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Perceived Stress Level and Coping Strategies among Undergraduate Pharmacy Students

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Abstract

The new norm of Coronavirus disease (COVID-19) pandemic in the education system most likely causes a negative impact on students' mental health all around the world, including university students in Malaysia. This study investigated perceived stress levels among the Diploma of Pharmacy students in Universiti Teknologi MARA Cawangan Pulau Pinang (UiTMCPP) Bertam Campus, the academic related stressors and non-academic related stressors experienced during this deadly pandemic, as well as their stress coping strategies. A total of 221 students were included in an online questionnaire study. The data was collected using Perceived Stress Scale (PSS), academic and non- academic stressors and stress coping strategies. The result of this study indicated that majority of the students have moderate level of stress.

Keywords: Students, Stress, Stressors, Academic, Non-Academic, Coping Strategies

Introduction

COVID-19 outbreak has been characterised as a worldwide pandemic by the World Health Organization (WHO) on 11th March 2020 (World Health Organization, 2020). The government of Malaysia had enforced the Movement Control Order (MCO) since 18 March 2020 as a preventive measure to control the spread of COVID-19 infection and it has been extended thrice. MCO or total lockdown has been exercised to restrict social and economic sectors and isolation to make people stay at home. People also are restricted to cross district and state where movement is limited within 10 kilometres radius in oneself's house area as well as prohibited in mass gatherings. Essential sectors are allowed to open except closure of educational institutes, workplaces and entertainment centres (Ministry of Health Malaysia, 2021). The consequences of COVID-19 pandemic elevate the stress in individuals as they have to adapt to new environments and routines (Javed et al., 2020).

Students are one of the populations that were affected by COVID-19 pandemic due to the closure of universities. The learning processes in the university need to be changed from face-to-face to virtual class. The adjustment of the learning process during COVID-19 pandemic increases the stress level of the students. The virtual classes are conducted through an online platform to deliver the knowledge in order for the lecturer to finish the syllabus of the courses. Online platforms such as Google Meet, Zoom, Microsoft Team and Zoom are the online tools used to further interaction between students and lecturers. Online classes are challenging for pharmacy students because several subjects require practical activities and laboratory sessions. Also, students who live in rural areas or low-income-family may have difficulties in their online education journey.

In addition, COVID-19 pandemic influences the mental health of students due to worry and fear for oneself and loved ones thinking they barely survive in this situation that can lead to stress or worsen. Besides, quarantines in the household as in their physical movement and social activities is limited, contributing to rising the stress level in the students. Longer quarantine duration, fears of COVID-19 virus, frustration, and boredom cause negative psychological effects on people during COVID-19 pandemic (Brooks et al., 2020). Study has shown that common stressors of the students are academic demands, adjustment to new environments, personal issues such as relationship problems, financial burden and changes in the social and cultural aspect (Kalaithasan et al., 2020). The stress could be divided into mild, moderate and severe stress depending on the individual itself. Moderate stress is acceptable on students as it can boost learning and enhance focus.

Stress can be either positive or negative for a person and it can be harmful if they cannot handle it with superior management. It has been proven that coping is a significant variable in the process of decreasing, minimising, or tolerating stress (Kostic et al., 2021). A study stated that appropriate and successful coping may reduce the effect of stressful situations on an individual's physical and mental health (Ganesan et al., 2018). Students employ a variety of strategies to cope with the stress. Hence, the aim of this study is to identify stress level and most common stressors as well as management of stress during COVID-19 pandemic. The correlation between perceived stress and coping strategies were also investigated. This study's finding may aid in the provision of suitable psychological support to improve mental health and wellbeing for this population.

Materials and Method

A cross sectional online surveillance study was conducted at Universiti Teknologi MARA Cawangan Pulau Pinang Bertam Campus. All Diploma of Pharmacy students on campus who were willing and eligible were included in this study. A total of 221 students participated in the study. In this study we assessed stress levels among pharmacy students in UiTMCPP Bertam Campus, common causes of stress among them during COVID-19 pandemic, and identified their coping strategies for stress.

With reference to previously published research (Alshagga et al., 2015; Hanna et al., 2018; Kristina et al., 2020), an online questionnaire was developed using Google Form. The questionnaire comprised of four sections. Section 1 consisted of background information that includes demographic characteristics and the academic profile of pharmacy students. Section 2 consisted of Perceived Stress Scale (PSS). It measures the perceived stress and the response

to the stressful environment. It was selected for use in this study as it is one of the most widely used and established validity and reliability tools for measuring stress perception (Cohen et al., 1983). The PSS contains 10 statements to assess the degree of stress experience in the past 4 weeks. Each item (PSS1- PSS10) is scored using a Likert 5-point scale (never = 0 to very often = 4), while statements expressing positive reactions are scored backwards. All the 10 items are added up to get the total score. The score ranges from 0 to 40 points. The higher the score, the higher the perceived stress level. Reliability of this scale was assessed using Cronbach's alpha coefficients with a result value of 0.714. It indicates that the 10 items of PSS are considered satisfactory. Section 3 consisted of causes of stress among pharmacy students related to both academics and non-academics. The answers in this section were recorded against a Likert 5-point scale (no stress = 0, mild stress = 1, moderate stress = 2, high stress = 3, severe stress = 4). The last section consisted of coping strategies used by students to reduce or manage stress.

The online questionnaire was collected from November 2021 to January 2022. For the data analysis, the data of the completed questionnaires were keyed into SPSS version 26 software. Descriptive statistics are used to present the demographic characteristics of respondents. Mann-Whitney tests were utilised for comparisons of continuous data between two groups which are gender and year of study, and Kruskal-Wallis test was utilised when comparing three or more groups which is current CGPA.

Results

Demographic Profile

Two hundred and twenty-one pharmacy students completed the questionnaire with a response rate of 91.7%. Table 1 presents the demographic backgrounds of respondents, their current Cumulative Grade Point Average (CGPA), and the students' answer whether they were stressed or not during the COVID-19 pandemic. The majority of students were females (76.9%) and the other 23.1% were males. The respondents of this study consisted of 43.4% Year 1 students and 56.6% Year 2 students. Approximately 95.4% of the students have achieved good performance on the cumulative grade point average (CGPA) measured at 3.01 or higher. Nevertheless, according to the students' self-assessment of their feelings of stress, 84.6% of the students were under stress during the COVID-19 pandemic. All students aged between 18 to 21 years old.

Table 1
Socio-demographic characteristics of the study participants.

Variables	Frequency(%)
Gender	
Male	51 (23.1)
Female	170 (76.9)
Year of Study	
Year 1 (Semester 2)	96 (43.4)
Year 2 (Semester 4)	125 (56.6)
Area of Residence	
Rural	30 (13.6)
Sub-urban	137 (62)
Urban	54 (24.4)
Current CGPA	
2.50 – 3.00	10 (4.5)
3.01 – 3.50	71 (32.1)
3.51 – 4.00	140 (63.3)
Do you feel COVID-19 pandemic makes your life as a student stressful?	
Yes	187 (84.6)
No	34 (15.4)

Perceived Stress Scale

This study evaluated the perceived stress of students based on the Perceived Stress Scale questionnaire, and scores are shown in Table 2. It is found that the total mean score of 10 items was moderately high, about 21.34 from the maximum score of 40, indicating that most students experienced moderate stress for the last four weeks. The stress score result of female students is higher than the male students. However, Year 1 and Year 2 students exhibited the same perceived stress score.

The Mann-Whitney test was used to compare median PSS scores by gender and year of study group, and Kruskal-Wallis test was used to compare median PSS score by CGPA group since the data were not normally distributed. A value of $p < 0.05$ was considered statistically significant. The results showed that the difference in scores between the male group ($n = 51$) and female group ($n = 170$) is statistically significant, ($p = 0.031$).

For the year of study group, the test showed that the difference in scores between the Year 1 group ($n = 96$) and Year 2 group ($n = 125$) is statistically insignificant, ($p = 0.534$). For the CGPA group, the test indicated that the difference in scores between 2.50 – 3.00 group ($n = 10$), 3.01 – 3.50 group ($n = 71$), and 3.51 – 4.00 group ($n = 140$) were statistically not significant ($p = 0.489$). Therefore, there is no CGPA difference in the median score of PSS.

From the results of the PSS scores of each pharmacy student who participated in this study, they were classified into three levels of stress, which are low stress, moderate stress, and high stress. Low stress is those who get a total score between 0 to 13, moderate stress is those who get a total score between 14 to 26, and high stress is those who get a total score of 27 to 40. The findings for the frequency of students for three levels of stress (by gender, the year of study, and the current CGPA group) are outlined in Figure 1.

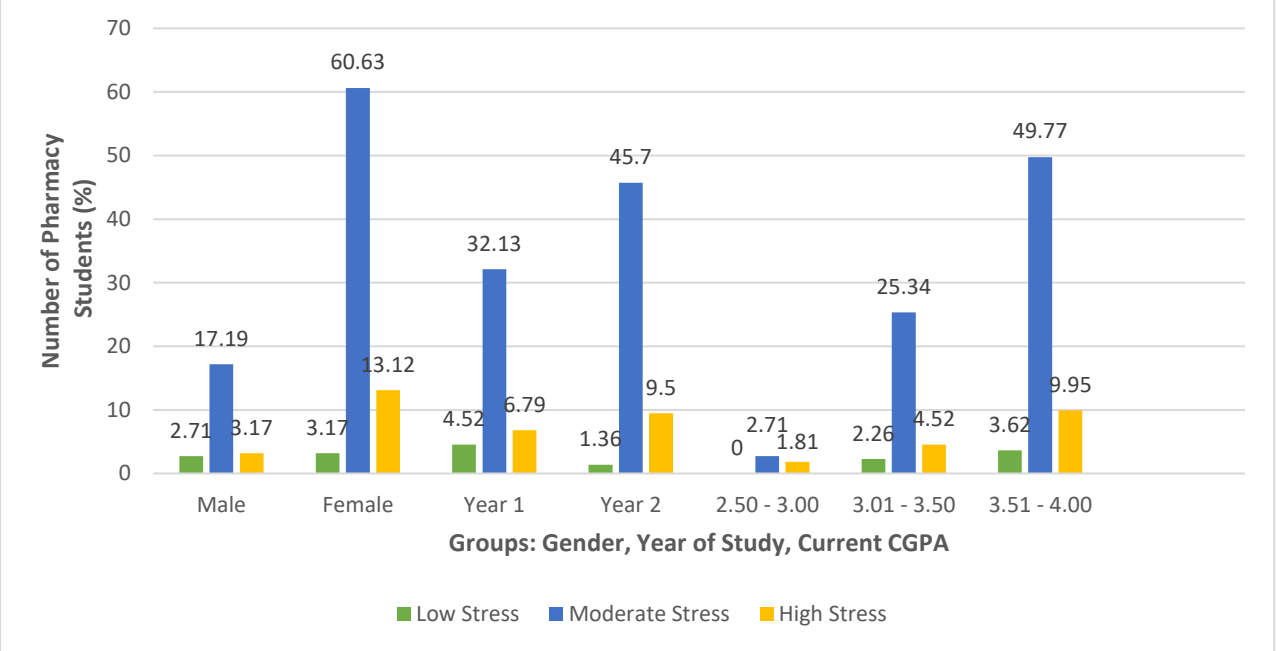

Figure 1: Levels of stress in Diploma of Pharmacy student at Universiti Teknologi MARA Cawangan, Pulau Pinang Bertam Campus (n=221) as set by (*Cohen et al., 1983).*

Academic and Non-Academic Related Stressors

As many as 70.6% of pharmacy students stated that the stress they encountered during the COVID-19 pandemic affected their academic performance. The stress they experience can be caused by academic and non-academic related stress. Academic stressor is a contributing factor that causes mental distress particularly academic challenges or the possibility of academic failure, whereas non-academic stressor causes mental distress in daily life other than academics such as financial, social, and health.

The academic related stressors that were included in this study: Multiple assignments (1a); Hard to discuss deeply with lecturers and friends (1b); Friends do not give cooperation in doing group assignment (1c); Does not have laptop or printer (1d); Difficult to focus and less motivation (1e), Peer competition (1f); Exam and grades (1g). The non-academic related stressors were: Social isolation (2a); Financial problems (2b); Living away from parents (2c); Worrying about the family, friends, and self-health (2d); Difficulties with personal relationships (2e); Fear of future (2f); Poor internet connection (2g). Data were presented as grouped mean± standard deviation.

The most commonly selected academic-related stressors that cause high stress among pharmacy students were 'difficult to focus and less motivation' (2.67±1.2), 'hard to discuss deeply with lecturers and friends' (2.64±1.22), 'exams and grades' (2.49±1.33), and 'multiple assignments' (2.48±1.24). The academic related stressors that caused moderate stress among pharmacy students were 'friends do not give cooperation in doing group assignments' (2.16±1.13) and 'peer competition' (2.03±1.4). 'Does not have laptop or printer' (0.53±0.1) causes no stress among them.

Next, the most commonly selected non-academic related stressor as high stress among pharmacy students was 'fear of the future' (2.55±1.5). The non-academic related stressors that caused moderate stress among pharmacy students were 'poor internet connection' (1.94±1.1), 'worrying about family, friends, and self-health' (grouped median (1.78±1.1), and 'social isolation' (1.68±1.2). The non-academic related stressors that caused mild stress among pharmacy students were 'difficulties in personal relationships' (1.55±1.11) and 'financial problems' (1.20±1.14). 'Living away from parents' (0.66±0.24) causes no stress among the pharmacy students.

Figures 2, Figure 3, and Figure 4 summarise the results of each stressor (by gender, the year of study, and CGPA group). It can be seen from Figure 1 that for most stressors, the score for female students is higher than that for male students. Furthermore, it can be seen in Figure 2 that for most stressors, the score for Year 2 students is higher than that for Year 1 students. In addition, from Figure 3, pharmacy students with the CGPA of 2.50 to 3.00 had the highest score among the pharmacy students with CGPA of 3.01 to 3.50 and 3.51 to 4.00 for most academic related stressors, however they had the lowest score among the other two groups for most non-academic stressors.

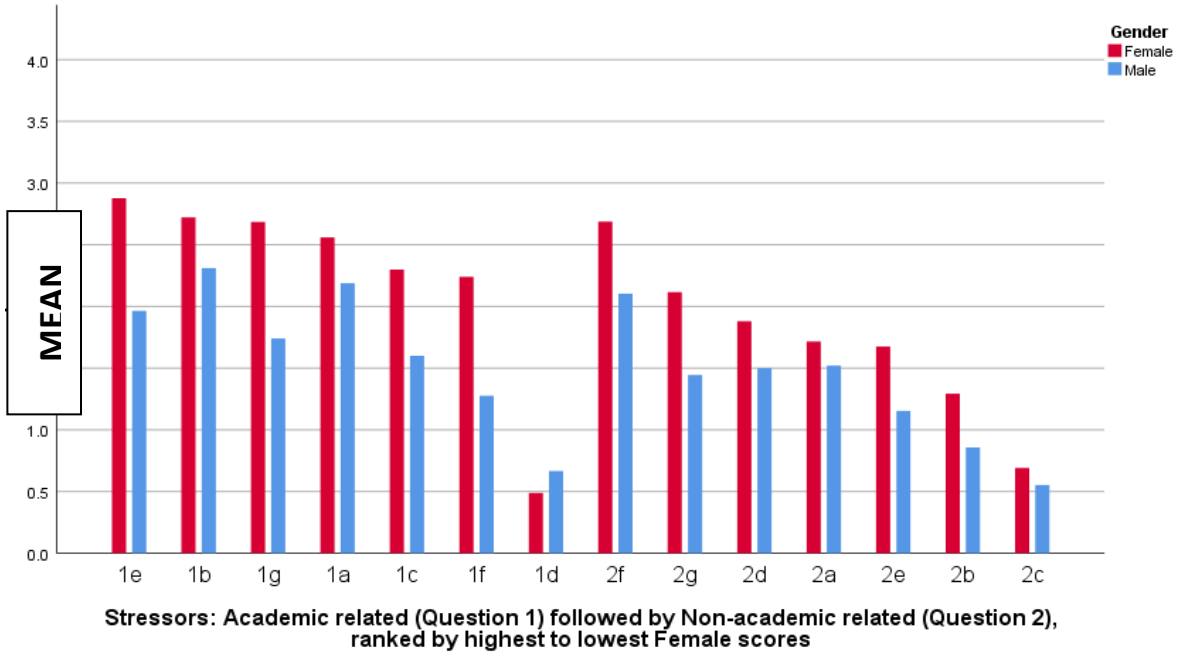

Figure 2: Academic and non-academic related stressors represented by female, n = 170 and male, n = 51. Stressors were rated from 0, no stress, to 4, severe stress

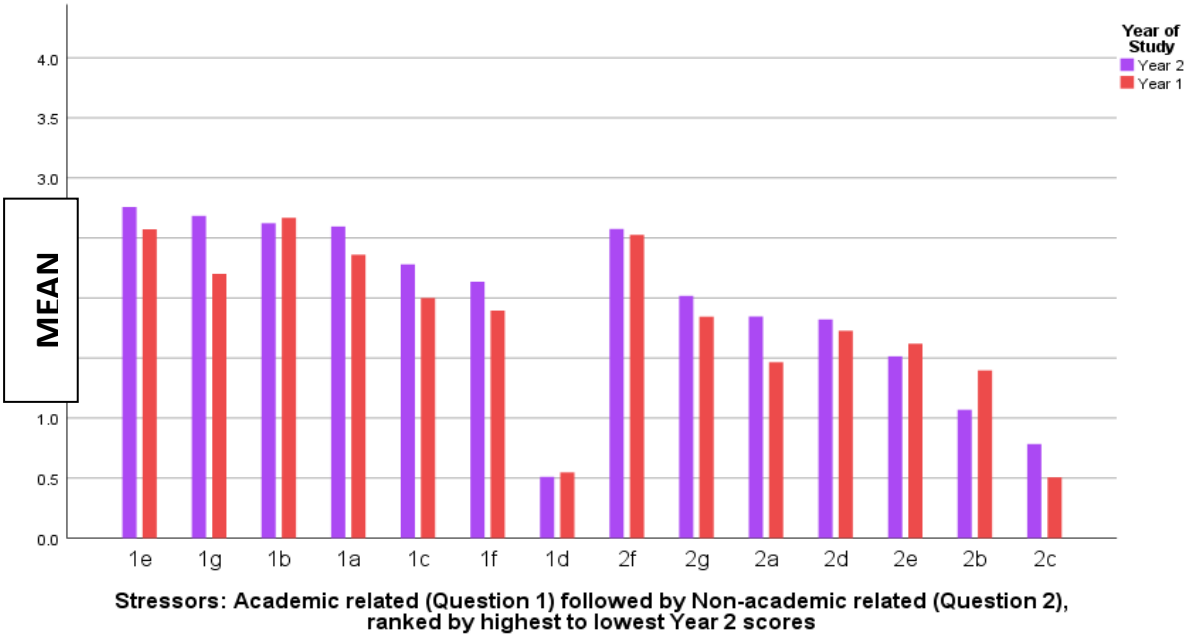

Figure 3: Academic and non-academic related stressors represented by Year 2, n = 125 and Year 1, n = 96. Stressors were rated from 0, no stress, to 4, severe stress

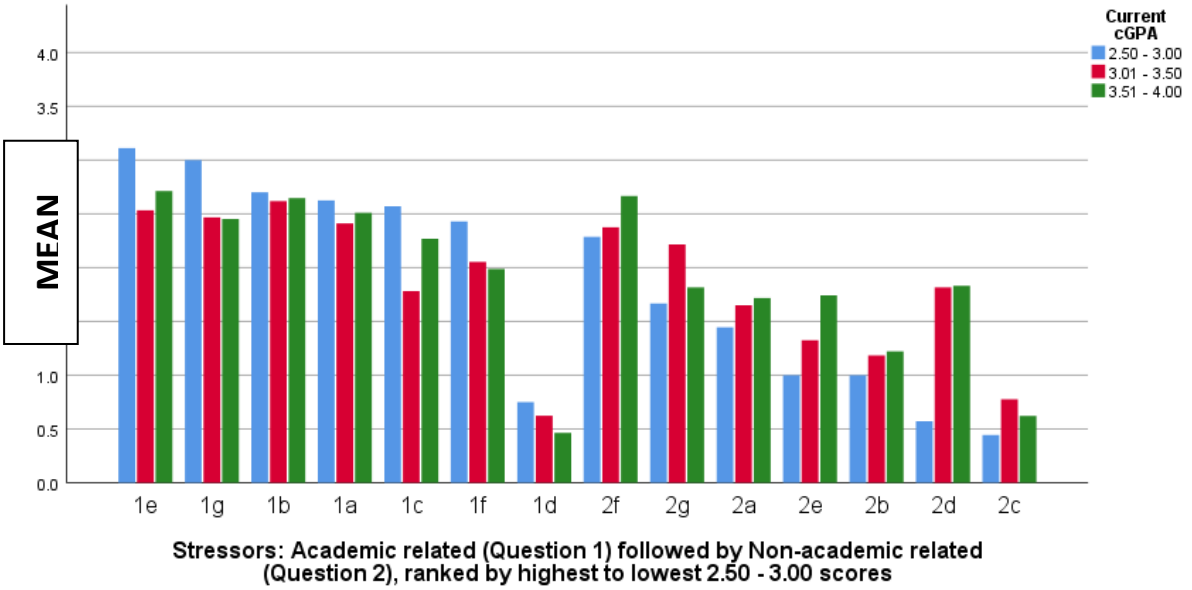

Figure 4: Academic and non-academic related stressors represented by CGPA of 2.50 - 3.00, n = 10 , CGPA of 3.01 – 3.50, n = 71, and CGPA of 3.51 – 4.00, n = 140. Stressors were rated from 0, no stress, to 4, severe stress

Stress Coping Strategies

Figure 5 shows the results regarding the stress coping strategies. As can be seen in the bar graph, the stress coping strategies that were used by them such as: Get emotional support from family (3a); Get emotional support from friend (3b); Talk to a healthcare professional (3c); Talk to university staff (3d); Self-distraction (3e); Plan a strategy on how to deal with the situation (3f); Make fun of the situation (3g); See something positive from it (3h); Refuse to believe it has happened (3i); Do exercise or sport (3j); Do relaxation technique or breathing exercise (3k); Pray or meditate (3l); Participate in university clubs or societies (3m); Eat junk

or comfort food (3n); Take over-the-counter products (3o); Take prescription-only medicines (3p), Others (3q).

Self-distraction, praying or meditating, and seeing something positive from it were the most preferred stress coping strategies by the pharmacy students in. On the other hand, three least popular stress coping strategies among them were talking to university staff, taking prescription-only medicines, and taking over-the-counter products. Other stress coping strategies that had been stated via free-response by a few students such as managing time wisely, sleeping, reading fictional books, and listening to songs.

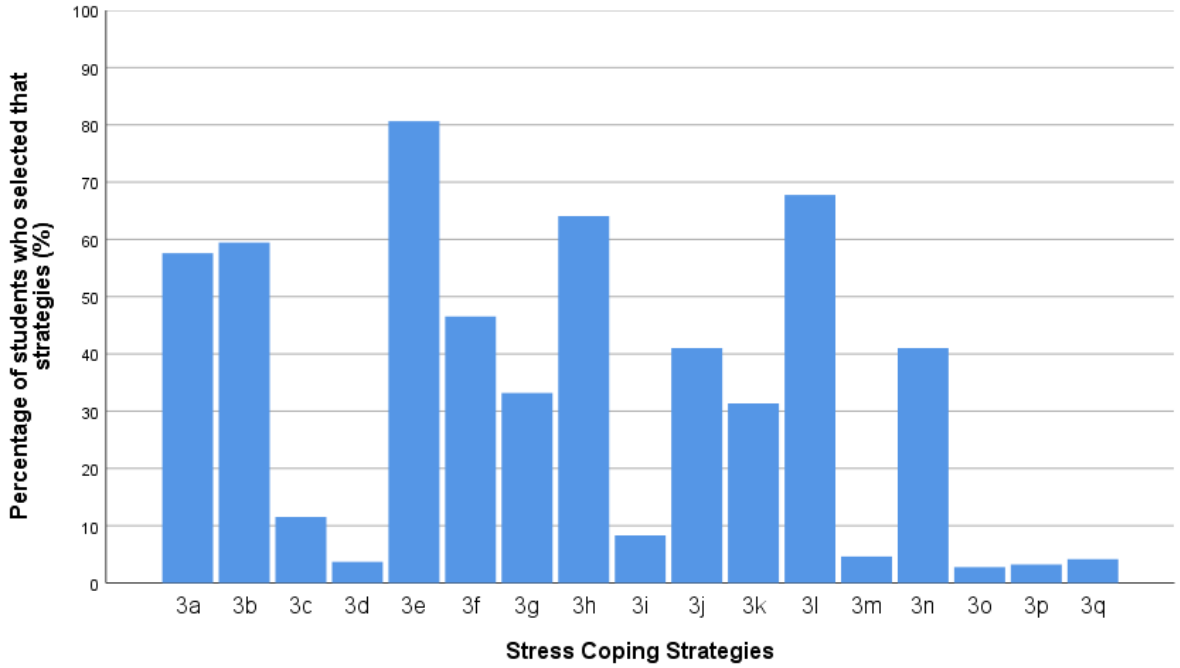

Figure 5: Distribution of pharmacy students for the selection of stress coping strategies (n = 221)

Discussion

Our study aimed to determine the stress levels, the most common causes of stress and stress management among pharmacy students in different academic years (i.e., year 1 and year 2 pharmacy students) in UiTMCPP Bertam Campus during COVID-19 pandemic. The stress level of students was assessed by using Perceived Stress Scale (PSS). This survey indicated that the majority of the pharmacy students in UiTMCPP Bertam Campus undergo moderate stress level (77.8%) followed by high stress level (16.3%) and low stress level (5.9%) during COVID-19 pandemic. The COVID-19 pandemic caused 138 (71%) of the 195 students to experience higher stress and anxiety (Son et al., 2020). Kalaithasan et al (2020) stated that a high number of pharmacy students in public university in the northern region of Malaysia (62.3%) felt stressed in march 2018. Our findings show a higher proportion of pharmacy students felt stressed than findings in previous studies in non-pandemic situations. It is expected for students to have moderate stress as they were in the middle of the semester where lots of assignments and tests as well as it shows they are committed to their studies.

Our respondents included all pharmacy students on campus except Year 3 pharmacy students. It should be mentioned that Year 1 and Year 2 syllabus are theoretical studies while Year 3 pharmacy students are occupied with practical training in the hospital attachment. Differences between ideal practise learnt in university and real-life events in the healthcare field contributed to different stress levels (Pulido-Martos et al., 2012). Students at higher levels (second and third years) can experience higher degrees of stress when examining specific events such as taking tests or amount of work. However, in our study, there are no significant differences in stress level between Year 1 and Year 2 students as different students experienced stress with different stressors during COVID-19 pandemic.

A noteworthy observation in this study is that female students experienced more stress than male students. According to Gefen & Fish (2012), when confronted with identical stresses, females perceived their stress to be higher than males. This is also supported in another study by Sulaiman et al (2009) where female students experience higher rates and levels of stress than male students due to their emotional and sensitive personalities and attitudes toward their surroundings. On the other hand, there is no relationship between stress level and CGPA among pharmacy students in UiTMCPP Bertam Campus. Previous study which involved final-year pharmacy students in Indonesia reported that students with a higher Grade Point Average (GPAs) felt more stressed than those with a lower GPA because students who performed well had larger expectations for their academic accomplishments, and they were more prone to depression as a result of their parents' expectations (Kristina et al., 2020). A similar study in University of Malaya, Malaysia among undergraduate pharmacy students, found a weak negative correlation between stress level and GPA in which students with higher stress levels had poorer GPAs (Sue & Aziz, 2015).

Based on the survey, 187 (84.6%) out of 221 Pharmacy students felt COVID-19 pandemic made their life as students stressful. The stressors for students during COVID-19 pandemic are divided into two parts which are academic stressors and non-academic stressors. Majority of students believed that the stress they encountered during COVID-19 pandemic affected their academic performances. Most of the students felt stressed due to hard to discuss deeply with friends and lecturers and difficult to focus and less motivation. Amir et al. (2020) reported that students preferred classroom learning for group discussion because distance learning made communication more difficult and provided less learning satisfaction. Challenges of online class include friends not giving cooperation in doing group assignments because of strain during COVID-19 pandemic that can lead to increased stress among students. Students' productivity also can be increased when shortening the duration lesson and sufficient break during online class as well as it can reduce cognitive burden and strain due to long-term usage of electronic devices (Muthuprasad et al., 2021).

On top of that, multiple assignments with rigid deadlines, exams and grades and peer competition put a lot of stress on students. This trend is similar to the previous study where it highlighted that intensive coursework, rapid succession exam and cumulative curricular and extra-curricular workload were major contributors of stress in pharmacy students (Babal et al., 2020). Educators' and parents' high expectations and peer pressures to compete and achieve top grades on examinations are associated with academic stress among students (Bedewy & Gabriel, 2015; Kumari & Jain, 2014). However, the lowest academic stressor of students during COVID-19 pandemic is does not have a laptop or printer. A laptop is a basic

necessity for students to perform during online learning but online class can be carried on with other gadgets such as smartphones and tablets for those who do not have a laptop. Accordingly, 'Program 1 Alumni 1 Laptop' initiated by a cooperation of Pre-Higher Education Unit (PPT) UiTM Penang Branch with Research, Industry, Community and Alumni Networking Division (PJIIM & A) succeeded in aiding 30 B40 students to undergo online classes during COVID-19 pandemic.

Non-academic stressors are related to life problems such as psychosocial factors. From the study, the highest perceived stress is fear of future. Fear of future could include worrying about family or friends or oneself's health related to contagion of COVID-19 diseases, virtual learning problems and delay in practical attachments in healthcare settings that will affect on-time graduation. According to pharmacy educators and students, not all virtual activities can substitute face-to-face learning in wet lab sessions and experience placements in healthcare settings. Therefore, this will lead them to stress due to lack of skills such as communication skills as well as hands-on skills that can actually be developed better through real life activities. worrying about family or friends or self's health.

Besides, living away from parents can lead to social isolation and difficulties with personal relationships. Social isolation is a stressful experience that has an impact on people's personalities and connections with others. It reduces social interaction and leads to withdrawal from social activities, negatively impacting the individual both personally and socially (Alghraibeh & Jnieed, 2018). Financial problems have been well correlated as a source of stress especially during COVID-19 pandemic where students struggle in paying costs of college, rent payments, dining plans, transportation, cell phone bills and data connection. Slow internet connections cause missed out information received during online class thus making students hard to understand and fall behind than others. Additional internet data requires money but it is more challenging for students who have financial problems. In any case, Malaysian government has played a significant part in assisting the B40 family and students by providing an internet allowance enabling them to use the internet and continue their online schooling.

215 pharmacy students (97.3%) employed some strategies in stress-reduction and -management techniques. The highest coping strategy in managing stress among pharmacy students is self-distraction. Self-distraction such as watching television and movies and listening to music can take mind off the situation that causes stress. Praying or meditating and to a lesser extent, relaxation techniques or breathing exercise help in controlling stress. A study in inner-city federally qualified health center among 23 patients highlighted that prayer, like meditation, mind-body therapies and breathing exercises, not only experienced stress reduction, but it improved physical and mental health (Burnett-Zeigler et al., 2016).

Additionally, students cope with stress by seeking emotional support from family and friends and slightly from talking to healthcare professionals and university staff. Long-term wellbeing has been linked to social relationships, which could be practised in a lockdown situation through telephonic, messaging, and video-contact with family, friends, and colleagues (Kanekar & Sharma, 2020). Effective social support can help students cope with stress by reducing negative emotions and increasing self-efficacy, which can boost their confidence and courage in the face of disasters like the COVID-19 outbreak (Li et al., 2021).

Besides, our study shows that the pharmacy students preferred more seeing something positive from the problem and planning a strategy on how to deal with the situation than making fun of it and refusing to believe it happened. The ability to keep a positive outlook on the future promotes resilience in difficult situations, acting as a buffer against the detrimental effects of stress (Leary & Derosier, 2012). Students believe that instead of approaching a stressful situation with a negative attitude, the problems they confront can help them grow in positive ways.

Exercise or sport and eating junk or comfort food. A study proved that physical activity (especially cardiovascular workouts like running or cycling) reduces psychological stress and anxiety through modulating hormones, amino acids, and neurotransmitter levels (Rogowska et al., 2020). Eating unhealthy, high-fat, palatable food has been linked to opioid release on a neurophysiological level, and opioid release boosts the consumption of palatable foods. Given that opioids release has a powerful influence on stress reduction, it is likely that unhealthy eating could become an addictive response to stressful conditions in an attempt to cope (Leary & Derosier, 2012). However, healthy eating has been found to lower stress and improve psychological well-being (Leary & Derosier, 2012). Accordingly, students could apply eating healthy food as their way to cope with stress instead of consuming junk food in order to better manage stress as well as boost the immune system leading to a healthy body.

Participating in university clubs or societies helps to decrease stress among students since socialising is a crucial aspect of stress reduction because it allows them to meet new people, enhance their collaboration skills, and relieve tension while socialising. Similarly, a study among preclinical medical students in Lebanon reported that extracurricular activities incorporate social engagement such as problem solving, positive interpretation, social support, and emotional expression, that can decrease the anxiety, stress and burnout on mental and physical health (Fares et al., 2015). The least method to tackle stress are taking prescription-only medicines and taking over-the-counter products. Most students used analgesic drugs such as paracetamol to treat headaches with increasing stress (Nandha & Chhabra, 2013). Prolonged and severe stress has a significant impact on mental health of students that can cause them to be prescribed medication treatment. Long-term stress can cause mental health problems in students such as anxiety and depression. A study among undergraduate students in Western Michigan University, USA described that 92 students obtained at least one prescribed medication from the center in which the common drugs are Selective Serotonin Reuptake Inhibitor (SSRI) and tricyclic amine medications to treat depression (Hysenbegasi et al., 2005).

Conclusion

Females in general reported higher perceived stress levels than male students. However, first-year and second-year pharmacy students reported no difference with their perceived stress levels. By recognising the source of stress, students could take proper precautions and continue the efforts to enhance the mental health and better handle their stress.

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