

ORIGINAL ARTICLE

Associations between Weight Teasing by Peers, Self Esteem, and Academic Related Stressors with Body Weight Status among Adolescents in Hulu Langat District, Selangor, Malaysia

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ABSTRACT

Introduction: Growing evidence highlighting the physical health risks linked with adolescent obesity and yet little is known on the role of psychosocial factors on the body weight status of adolescents. A cross sectional study was conducted to ascertain the associations between psychosocial factors (operationalised as weight teasing by peers, self-esteem and academic related stressor) with body weight status of adolescents in Hulu Langat District, Selangor, Malaysia. **Methods:** A total of 455 adolescents aged 13-16 years (50.3% male and 49.7% female) were recruited from five randomly selected schools through a multistage cluster sampling. Body weight and height were assessed and body mass index (BMI) was computed. Weight teasing by peers, self-esteem and academic related stressor were assessed using self-administered questionnaire of Perception of Teasing Scale (POTS), Rosenberg Self esteem Scale (RSE) and Secondary School Stressor (SSS) respectively. **Results:** The prevalence of overweight and obesity were 17.1% and 12.2%. Binary logistic regression revealed that adolescents who experienced weight teasing by their peers had 12 times higher odds to be overweight and obese. However, low self-esteem and high academic stressor were associated with a reduction in the likelihood of being overweight and obese. This rather contradictory results may be due to various factors that may affect the adolescents' self-esteem and academic related stressor. **Conclusion:** Intervention programmes need to consider the peer environment of adolescents, increasing awareness on the effect of weight teasing by peers and further well designed study is crucial to stimulate the central understanding of psychosocial correlates to the adolescent obesity.

Keywords: Weight teasing by peers, Self-esteem, Academic related stressor, Overweight obesity, Adolescents

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INTRODUCTION

Adolescence is a critical period of developmental changes through interaction between social, psychological, and physiologic risk such as obesity and nutritional problems (1-3). An obese adolescent is at risk of having social and psychological problems such as weight teasing (4,5), bullying and low self-esteem (3,6,7). Generally, prevalence of obesity in Asia Pacific Regions were relatively low across low-, middle and high-income (8). Nevertheless, the prevalence of obesity among childhood and adolescent has swiftly escalated and become the most common disease especially in developed country recently (1). In between 1976 to 2008, the prevalence of obesity among adolescents had risen from 5.0% to 18.1% (9). In Malaysia, national study reported the prevalence of overweight and obesity

among individuals aged 18 years and below was 11.9% (10). Moreover, higher prevalence of overweight and obesity among school adolescents were noted in Selangor with 19% (11) and Terengganu with 27% (12). As a major concern to the public, obesity has grown into a significant health related concern that attributed to multiple chronic diseases and illness (13). Obese adolescents are at major risk for cardiovascular disease (14), pre-diabetes (15), sleep apnea, bone and joint complications, social and psychological issues such as exposure to stressful events, weight teasing and poor self esteem (13) and associated with many types of cancer such as breast cancer (16).

Weight teasing is commonly experienced by the adolescents and frequent exposure to the treats can harm the health (17,18). Majority of the adolescents were made fun by other and being teased about their weight status (17). Weight related teasing was associated with lower self-esteem and greater body fat dissatisfaction (4). Meanwhile, self esteem literally defined as an evaluation of a person on him or herself worth which is

included positive or negative orientation on themselves (19). High self esteem is explained by having a highly positive appraisal while low self esteem is explained by negative definition of the self (20). Self esteem has been shown to be associated with obesity among adolescents (4). Furthermore, there was a wide variety of stressor exposure (household and individual stressors) as well as in school setting that can be associated with body weight status (21).

Although previous studies have addressed the sudden advance in prevalence of overweight and obesity, there is a paucity data on weight-teasing by peers, self-esteem and academic related stressor that influenced adolescent's obesity. Therefore, this study aimed to determine associations between three psychosocial problems (weight-teasing, self-esteem and academic related stressor) with overweight and obesity among adolescents in Hulu Langat district, Selangor.

MATERIALS AND METHODS

This cross sectional study was conducted among school adolescents in Hulu Langat district Selangor, Malaysia. A total of 42 secondary schools in Hulu Langat district had been identified and only 32 schools met the inclusion criteria; national secondary school and students from non-examination class (Form 1, Form 2 and Form 4). Number of schools needed was calculated based on the cluster formula as described by Levy and Lemeshow (22).

Five out of the 32 schools were selected via simple random sampling. In each school, one class was randomly selected from form 1, 2 and 4. The number of students in selected classes was approximately 60-100 students per class. The information sheets and consent form were distributed to parents of the eligible students. This study has obtained the ethical approval by the Medical Research Ethic Committee of Faculty of Medicine and Health Sciences, UPM (JKEUPM) and the Ministry of Education, Malaysia.

Socio-demographic background

Socio-demographic background of the subject included age, gender, ethnicity, parent's education level, occupation and household income.

Anthropometric measurements

Body weight status was assessed using a TANITA digital weighing scale with a precision of 0.1 kg. Before the measurement, subjects were asked to stand on weighing scale with no objects in their hands and emptied pockets. Weight was determined in duplicate and the mean measures were noted with an accuracy of 0.1 kg. Height was measured using a SECA body meter suspended upright against a straight wall. The students were asked to stand in front of the wall, stood underneath the body meter, and the measuring beam was pulled down to rest

on their heads. Two measurements were taken and the average readings were recorded to the nearest 0.1cm. In order to classify body weight status of the subjects, both height and weight were converted to BMI-for-age using WHO AnthroPlus Version 1.0.4 Software derived from the World Health Organisation Growth Reference 2007 (23).

Academic related stressor

Stress is defined as a process of adaptation in response to the challenge either physical or psychological challenges (Kim et al., 2009). For the current study, stress was operationalised using a self-report questionnaire, Perceived Stress Scale in which to assess stress response of the subject last one month (Cohen, Kamarck, & Mermelstein, 1983).

Academic stressors of the adolescents were determined using a validated and reliable self-reporting questionnaire; The Secondary School Stressor Questionnaire (SSSQ) developed by Muhamad Saiful Bahri et al. (24). There were 10-item in SSSQ regarding on the possible sources of academic stress in secondary school students. Each item was rated using 5-point Likert scale ranging from 0= causing no stress at all to 4= causing severe stress. The score was classified into four level of stressor- none to low stress, low to medium stress, medium to high stress and high to very high stress (24). Cronbach's alpha of academic stressor was 0.833 in the present study.

Self esteem

Self esteem was assessed using Rosenberg Self esteem Scale (RSE) (19). The RSE is a 10-item uni-dimensional self-report aimed to measure global self esteem using a 4-point Likert response format ranging from strongly agree to strongly disagree. Five items had reversed score (Items 2, 5, 6, 8, and 9) in which a score of 1 was assigned to "Strongly Disagree" and a score of 4 was assigned to "Strongly Agree". In order to identify the level of self esteem of the subjects, the total score of self esteem was categorised into low and high self esteem (25). The score for each subscale range from 10 to 40 with higher scores indicating higher self esteem (25). Cronbach's alpha of SES was 0.688 in the present study.

Weight teasing scale

Weight teasing by peers of the subjects was assessed using Perception of Teasing Scale (POTS) questionnaire adopted from Thomson et al. (26). The Perception of Teasing Scale (POTS) is an 11-item scale used to assess frequency weight teasing (6 items) and the individual's competency-related teasing (5 items). Only 6-item of weight related teasing questions was adapted. The term of 'people' was replaced with 'peer' to focus on weight related teasing by peers among the subjects. The weight related teasing is a 5-point Likert scale ranging from '1' for never, '2' for sometimes, '3' for seldom, '4' for often and '5' for very often. All items of weight teasing are summed and the total score range from 0 to 50 with

a higher score indicating greater frequency of weight teasing by peers for both male and female subjects. The POTS has been used extensively among children and adolescents (24,27–29). It was translated into Malay language with Cronbach's alpha coefficients of 0.93 and 0.95 for both male and female respectively. The reliability (internal consistency) of POTS for the present study was 0.889 (29).

Statistical analysis

Data were analysed using IBM SPSS version 24.0. The mean, percentage, standard deviation and frequency were calculated using descriptive statistics. The levels of significance were set at a standard p-value < 0.05. Binary logistic regression analysis was used to determine the contribution of independent variables (weight teasing by peers, self-esteem and academic related stressor) on the overweight and obesity.

RESULTS

A total of 455 students participated in this study with more than half were males (50.3%), while 49.7% were females (Table I). Two-third of the subjects (69.9%) were Malays, followed by Chinese (17.1%), Indian (12.5%) and others (0.4%). The mean age of the subjects was 14.33 (SD = 1.23) years old and ranged from 13 to 16 years old. Majority of the subjects' parents (father: 47.0%; mother: 58.0%) have completed a minimum of secondary education. The median monthly income for fathers was RM 3000.00 and RM300.00 for mothers.

According to WHO Growth Reference 2007 (WHO, 2007), two-thirds of the subjects were in normal category (64.4%) (Table I). Thirty percent of them were in overweight and obese category while around six percent of them were in thinness and severe thinness category. Meanwhile, one-fourth of female (26.1%) and 33.6% of male subjects were in overweight/obese category (Table II). Chi-square analysis showed that there was a significant association between weight-related teasing and body weight status ($\chi^2=99.239$, $p<0.001$) (Table II). The subjects who were overweight/obese group were significantly more likely to be teased. Approximately 60.0% of overweight/obese subjects had high scores of weight teasing by peers.

Students were classified to have low self-esteem if their score was below 25 and those who had score more than 25 were classified to have high self esteem (25). There is a significant association between self esteem with body weight status ($\chi^2 = 7.756$, $p< 0.01$) (Table II). In order to compare academic stressor with body weight status, Chi-square analysis was performed in which subjects were classified into low (1.0-2.0) to high (2.10-4.0) stressor. Thus, there showed significant association between academic stressor with body weight status ($\chi^2=6.166$, $p < 0.05$) (Table II).

Table I: Study characteristics of the subjects (n=455)

Characteristics	n (%)	Mean (SD)
Gender	229 (50.3)	
Male	226 (49.7)	
Female		
Ethnicity	318 (69.9)	
Malay	78 (17.1)	
Chinese	57 (12.5)	
Indian	2 (0.4)	
Others		
School level / Age		
Form 1 /13	144 (31.6)	
Form 2 /14	163 (35.8)	
Form 4 /16	148 (32.5)	
Father's education level (n=437)		
Secondary or below	228 (52.2)	
Tertiary	209 (48.8)	
Mother's education level (n=454)		
Secondary or below	281 (61.9)	
Tertiary	173 (38.1)	
Father's income (n=437)		
<RM 1000.00	24 (5.1)	
RM 1000.01-RM 2000.00	88 (20.1)	Median: RM
RM 2000.01-RM 3000.00	118 (27.0)	3000.00
RM 3000.01-RM 4000.00	67 (15.3)	
>RM 4000.00	140 (32.0)	
Mother's income (n=454)		
<RM 1000.00	261 (57.5)	
RM 1000.01-RM 2000.00	44 (9.7)	Median: RM
RM 2000.01-RM 3000.00	51 (11.2)	300.00
RM 3000.01-RM 4000.00	38 (8.4)	
>RM 4000.00	60 (13.2)	
BMI-for-age classification		
Severe thinness	8 (1.8)	
Thinness	18 (4.0)	
Normal	293 (64.4)	20.79 (4.68) kgm ²
Overweight	78 (17.1)	
Obese	58 (12.7)	

Table II: Associations between sociodemographic characteristics, weight teasing by peers, self-esteem and academic related stressors with body weight status of the subjects.

Variables	Body weight status		χ^2 - statistic ^a (df)	P-value ^a
	Non-obese n (%)	Over- weight-obese n (%)		
Gender				
Male	152 (66.4)	77 (33.6)	3.07 (1)	0.080
Female	167 (73.9)	59 (26.1)		
Ethnicity				
Malays	219 (69.1)	98 (30.9)	0.52 (1)	0.469
Non-Malays	100 (72.5)	38 (27.5)		
Age (years old)				
13-15	206 (67.1)	101 (32.9)	4.08 (1)	0.043*
16-18	113 (76.4)	35 (23.6)		
Fathers' education level				
None-secondary	160 (70.2)	68 (29.8)	0.07 (1)	0.796
Tertiary	143 (68.4)	66 (31.6)		
Mothers' education level				
None-secondary	197 (70.1)	84 (29.9)	0.01 (1)	0.970
Tertiary	121 (69.9)	52 (30.1)		
Fathers' monthly income				
<RM 1000	31 (73.8)	11 (26.2)	0.038 (2)	0.857
RM 1000-RM 3000	144 (69.9)	62 (30.1)		
≥RM 3000	144 (69.9)	63 (30.4)		
Mothers' monthly income				
<RM 1000	185 (70.6)	77 (29.4)	0.453 (2)	0.797
RM 1000-RM 3000	64 (67.4)	31 (32.6)		
≥RM 3000	70 (71.4)	28 (28.6)		
Weight related teasing				
Lowest (≤6.9)	252 (86.0)	41 (14.0)	99.239 (1)	0.000**
Highest (≥7.0)	67 (41.4)	95 (58.6)		
Self-esteem				
Low (<25)	123 (78.3)	34 (21.7)	7.756 (1)	0.005**
High (≥25)	196 (65.8)	102 (34.2)		
Academic related stressor				
Low (1.0-2.0)	214 (66.7)	107 (33.3)	6.166 (1)	0.013*
High (2.01-4.0)	105 (78.4)	29 (21.6)		

^aChi-square test for independence, **significant, $p<0.01$, *significant, $p<0.05$

Binary logistic regression revealed that adolescents who experienced weight teasing by their peers had 12 times higher odds to be overweight and obese. However, low self-esteem and high academic stressor were associated with a reduction in the likelihood of being overweight and obese (Table III).

Table III: Logistic regression model on contribution of weight teasing by peers, self-esteem and academic related stressor to overweight and obesity in adolescents (n = 455)

	OR*	95% CI	P-value
Weight teasing by peers			
Low	Reference	-	0.0001
High	12.025	7.247-19.955	
Self-esteem			
High	Reference	-	0.001
Low	0.407	0.236-0.701	
Academic related stressor			
Low	Reference	-	0.002
High	0.412	0.233-0.727	

*Model adjusted for age and sex; OR= Odd ratio, CI= Confidence interval

DISCUSSION

This study reveals the prevalence of overweight and obesity which were slightly higher than other studies in Central and Eastern region of Peninsular Malaysia (11,12,30). Findings from this study indicate that there was a significant association between weight teasing by peers with body weight status. This finding matched those observed in earlier studies (4,17,31) which indicated that overweight and obese adolescents were more likely to be teased by their peers. This finding may help us to understand the recent outcomes from a longitudinal study in United States which confirm that weight teasing by peers during adolescents is one of the predicting factors of having higher BMI, obesity and adverse eating behavior into adulthood (17). It is therefore crucial to focus on the coping strategies for the overweight and obese adolescents to improve psychosocial functioning and achieve better quality of life (17,32,33).

While many studies found that adolescents who experienced low self-esteem and stressful events have a higher tendency to become overweight and obese (6,34), this study reveals contradictory results. Large discrepancies in findings on obesity and self-esteem are due to race, ethnicity, gender, sample size and tool used (35). Body weight status may not be sole contributing factors to adolescents' self-esteem and this has been supported by other studies (29,36)

In addition, stressful and challenging environment may contribute to various emotional disorders among adolescents. Similarly, children and adolescents in developing countries are particularly vulnerable to have very light to chronic stress (37). Adolescents with greater

individual stressors were more likely to be overweight and obese. (21). A study demonstrates that there was a significant difference between academic-related stressor and body weight status. It was reported that academic-related stressors are the major stressor that give an impact to the students (24,33). Previous study stated that obese adolescents reported more likely to consider themselves as poor in academic compared with non-obese adolescents (38).

There are several limitations to this study, the causality or direction of the relationship could not be established due to cross-sectional study design. Thus, longitudinal study design would be helpful to established temporal relationship between the variables. Another limitation of the study is that the data collected were self-reported which is highly dependent on sincerely, truthfulness and their honesty. Eventhough most of the questions that were used for the study are well known instruments and had good validity and realibility but the tendency of response or recall bias is high. For instance, subjects who were overweight and obese may remember frequently of body weight-related teasing compared to those who are normal body weight status. In addition, self-concentration also may affect the findings as well, since the data collection were done right after the subjects had received a lesson from the teachers.

CONCLUSION

In conclusion, prevalence of overweight and obesity was high among the adolescents students in Hulu Langat District. Overweight and obesity students have tendency to have low self esteem and being teased on their weights by their peers. Additionally, students who faced academic-related stressor during the school session may lead to have high body weight status. Hence, effective intervention programmes need to consider the psychosocial factors that could be one of the determinant of adolescents' obesity. Intervention programmes need to consider the peer environment of adolescents, increasing awareness on the effect of weight teasing by peers and further well designed study is crucial to stimulate the central understanding of psychosocial correlates to the adolescent obesity.

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