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ความสัมพันธ์ของผลการเรียนกับความเครียด อารมณ์ซึมเศร้า และการอดนอนในนิสิตแพทยศาสตร์

กิตติพงษ์ คงสมบูรณ์
ภาควิชาเวชศาสตร์ป้องกันและสังคม คณะแพทยศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ นครนายก 26120

Academic Achievement Correlated to Stress, Depression, and Sleep Deprivation in Medical Students

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หลักการและวัตถุประสงค์: ผลการเรียนมีความสำคัญกับการเรียนในมหาวิทยาลัยเป็นอย่างมาก การเรียนในคณะแพทยศาสตร์ทำให้นิสิตแพทย์ต้องอดนอนทั้งจากการอ่านหนังสือและการอยู่เวรดูแลผู้ป่วยในเวลากลางคืน พบว่านิสิตแพทย์มีอารมณ์ซึมเศร้าและความเครียดสูงกว่านิสิตคณะอื่นๆ จึงทำการศึกษาเพื่อหาความสัมพันธ์ระหว่างความเครียด อารมณ์ซึมเศร้า และการอดนอนกับผลการเรียนของนิสิตแพทย์

วิธีการศึกษา: เลือกนิสิตคณะแพทยศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒทั้ง 6 ชั้นปีจำนวนทั้งสิ้น 646 คน ตอบแบบสอบถามร้อยละ 75 เป็นการศึกษาเชิงวิเคราะห์ แบบภาคตัดขวาง เก็บข้อมูลปลายภาคการศึกษาที่ 2 ระหว่างวันที่ 11 กุมภาพันธ์ ถึงวันที่ 4 มีนาคม 2551 โดยใช้แบบคัดกรองภาวะซึมเศร้าของกรมสุขภาพจิต (Health-Related Self-Reported Scale) และแบบวัดความเครียดของโรงพยาบาลสวนปรุง นำข้อมูลมาวิเคราะห์หาความสัมพันธ์ระหว่างข้อมูลเชิงคุณภาพด้วย Chi-square test หรือ Fisher exact test และวิเคราะห์สหสัมพันธ์ด้วย Logistic regression ทดสอบสมมติฐานแบบสองทางด้วยค่า $p < 0.05$

ผลการศึกษา: ทดสอบความสัมพันธ์ระหว่างผลการเรียน (เกรด) กับระยะเวลาการนอนหลับ อารมณ์ซึมเศร้า และระดับความเครียด พบว่าผลการเรียนสัมพันธ์กับระยะเวลา

Background and Objective: Academic achievement is an important dimension for studying in university, so the effect on academic achievement is an important topic in medical training. The medical students have higher depression rates and stressful than student of other faculties. The medical training causes medical students to study hard at night and resulting sleep deprivation. Aims of this study were to determine the academic achievement and it's association with stress, depression and sleep deprivation.

Methods: All of the medical students from Srinakharinwirot University were selected. The design was cross-sectional study. The total subjects were 646; the response rate was 75%. Each participant was evaluated at the end of the second semester during February, 11th 2008 to March, 4th 2008. Each student was asked to answer the questionnaires including Health-Related Self-Reported (HRSR) Scale from Mental Health Department, Ministry of Public Health, Suanprung stress test. Categorical variables were analyzed using the Chi-square test or Fisher exact test. For continuous and binary response variables, we first identified significant explanatory variables through bivariate linear or logistic regressions, respectively.

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การนอนหลับและระดับความเครียดอย่างมีนัยสำคัญทางสถิติ (p<0.05) แต่ไม่สัมพันธ์กับอารมณ์ซึมเศร้า ระยะเวลาการนอนหลับตั้งแต่ 6 ชั่วโมงขึ้นไปมีค่า Odds ratio ของผลการเรียนเป็น 1.8 เท่าของการนอนหลับที่น้อยกว่า 6 ชั่วโมง (p<0.05) แต่ไม่มีความแตกต่างระหว่างอารมณ์ซึมเศร้าและระดับความเครียดกับผลการเรียน

สรุป: ผลการเรียนที่ต่ำในนิสิตแพทยศาสตร์กับการอดนอนหรือการนอนที่น้อยกว่า 6 ชั่วโมงต่อวันและสัมพันธ์กับระดับความเครียดที่เพิ่มขึ้น

คำสำคัญ: ผลการเรียน ความเครียด อารมณ์ซึมเศร้า การอดนอน นิสิตแพทย์

A p-value of less than 0.05 was considered significant.

Results: Spearman's rank correlation between academic achievement (grade) and duration of sleep, depression and level of stress showed correlation with duration of sleep and levels of stress ($p < 0.05$) but not correlated to depression. Sleep 6 hours and more had odds ratio of academic achievement 1.8 times to sleep less than 6 hours ($p < 0.05$) but depression and levels of stress were not significantly different.

Conclusion: Poor academic achievement of medical students was correlated to sleep deprivation of less than 6 hours per day and correlated to increase levels of stress.

Key words: academic achievement, stress, depression, sleep deprivation, medical students

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Introduction

Academic achievement is an important dimension for students. Training in medical school, students need to study hard that induced stress. The medical students are recognized as a stressful persons and have many stressful environments that often exerts a negative effect on the academic achievement[1,2]. And they have higher depression rates than general population[3]. The academic achievement correlates to depression if the level of depression is high, it affects the academic achievement[4]. The effect of depression disturbs cognitive function by poor attention, poor memory and psychomotor retardation cause low academic achievement[5]. Medical curriculum in Thailand need to study for 6 years and more than 16 education credits per semester. The students need to spend more time to study and less time to sleep. Sleep deprivation results in fatigue and excessive daytime sleepiness which decline cognitive function and academic achievement[6-9]. In addition, there is a report effect in levels of several hormones that might cause obesity[10]. If academic achievement correlates to stress, depression and sleep deprivation, the medical students may improve their academic achievement by reducing these variables.

The objective of this study was to determine the academic achievement of medical students according to stress, depression and sleep deprivation.

Materials and Methods

All of the medical students from Srinakharinwirot University were selected for evaluation in the study. The design was cross-sectional study. The total subjects were 646 but the participants in the study were 486, the response rate was 75% which was the sample of this study. Each participant was evaluated at the end of the second semester. This project was allowed by Ethical committee of Faculty of Medicine, Srinakharinwirot University.

Data were collected at the end of the second semester, the questionnaires composed of three parts. The first part inquired age, gender, weight, height, grade, sleep time and awaken time. The second part composed of the diagnostic screening test for depression in Thai population: Health-Related Self-Reported (HRSR) Scale from Psychological Department, Ministry of Public Health, Thailand. The third part composed of Suanprung stress test from Suanprung Hospital, Thailand. The questionnaires were sent to the medical students all classes during February, 11th 2008 to March, 4th 2008. The questionnaires showed identification number of each student for recheck their final grade.

Operative definition

To measure the depressive score by using screening test for depression in Thai population: Health-Related Self-Reported (HRSR) Scale from Mental Health Department, Ministry of Public Health, Thailand interprets depressive score as:

- Depressive score was 25 or more but less than 30 defined as stress situation, depressive mood, or other psychological problems which should get early treatment.
- Depressive score was 30 or more defined as major depression.

To measure stress score in medical students by using Suanprung stress test from Suanprung Hospital, Thailand interprets stress score as:

- Stress score was 0 to 23 defined as mild stress.
- Stress score was 24 to 41 defined as moderate stress.
- Stress score was 42 to 61 defined as high stress.
- Stress score was 62 or more defined as severe stress.

Sleep deprivation defined as night time sleep less than 6 hours[11] and collected data by questionnaire.

Academic achievement was classified by grade point average (GPA). GPA was divided into four groups. The first group was grade up to 2.50. The second group was grade between 2.51 and 3.00. The third group was grade between 3.01 and 3.50. The fourth group was grade between 3.51 and 4.00. Then divided into two groups when analyzed with logistic regression: the first group was grade up to 3.00 and the second group was grade more than 3.00.

Categorical variables were analyzed using the Chi-square test or Fisher exact test. For continuous and binary response variables, we first identified significant explanatory variables through bivariate linear or logistic regressions, respectively. A two-tailed p-value of less than 0.05 was considered significant.

Table 1 Demographic data

Age (year)	Mean±SD	20.7±1.9
Gender	Male	41%
	Female	59%
Class	Year 1	19.3%
	Year 2	18.8%
	Year 3	15.8%
	Year 4	20.6%
	Year 5	14.0%
	Year 6	11.5%

Table 2 GPA of The students classified by sleep deprivation, depression and stress.

GPA	Sleep deprivation	p-value	Depression	p-value	High-severe stress	p-value
< 2.51	23.5%	0.007	19.1%	0.204	15.2%	0.058
2.51 - 3.00	22.1%		23.8%		21.0%	
3.01 - 3.50	35.3%		26.2%		35.8%	
3.51 - 4.00	19.1%		30.9%		28.0%	
Total	100%		100%		100%	

Note: Sleep deprivation defined as night time sleep less than 6 hours
Depression defined as depressive score was 25 or more including depressive mood, psychological problems, and major depression.
High-severe stress defined as stress score was 42 or more including high to severe stress.

Table 3 Spearman's rank correlation between academic achievement (grade) and sleep hours, depressive score and levels of stress

Variable	Number of observation	Spearman's rho	p-value
Sleep hours	460	0.153	0.001*
Depressive score	509	-0.046	0.297
Levels of stress	510	-0.101	0.023*

*p < 0.05

Table 4 Odds ratios of sleep hours, depressive score and levels of stress on academic achievement (grade) by logistic regression

Variable	Odds ratio	p-value	95% Confidence interval
Sleep < 6 hours	1	Reference group	
Sleep ≥ 6 hours	1.80	0.030*	1.06 - 3.07
Depressive score < 25	1	Reference group	
Depressive score 25-30	0.90	0.841	0.34 - 2.44
Depressive score ≥ 30	0.86	0.806	0.26 - 2.82
Mild stress	1	Reference group	
Moderate stress	1.42	0.480	0.53 - 3.80
High stress	1.11	0.834	0.41 - 3.00
Severe stress	0.91	0.876	0.26 - 3.15

*p < 0.05

Note: Grade was divided into two groups: one was up to 3 and the other was above 3.

Results

Mean age of medical students was 20.7 years; male was 41% and female was 59%. Medical students in year 1, year 2, year 3, year 4, year 5, and year 6 were 19.3%, 18.8%, 15.8%, 20.6%, 14%, and 11.5%, respectively. (Table 1)

The medical students, Srinakharinwirot University had sleep deprivation (sleep less than 6 hours) significantly correlated to academic achievement but depression and high to severe stress were not. (Table 2)

Academic achievement correlated with sleep hours and levels of stress but uncorrelated to depressive score. (Table 3)

Sleep 6 hours and more had odds ratio of academic achievement 1.8 times to sleep less than 6 hours with p-value 0.03 but depressive score and levels of stress were not significantly different. (Table 4)

Discussion

Academic achievement of medical students, Srinakharinwirot University, Thailand correlated to duration of sleep and levels of stress (Table 3). Logistic regression illustrated only sleep 6 hours and more had grade more than 3 with odds ratio 1.8 times to sleep less than 6 hours but levels of stress did not (Table 4). It may due to academic achievement (grade) when analyzed with logistic regression was divided into two groups instead of four groups: one was grade up to 3 and the other was above 3. So it could not compare each levels of stress to academic achievement and the same as depression. The depression did not correlate to academic achievement, might due to information bias that the questionnaires showed the identification number of each student who anxious about their depressive score. Some study demonstrated excessive daytime sleepiness which defined as Epworth sleepiness scale scored above 10, declined in school performance[7].

But this study, the result of Epworth sleepiness scale did not correlate to academic achievement, might be in the same reason as depression.

In late adolescent to early adulthood, the medical students should sleep 7-10 hours per day. But the optimal amount of sleep was not a meaningful concept unless the timing of that sleep was seen in relation to an individual's circadian rhythms which depended on maximum concentration of the hormone melatonin, and minimum core body temperature[11]. The National Sleep Foundation in the United States maintains that eight to nine hours of sleep for adult humans was optimal and that benefited alertness, memory and problem solving, and overall health, as well as reducing the risk of accidents. The University of Pennsylvania School of Medicine demonstrated that cognitive performance declined with fewer than eight hours of sleep[9].

There were other factors affect the academic achievement of medical students such as social support[12], gender, maturity and intrinsic motivational structure[13]. Some studies predicted an optimal academic achievement of medical students by high secondary school grade and admission biology test scores[13,14]. On the contrary, the major cause of stress among medical students in Thai medical school was academic problems which were the test and examination[15].

These findings could help medical teachers understand more about academic achievement of medical students and guided the way to improve their achievements. The one needed to decrease stress by student advisors and counselors might train students about stress management[16]. It should give social and psychological support to improve students' quality of life and may change in current educational structure to lessen the effect on students' sleep hour. And there was also need to bring about academic changes in quality of teaching and evaluation system[16].

In conclusion, poor academic achievement of medical students, Srinakharinwirot University, Thailand correlated to sleep deprivation less than 6 hours per day and correlated to increase levels of stress.

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