. It has been reported that lack of quality assurance of the learning materials may be perceived as poor learning materials by students, which is an added stress and impacts learning [21]. Although the students who were interviewed were preclinical, they were concerned about their clinical skills competencies as there were either no hands-on or limited practice of clinical skills due to the crisis. Online learning of clinical skills is seen as a major challenge due to limited and/or absent hands-on experience [22]. The students worry that the lack of clinical skills competencies compared to their seniors may affect their progression to the next semester, performance in exams, and subsequent transfer to a clinical setting [7]. To overcome students' concerns in learning clinical skills, our institution has been introducing an EASI (Evaluate, Align, Student-centered, Implement, and Improve) framework for faculty to use [23]. The framework suggests that faculty evaluate existing deliveries and align it to the current context and learning outcomes, before using student-centered learning methods to implement them. While these changes are new and can be seen temporary due to the pandemic, it is also an opportunity to explore complementary alternatives to enhance students' learning of clinical skills.

In the time of crisis, student might easily feel guilt and shame when they make mistakes or errors. Mentors and teachers need to change their approaches to dealing with students' negative coping mechanisms during teaching and learning activities as well as promoting student well-being [24]. Different approaches suggested by Gotian [25] to support students emotionally such as frequent contact and chatting with students, being a good listener and not a fixer, helping students to focus on what is important during the crisis will be beneficial.

2. Coping strategies used by medical students during a crisis

Given the challenges described by the students, it was equally important to explore in-depth the coping strategies they used to overcome or adapt to these challenges. Students adapted by applying behavioral strategies. Behavioral strategies can be described as modifying the way we act to the problem to eliminate stress, for example absence of face-to-face sessions, led to different methods to improve their knowledge and skills. Although students did feel demotivated to study at times, they found a solution to the problem instead of avoiding the situation. Students also took the opportunity to learn new or enhance existing skills. This observation was also reported by Lyons et al. [7]. This finding of positive behavioral strategies is not always expected, as it is also reported that medical students used negative behavioral strategies such as smoking or drinking alcohol to cope with the challenges faced in medical school [26]. While there is no evidence shown in this study that students adopted substance abuse as coping strategies to overcome stress, it needs to be acknowledged that these matters are sensitive and students may not want to reveal. Institutions could have engaging activities to highlight these risks and provide communication channels to seek help from the relevant department such as counselling unit [27]. The evolution of medical education towards emotional intelligence activities and workshops to empower medical students to face the real world are strongly recommended. For example, at our own institution support and preventive measures provided were adapted for the COVID-19 crisis (Table 1).

Contribution to society is viewed as motivation by the students to cope with the uncertainty of the situation. Intrinsic motivation to become a health professional encourages students to reassess and appraise the situation, resulting in a motivational perception that assist students to overcome their fears [28]. Furthermore, finding new meaning or reaffirming their intent during a crisis situations may lead to resilience building [29]. Furthermore, students made efforts to connect and get involved in each other's life to reduce the negative effects of stress. The feeling of being supported by pre-existing communities can help foster resilience in the individual [30].

Based on the conceptual model of medical students' well-being, personality traits are depicted as complementary influencers of students' coping strategies. This study has found that when students face challenges, traits such as being proactive, open to sharing and getting support to enable coping with the challenges and gradually building resilience. However, there are indications of traits underlying the way medical students choose to cope with challenges faced during the crisis either leads to resilience building or experiencing burnout. These are indicated by

Table 1. Summary of Institutional Preventive and Support Measures

No.	Support and preventive measures
1	Establish communication platform of informing the updates of coronavirus disease 2019 situations.
2	Continue teaching session despite of a pandemic, changing face to face sessions to fully online teaching to ensure students' continuous learning.
3	Provide enough hand sanitizer in prominent places that allows easy access to perform hand hygiene.
4	Organize motivational talk to students, faculty, and staff.
5	Provide opportunities for students to learn communication skills online with trained simulated patients.
6	Offer online counselling to students.
7	Provide mentoring programs to assist students' professional development.

coping through adopting different behavioral strategies, reappraising the situation, and applying active coping mechanism. The findings of the study overlap with the conceptual model, which allowed for a deeper understanding of how medical student well-being was impacted during the crisis.

3. Limitations

There are several limitations to this study. This is a single-institution study which is not generalizable to other population. Furthermore, as a qualitative study, the small sample is not broadly representative of the student population in a medical school as the aim was exploratory and to create awareness for further strategies. Future studies should involve other health sciences students with exploration of the long-term impact of the pandemic on the wellbeing of future health professionals.

4. Conclusion

Challenges faced in a crisis impacts medical student's well-being. However, students can overcome these challenges based on their coping strategies which includes receiving multisource support, connecting with others, and learning new skills during the crisis. The themes identified in the study helps in establishing proactive institutional preventive and interventional measures to safeguard students' wellbeing.

5. Practice points

(1) This study serves as evidence for urgent and proactive preventive measures from the institution to mitigate stress and improve medical students' well-being during COVID-19 crisis. (2) Institutional preventive measures should include improvements to the delivery of online teaching, effective communication, and diversity of wellbeing support programs.

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