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Influence Of Academic Strain, Remoteness From School, And Fear Of Infection In Medical Students' Stress And Health During The Covid-19 Pandemic

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ABSTRACT

The emergence of the COVID-19 has greatly affected the world and caused many unprecedented changes in our lives. For many, it has generated a significant amount of stress, anxiety, worries about health, social isolation, unemployment as well as financial problems. Just like the rest, the pandemic has really taken a toll on students' well-being all around the world. They have a lot on their plates, especially dealing with academic strains, remoteness from school and fear of infection during this time of crisis. Therefore, a cross-sectional study was conducted to explore how and if these three stressors have an impact on the medical students' stress and health during the pandemic. The analysis included mean, frequency, correlation, unpaired T-test & ANOVA. Out of 159 students, we have found that Hindu religion has a higher stress level (mean =24.4). Female gender (mean = 25.6) and those who have underlying mental health issues (mean=30.3) have a higher physical and psychological impairment. There is a positive significant association between academic strain (r= 0.245, p=0.001), remoteness from school (r=0.223, p=0.003) with perceived stress. There is also a positive significant correlation between academic strain (r=0.283, p=0.000), remoteness from school (r=0.387, p=0.000), perceived stress (r=0.583, p=0.000) with impairment of physical and psychological health. Thus, with this information we can conclude that we have found that there is a positive significant association between academic strain, remoteness from school with perceived stress, physical and psychological health.

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INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) is an illness caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). On December 31, 2019, the World Health Organization (WHO) received the first notification of the outbreak. It began as an epidemic outbreak in Wuhan City, Hubei Province, China that has now spread uncontrollably to the rest of the world and has become a global pandemic [1]. It is an airborne disease transmitted through respiratory droplets produced from coughing or sneezing. The illness manifests usually as fever, a dry cough, sore throat, and fatigability. Some people may get lung infections like pneumonia, organ failure, or septic shock, all of which can result in death [2].

In January 2020, the first case of COVID-19 was detected in Malaysia [3]. In February, the first local Malaysian case was identified. The number of COVID-19 cases were slowly rising in March 2020 until an abrupt increase in cases after that [4]. As a precautionary measure, the Prime Minister of Malaysia announced a Movement Control order (MCO) to reduce the spread of the virus [5]. Employees in the non-critical public sector were obliged to work from home, activities at educational institutions were suspended, closure of businesses, social distancing, followed by border closures [6]. These measures not only have a negative effect on the educational institution but also affected business, health, and tourism sectors [7].

A few studies have been conducted to acknowledge the sources of stress among college students. Examples include a Danish study that suggests the COVID-19 outbreak has influenced university students' academic stress during the first lockdown in Denmark [8]. Moreover, in Qinhuangdao City, Hebei, China, a study was conducted to examine the relationship between three clinical stressors and two types of health in the COVID-19 pandemic setting among undergraduate students recruited from four public universities in China. According to the findings of this study, academic workload, remoteness from school, and fears of contagion all had negative consequences on college students' health. Only 29.2% of the students rated the quality of online courses as good. Where else, 49.2% of the participants said they wanted school to start soon. Of the 867 college students who had participated, 56.2% of them were concerned about the possibility of contracting COVID-19 once the semester began [9].

Due to the implementation of MCO in Malaysia, there has been a sudden shift to virtual teaching and learning in all the universities as well as in other educational facilities [10]. This change is likely to cause an academic strain on the students as it affects teacher-student communication, peer interaction and increases student isolation [8]. There are also concerns that long-term school suspensions, house arrest, and distance learning may have negative effects on the physical and mental health for college students [11]. Moreover, emerging issues during the COVID-19 pandemic, such as clashing family schedules, alterations in eating and sleeping habits, and disconnection from classmates could also negatively affect college students [12].

Academic strain is described as the body's reaction to academic demands that surpass pupils' adaptive capacity. It is regarded as the most common cause of stress among college students, which can come in the form of constant studying, preparing for exams, and short time frames with a large amount of workload [13]. Since the commencement of COVID-19, increased concerns about academic achievement have arisen. This is seen from the lack of motivation to study and poor concentration during virtual classes that has now become a norm. Moreover, learning can also be tough due to poor teacher- student communication and peer interaction in the form of group studies [8]. With that being said, the increasing amount of workload, exams, and assessment conducted along with poor learning and lack of subject mastery can eventually result in poor academic performance, poor health, anxiety and depression [14,15].

Due to the nationwide lockdown, the Malaysian population has been forced to live in social isolation. All educational facilities have also been closed to restrict the movement of citizens, thus students are now being secluded to their homes and confined to loneliness [16]. This has majorly taken a toll on the mental well-being of the students as there is less social interaction. Mental health is a crucial component of overall health and well-being, which includes intellectual, spiritual, and emotional well-being [17]. Without a doubt, social separation reduces social contact and hence slows the transmission of COVID-19. However, social separation can disrupt social rhythms by robbing people of their typical stress coping methods thus, putting their mental health at risk [16]. As a result, knowing the incidence and determinants of mental health problems among college students could aid in the development of effective psychological interventions and the reduction of negative consequences [16].

Fear of infection reflects concerns about having COVID-19 or contracting it. According to research on health anxiety situations such as a global pandemic, cause high levels of stress and anxiety [9]. Due to the current outbreak in Malaysia, the government had decided that since there’s a lack of a safe and effective treatment for COVID-19, Malaysia had implemented the strict guideline tailored by WHO. These include using alcoholic hand sanitizers, greetings that omit hand shaking, wearing face masks and even gloves, a minimum of 1-2 metres of distance in social settings, flexing elbows and coughing into them and also self-quarantine if showing of signs of illness and unessential travels are not permitted [2]. Lazurus et al. quoted that stress is “a particular interaction between a person and the environment that the individual perceives to be straining or exceeding his or her resources and putting his or her well-being at risk” [18]. It's also been studied that stress is clearly perceived as an interpretive prototype that contrasts between the individual's stressors and psychological reactions [18]. Hypothetically based on these studies its evident that the fear contagion among medical students may have a negative impact on their stress and health.

The abrupt modification of teaching methods due to the potential risk of death caused by COVID19, isolation and imprisonment have increased the level of anxiety and caused great pressure on the public and students [19,20]. The abnormal stress and depression among students will not only impact their performance, but also increase serious mental health impacts [21]. Therefore, it is essential to study the possible risk factors that could prevent the detriment of students' stress levels and health during the pandemic. Due to the best data collection possibilities, we chose Malaysia as the case country. To add to this, so far,

the majority of the studies have explored the impact of COVID-19 on Chinese students, paramedical staff, patients and even the general public, but have ignored Malaysian medical university students.

A study conducted in Universiti Sains Malaysia, concluded that the prevalence of stress among medical students is high and the top 10 stressors were academic related [22]. To the best of our knowledge, there is no research involving three stressors (academic strain, remoteness from school and fear of infection) correlating to the psychological health and the stress among medical students during the pandemic in Malaysia. Therefore, this study aimed to assess how remoteness from school, academic pressure and fear of contagion during the COVID-19 pandemic affects the medical university student's stress and health.

METHODS

STUDY DESIGN

This cross-sectional study was conducted in the month of June-July 2021 among the undergraduate students in a private medical college in Malaysia.

SAMPLE SIZE

Based on previous research, the prevalence of the students with perceived stress is 22% among medical students in Sarawak, Malaysia [23]. By using Microsoft Excel sample size calculator with a total population of 1300 MBBS students, along with the study estimation of 22%, and a 7% acceptable margin of error, the minimum sample size was 127 participants [24]. With non-response percentage of 20%, the final sample size was estimated as 159 participants.

SAMPLING

Purposive sampling was used to conduct this study. The inclusion criteria were pre-clinical and clinical medical students who voluntarily consented and agreed to participate in our study; they were asked to complete questionnaires to be included in the study. Participants who did not consent, Bachelor of Dental Surgery (BDS) students, and Foundation In Science (FIS) students were excluded from this study.

DATA COLLECTION

A google survey form link was sent through WhatsApp Messenger to each class representative of the concerned subjects to distribute among their classmates. This form was only sent to the preclinical and clinical batch students in the study university. The participation in this study was voluntary.

The questionnaire consisted of six sections: (i) the sociodemographic data of our participants, (ii) questions on fear of infection created by Chunjiang Yang, Aobo Chen and Yashuo Chen [9], (iii) questions on academic strain caused by the pandemic developed by Hystad et al. [25], (iv) remoteness from school by using the attachment avoidance scale developed by Smith et al. [26], (v) Perceived Stress Scale (PSS) [27], (vi) CHQ-12 to assess physical and psychological health [9]. Perceived stress is calculated using the perceived stress scale (PSS). There was a total of 10 questions to answer from, where each question was given a scale of 0 to 4, (0= never, 4= very often). The scores for each question were added up to get a total. Then, it is classified as low stress (score 0-13), moderate stress (score 14-26) and high stress (score 27-40) according to literature. [26]

DATA ANALYSIS

Epi info version 7.0 was used to analyse and calculate the mean, standard deviation. range and correlation of the quantitative data which were fear of infection, academic strain, remoteness from school, perceived stress, and physical and psychological health whereas we have tabulated the qualitative data using Microsoft Excel 2011. The statistical tests used for our hypothesis testing are correlation, unpaired T-test and ANOVA. The level of significance was set at 5%.

ETHICAL CONSIDERATION

Informed consent was obtained from the participants and anonymity was ensured. Ethical approval was granted by the Research Ethics Committee of the Faculty of Medicine, Manipal University College Malaysia, Melaka, Malaysia.

RESULTS

Table 1 presents the demographic characteristics of the respondents. The mean age of our sample was 22.1 (SD1.3). Our study consisted of 67(42.14%) males and 92(57.86%) females. Majority (89.94%) were Malaysian students. Our participants consisted of preclinical and clinical MBBS students, 38(23.90%) participants were in the preclinical phase, while the majority of them,121(76.10%) were in their clinical phase of studies. Most of our participants, 97(61.01%), currently lived with their parents/relatives, while 39 (24.53%) of them lived in the hostel**.** Only 13(8.18%) of our participants personally knew someone infected with COVID-19 as opposed to 72(45.28%) who didn't (Table 1).

Table 1: Socio-demographic data of the participants (n=159)

Variable	**Frequency (%)**
Age	
<22	45(28.3%)
>22	144(71.1%)
Mean (SD)	22.1 (1.3)
Minimum- Maximum	19-25
Gender	
Male	67(42.14%)
Female	92(57.86%)
Ethnicity	
Chinese	48(30.9%)
Indian	84(52.83%)
Malay	10(6.29%)
Others	17(9.98%)
Nationality	
Malaysian	143(89.94%)
International Students	16(10.06%)
Religion	
Buddhist	47(29.56%)
Christian	25(15.72%)
Hindu	67(42.14%)
Islam	16(10.06%)
Others	4(2.52%)
Program and Academic Year	
MBBS Clinical Year (semester 6-10)	121(76.10%)
MBBS Pre-clinical Year (semester 1-5)	38(23.90%)
Where and with whom do you live currently?	
Alone in campus	4(2.5%)
Friends outside campus	19(11.95%)
In the hostel	39(24.53%)
Parents/Relatives	97(61.01%)

Do you personally know anyone infected with COVID-19?	
No	72(45.28%)
Yes	13(8.18%)
Do you smoke?	
No	150(94.34%)
Yes	9(5.66%)
Do you consume alcohol?	
No	96(60.38%)
Yes	63(39.62%)
Do you exercise?	
No	39(24.53%)
Yes	120(75.47%)
Scholarship Status	
No	131(82.39%)
Yes, full	1(0.63)
Yes, partial	27(16.98)
Monthly Family Income	
<RM 4360	33(20.75%)
>RM 9619	62(38.99%)
RM 4360- RM 9619	64(40.25%)

Table 2 shows academic strain, remoteness from school, fear of infection, perceived stress, physical and psychological health among the respondents. The mean score for academic strain was 16.3 (SD 4.3). For remoteness from school, the mean score was 52.6 (SD 18.7). For fear of infection, the mean score was 21.1 (SD 5.8). Among 159 students, 1.9% of them were categorized under low perceived stress. Majority of them bringing the total percentage of 95.6 are categorized under high perceived stress while the remaining 2.5% were categorized under moderate perceived stress. Lastly, for physical and psychological health, the mean score calculated was 24.0 (SD 8.5) (Table 2).

Table 2: Academic strain, remoteness from school, fear of infection, perceived stress, physical and psychological health (n=159)

Variables	Mean (SD)	Frequency (n)	Percentage %
Academic strain	16.3 (4.3)		
Remoteness from school	52.6 (18.7)		
Fear of infection	21.1 (5.8)		
Perceived stress	22.9 (6.8)		
Low		3	1.89
Moderate		4	2.52
High		152	95.60
Physical and Psychological health	24.0 (8.5)		

Table 3 shows the correlation between the Academic strain, Remoteness from school, Fear of infection and the Perceived stress among the participants. Based on the absolute value of r which was 0.25 (academic strain and perceived stress) and 0.22 (remoteness from school and perceived stress), the correlation was positive, little if any relationship. When academic strain was more, the perceived stress increased. As the remoteness from school increased, the perceived stress increased (Table 3).

Table 3: Correlation between academic strain, remoteness from school, fear of infection, and perceived stress

Variable	Perceived stress correlation (r)	P value
Academic strain	0.245	0.001
Remoteness from school	0.223	0.003
Fear of infection	-0.141	0.064

Table 4 shows correlation between Academic Strain, Remoteness from School, Fear of Infection, Perceived Stress and Physical and Psychological Health among the participants. The absolute value of r was 0.28 for academic strain and physical and psychological health, indicating the correlation was positive and has little if any relationship. The absolute r value for remoteness from school and physical and psychological health was 0.40 indicating the correlation was positive and had a low relationship. The absolute r value was 0.58 for perceived stress and perceived stress and physical and psychological health, indicating the correlation was positive and had a moderate relationship. When the academic strain increases, their Impairment of Physical and Psychological health increased. As remoteness from school was more, their Impairment of Physical and Psychological health increased and as the Perceived stress among medical students in MUCM increased, their Impairment of Physical and Psychological health increased.

Table 4: Correlation between academic strain, remoteness from school, fear on infection, perceived stress, and physical and psychological health

Variable	Physical and psychological health correlation (r)	P value
Academic strain	0.283	0.000
Remoteness from school	0.387	0.000
Fear of infection	-0.000	0.403
Perceived stress	0.583	0.000

Table 5 shows the association between demographic variables and perceived stress. Only religion was found to be significantly associated with perceived stress among the participants. Under religion, Buddhist, Christian, Hindu, Islam and other religions have the mean perceived stress score of 22.2, 23.5, 24.4, 24.2 and 18.0 respectively (p value 0.028) (Table 5).

Table 5: Association between demographic variables and perceived stress

Demographic variables	Perceived stress Mean (SD)	Mean difference (95% CI)	P value
Gender			
Female	24.1 (5.3)	1.6 (-0.1 – 3.4)	0.068
Male	22.4 (6.2)		
Age			
<22	23.0 (4.6)	- 0.5 (-2.4 – 1.4)	0.624
≥22	23.5 (6.2)		
Ethnicity			
Chinese	22.3 (6.0)	-	0.129
Indian	24.3 (5.7)		
Malay	22.8 (6.6)		
Others	21.9 (4.2)		
Nationality			
International students	23.8 (5.4)	0.5 (-2.4 – 3.4)	0.734
Malaysian students	23.3 (5.8)		
Religion			
Buddhist	22.2 (6.1)	-	0.028
Christian	23.5 (5.2)		
Hindu	24.4 (5.4)		
Islam	24.2 (6.5)		
Others	18.0 (4.3)		
Programme and academic years			
MBBS clinical year (Semester 6-10)	23.6 (6.1)	0.9 (-1.1 – 2.8)	0.382
MBBS pre-clinical year (Semester 1-5)	22.7 (4.7)		
Residing country			

Malaysia	23.4 (5.8)	0.6 (-5.1 – 6.4)	0.828
Outside Malaysia	22.8 (3.1)		
Living situations			
Alone outside campus	27.8 (3.5)	-	0.072
Friends outside campus	25.9 (6.2)		
In the hostel	22.9 (4.7)		
Parents/ Relatives	22.9 (6.0)		
Personally know a person infected with COVID-19			
No	22.7 (6.0)	-1.3 (-3.0 – 0.4)	0.136
Yes	24.0 (5.5)		
Underlying mental/physical health			
No	23.4 (5.8)	0.2 (-3.0 – 3.3)	0.915
Yes	23.2 (5.7)		
Smoking			
No	23.3 (5.6)	-1.6 (-5.3 – 2.1)	0.388
Yes	24.9 (8.3)		
Alcohol			
No	23.2 (5.5)	-0.6 (-2.4 – 1.2)	0.534
Yes	23.7 (6.2)		
Exercise			
No	23.4 (9.3)	<0.1 (-2.0 – 2.1)	0.972
Yes	≈23.4 (8.2)		
Monthly family income			
<RM 4360	22.1 (7.4)	-	0.304
>RM 9619	23.5 (5.1)		
RM 4360 – RM 9619	23.9 (5.4)		

Table 6 shows the association between demographic variables and physical and psychological health. There was a significant association between gender and physical and psychological health. Females' mean score was 25.6 and males' mean score was 22.1 (95% CI 0.9, 6.0, p value 0.007). Students who did not have underlying mental or physical health and students who had underlying mental or physical health had the mean score of 23.6 and 30.3 respectively. The mean difference was -6.7 (95%CI -11.3, -2.2, p value 0.004) (Table 6).

Table 6: The association between demographic variables and physical and physiological health.

Demographic variables	**Physical and psychological health Mean (SD)**	**Mean difference (95% CI)**	**P value**
Gender			
Female	25.6 (8.2)	3.5 (0.9 – 6.0)	0.007
Male	22.1 (8.4)		
Age			
<22	23.5 (8.0)	- 0.9 (-3.6 – 1.9)	0.5395
≥22	24.4 (8.6)		
Ethnicity			
Chinese	22.5 (8.3)	-	0.398
Indian	25.0 (9.2)		
Malay	24.6 (6.2)		
Others	23.7 (5.3)		
Nationality			
International students	25.6 (7.4)	1.7 (-2.6 – 5.9)	0.444
Malaysian students	23.9 (8.5)		
Religion			
Buddhist	22.4 (8.2)	-	0.320
Christian	24.6 (9.5)		
Hindu	25.2 (8.6)		
Islam	24.5 (7.2)		

Others	20.4 (4.4)		
Programme and academic years			
MBBS clinical year (Semester 6-10)	24.7 (8.4)	2.3 (-0.5 – 5.2)	0.106
MBBS pre-clinical year (Semester 1-5)	22.4 (8.2)		
Residing country			
Malaysia	24.2 (8.4)	4.2 (-4.2 – 12.6)	0.326
Outside Malaysia	20.0 (7.3)		
Living situation			
Alone outside campus	23.0 (12.3)	-	0.501
Friends outside campus	26.8 (8.8)		
In the hostel	23.6 (6.6)		
Parents/ Relatives	23.8 (8.8)		
Personally know a person infected with COVID-19			
No	22.8 (8.5)	-2.5 (-5.0 – 0.1)	0.056
Yes	25.2 (8.2)		
Underlying mental/physical health			
No	23.6 (8.3)	-6.7 (-11.3 – -2.2)	0.004
Yes	30.3 (8.0)		
Smoking			
No	24.3 (8.2)	3.8 (-1.6 – 9.2)	0.164
Yes	20.5 (10.6)		
Alcohol			
No	23.5 (7.7)	-1.5 (-4.1 – 1.1)	0.259
Yes	25.0 (9.4)		

Exercise			
No	25.1 (9.3)	1.2 (-1.8 – 4.2)	0.416
Yes	23.8 (8.2)		
Monthly family income			
<RM 4360	21.9 (9.0)	-	0.199
>RM 9619	24.8 (8.9)		
RM 4360 – RM 9619	24.6 (7.6)		

DISCUSSION

This cross-sectional study among medical students in a private medical university to explore how and if these academic strains, remoteness from school and the fear of infection have an impact on the medical students' stress and health during the pandemic. Our main hypothesis was that the academic strain, fear of infection and remoteness from school caused by the COVID-19 pandemic had a negative impact on the stress and health of medical students. The secondary hypothesis was that the pre-existing mental health status of an individual varies in the study and the three stressors mentioned above caused by the pandemic also contribute to the stress and health of the medical students.

Based on the findings our study, there was a significant association between academic strain, remoteness from school and perceived stress. The higher the scores the participants obtained in the academic strain component the higher the perceived stress scores. In previous studies, there was a significant positive correlation between academic strain and perceived stress [9]. The higher the scores the participants obtained in the remoteness from school component, the higher the perceived stress scores. Based on a similar study previously carried out in Hong Kong, they've also demonstrated that separation from school was positively associated with perceived stress [9]. We concluded that this association was a positive association. However, when it comes to fear of infection and perceived stress there was no significant association. In previous studies however there was a significant association between fears of contagion and perceived stress [9].

In this study, we have found that there was a positive significant correlation between academic strain, remoteness from school, perceived stress and the impairment of physical and psychological health. The higher the score of academic strain, the higher the impairment of physical and psychological health. The previous study also showed a significant association as the results obtained were the higher the academic strain the more it indirectly affects physical and psychological health through perceived stress [9]. The higher the score of remoteness from school (the more the student is remote from school) the higher the impairment of physical and psychological health. Compared to the previous study, there is a significant association as well when the separation from school

is more the more it indirectly affects the physical and psychological health through perceived stress [9]. The higher the score of perceived stress (the more stress the student feels), the higher the impairment of physical and psychological health. Collectively the previous study showed that there is a significant association between perceived stress and physical and psychological health [9]. However, we have found that there is no significant association between fear of infection and impairment of physical and psychological health of the individual. This is not the case in the previous study as their results showed a significant association between fear of contagion indirectly affecting physical and psychological health through perceived stress [9].

Regarding the association between demographic variables and perceived stress, there was a significant association of perceived stress between different religions. Hindu have the highest mean score of perceived stress followed by Islam, Christian, Buddhist, and lastly other religions have the lowest mean score of perceived stress. Although there are different mean scores of the perceived stress, the range of the mean scores of all religions fall in 14-26 which indicates moderate stress. For instance, a study conducted in University Sains Malaysia showed religion as one of the main coping strategies [28].

Another study has also proven that an individual with positive religious coping has less perceived stress [29].

A study by Bong-Jae Lee also showed that the stress effect is reduced by religious coping [30].

In addition, a study conducted at church-sponsored school in the Western United States concluded that higher levels of religiosity can reduce negative outcomes with stress [31].

Unfortunately, this study did not study the levels of religiosity and we need more research on different perceived stress levels between different religions to differentiate the stress levels from each religion specifically. However, there is no significant association between perceived stress and other demographic variables which are gender, age, ethnicity, nationality, programme, and academic years, residing country, living situation, personally know a person infected with COVID-19, underlying mental or physical health, smoking, alcohol, exercise and monthly family income.In this study, it could be concluded that gender and those with underlying mental health conditions have a significant association with physical and psychological health. Due to females obtaining a higher mean than males, females are concluded to have a higher impairment compared to males. There has been some research done to study the association between these two factors. A study conducted in Wallonia-Brussels Federation, Belgium, has similar results as theirs and concluded a significant association between gender and physical and psychological health [32].

The results also showed a significant disadvantage for girls compared to boys in psychological complaints through well-being factors (life satisfaction, self-confidence, helplessness, and body image) they were evaluated on. In another study conducted in Italy, the correlation between physical activity and psychological well-being during this time of crisis were evaluated using the PGWBI scores of six health domains comprising anxiety, depressed mood, positive well-being, self-control, general health, and vitality of

participants [33].

There was a significant association between gender and psychological health and the total score of females interpreted reflected moderate distress, thus concluding a higher impairment.Underlying mental conditions has been a concerning factor among undergraduates especially during this pandemic. True enough, the data tabulated shows a significant association between underlying mental/physical health and physical and psychological health. A study was conducted to explore the association of loneliness, typically observed in those suffering from chronic health conditions, mental health conditions, and neurodivergent populations with the mental and physical health [34].

Similarly, the results correspond to our study as there is a significant association and positive detrimental effects on mental and physical well-being. In another study, pre-lockdown and lockdown assessments of depressive symptoms were evaluated and found to have a significant association too [35].

Lastly, another study done in China reported significant association between those with pre-existing mental health conditions and physical and psychological health, having a higher vulnerability to the negative influence of COVID-19 on their physical and psychological health [36].

There were some limitations in our study. The first of many would be our method of data collection which was an online survey using a questionnaire on google forms, without proper face to face explanations and clarifications there could have been less understanding on how to complete the questionnaire and what we expect from it. Secondly, the majority of our sample were clinical year MBBS students compared to pre-clinical year students, the level of exposure and stress between these two groups could vary which would result in a bias in our study. To add on to this, our results are based on our sample which only consists of MBBS students from a private medical university and therefore generalization of the findings might be limited for other medical schools whether in Malaysia or overseas. Future researchers are recommended to increase their sample size by incorporating students from different universities to make the results more representative of medical students. We've also come to terms that different individual has different learning style and educational capacity which could affect our results when it comes to academic strain caused by the COVID-19 pandemic. Hence, future research could maybe explore more on individual learning styles and understanding capacity of a subject matter which may influence the college students' response to stress. Students are able to adapt to the situation and cultivate stress relieving habits such as time management and problem-solving skills that will indirectly lower the impairment of physical and psychological health of the individual [37].

Lastly our study method being cross sectional prevents us from conducting follow ups to see if the students stress and health would've improved when these three stressors induced by the pandemic are no longer applicable. Thus, in the future, research should be conducted as a longitudinal data to follow up the progress of students' health and stress to ensure the conclusion reflects the causation.

CONCLUSION

In summary, our study proved that among the study participants, the increased academic strain and remoteness from school caused an increase in perceived stress, physiological and psychological impairment during the pandemic. In turn the higher perceived stress also caused an increase in physical and psychological impairment among the medical students in MUCM. There is a significant positive, correlation between academic strain, remoteness from school and perceived stress. The correlation between academic strain and physical and psychological health was significant positive too. There was a significant positive, low correlation between remoteness from school and physical and psychological health, while the correlation between perceived stress and physical and psychological health was a significant positive and moderate relationship. For fear of infection, our study showed that there is no significant association with perceived stress and physical and psychological health. It was also found that Hindus (42.14%) perceived the most stress among other religions of the medical students. To add on to this, females (57.86%) were significantly more likely to have physical and psychological impairment. There was also significant association between pre-existing mental or physical health disorders and physical and psychological health. Todays' medical students play a big role in improving tomorrow's health care system. Hence, it will be beneficial providing support to cope with academic strain, remoteness from school, fear of infection and perceived stress in order to ensure good physical and psychological health among the medical students.

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