

## Reduction of stress, depression and overweight by awareness of problems in Thai medical students, Srinakharinwirot University

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**Objective** : *To determine the effect of awareness in reducing the stress, depression and overweight in medical students of Srinakharinwirot University.*

**Design** : *Cohort study.*

**Materials and Methods** : *All 646 medical students of Srinakharinwirot University were recruited, and the response rate was 86%. The study was done from September 2007 to March 2008. Each participant was evaluated at twice; at the end of the first and second semester. The diagnostic screening test for depression was from the Department of Mental Health, Ministry of Public Health, Thailand and the stress test of Suanprung Hospital, Thailand. After evaluation at the end of the first semester, each student was told to be aware their health problems and explained the pre-clinical students the knowledge, then repeated the questionnaire. Categorical variables were analyzed using McNemar's Chi-square test. A two-tailed p-value of less than 0.05 was considered significant.*

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- Results** : *Depression was significant decreased from the first semester to the second semester with odds ratio of 0.39 (95% CI = 0.18 – 0.78). Male students were more overweight than female students. Male gender was correlated to decrease depression with odds ratio of 0.17 (95% CI = 0.02 – 0.75). Students in clinical class had significant decreasing of depression and stress level from the first semester to the second semester with odds ratio of 0.12 (95% CI = 0.01 – 0.50) and 0.38 (95% CI = 0.18 – 0.75), respectively. But the students in the pre-clinical class had increased stress level with odds ratio of 1.76 (95% CI = 1.00 – 3.17).*
- Conclusion** : *The awareness of medical students in clinical class could decrease depression and stress level. Male students' awareness affected decreasing of depression more than female students.*
- Keywords** : *Awareness, depression, stress, overweight, medical students.*

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อารมณ์ซึมเศร้า และภาวะน้ำหนักตัวเกินปกติในนิสิต คณะแพทยศาสตร์ มหาวิทยาลัย  
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**วัตถุประสงค์** : เพื่อประเมินผลการรับรู้ปัญหาสุขภาพของนิสิตแพทย์กับการลดความเครียด  
อารมณ์ซึมเศร้า และภาวะน้ำหนักตัวเกินปกติ

**ชนิดของการวิจัย** : การวิจัยเชิงวิเคราะห์แบบ Cohort

**วัสดุและวิธีการ** : ทำการเก็บข้อมูลในนิสิต คณะแพทยศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ  
ทั้ง 6 ชั้นปีจำนวนทั้งสิ้น 646 คน ตอบแบบสอบถามร้อยละ 86 ศึกษาตั้งแต่  
เดือนกันยายน 2550 ถึงเดือนมีนาคม 2551 เก็บข้อมูล 2 ครั้ง ได้แก่ ปลาย  
ภาคการเรียนที่ 1 และปลายภาคการเรียนที่ 2 ประเมินภาวะซึมเศร้าด้วยแบบ  
คัดกรองของกรมสุขภาพจิตและวัดระดับความเครียดด้วยแบบวัดความเครียด  
ของโรงพยาบาลสวนปรุง หลังเก็บข้อมูลจะแจ้งผลให้นิสิตแพทย์ทราบปัญหา  
สุขภาพของตน ได้แก่ ภาวะซึมเศร้า ระดับความเครียด และน้ำหนักตัวเกิน  
ปกติ สำหรับนิสิตแพทย์ชั้น Pre-clinic จะให้ความรู้เกี่ยวกับภาวะซึมเศร้า  
ความเครียด และน้ำหนักตัวเกินปกติก่อนการเก็บข้อมูลครั้งต่อไป หาความ  
สัมพันธ์ระหว่างข้อมูลเชิงคุณภาพด้วย McNemar's Chi-square test ทดสอบ  
สมมติฐานแบบสองทางด้วยค่า  $p < 0.05$

**ผลการศึกษา** : ภาวะซึมเศร้าในภาคการเรียนที่ 2 ลดลงเมื่อเทียบกับภาคการเรียนที่ 1 ค่า  
odds ratio 0.39 (95% CI = 0.18 - 0.78) นิสิตแพทย์ชายมีน้ำหนักตัวเกิน  
ปกติมากกว่านิสิตแพทย์หญิง เพศชายสัมพันธ์กับภาวะซึมเศร้าที่ลดลง ค่า  
odds ratio 0.17 (95% CI = 0.02 - 0.75) นิสิตแพทย์ชั้นคลินิกมีภาวะซึมเศร้า  
และความเครียดระดับสูงถึงรุนแรงในภาคเรียน ที่ 2 ลดลงเมื่อเทียบกับ  
ภาคเรียนที่ 1 ค่า odds ratio 0.12 (95% CI = 0.01 - 0.50) และ 0.38 (95%  
CI = 0.18 - 0.75) ตามลำดับ แต่นิสิตแพทย์ชั้นพรีคลินิกมีความเครียด  
ระดับสูงถึงรุนแรงมากขึ้นในภาคเรียนที่ 2 ค่า odds ratio 1.76 (95% CI =  
1.00 - 3.17)

**สรุป** : การรับรู้ปัญหาสุขภาพของนิสิตแพทย์ในชั้นคลินิกสามารถลดปัญหาภาวะ  
ซึมเศร้าและความเครียด นิสิตแพทย์ชายที่รับรู้ภาวะซึมเศร้าจะลดปัญหาได้  
ดีกว่านิสิตแพทย์หญิง

**คำสำคัญ** : การรับรู้ปัญหา, อารมณ์ซึมเศร้า, ความเครียด, น้ำหนักตัวเกินปกติ, นิสิตแพทย์.

Stress, depression and overweight were common problems among medical students.<sup>(1-3)</sup> Academic problems were a major cause of stress and found highest in third-year medical students.<sup>(1)</sup> Female students might have higher prevalence of depressive symptoms and they were more overweight than male students.<sup>(3,4)</sup> Stress and depression provided suicidal tendency, as well as substance abuse in physicians, and job-related stress increased suicidal risk in physicians.<sup>(5)</sup> In addition, stress could affect academic performance.<sup>(6)</sup> Some studies suggested informing medical students about stressors and strategies to prevent these problems.<sup>(5)</sup> But the problems of treatment in medical students were risk perception, clinical experience and personal treatment of depression, especially when a close friend was treated for major depression that should be used in preparing communication message for medical students.<sup>(7)</sup> Although, there was under-treatment of medical students' depression, some authors suggested the need to use targeting messages to help medical students aware of their depression and submit themselves for appropriate treatment.<sup>(8)</sup> Many universities used simple and cheap media such as postcards and posters to improve the awareness of their students.<sup>(9)</sup>

The majority of medical students consumed too much fat and took insufficient amount of vegetables and fruits.<sup>(10)</sup> The medical students' life style deal with spending longer time on computer, eating more when they had stress, and snacking between meals which was responsible for their obesity.<sup>(11)</sup> Some authors recommended developing nutritional education and physical activities programs to decrease the overweight problem.<sup>(11)</sup> But the

problem was that the medical students' weight perception was not associated to their real body mass index (BMI). The increasing awareness might improve the accuracy of weight perceptions and lead to healthier eating and increased physical activities.<sup>(12)</sup> The advantage of medical students in the health knowledge might help to solve these problems by merely raising their awareness.<sup>(9)</sup> Therefore, the objective was to determine the effect of awareness to reduce stress, depression and overweight in medical students of Srinakharinwirot University.

## Materials and Methods

### Study population

All medical students of Srinakharinwirot University were recruited for evaluation in the study. The study design was cohort which was done from September 2007 to March 2008. Each participant was evaluated at two periods: the end of the first semester and the end of the second semester. This project has been approved by Ethics Committee of Faculty of Medicine, Srinakharinwirot University.

### Operative definition

The diagnostic screening test for depression in Thai population: Health-Related Self-Reported (HRSR) Scale from Department of Mental Health, Ministry of Public Health, Thailand interprets depressive score as follows:

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

This study categorized depressive score in two groups: first, those that scored less than 25 was normal, and second, those that scored 25 and more was depression. Cronbach's Alpha Reliability Coefficient of this test is 0.91.

Suanprung Stress Test of Suanprung Hospital interprets stress score as follows:

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

This study categorized stress levels in two groups: one was mild to moderate stress, and the other was high to severe stress. Cronbach's Alpha Reliability Coefficient of this test is more than 0.7.

Body mass index (BMI) was calculated by dividing body weight (kilograms) by height (meters).<sup>(2)</sup> It is classified by the Ministry of Public Health of Thailand as follows:

- BMI < 18.5 as underweight
- BMI 18.5 – 22.9 as normal
- BMI 23 – 24.9 as risk to overweight
- BMI 25 – 29.9 as obesity type 1
- BMI 30 and more as obesity type 2

This study defined overweight as BMI of 23 and more, included risk to overweight, obesity type 1 and obesity type 2.

The class was categorized in two groups. One was pre-clinical class which included class 1, 2, and 3. And the other included class 4, 5, and 6.

#### Data collection

At the end of the first semester, a questionnaire composed of three parts was distributed to medical students. The first part inquired about their age, gender, class, weight, height and underlying disease. The second part was composed of diagnostic screening test for depression in Thai population: Health-Related Self-Reported (HRSR) Scale from Department of Mental Health, Ministry of Public Health, Thailand. The third part was composed of Suanprung Stress Test of Suanprung Hospital, Thailand. The questionnaire was sent to the medical students of all classes from September, 25<sup>th</sup> 2007 to October, 15<sup>th</sup> 2007. In total, the subjects were 646 but the participants in the study were 616. The rate of response was 86% which was the sample of this study. After the first semester, we told each medical student about their BMI, the results of depression and stress test to be aware of their health problems, and explained the pre-clinical students about the knowledge of these ones. The questionnaires also showed identification number of each student for the follow up in the second semester. The outcome was overweight, depression, and high to severe stress. The intervention in this study was the awareness of students' health problems which were overweight, depression, and high to severe stress.

At the end of the second semester, the questionnaires were the same as the first semester. The questionnaires were sent to the medical students of all classes from February, 11<sup>th</sup> 2008 to March, 4<sup>th</sup> 2008. The participants in the study were 486; the response rate was 75% which was taken as another sample of this study. Each variable was divided the same as the first semester.

**Statistical analysis**

Categorical variables (Overweight, depression, and high to severe stress) were analyzed using McNemar's Chi-square test for paired data (the first semester and the second semester). A two-tailed p-value of less than 0.05 was considered significant.

**Results**

The medical students of Srinakharinwirot University had mean age 20.7 years old. Male

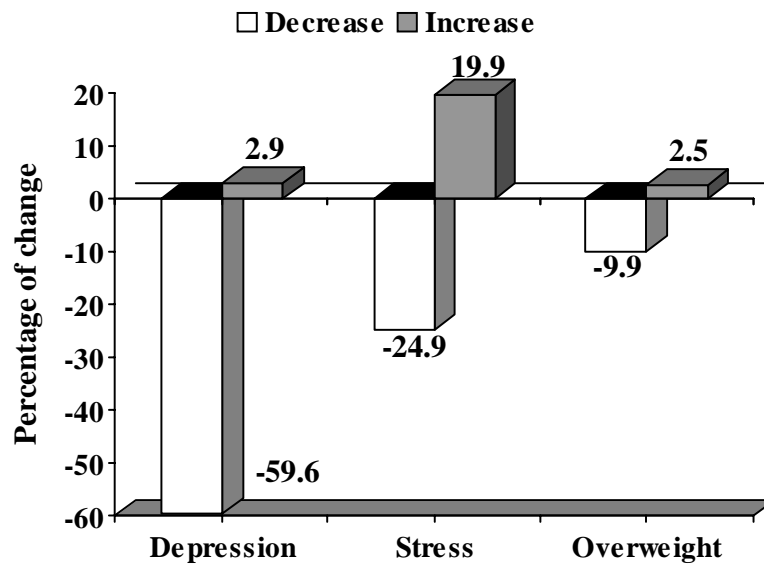
students were 41% and pre-clinical class was 54%. (Table 1)

Each depression, stress and overweight totally decreased from the first semester to the second semester. Depression decreased more than the others. (Figure 1)

There was significant decreasing of depression from the first semester to the second semester with odds ratio of 0.39 but overweight and stress were not. (Table 2)

**Table 1.** Characteristic of the medical students, Srinakharinwirot University.

Age: Mean (year) ± SD		20.7 ± 1.9
Gender: Number (%)	- Male	243 (41)
	- Female	350 (59)
Class: Number (%)	- Pre-clinic	332 (54)
	- Clinic	284 (46)



**Figure 1.** Percentage of change in depression, stress and overweight from the first semester to the second semester.

**Table 2.** Odds ratio of depression, stress and overweight in the second semester compare to the first semester.

	First semester		Second semester		OR <sup>1</sup>	95% CI <sup>2</sup>	p-value <sup>3</sup>
	No (%)	Yes (%)	No (%)	Yes (%)			
Overweight	363(81.8)	81(18.2)	362(81.5)	82(18.5)	1.13	0.39 - 3.35	0.808
Depression	413(88.8)	52(11.2)	432(92.9)	33(7.1)	0.39	0.18 - 0.78	0.004
Stress	246(53.6)	213(46.4)	250(54.5)	209(45.5)	0.92	0.61 - 1.39	0.692

<sup>1</sup>OR = Odds ratio compares the second semester to the first semester

<sup>2</sup>95% CI = 95% Confidence interval

<sup>3</sup>p-value from McNemar's chi-square

Male students had significant decreasing of depression from the first semester to the second semester with odds ratio of 0.17. (Table 3)

Medical students in clinical class had significant decreasing of depression and stress

from the first semester to the second semester with odds ratio of 0.12 and 0.38, respectively but medical students in pre-clinical class had significant increasing of stress from the first semester to the second semester with odds ratio of 1.76. (Table 4)

**Table 3.** Odds ratio of depression, stress and overweight in the second semester compare to the first semester according to gender.

	First semester		Second semester		OR <sup>1</sup>	95% CI <sup>2</sup>	p-value <sup>3</sup>
	No (%)	Yes (%)	No (%)	Yes (%)			
<b>Overweight</b>							
Male	121(69.9)	52(30.1)	121(69.9)	52(30.1)	1	0.19 - 5.37	1
Female	242(89.3)	29(10.7)	241(88.9)	30(11.1)	0.8	0.16 - 3.72	0.739
<b>Depression</b>							
Male	153(87.4)	22(12.6)	163(93.1)	12(6.9)	0.17	0.02 - 0.75	0.013
Female	254(89.8)	29(10.3)	262(92.6)	21(7.4)	0.56	0.23 - 1.27	0.131
<b>Stress</b>							
Male	97(55.4)	78(44.6)	94(53.7)	81(46.3)	1.17	0.59 - 2.32	0.631
Female	148(52.5)	134(47.5)	155(55)	127(45)	0.8	0.47 - 1.35	0.378

<sup>1</sup>OR = Odds ratio compares the second semester to the first semester

<sup>2</sup>95% CI = 95% Confidence interval

<sup>3</sup>p-value from McNemar's chi-square

**Table 4.** Odds ratio of depression, stress and overweight in the second semester compare to the first semester according to pre-clinical and clinical class.

	First semester		Second semester		OR <sup>1</sup>	95% CI <sup>2</sup>	p-value <sup>3</sup>
	No (%)	Yes (%)	No (%)	Yes (%)			
<b>Overweight</b>							
Pre-clinic	206(84.4)	38(15.6)	207(84.8)	37(15.2)	0.8	0.16 - 3.72	0.739
Clinic	157(78.5)	43(21.5)	155(77.5)	45(22.5)	1.67	0.32 - 10.73	0.480
<b>Depression</b>							
Pre-clinic	232(90.6)	24(9.4)	236(92.2)	20(7.8)	0.71	0.28 - 1.73	0.414
Clinic	181(86.6)	28(13.4)	196(93.8)	13(6.2)	0.12	0.01 - 0.50	0.0007
<b>Stress</b>							
Pre-clinic	154(60.2)	102(39.8)	138(53.9)	118(46.1)	1.76	1.00 - 3.17	0.036
Clinic	92(45.3)	111(54.7)	112(55.2)	91(44.8)	0.38	0.18 - 0.75	0.003

<sup>1</sup>OR = Odds ratio compares the second semester to the first semester

<sup>2</sup>95% CI = 95% Confidence interval

<sup>3</sup>p-value from McNemar's chi-square

## Discussion

Knowledge is an important intervention in the treatment of depression.<sup>(9)</sup> The medical students were assumed that they had medical knowledge, especially those in class 4, 5, and 6. But the students in class 1, 2, and 3 were told about the knowledge of depression, stress and overweight. Therefore, all medical students had that knowledge. Then, they were told to recognize their health problems and repeated the outcomes. Depression was the most reduced and stress was second more decreased than overweight (Figure 1). Depression was significant decreasing but stress and overweight were not (Table 2). Depression might be mostly not a major depression so it was easy to treat. And stress was the consequence of the failure to adapt to change of everyday life, the response to stress included anxiety, depression and etc.<sup>(13)</sup> It was then more difficulty to correct than the depression.

Regarding overweight, it was the most difficulty to correct because they needed to change their eating habits and to take more exercises so we found that overweight changed the least among the three. In addition to information bias, the questionnaires showed identification number so the students might conflict to complete questionnaires correctly, they learned to answer healthier than the one before.

Gender affected only depression, male students had significant decreasing but female students were not (Table 3). From study of Kaya, et al., male students had more active coping to depression than female student. The active coping style is a problem oriented method which is seeking for social support, optimism, and self-confidence but passive coping style, is more coped by female students, is an emotional oriented method which is helplessness and submissiveness.<sup>(14)</sup> Male students



in this study might use active coping style after awareness of their depression. Male students were more overweight than the female (Table 3). The difference could be explained by body dysmorphic disorder (BDD) which was a psychiatric disorder characterized by a preoccupation with an imagined or slight defect which caused significant distress or impairment in functioning. There was gender difference in BDD which the female students were obviously more concerned about, i.e., overweight, whereas the male students more concern about being thin and BDD is fairly common among Pakistani medical students with a higher prevalence among the male.<sup>(15)</sup> But culture was another factor which had an impact on gender difference in bodyweight.

Students in the clinical class had higher stress level than those in the pre-clinical class but they had significant decreasing from the first semester to the second semester (Table 4). Decreasing in stress level might affect the awareness of students' health problems and they had enough medical knowledge to adapt for self care. We should evaluate the effect of awareness on students from other faculties with the same problems to conclude that only awareness is enough for decreasing their problems or not. The higher stress level in clinical class may be the clinical course required the students to study real patients and thus changed the students' life style. In the second semester, the students in pre-clinical class had increased stress level more than students in clinical class significantly (Table 4). This change might be from the curriculum that the pre-clinical course might be imbalance between the first semester and second semester. Study of Smith, et al. found that medical curriculum played an important role in the

increased prevalence of depression during their medical education so we should have preventive program before going to medical students.<sup>(16)</sup> And study of Klink, et al. found that family support was a key to establish students' confidence in their ability to deal with the challenges of academic stress from medical curriculum.<sup>(17)</sup>

In conclusion, the awareness of medical students in clinical class could decrease depression and stress level. Male students' awareness affected decreasing of depression more than female students.

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