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Research Article

SELF-REGULATED LEARNING AND ACADEMIC STRESS IN MEDICAL SCHOOL: ARE THEY RELATED?

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ABSTRACT

Background: During the transition to higher education, many students experience stress due to the process of adapting to a new educational and social environment. Excessive or negative stress may lead to physical and psychological reactions, such as persistent lack of energy, loss of appetite, headaches, gastrointestinal problems or signs of emotional distress. It may be theorized that students who are more proficient at self-regulated learning would display problem solving coping strategies when dealing with academic demands, therefore reducing perceived levels of academic stress. This study aims to explore any statistically significant relationship between the levels of self-regulated learning and academic stress.
Methods: The study is a cross-sectional, observational analytic study with a sample size of 222 respondents obtained from medical students at Tarumanagara University.
Results: The majority of respondents (80.6%) experienced moderate academic stress, although statistical analysis shows no statistically significant relationship between self-regulated learning and academic stress.
Conclusions: Further research should be done on the cross-cultural applicability of the concepts of self-regulated learning. Medical educational institutions should implement learning and lecture strategies that promote emotional and mental wellness among students as an approach to reduce the levels of academic stress.

Keywords : Self-Regulated, Learning strategy, Academic Stress, Medical Student

INTRODUCTION

During the transition to higher education, many students experience stress due to the process of adapting to a new educational and social environment [1]. A meta-analysis conducted in 2019 shows that around a third of medical students worldwide experience anxiety, with medical students in the Middle East and Asia having the highest prevalence of anxiety. Aggregated data from 18 studies shows that 35.2% of medical students in Asia experience anxiety [2]. Excessive or negative stress may lead to physical and psychological reactions, such as persistent lack of energy, loss of appetite, headaches, gastrointestinal problems or signs of emotional distress [1].

Coping is an effort to manage stress through cognitive and behavioral changes. Coping consists of the process of analyzing and evaluating strategies that an individual can use to avoid the negative effects of a stressor. The coping strategies may be classed into two broad classifications which include problem focused coping and emotion focused coping. Individuals who apply problem focused coping strategies are more likely to take an active role in solving problems in an effort to deal with stress, while individuals who apply emotion focused coping strategies deal with stressful situations with efforts to regulate, reduce, or eliminate the emotional discomfort associated with stress, usually by implementing strategies such as avoidance, minimizing the significance of a situation, distancing and selective attention [3].

The theoretical framework behind self-regulated learning is very similar to coping strategies. Self-regulated learning is a cognitive process that allows students to identify academic demands, make appropriate strategies to deal with the demands, and adapt through a feedback process. Both self-regulated learning and coping involve the perception of a challenge, the interpretation of its significance, emotional reaction, and strategies implemented to manage the challenge [4]. It may be theorized that students who are more proficient at self-regulated learning would display problem solving coping strategies when dealing with academic demands, therefore reducing perceived levels of academic stress.

There is evidence from several studies, such as those from Spain, China and Iran, that show that higher levels of self-regulated learning are related to lower levels of academic stress [5,6,7]. Although some studies show that self-regulated learning is associated with lower academic stress, most of the studies on self-regulated learning have been conducted in a Western cultural background [8]. In this regard, further research should be conducted in Eastern cultural backgrounds, where there is a diversity of norms and values.

MATERIALS AND METHODS

The study is a cross-sectional, observational analytic study with a sample size of 222 respondents obtained from medical students at Tarumanagara University with a cluster random sampling method. The sample size was obtained by the equation to determine sample size for hypothesis testing of two independent groups [9]. The inclusion criteria were academic stage medical students at Tarumanagara University, ranging from the class of 2018 to 2022. The exclusion criteria were medical students who have a history of diagnosis of psychiatric disorders before entering medical school, as

their mental state may not represent academic stress caused by studying at medical school. The Motivated Strategies for Learning Questionnaire (MSLQ) was used to measure the level of self-regulated learning. The MSLQ is composed of two components which include the motivation scale and the learning strategy scale [10]. The Perceived Stress Scale (PSS-10) was used as a measure of academic stress [11]. Statistical analysis was done with IBM® SPSS® Statistics using the Chi-squared test. The results of the Chi-squared test were considered significant if the ρ value < 0.05.

RESULTS

The results of the Motivated Strategies for Learning Questionnaire are interpreted on a quartile basis. Scores below the 25th percentiles are considered "low/poor", scores between the 25th and 75th percentile are considered "average", and scores that are above the 75th percentile are considered "high/good".

Table 1 Results of the Motivated Strategies for Learning Questionnaire

Characteristic	Number of Respondents	Percentage
Self-Regulated Learning (SRL)		
Low	52	23.4%
Average	115	51.8%
High	55	24.8%
Motivation		
Low	53	23.9%
Average	115	51.8%
High	54	24.3%
Learning Strategy		
Poor	53	23.9%
Average	117	52.7%
Good	52	23.4

Source: Primary Data

The Perceived Stress Scale (PSS-10) consists of 10 items arranged in a 5-point Likert scale, with the highest possible score being 40. Respondents with a score between 0-13 were classified as having low academic stress, scores between 14-26 were classified as moderate academic stress, and scores from 27-40 are classified as high academic stress.

Table 2 Academic Stress

Academic stress	Number of Respondents	Percentage
Low	26	11.7%
Moderate	179	80.6%
High	17	7.7%

Source: Primary Data

The majority of respondents (80.6%) experienced moderate amounts of academic stress, while 26 respondents (11.7%) experienced low academic stress, and 17 respondents (7.7%) experienced high amounts of academic stress. The Chi-squared test was used to investigate if there is an association between the levels of self-regulated learning and the levels of academic stress.

Linear-by-Linear Association for self-regulated learning and academic stress yielded an Asymptotic Significance (2-sided) of 0.283. The significance value is greater than the threshold of 0.05, meaning that the results obtained are not statistically significant. The epidemiological association was calculated to investigate if respondents with low levels of self-regulated learning were more likely to experience high academic stress.

Table 3 prevalence ratio of self-regulated learning and academic Stress

Self-Regulated Learning	Academic Stress	
	High	**Moderate – Low**
Low	6 (2.7%)	46 (20.7%)
Average – High	11 (5.0%)	159 (71.6%)

Source: Primary Data

The prevalence ratio was found to be 1.783 with a 95% confidence interval between 0.693 – 4.588. The results show that respondents with low self-regulated learning scores are 1.783 times more likely to experience high academic stress compared to respondents who have average–high self-regulated learning scores. This result cannot be considered statistically significant because the confidence interval includes the value 1 [12,13].

Linear-by-Linear Association for motivation and academic stress yielded an asymptotic significance (2-sided) of 0.126. The significance value is greater than the threshold of 0.05, therefore the results obtained are not statistically significant. The epidemiological association was also calculated for motivation and academic stress.

Table 4 prevalence ratio of motivation and academic stress

Motivation	Academic Stress	
	High	**Moderate – Low**
Low – Average	5 (2.3%)	48 (21.6%)
High	12 (5.4%)	157 (70.7%)

Source: Primary Data

The prevalence ratio was found to be 1.329 with a 95% confidence interval between 0.490 – 3.599. The results show that respondents with low motivation are 1.329 times more likely to experience high academic stress compared to respondents with average–high motivation. This result cannot be considered statistically significant because the confidence interval includes the value 1.

Linear-by-Linear Association for learning strategy and academic stress yielded an asymptotic significance (2-sided) of 0.180. The significance value of 0.180 is greater than the threshold of 0.05 therefore the results obtained are not statistically significant. Similarly, the epidemiological association was also calculated.

Table 5 prevalence ratio of learning strategy and academic stress

Learning Strategy	Academic Stress	
	High	**Moderate – Low**
Poor	6 (2.7%)	47 (21.1%)
Average – Good	11 (5.0%)	158 (71.2%)

Source: Primary Data

The prevalence ratio was found to be 1.739 with a 95% confidence interval between 0.676 – 4.478. The results show that respondents with poor learning strategy are 1.739 times more likely to experience high academic stress compared to students with average–good learning strategy. This result cannot be considered statistically significant because the confidence interval includes the value 1

Based on table 2, it is known that of the 11 students who showed the positive impact of smoking on health (no effect) there were 9 students (81%) who had good knowledge and 2 students (18.8%) who had less knowledge. While of the 24 students who showed the negative impact of smoking on health all (100%) had less knowledge. This shows that there is a relationship

between the impact of smoking for health on the knowledge of Sragen Central Java high school students as evidenced by the acquisition of Chi-Square test results which is 0.00 <0.05 with a value of 26.434b%. This shows that there is a relationship between the impact of smoking and the knowledge of male students in Sragen High School, Central Java.

DISCUSSION

The results of statistical analysis show that the levels self-regulated learning, motivation and learning strategies are not associated with the levels of academic stress. The results of this study also indicate that there is no statistically significant epidemiological association between self-regulated learning, motivation, learning strategies and academic stress.

The results of this study are not in line with previous studies on self-regulated learning and academic stress, such as those mentioned in the introduction. These results may be explained by the theory that the sources of academic stress are multifactorial and that student-centred factors such as self-regulated learning do not fully predict the levels of academic stress.

External factors can be a source of academic stress. Previous research shows that medical students reported that the main causes of stress were exams, falling behind on study schedules, heavy workloads, and lack of time [14].

Self-regulated learning is a cognitive process that allows students to identify academic demands, make appropriate strategies to deal with demands, and adapt strategies through a feedback process. Students with a high level of self-regulated learning can process information and plan learning strategies well and should respond to academic demands by adopting problem solving strategies in such a way that these demands can be handled. Theoretically, problem solving would cause these students to experience lower levels of academic stress, but this study is inconsistent with previous theories.

One possible explanation is that external factors may play a greater role in students' perceptions of academic stress. Students with a high level of self-regulated learning should be better able to deal with academic demands, but continuous academic demands over a long period of time can deplete students' ability to adapt to stressors.

Another possible explanation is that cultural factors may have a significant impact on self-regulated learning and academic stress. Most research done on self-regulated learning have been done in a Western cultural background [8], however educational and cultural differences between Western and Asian societies can contribute to differences in self-regulated learning. Cultural values and beliefs directly and indirectly influence students' motivation and behaviour. Previous studies have found that collectivist cultures such as Japan emphasize group cohesiveness through collective identity, solidarity and harmony within groups, duties and obligations, regulation of behaviour by norms within groups, and family integrity. Japanese students are also considered to be more dependent on external sources of control than American students due to cultural characteristics [15].

According to Hofstede, Indonesia has a high Power Distance score, meaning there is a strong dependence on hierarchy, unequal rights between power holders and non-power holders, and a centralized power structure. Leaders are directors and employees expect

to be told what to do. Students may be more inclined to defer to authority figures such as professors or parents when making decisions. This can result in a lack of autonomy and self-direction in the learning process, which can hinder the development of self-regulated learning skills. These cultural differences may help explain the finding that external factors seem to play a greater role in students' perceptions of academic stress [16].

CONCLUSIONS

Statistical analysis shows no statistically significant relationship between the levels self-regulated learning, motivation, learning strategies and academic stress. The majority of respondents (80.6%) experienced moderate amounts of academic stress, which may prompt medical educational institutions to implement learning and lecture strategies that promote emotional and mental wellness among students as an approach to reduce the levels of academic stress. The results of this study may be furthered with more research on external sources of academic stress as well as the cultural impact on self-regulated learning and perceptions of academic stress, especially in medical schools in Eastern cultures such as Indonesia.

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