Stress and Coping Strategies among Thai Medical Students in a Southern Medical School

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ABSTRACT

Objective: To assess stress, and coping strategies and related factors among medical students.

Methods: This cross-sectional study surveyed all 1st to 6th year medical students at the Faculty of Medicine, Prince of Songkla University, from March to May, 2019. Three questionnaires were employed: 1) Demographic data 2) The Suanprung stress test 3) The Brief COPE inventory Thai version. Data were analyzed using descriptive statistics, and the results were presented as percentage, frequency, average and standard deviation. Factors associated with coping strategies were analyzed by means of chi-square or kruskal-wallis test.

Results: There were 827 respondents from 1,109 medical students, and 74.6% response rate. The majority of medical students were female (60.7%) with moderate and high stress level scores (44.9% and 38.6%, respectively). The medical students commonly used adaptive coping strategies (self-distraction, acceptance, active coping, and positive reframing) rather than maladaptive coping strategies (denial and substance use). According to the association between general demographic characteristics and coping strategies, we found that; gender, GPA, religion and medical illness had significant correlation with adaptive coping strategies. Whereas, high stress levels were significantly associated with maladaptive coping strategies.

Conclusion: Most medical students use adaptive coping strategies. Gender, GPA, religion and medical illness had significant correlation with adaptive coping strategies.

Keywords: Medical students; stress; coping strategies (Siriraj Med J 2020; 72: 238-244)

INTRODUCTION

Stress is the result of an individual's perception that they lack resources to cope with a perceived situation occurring in the past, present or foreseeable future. Stress occurs when the individual is confronted with a situation that is perceived as overwhelming and with which they cannot cope.[1]

A previous study found medical students had higher levels of stress than other groups of the general population.[2] The prevalence of stress suffering among medical students was 54.0% for 3rdacademic year and 55.0% for 4thacademic year students.[3] In Thailand, the prevalence of those suffering from stress among medical students in Ramathibodi Hospital was 61.4%[4], and in Khon Kaen University, 55.8%.[5]

Response to stress can be categorized into: 1) Emotional aspects: fear, anxiety, worry, guilt, depression and irritability; 2) Cognitive reactions: their appraisal of stressful situations and strategies; 3) Behavioral responses: crying, abuse of self or others, smoking and drinking; 4) Physiological reactions: sweating, trembling, stuttering, headaches, weight loss or gain, and body aches.[6] Coping

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strategies that involve engagement can reduce both anxiety and depression as well as their effects on mental and physical health.[7] However, coping strategies which center on disengagement; such as: problem avoidance, wishful thinking, social withdrawal and self-criticism have negative consequences, and correlate with depression, anxiety, poor mental health[7] and physical problems.[8]

In 2007, a cross-sectional survey, which explored 4,287 students at 7 medical schools in the United States, found burnout was reported by 49.0% of medical students, and 11.2% reported suicidal ideation within the past year.[9] A study conducted in Thailand in 2007, found coping strategies among clinical medical students at Khon Kaen University included: tension reduction, seeking social support, positive thinking and planful problem solving.[5] Whilst in 2010, among 2nd academic year medical students at Thammasat University, common coping strategies were: investing in close friends, relaxing, being humorous, and developing self-reliance and optimism.[10]

In 2008, a cross-sectional study at the Faculty of Medicine, Prince of Songkla University, discovered 29.1% of medical students had mental health problems. Factors related to mental health problems were: female, 2nd academic year and rural home province.[11] Another study in 2015, among clinical medical students, found that no history of drinking and having a history of exercise had a higher happiness status than that of other groups.[12] Of medical students, 53.3% were drinkers, with the gender proportion of alcohol usages at 60.0% in males, and 48.1% in females. Gender as well as substance usage were significant correlated factors with high-risk drinking.[13] According to this information, the questions are: "What are the stress coping strategies among medical students?"; and: "Are substance use or alcohol consumption other stress coping strategies of medical students?". In the past, there were no in-depth studies that explored these questions among medical students at Prince of Songkla University. Therefore, the purpose of the study was to determine stress, coping strategies and related factors among medical students, and enhance the focusing of these problems.

MATERIALS AND METHODS

The Ethics Committee of the Faculty of Medicine, Prince of Songkla University approved this cross-sectional study (REC: 60-472-03-4). The study explored all 1st to 6th academic year medical students that studying at the Faculty of Medicine, Prince of Songkla University, Hat Yai Hospital Medical Education Center, and Yala Hospital Medical Education Center, from March to May, 2019. There were 1,109 medical students, categorized by 1st to 6th academic year as follows: 189, 182, 185, 184, 189 and 180, respectively. The inclusion criterion was being a medical student who could complete all questionnaire. The exclusion criterion was medical students who being foreign students or on a leave of absence.

Methodology

The medical students were communicated by a research assistant in their classes beforehand. After the end of class, the medical students had free time of 1 hour, so a research assistant invited them to participate, by introducing the rationale and overview information of this research. In cases where cooperation was successful, the research assistant distributed self-reporting questionnaires consisting of 3 parts, and thoroughly explained them in detail to participants. The medical students took 5 minutes to consider whether or not to join in the study. After this, the research assistant distributed the documentation, whilst assuring the volunteers that their identities would be protected. Then, the signatures of participants were not required, and all participants retained the right to withdraw from the study at any time.

All participants were allowed to finish and return the questionnaires immediately or later time. They were permitted to submit the questionnaire two options: drop it in the box at the front of the classroom, or bring it back and place it in the box located at the Psychiatry Department. Thus, participant confidentiality was protected.

Instruments

The questionnaire comprised of 3 parts:

1) General information consisting of: gender, age, academic year, religion, accumulative GPA, income, parental marriage status, hometown, and underlying diseases.

2) The Suanprung stress test, which uses questions to determine stress levels for the last six months contains 20 items, rated on a 5-point Likert scale; with item responses ranging from: "1" (no stress) to "5" (extremely high stress). Total scores were classified into four levels: 0 to 23 as mild, 24 to 41 as moderate, 42 to 61 as high and more than 61 as severe stress. The Suanprung stress test was shown to have an overall Cronbach's alpha greater than 0.7.[14]

3) The Brief COPE inventory Thai version, consisted of 28 questions, and 14 subscales of coping strategies. The Brief COPE scale was designed to assess a broad range of coping responses among adults for all diseases. It contains 28 items, and is rated by a four-point Likert scale, ranging from: "I haven't been doing this at all" (score one) to "I have been doing this a lot" (score four).[15]

Cronbach's alpha of the Brief COPE inventory Thai version was 0.7.[16]

In the stress-coping model, specific coping behaviors are understood as predominantly adaptive or maladaptive. Adaptive coping strategies are: active coping, planning, positive reframing, acceptance, humor, religion, using emotional support and using instrumental support. Whereas, maladaptive coping strategies include: self-distraction, denial, venting negative emotions, substance use, behavioral disengagement and self-blame.[15,17]

Statistical analysis

All data were analyzed, in order to present the sample's behavior using descriptive statistics. The results are described as: percentage, frequency, average and standard deviation. The correlated factors with coping strategies were analyzed using Chi-square or Kruskal-wallis test.

RESULTS

Demographic data

Medical students who completed the questionnaires were 827; the response rate was 74.6%. Of the participants, 502 were female (60.7%) (Table 1). Mean age was 21.4±2.0 years, with mean cumulative grade point average (GPA) being 3.5±0.4. Median income (IQR) was 8,000 (6,000-10,000) baht, per month.

Stress level and coping strategies

The majority of medical students had moderate and high stress level scores (44.9% and 38.6%, respectively) (Fig 1). Coping strategies frequently performed by medical students were adaptive types; acceptance, active coping, positive reframing and maladaptive types; self-distraction. Whereas maladaptive types; denial and substance use were coping strategies that medical students did not perform at all (Fig 2).

The association between demographic data, stress level and coping strategies

The association between general demographic characteristics and coping strategies are described (Table 2). Using adaptive coping strategies for controlling stress levels was significantly associated with: gender, religion, GPA, and medical illness. According to gender and GPA factors, the study found that females and those with a high GPA (≥3.5) used adaptive coping strategies more than males and those with a low GPA (<3.5), respectively. There was no significant difference in the use of both adaptive and maladaptive coping strategies between pre-clinic and clinic medical students. In addition, medical students who had a medical illness (such as allergy, dyspepsia, migraine) often used adaptive coping strategies.

Analysis of the association between demographic characteristics and stress levels, showed that only the variable concerning academic year of medical study (pre-clinical and clinical year) was significantly related to stress levels ($p<0.001$). Pre-clinical medical students, had high to severe stress levels, more so than clinical medical students (52.9% and 39.5%, respectively) (Fig 3).

DISCUSSION

This study found the prevalence of moderate and high stress level scores among medical students were 44.9% and 38.6%, respectively. In Thailand, a previous study at the Faculty of Medicine, Ramathibodi Hospital reported 61.4% of medical students had experienced some degree of stress.[4] At the Faculty of Medicine, Khon Kaen University, it was found that 55.8% of medical students had morbid stress.[5] However, a study at Siriraj Hospital reported only 17.9% of medical students had stress.[18] The cause of these different results may be that the subjects of this study only included 3rd year medical students.[19] In other countries, 56.0% of Malaysian[19], and 63.0% of Saudi Arabian medical students also had a high level of stress. Academic problems were the most common stressors of studying in medical training. Reasons for this could be that academic achievement has always been the top priority for medical students. Medical students with stress also reported significantly more academic problems than students without stress.[4]

In our study, medical students used adaptive coping (self-distraction, acceptance, active coping and positive reframing) rather than maladaptive coping strategies (denial, behavioral disengagement and substance use). These were the same coping strategies commonly used among medical students at Thammasat University,[10] in India[20] and other countries.[21,22] However, females utilized adaptive coping strategies more than males, which may be caused by female appraisal of threatening events as more stressful; hence, they were also more affected by the stress of those around them. This in turn led them to be more emotionally involved than their male counterparts. As they used more emotional coping strategies to deal with stress than males, this leads to more adaptive coping strategies being used in females.[23]

Among medical students who have high grades (GPA≥3.5), the use of adaptive coping strategies is similar to a study from Argentina.[24] The reason may be the adaptive ability to study, and more coping strategies and problem solving skills than others. Additionally, this may lead

TABLE 1. Demographic characteristics (n=827).

Demographic characteristics	Number (%)
Gender	
Female	502 (60.7)
Male	323 (39.1)
Unreported	2 (0.2)
Academic year of medical student	
1	168 (20.3)
2	121 (14.6)
3	161 (19.5)
4	98 (11.9)
5	161 (19.5)
6	118 (14.3)
Religion	
Buddhism	700 (84.6)
Islam	31 (3.7)
Islam 3 southern border provinces	30 (3.6)
Christianity/other	32 (3.9)
Unreported	34 (4.1)
Home province	
Songkhla	336 (40.6)
3 southern border provinces	126 (15.2)
Other	352 (42.6)
Unreported	13 (1.6)
Parental marriage status	
Couple	707 (85.5)
Divorce/pass away	112 (13.5)
Unreported	8 (1.0)
Underlying disease	
Medical illness	
No	694 (83.9)
Yes	130 (15.7)
Unreported	3 (0.4)
Psychiatric illness	
No	784 (94.8)
Yes	39 (4.7)
Unreported	4 (0.5)

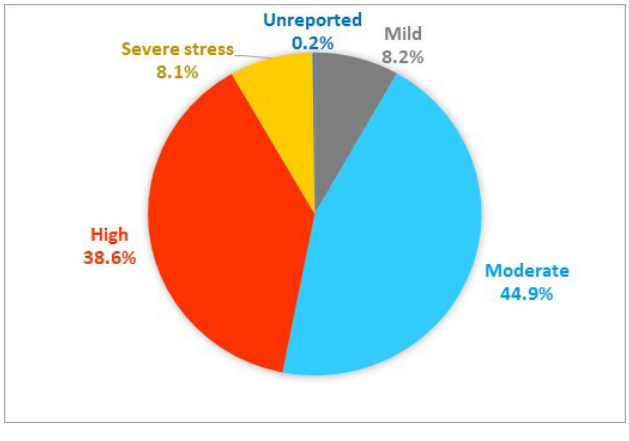

Fig 1. Percentage of stress level among medical students (n= 827).

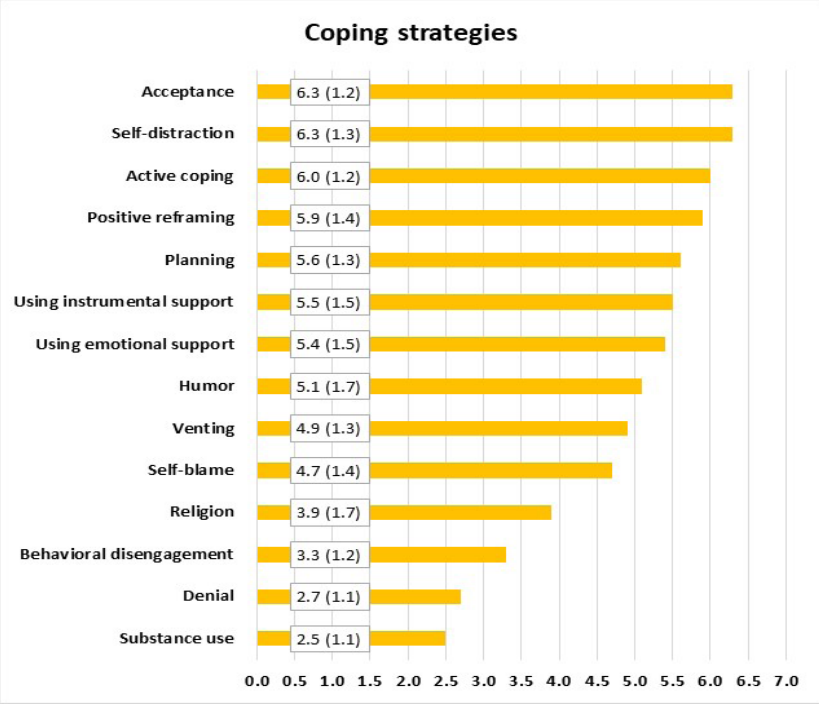

Fig 2. Coping strategies score (n=827).

*Mean score interpretations were as below: 2.00 = have not been doing this at all, 2.01 to 4.00 = have been doing this a little bit, 4.01 to 6.00 = have been doing this a medium amount, 6.01 to 8.00 = have been doing this a lot

TABLE 2. Multiple linear regression of the association between demographic data and coping strategies.

Demographic	Adaptive			Maladaptive		
	Median (IQR)	Beta (coefficient)	*P*-value	Median (IQR)	Beta (coefficient)	*P*-value
Gender						
Male	2.7 (2.4, 3.0)	reference		2.0 (1.8, 2.2)		
Female	2.8 (2.5, 3.1)	0.105	0.003	2.1 (1.8, 2.2)		
Year of medical student						
Pre-clinic	2.8 (2.4, 3.1)			2.1 (1.8, 2.2)		
Clinic	2.8 (2.4, 3.0)			2.0 (1.8, 2.2)		
Religion						
Buddhism/christianity/ others	2.8 (2.4, 3.0)	reference		2.0 (1.8, 2.2)		
Islam 3 provinces	3.0 (2.8, 3.3)	0.288	0.002	2.2 (1.9, 2.3)		
Islam	2.9 (2.7, 3.0)	0.096	0.265	2.1 (1.8, 2.2)		
Grade point average						
<3.5	2.7 (2.4, 3.0)	reference		2.0 (1.8, 2.3)		
>3.5	2.8 (2.5, 3.1)	0.099	0.005	2.1 (1.8, 2.3)		
Medical illness						
No	2.8 (2.4, 3.0)	reference		2.0 (1.8, 2.2)	reference	
Yes	2.9 (2.5, 3.1)	0.116	0.018	2.1 (1.8, 2.3)	0.027	0.367
Stress level						
Mild-moderate	2.8 (2.4, 3.1)	reference		1.9 (1.8, 2.1)	reference	
High-severe	2.8 (2.5, 3.0)	0.021	0.553	2.2 (1.9, 2.4)	0.258	<0.001

*Significant (p-value <0.05)

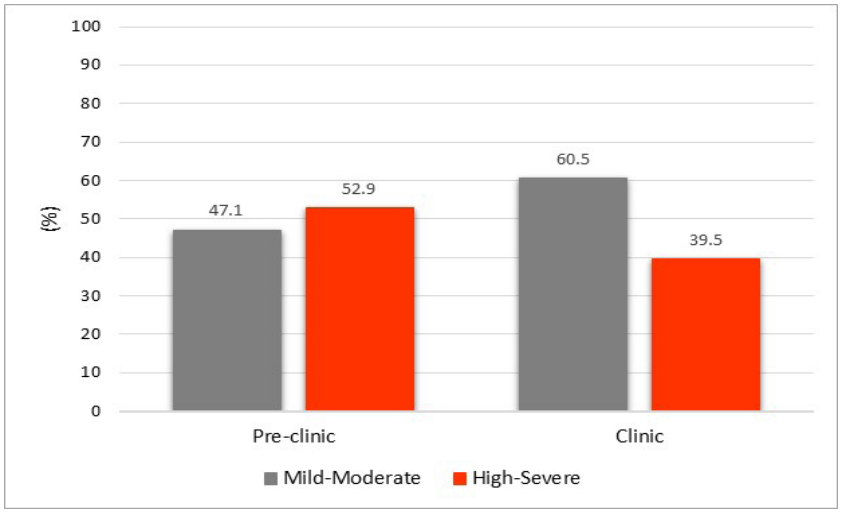

Fig 3. Stress level and year of medical student.

them to acquire better academic performance. Besides, this study found Muslim students in 3 southern border provinces used religious coping strategies more than others. This result is similar to studies in Malaysia.[19,22] This may be related to medical students' strong religious beliefs, providing guidance on how to live and giving individuals meaning and identity.[25] In addition, medical students who had high-severe levels of stress tended to use maladaptive coping strategies, rather than those of the mild-moderate group, since performance and coping skills could be markedly impaired in persons who perceived greater stresses in certain situations.[26]

Among the academic year, the clinical medical students stress score was less than pre-clinical medical students. These results were similar to studies in India[27] and Morocco.[28] Pre-clinical medical students may be stressed by the overwhelming amount of information they have to learn, whilst handling the lifestyle of a medical college.[27] However, there was no significant difference in coping strategies between pre-clinical and clinical medical students. This finding might be because of an adaptive or mature defense mechanism being an innate or part of developing changes of both pre-clinical and clinical medical students. In addition, a mature defense mechanism is a part of medical professionalism development in medical education curricula. Thus, a longitudinal and prospective study about individual changes, from pre-clinical to clinical phase, in coping strategies and other areas would be interesting for further study.

Furthermore, there is correlation between high level stress and maladaptive coping strategies. The results of maladaptive coping strategies may eventually have a negative impact on physical and mental health. Therefore, faculty policy should be reviewed to focus on stress in medical students, indicating a need for stress management programs within their medical education.

Limitations

This study was of a cross-sectional survey, and employed self-reporting for individual perception assessment. Besides its high response rate (74.6%), the information might not have led to finding bias. However, the population was limited to only medical students in the Faculty of Medicine, Prince of Songkla University. Then, it is too soon to generalize these data to a nationwide setting.

Implications and future recommendations

Further studies should cover more medical schools within Thailand and employ a more quantitative method. In other words, a multi-center survey is recommended.

CONCLUSION

Half of the medical students perceived stress, and they use mainly adaptive coping strategies; rather than maladaptive coping strategies. Gender, GPA, academic year, medical illness and religion had significant correlations with coping strategies. High level stress was correlated with maladaptive coping strategies. In the future, focusing on medical students' stress coupled with coping strategies could prevent the harmful effects of stress on health and academic performance.

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