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Learning Problems and Adaptation under the Coronavirus Disease 2019 of Medical Students

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Abstract: Since its discovery in 2019, COVID-19 has generated public health concerns. It has influenced nearly every facet of life, including medical education. In this regard, the purposes of this study were to investigate the level of problems and adaptation among preclinical year medical students at Suranaree University of Technology in Thailand. This online cross-sectional study was conducted at Suranaree University of Technology in Thailand, between December 20, 2021 and March 20, 2022. All of the medical students were invited to complete an online questionnaire on demographics, their learning problems in the COVID-19 pandemic, and adaptation. The data were analyzed using statistics, including an independent t-test, Analysis of Variance (ANOVA), the Least-Significant Different method (LSD) and the Pearson correlation to determine the correlation between learning problems and adaptation factors. The response rate was 177 out of 186 people (64.1%). The respondents had a moderate level of their problems with the most personal issues (88.7%) and emotional adaptation was at a high level. Males had more difficulties than females. The third-year medical students had the most difficulty and the least adaptation during the COVID-19 pandemic. During the COVID-19 pandemic, third-year medical students had the most problems. The second-and-third-year students had lower levels of study and emotional adaptation than the first year ($p<0.01$). Therefore, in order to build psychological support and resilience, training is essential to increase mental wellness and educate medical students to cope with unprecedented events.

Keywords: Medical students, Adaptation, COVID-19

Introduction

The novel Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), also known as COVID-19, has caused a global pandemic, posing serious health risks to humans. COVID-19 has different epidemiological properties, making it more transmissible than prior pandemics, like SARS-CoV and MERS-CoV, making the present pandemic more of a threat to humanity (Meo et al., 2020). This crisis has put the entire world in danger, and citizens in several nations have been ordered to be quarantined if they had come into contact with the infection (Haleem, et al., 2020). The quarantine is a state of voluntary house arrest, the cancellation of public gatherings, and travel restrictions (Usher et al., 2020). The COVID-19 pandemic has caused public panic and deterioration in mental wellbeing. Medical and healthcare workers are also more vulnerable to mental illness (Bao et al., 2020). Furthermore, compared to the general population, medical students had greater rates of mental illness, such as anxiety and depression (Rose, 2020; Ahmad et al., 2020; Ferrel and Ryan, 2020).

Research on the psychological impact of the COVID-19 pandemic on medical students has been undertaken all around the world (Cao et al., 2020; Ahmed et al., 2020; Choi et al., 2020; Lyons et al., 2020; Bachir et al., 2021). COVID-19 had the potential to damage the lives of the students because of the same social distance criteria that rendered medical education completely remote. Soon after COVID-19 became prevalent in China, a survey from a Chinese medical school found that roughly a quarter of its students developed anxiety symptoms (Cao et al., 2020).

Adaptation refers to the ability of an individual to adapt their thoughts, feelings, and behaviors in response to their surroundings, society, and position to suit themselves and the outside world is referred to as adaptation. Adaptation is an important concept in evolutionary

biology that explains why living organisms adjust to various settings and confront and accept the realities of life (Grandcolas, 2015). According to studies on the influence of the COVID-19 pandemic on medical students, it made them anxious about their education (Kapila et al., 2020; Sahu, 2020). Medical students have a substantial impact on medical education, according to other studies, which cause students to make different adaptions during the COVID-19 pandemic condition (Harries et al., 2021). As a result, the researchers were interested in the learning and adaptation of medical students in order to use the findings as a guideline for planning, problem-solving, and delivering as much advice as possible to medical students.

The significance of the problems of adaptation among medical students was the subject of this study. Basic knowledge is taught to medical students in their preclinical year. They must change how they divide their study time as they handle more challenging subjects and specifics. Despite the fact that research on the psychological impact of medical students during the COVID-19 pandemic has been published in a number of countries, there have been few studies on the subject in Thailand. The purposes of this study were to assess the psychological impact of the COVID-19 pandemic on medical students at Suranaree University of Technology (SUT) in Thailand, such as learning problems, and to identify the factors associated with the psychological impact.

Research methodology

In this study, observations and analyses were cross-sectional, with the data collected between December 20, 2021 and March 20, 2022. The Research Ethics Committee at Suranaree University of Technology (Thailand) officially approved this study, with Approval EC COA No. 105/2564.

Participants

The participating subjects consisted of 177 out of 186 medical students, studying in their first, second, and third years at Suranaree University of Technology, Nakhon Ratchasima, Thailand, during the 2021 academic year. The samples were collected by simple random sampling from a target population.

Instruments

The questionnaires adopted in this study were divided into three main parts, as follows:

1. General demographic part, consisting of four items regarding, for example, gender, year of study, and hospital of clinical education level.
2. Learning problem part, consisting of four items to assess the issues in personal, friend, family and environmental contexts.
3. Adaptation part, consisting of three items to assess the issues in study, emotion, and social context.

The questionnaire was the quality examined by three experts from the Index of Item Objective Congruence (IOC) by only selecting questions with an IOC value of 0.60 or higher, and then the questionnaire was used to try on nearby groups of medical students with a Cronbach's Alpha Coefficient (α) =0.92.

Data analysis

The data of 177 medical students were recorded in Excel software and analyzed by using IBM SPSS Statistics for Windows. All of the data were analyzed to determine the statistics, including frequency, percentage, mean, standard deviation (SD), characteristic data, and the problem and adaptation of study levels were analyzed using chi-square test to test the correlation between the variables. The samples were classified by gender and year of study to compare mean difference scores in problem and adaptation levels by independent t-test, Analysis of Variance (ANOVA) and Least-Significant Different method (LSD). In addition, the Pearson correlation was used to define the correlation between the problem and adaptation of study scores. The significant levels of all of the variables studied were $p < 0.05$ and 0.01. Problem and adaptation scoring interpretation is seen in Table 1.

Table 1 Problem Classification and Adaptation Levels

Classification Level	Ranges
Problem of Study	
Extremely Severe	4.21 – 5.00
Severe	3.41 – 4.20
Moderate	2.61 – 3.40
Mild	1.81 – 2.60
Mildest	1.00 – 1.80
Adaptation of Study	
Greatest	4.21 – 5.00
Great	3.41 – 4.20
Moderate	2.61 – 3.40
Less	1.81 – 2.60
Least	1.00 – 1.80

Research results

The response rate was 177 out of 186 medical students (64.1%). Of these, 124 (70.1%) were females, and 71 (40.1%) were in their first year of study. During the COVID-19 outbreak, medical students had environmental problems at a severe level (17.5%) and the extremely severe level (6.8%). Family problems was the aspect with the mildest level (70.1%). Additionally, the majority of medical students had mild and moderate levels in personal and friend problems: personal (88.7%) and friend (70.6%). The relationship between the characteristics and problem/adaptation of study levels revealed that gender was associated with problem ($p<0.05$) and year was associated with both problem and adaptation ($p<0.05$ and $p<0.01$, respectively). The majority of students with a high level of problems were male students (47.2%) and third-year students (51.6%). The level of adaptation in the first year was high (98.6%), while it was low for the third-year students (11.3%). When the relationship between problem and adaptation of study scores was examined, the two scores had an inverse correlation (Pearson correlation = -0.539, $p<0.01$), as shown in Table 2, Figures 1 and 2.

Table 2 Characteristics of Students and Correlation with Problems and Adaptation in the Study

Characteristics	Count	%	Problem of Study		p	Adaptation of Study		p
			Low (%)	High (%)		Low (%)	High (%)	
Gender								
Male	53	29.9	28 (52.8)	25 (47.2)	0.046*	1 (1.9)	52 (98.1)	0.067
Female	124	70.1	85 (68.5)	39 (31.5)		13 (10.5)	111 (89.5)	
Year of Study								
1st	71	40.1	55 (77.5)	16 (22.5)	0.002**	1 (1.4)	70 (98.6)	0.013*
2nd	44	24.9	28 (63.6)	16 (36.4)		6 (13.6)	38 (86.4)	
3rd	62	35.0	30 (48.4)	32 (51.6)		7 (11.3)	55 (88.7)	
Hospital of Clinical Education Level								
Nakhon Ratchasima	19	10.7	14 (73.3)	5 (26.3)	0.770	1 (5.3)	18 (94.7)	0.302
Chaiyaphum	39	22.0	22 (56.4)	17 (43.6)		5 (12.8)	34 (87.2)	
Buriram	41	23.2	26 (63.4)	15 (36.6)		3 (7.3)	38 (92.7)	
Surin	46	26.0	30 (83.3)	16 (16.7)		1 (2.2)	45 (97.8)	
None	32	18.1	21 (65.6)	11 (34.4)		4 (12.5)	28 (87.5)	

*** statistical significance of 0.01, * statistical significance of 0.05*

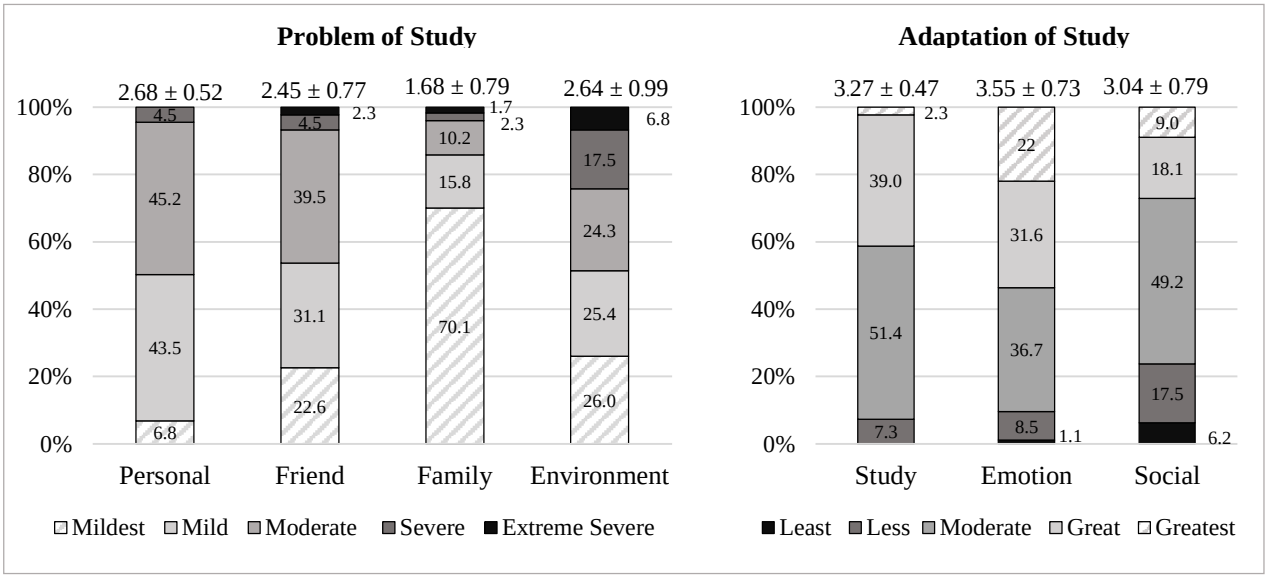

Figure 1 Percentage of Students at the Problem and Adaptation Level

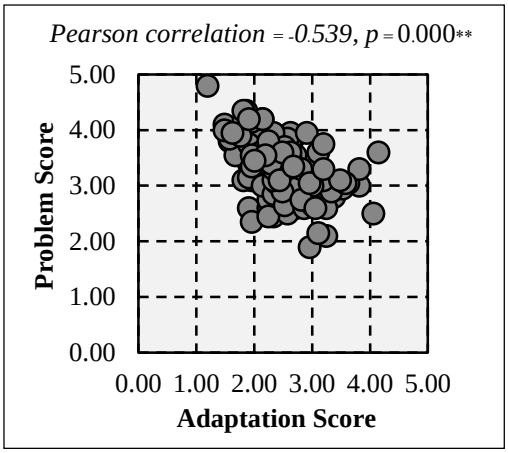

Figure 2 Correlation between Adaptation and Problem Scores

When the problem and adaptation scores were compared by gender, males had higher mean problem scores in terms of friends and family than females ($p<0.05$ and $p<0.01$, respectively). Furthermore, when problem and adaptation scores were compared across years, the third-year students had higher mean scores for personal, friend, and environmental problems ($p<0.01$). The second- and-third-year students had lower levels of study and emotional adaptation than the first years ($p<0.01$), as shown in Figure 3 and Table 3.

Table 3 Comparison of Mean Problem and Adaptation Score between Year of Study

Problem and Adaptation	F	p	Academic Institutes	Mean	Year of Study [a] 1st	2nd	3rd
Problem of Study							
Personal	4.870	0.009**	1st	2.54			
			2nd	2.71	-0.17		
			3rd	2.81	-0.27**	-0.10	
Relationship with Friends	4.011	0.020*	1st	2.28			
			2nd	2.44	-0.16		
			3rd	2.65	-0.37**	-0.21**	
Family	1.269	0.284	1st	1.68			
			2nd	1.53			
			3rd	1.78			
Environment	13.556	0.000**	1st	2.27			
			2nd	2.55	-0.28		
			3rd	3.11	-0.84**	-0.56	
Adaptation of Study							
Study	10.815	0.000**	1st	3.46			
			2nd	3.19	0.27**		
			3rd	3.11	0.35**	0.08	
Emotion	8.639	0.000**	1st	3.82			
			2nd	3.42	0.40**		
			3rd	3.33	0.49**	0.09	
Social	0.065	0.936	1st	3.04			
			2nd	3.08			
			3rd	3.02			

** statistical significance at a level of 0.01, mean difference scores by year of study

Discussion

This study revealed the problems and adaptation in several sectors of medical students during the COVID-19 pandemic. In terms of the environment problem, 24.3% of medical students had severe and extremely severe levels. They mildest of their problems was family. The majority of them had mild and moderate problem levels, with 88.7% experiencing personal issues and 70.6% experiencing peer issues. Obviously, problem and adaptation levels were related to gender and year of study. Most of the males and the third-year students had problems at a high level. In addition, it was discovered that first-year students had a high level of adaptation, while the third-year students had a low level of adaptation. The third-year students had more personal, friend, and environmental problems than other years. For the second-and-third-years, the level of adaptation in studying and emotion was lower than the first-year students. Each year has a different level of adaptation, with different levels of stress leading to depression (Perissotto et al., 2021). Noticeably, gender and year of study were related to the stress level of medical students, especially male and the third-year students were more stressed than the other groups.

In addition, the stress levels of the third-year students were at a severe level (Abdulghani et al., 2020). The levels of stress were consistent with adaptation, and this adaptation was related to the year of study (Arpornkul and Suppapitiporn, 2017). Students in Thailand's other faculties made the most learning and social adaptations, but had a low level of emotional adaptation. There were no differences in adaption between males and females, contradicting the findings of the study. Gender is a significant predictor of health. Autoimmune illnesses, chronic pain, depression, and anxiety disorders are more common among women than men (Holden, 2005; Kudielka, 2005; Lundberg, 2005; Kajantie and Phillips, 2006; Kannikar et al., 2020; Abdulghani et al., 2020).

Males have more issues with family and friends than females. Males are more adaptable than females in social situations. This could be because medical student education and learning is structured around a block system with practice. There is a finite amount of time available for studying. As a result, students have less time than normal to acclimate. Medical students adjust by spending more attention and bonding with others in their immediate environment, such as friends, lovers, and family members. They were worried about the future of their careers and their personal health; therefore, they were stressed. When students feel stressed, they usually change their behavior, such as speaking with friends or exercising, but they are required to adjust irregularly (Slivkoff et al., 2021).

Some students have a high degree of problems and low level of adaption as a result of the COVID-19 pandemic. COVID-19 wreaks havoc on education, family finances, and the physical and mental wellbeing of students (Al-Husban et al., 2021). This is consistent with prior study, which revealed that third-year medical students experienced more stress, anxiety, and depression than students in other years. Psychological impact was linked to preclinical students, sleep disorders, and a significant decline in family income (Puttakiaw et al., 2020; Sasikala et al., 2020). Sleep problems, such as poor sleep quality, insufficient sleep, and insufficient time, affected the majority of medical students, resulting in problems and poor adaptability (Alnaser et al., 2021). A student with a high level of difficulty will also have a low level of adaptability. In medical school, instructors and course developers should change their tactics and teaching styles, such as combining modern techniques for medical education to fulfill the demands of medical students, such as an online counseling clinic, the online learning model of telemedicine, clinical teaching simulations, and so on.

The results showed that gender and year of study were related to the stress level of medical students. The levels of stress were consistent with adaptation, and this adaptation was related to the year of study. A student with a high level of difficulty also had a low level of adaptability. Furthermore, periodic evaluations should be undertaken as part of the learning assessment in order to improve changes in teaching and learning. Academic clinics that provide counseling for each year should be established, as follows: (1) online counseling clinics that protect personal information of students and advisers to make students feel safe; and (2) counseling to ease the discomfort or anxiety of medical students (Liang et al., 2020; Emanuel, 2020; Niriella et al., 2020). Listening to the problem should be part of the consultation. It may be advisable to stay away from news and current events that could make people feel uncomfortable or disturbed and planning activities for students to participate in small group teaching, large group teaching, and virtual clinical skills (Shehata et al., 2020; Cárdenas-Cruz et al., 2022).

This was a cross-sectional study of participants learning in a block system throughout their pre-clinical year. There were no long-term changes or problems with clinical students as a result of the time constraints of the study. Thus, the educational institution should explore the issues, consequences, and long-term adjustments of medical students in both pre-clinical and clinical classes as a result of the COVID-19 outbreak on their learning and attitudes (Alsoufi et al., 2020). Lastly, the impact on teaching practice management and the practical examination (OSCE) should be emphasized to study new practice exams and assessments (Tzeng et al., 2021).

Conclusion

The medical students had a moderate level of problems with the most personal issues. The emotional adaptation was at a high level. Males had more difficulties than females. The third-year medical students had the most difficulty and the least adaptation during the COVID-19 pandemic. During the COVID-19 pandemic, third-year medical students had the most problems. Therefore, in order to build psychological support and resilience, training is essential to increase mental wellness and educate medical students to cope with unprecedented events.

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