ORIGINAL ARTICLE

STRESS AND ITS RELATIONSHIP WITH BODY MASS INDEX AMONG BIOMEDICAL SCIENCE STUDENTS IN KUALA LUMPUR, MALAYSIA

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Abstract

Objective: **The objective of this study was to assess the relationship between stress score and body mass index (BMI) of students of Science in Kuala Lumpur.** *Methods:* **A cross-sectional study was carried out among 126 students. Data about stress score were collected using a questionnaire, the Student-Life Stress Inventory (SLSI) Data about BMI were calculated from height and weight of the respondents.** *Results:* **A total of 117 (92.85%) out of 126 students had responded. The mean difference of stress score among first, second and third year students were 87.6 ± 17.0, 83.4 ± 16.9 and 86.7 ± 15.4 respectively. The mean difference of stress scores between the Bumiputra and non-Bumiputra students were 87.9 ± 16.5 and 83.2 ± 15.9. The mean of body mass Index(BMI) between first, second and third year students were 21.0 ± 3.5, 20.3 ± 2.7 and 21.8 ± 4.3 respectively.** *Conclusions:* **This study showed that the stress level is higher in first year, female and bumiputra student. There was no significant relationship between stress score and BMI.** *ASEAN Journal of Psychiatry Vol. 11 (2): July-Dec 2010: XX XX.*

Keywords: Stress, Body Mass Index, Student-Life Stress Inventory

Introduction

Stress is one of a factor which may influence behaviors and health especially when an individual faces challenges that surpass his or her coping skills [1]. Another research by Torres et al.(2007) indicated that stress may change overall food intake such as, under- or overeating according to stress severity. Stress-induced eating may be one of the factors that lead to obesity[2].

Obesity, as indicated by a high body mass index (BMI, kg/m2), is a well-established

risk factor for major causes of morbidity and mortality such as cardiovascular disease, hypertension, stroke, type 2 diabetes, and certain forms of cancer [3-6]. The cause of obesity is not well understood [7, 8], but it is related to an interaction between biological and environmental factors [9]. For the past few decades, obesity has grown to epidemic proportions, and its prevalence is still increasing rapidly [3, 4]. Globally, already more than 1 billion adults are overweight and at least 300 million of them are clinically obese [4].

Chronic psychosocial stress may lead to obesity through physiological effects, such as excess cortisol secretion, or could contribute to the development of obesity through an association with poorer behavioral risk factors, increased caloric intake and sedentary lifestyle [10]. Dietary habits are major aspects of people's lifestyles that influence health, morbidity, and mortality for a range of conditions. Carbohydrate consumption has been hypothesized to relieve depressive moods [11], and this has been considered as part of the causal link for developing obesity [12]. However, the association has also been seen in the opposite direction, with stress resulting in poorer food choices [13]. Stress may increases food consumption in certain individuals but also may change their food choices from lower fat to higher fat foods [14].

Although there are many study that has been done on obesity and stress, however very few study relates stress and obesity especially among university student. Therefore, the objective of this study is to determine the relationship between stress score and BMI changes across from first to third year of study.

Methods

A cross-sectional study was conducted among 126 Science students, in Kuala Lumpur, Malaysia. The participants were selected by using stratified random sampling followed by systematic random sampling method. The questionnaire consists of two parts: (i) sociodemographic questions and (ii) questions designed to gain information of stress score. Sociodemographic information include years of study, gender and race. The Student-Life Stress Inventory (SLSI) [15] comprises of 33 questions that were already modified. SLSI is a questionnaire with a Likert type response format (1 = never, 2 = seldom, 3 = occasionally, 4 = often, 5 = most of the time). Examples of questions: As a student, I fail to achieve the self-set goals. As a student, I am not socially accepted. As an individual, I always worry about all the things and people around me. The SLSI score was calculated by adding up all the marks according to participants' rating.

Body mass index(BMI) were measured using height and weight of the respondents Data for both stress score and BMI were collected one week before mid-semester examination. Questionnaires were administered in the same week to minimize the effect of varying stress levels that may occur during the mid-semester examination.

Pilot study was carried out on 30 students. With data from the pilot study, Cronbach's alpha value for modified SLSI was calculated, and the value was 0.96. This shows that the modified SLSI is reliable

since acceptable level of reliability is 0.80 or higher. [16]. Data were analyzed using Statistical Package for Social Sciences (SPSS) version 16.

Results

A total of 117 (92.85%) out of 126 students had responded in which 95 (81.2%) of them were female students. All years of study were approximately equally represented: 37 students (31.7%) from first year, 39 students (33.3%) from second year and 41 students (35.0%) from third year. According to race, 67 (57.3%) students were Bumiputras while 50 (42.7%) students were non-Bumiputras.

In this study we found that the stress score among study year, gender and race were showed in Table 2. First year students showed highest mean stress score (87.6 ± 17.0) among the three study years, followed by third year (86.7 ± 15.4) and second year (83.4 ± 16.9) students. There was no significant mean difference of stress score among study years (p=0.509, p>0.05). Male students showed lower stress score (83.4 ± 17.9) compared to female students (86.5 ± 16.0).

However there was no significant difference of stress score between male and female students (p=0.366, p>0.05). Besides, bumiputra students (87.9 ± 16.5) showed higher stress score compared to non-Bumiputra students (83.2 ± 15.9). There was no significant mean difference of stress score between Bumiputra and non-Bumiputra (p=0.123, p>0.05).

Table 1: Description of demographic factors

Demographic factors	Variables	Frequency (n)	Percentage (%)
Study year	First year	37	31.7
	Second year	39	33.3
	Third year	41	35.0
Gender	Male	22	18.8
	Female	95	81.2
Race	Bumiputra	67	57.3
	Non-Bumiputra	50	42.7

Table 2: Comparison of stress score among study year, gender and race

Variables	Mean ± Standard Deviation	test statistic	p value
First year	87.6 ± 17.0	0.680	0.509
Second year	83.4 ± 16.9		
Third year	86.7 ± 15.4		
Male	83.4 ± 17.9	915.500	0.366
Female	86.474± 16.044		
Bumiputra	87.910 ± 16.520	1.555	0.123
Non-bumiputra	83.180± 15.940		

Table 3: Comparison of BMI among study year, gender and race

Variables	Mean ± Standard Deviation	test statistic	p value
First year	21.0 ± 3.5	1.268	0.530
Second year	20.3 ± 2.7		
Third year	21.8 ± 4.3		
Male	21.9 ± 5.3	983.500	0.668
Female	20.8 ± 3.1		
Bumiputra	21.5 ± 3.7	1321.000	0.051
Non-bumiputra	20.3 ± 3.3		

Table 3 shows a comparison of BMI among study year, gender and race. Third year students showed highest BMI (21.8 ± 4.3) among the three study years, followed by first year (21.0 ± 3.5) and second year (20.3 ± 2.7) students. However, there was no significant difference of BMI among study years (p=0.530, p>0.05). Meanwhile, male students (21.9 ± 5.3) showed slightly higher BMI compared to female students (20.8 ± 3.1) but there was no significant difference of BMI between them (p=0.668, p>0.05). Moreover, Bumiputra (21.5 ± 3.7) showed slightly higher BMI compared to non-Bumiputra (20.3 ± 3.3). There was no significant difference of BMI between Bumiputra and non-Bumiputra (p=0.051, p>0.05).

In order to find out the relationship between overall stress score and BMI, Spearman's correlation was employed. The result showed that there was no relationship between the stress score and the BMI (r=0.056,p>0.05). Furthermore, according to year of study the results from Spearman's correlation shows that there was no significant relationship between stress score and BMI of first(r=0,125,p>0.05), second(r=0.125,p>0.05) and third year students(r=-0.185,p>0.05) respectively . Thus, there was also no significant relationship between the stress score and BMI according to first year, second year and third year students respectively. Furthermore, according to gender there was no association between stress score and BMI for both male(r=0.26,p>0.05) and female student (r=0.002,p>0.05). Moreover according to race, there was no significant relationship between stress score and BMI for Bumiputra(r=-0.058,p>0.05) and non-Bumiputra respectively (r=0.198,p>0.05)

Discussion

Previous studies in Mexico using SLSI found that academic stress among college students varies across the years academic. Specifically, freshman and sophomores had higher academic stress level than juniors and seniors, among pharmacy students [17]. On the other hand, our study had shown that first year students had the highest stress score. This suggests that different courses and places will have different stress score among the study years. Besides, their mean stress scores were higher compared to our finding. This study had shown that there was no significant difference of BMI among study years. This is because narrow age ranges does not affect the BMI. This is supported by other studies which found that width of the age ranges was often affected by the sample size. Hence, combining subjects of different ages is needed to have a significant difference of BMI [18]

The comparison of mean stress score between races was not significant in our study. This result is consistent with previous studies claiming that other factors such as race did not contribute to stress level in students [19]. Besides that, other studies find that there was significant difference between races with Malays having the highest mean BMI, followed by the Indians and Chinese [20]. The differences may be due to our research was too centralized at one place. However, the Bumiputra with majority being Malays, still showed higher mean BMI compared to non-Bumiputra which were Chinese and Indians.

Our finding had also shown that there was no significant difference for mean stress score between male and female students and this is different compared to other studies.

They had found that females had significantly higher stress scores compared to males [17]. However, females' stress score was still slightly higher than the males. This could be due to females being more emotional and sensitive than males. There was no significant difference in the BMI between male and female students and this should not be comparable to other studies because the subjects university student. Other study found that the mean BMI of adult women was significantly higher than the mean BMI of adult men [20]. Possible reason to explain this is that our sample was too localized at one place

Our study had shown that there was no significant relationship between the overall stress score and BMI. Besides, the relationship of stress score and BMI of first year, second year, third year, male, female, Bumiputra and non-Bumiputra students respectively had also shown no significant relationships. This is different from other studies [1] where there was a weak relationship between work stress and BMI. Besides, the previous study had measured the stress score of people in working sector while this study measured stress among students in education sector. This is because the stress at workplace differed with academic stress. In the workplace, stress is influenced by skill, team work and work load especially in the professional areas such as medical doctors, engineer, teachers and nurse [21-23]. Mean while for stress among students maybe due to concern with academic performance, relationship with colleagues, friends and family [24]

Conclusion

In conclusion, this study showed that the level of stress score varies according to years of study, gender and race among students of Science Kuala Lumpur Student in first year , female and bumiputra showed a higher level of stress. Mean while the BMI is higher among third year, male and bumuputras. However in this study, there was no significant relationship between stress and BMI. Other factors may also contribute to the stress score such as time allocation, social support and individual characteristic.

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