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Eating Behaviors among Female Adolescents in Kuantan District, Pahang, Malaysia

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Abstract: This study examined eating behaviors among female adolescents. A total of 407 female students aged between 13-19 years were randomly selected from two secondary schools in Kuantan district, Pahang, Malaysia. All participants were required to complete a self-administered Eating Behaviors Questionnaire and their weight and height were measured by the researchers. A majority of the participants were Malays (65.3%), followed by Chinese (28.3%) and Indians (6.4%). There were 5.9% underweight participants, 75.4% were normal-weight and 18.7% were overweight. About one third (35.9%) never skipped any of the daily three meals, but another half (52.6%) skipped at least one meal a day and the remaining (11.5%) had even skipped all three meals in a day. The most frequently missed meals were breakfast (47.4%). Half (51.4%) snacked between meals daily and three in four (76.9%) had their meals with family members. No differences were found between the socio-demographic variables (age, household members, parent's total year of schooling, parental monthly income and living arrangement) and meal skipping behaviors. However, those who usually skipped meals were those who usually eat alone ($Chi^2 = 16.933$, $p < 0.0001$), overweight ($Chi^2 = 15.943$, $p < 0.05$) and were Malays ($Chi^2 = 33.827$, $p < 0.05$). In conclusion, meal skipping, snacking and practicing various weight loss behaviors were some of the unhealthy eating behaviors depicted among adolescent girls. Focusing on promotion of healthy eating that stresses on the importance of regular intakes of main meals during adolescence is crucial for their current and future health and well-being.

Key words: Adolescents, snacking, meal skipping, breakfast, Malaysia

INTRODUCTION

Adolescence is a transitional period between childhood and adulthood, which begins from the earliest signs of secondary sexual characteristics development and ends when a person has achieved adult status (WHO, 1995). Hence, dramatic changes and development of the physical, emotional and cognitive functions occur during adolescence. In order to achieve optimal growth and development during adolescence, the nutritional requirements are the highest across the life span (NCCFN, 2005). Practicing healthy eating behavior is one of the important factors to meet the nutritional needs of adolescents.

Previous studies found that the rapid changes in physical growth and psychosocial development have placed adolescents as a nutritionally vulnerable group with unhealthy eating behaviors that did not meet dietary recommendations (Savige *et al*., 2007; Shi *et al*., 2005; WHO, 2005). Typical eating patterns among adolescents are meal skipping, snacking, eating away from home, fast food consumption for meal and snack consumption and unconventional dietary patterns such as adopting vegetarian diet, specific weight loss diet and an overall reduction of food intake (Savige *et al*., 2007; Shi *et al*., 2005; WHO, 2005). Studies have also shown that teenagers who have healthy eating behaviors were more likely to perform better academically than teenagers who have unhealthy eating behaviors (Affenito, 2007; Kleinman *et al*., 2002; Pollitt and Mathews, 1998). Similarly, breakfast consumption as part of a healthful diet may improve cognitive function related to memory, test grades and school attendance (Rampersaud *et al*., 2005). Additionally, the triadic problems of obesity, eating disorders and body image disturbances are associated with eating behaviors of adolescents, particularly females (Irving and Neumark-Sztainer, 2002). Healthy eating behaviors during adolescence are not only imperative for physical and psychosocial growth and development as well as for cognitive performance, but also important for the prevention of diet-related chronic diseases in adulthood (Quatromoni *et al*., 2002). It is noteworthy that unhealthy eating behaviors and their health compromising consequences are serious issues during adolecence and future adulthood and should be duly addressed.

Despite increased concerns for adolescent health worldwide, adolescence has not been considered to be a high priority life stage for nutritional needs and intervention, except for adolescent pregnancy (WHO, 2005). While dealing with the increased nutritional needs for rapid growth and development, adolescents are also exposed to a multitude of external factors that may affect their dietary choices and behaviors. As one of the developing countries, Malaysians are experiencing

a nutritional and lifestyle transition due to urbanization, industrialization and globalization. There was an increase in refined carbohydrates, saturated fats and sugars in the Malaysian diet since the last two decades (Ismail, 2002). Although most adolescents are normal-weight, they are increasingly at risk of malnutrition, where overnutrition coexists with undernutrition (Moy *et al*., 2004). About one in five adolescent girls (underweight: 13.3%; overweight: 7.1%) in Kuala Lumpur, Malaysia is facing malnutrition problems (Moy *et al*., 2004) and this has been linked to unhealthy eating behaviors (WHO, 2005; Pon *et al*., 2004). Further, Malaysian female adolescents are likely to be most vulnerable to and at risk of practicing unhealthy eating behaviors since they tend to have greater concerns over their body image and may alter their eating habits to achieve the ideal body image, in comparison to their male counterparts (Moy *et al*., 2006). To date, there are limited published studies reporting on eating behaviors among Malaysian adolescents. Hence, the present study was conducted to examine and understand eating behaviors among Malaysian female adolescents.

MATERIALS AND METHODS

Sample and study design: The study protocol was approved by the Ministry of Education and ethical approval was obtained from the Medical Research Ethics Committee of the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. The present study was conducted in Kuantan district, in the state of Pahang, which is the largest state in west Malaysia, covering about 35,964km^2. Kuantan is the capital of Pahang, covering 2960km^2 of Pahang with a population of 358,261.

A list of all 35 secondary schools in the Kuantan district was obtained from the Kuantan District Education Department. Schools were selected by using two inclusion criteria whereby the school has to be a co-educational secondary school and contained all the three major races (Malay, Chinese, Indian). Out of nine secondary schools that met the inclusion criteria, two schools were randomly selected for the present study. A total of 407 female students from 27 classes from the two selected schools participated in this study. Before informed consents were obtained from the participants, information sheets explaining the study purpose and its protocol were distributed and explained to them. All participants were required to complete a self-administered Eating Behaviors Questionnaire and their weight and height were measured by the researchers.

Measures: Socio-demographic information including date of birth, age, ethnicity, living arrangement, household size and number of siblings were each assessed by self-report. Besides, each participant was required to provide information on her parental educational attainment, occupation and monthly income. Eating behaviors of female adolescent were assessed using a self-administered Eating Behaviors Questionnaire (EBQ). The pretested EBQ was developed for the present study based on previous literature on eating behaviors among adolescents, especially females. Nine items that assessed frequency of meal consumption, frequency of snacking between meals, type of snacks consumption, frequency of eating outside and take-away food, use of dietary supplement, type of dietary consumption and participation in body change programs.

Body weight and height were measured to determine body mass index (BMI) of the participant. Body weight was measured by using a TANITA digital weighing scale to the nearest 0.1kg and height was assessed by using a SECA body meter to the nearest 0.1cm. BMI was then calculated as kg/m^2 and nutritional status of the participant was classified based on WHO (1995) criteria.

Statistical analysis: All statistical analyses were conducted by using SPSS for Windows version 15.0. Descriptive statistics such as frequencies, means, standard deviations (SD), percentage were used to describe all variables. One-way ANOVA was used to determine differences in continuous variables such as age, household members, parental total year of schooling and parental income, by meal skipping behaviors; whereas Chi-square test was used to determine associations between categorical variables such as ethnicity, living arrangement, body weight status and eating companions and meal skipping behaviors. A statistical probability level of $p < 0.05$ was considered as significant.

RESULTS

Socio-demographic characteristics: Descriptive statistics of the sample are presented in Table 1. Adolescents in the sample ranged in age from 13-19 years, with an average age of 15.26±1.95 years. Two thirds of the participants (65.3%) were Malays, followed by Chinese (28.3%) and Indians (6.4%). Most of the participants (82.8%) lived with family members and most (65.1%) lived in households with five to seven members. About half of their parents (father: 49.2%; mother: 57.0%) had attained a minimum of secondary school education. The mean parental income was RM 3266.19±2566.90 (USD 1053.61±828.03) with a minimum of RM 300.00 (USD 96.77) and a maximum of RM10000.00 (USD 3225.81) per month. Based on WHO (1995) classification, 5.9% of the participants were underweight, 75.4% were normal-weight and 18.7% were overweight. At least three in four (76.9%) of the participants reported that they usually had meals with family members. There were 15.2% of the participants who had meals with peers, but 7.6% of the participants ate alone.

Meal consumption and skipping behaviors: Table 2 shows the distribution of participants by frequency of meal consumption. About half of the participants (52.6%) took breakfast everyday. Another one-third of the participants did not take breakfast daily and skipped breakfast for some days in a week, whereby 19.7% of them took breakfast for 4-6 days in a week; followed by 2-3 days in a week (16.7%) and once a week (4.4%). Further, a small number of the participants (3.4%) took breakfast for 1-3 times a month and 3.2% of the participants had taken breakfast less than once a month or never at all. As for the lunch consumption, three in four (75.2%) ate lunch daily. This was followed by 16.2% of the participants who had lunch for 4-6 days in a week, 6.2% took lunch for 2-3 days a week and only 1.0% of the participants took lunch once a week. Both participants, who ate lunch 1-3 times a month and who never ate or ate less than a month, were 0.7%, respectively. A similar pattern was found for dinner consumption, whereby most of the participants (62.4%) ate dinner everyday, 21.6% had dinner 4-6 days in a week, 9.1% took dinner 2-3 days in a week and 4.7% ate dinner once a week. Only a small number of the participants skipped dinner altogether (participants who ate dinner 1-3 times a month: 1.7%; participants who never ate or ate dinner less than once a month: 0.5%).

Meal skipping behaviors of the participants in this study are revealed in Fig. 1. About one third of the participants (35.9%) never skipped any of the daily three main meals, but another half (52.6%) skipped at least one meal and the remaining (11.5%) even skipped all three main meals daily. Specifically, the most frequently missed meal was breakfast (47.4%) as only 52.6% of the participant took breakfast daily and this was followed by dinner (37.6%) and lunch (24.8%) (Table 2).

Snacking behaviors: The present findings show that participants frequently snacked during morning tea time. Table 2 shows that about half (43.5%) snacked between breakfast and lunch time daily and only 8.4% of the participants less than once a month or never snacked during morning tea break. As for the afternoon tea, one-forth (25.8%) snacked between lunch and dinner for 2-3 days a week and 21.6% snacked during afternoon tea break daily. It should be highlighted that 4.9% of the participants snakced daily for their supper.

Figure 2 summarizes that 51.4% of the participants snacked between meals daily while another half of the participants (48.6%) did not snack between meals daily. Types of snack taken between meals by the participants are described in Table 3. Foods that were most frequently consumed between meals include fruits (26.9%), breads (15.0%) and local cakes (*kuih-muih*; 14.2%); while beverages that were most frequently consumed between meals include tea (33.3%), chocolate malted milk (27.9%) and fruit juices (26.5%).

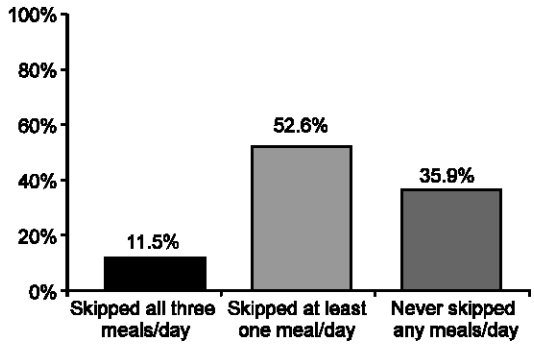

Fig. 1: Distribution of participants by frequency of meal skipping per day (n=407)

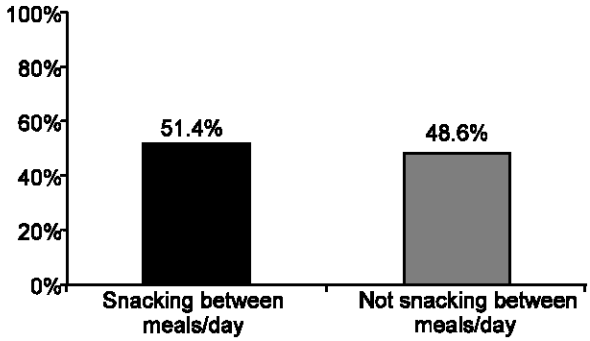

Fig. 2: Distribution of participants by frequency of snacking per day (n=407)

Eating away from home: Although 10.6% of the participants expressed that they never ate or only ate at hawker centers, coffee shops or other food stalls less than once a month, about half (41.3%) had their meals at hawker centers, coffee shops or other food stalls for one to three times a month (Table 4). Further, another one-fifth (20.9%) had their meals at similar venues once a week, followed by 17.7% of the participants who had their meals for at least two to three times a week and 7.6% of the participants who ate their meals for four to six days weekly. Only 2.0% of the participants had their meals at the similar venues daily. About one in two of the participants (54.5%) stated that they ate at western fast food restaurants for one to three times a month, while 30.2% of the participants never ate or only ate at western fast food restaurants less than once a month and 9.8% ate for once a week (Table 4). Only a small proportion of the participants had their meals at fast food restaurants for two to three days weekly (4.7%) and for four to six days weekly (0.7%).

Consumption of dietary supplements: As for dietary supplements consumption, most of the participants (68.6%) did not consume any dietary supplements at the point of study (Table 5). Conversely, about one-third of the participants (31.4%) claimed that they were taking

Table 1: Socio-demographic background of participants

		Participants (%)	Mean ± SD
Age	13 years	91 (22.4)	
	14 years	120 (29.5)	
	16 years	95 (23.3)	
	17 years	3 (0.7)	
	18 years	85 (20.9)	
	19 years	13 (3.2)	
	Total	407 (100.0)	15.26±1.95
Ethnicity	Malay	266 (65.3)	
	Chinese	115 (28.3)	
	Indian	26 (6.4)	
	Total	407 (100.0)	
Living arrangement	Staying with family	337 (82.8)	
	Staying in school hostel	70 (17.2)	
	Total	407 (100.0)	
Household members	2-4 persons	89 (21.9)	
	5-7 persons	265 (65.1)	
	≥ 8 persons	53 (13.0)	
	Total	407 (100.0)	5.72±1.71
Father's educational attainment	University	109 (27.5)	
	College/ Diploma	65 (16.4)	
	Secondary school	195 (49.2)	
	Primary school	24 (6.1)	
	No formal education	3 (0.8)	
Father's total year of schooling			12.48±3.19
	Total	396 (100.0)	
Mother's educational attainment	University	71 (17.5)	
	College/ Diploma	76 (18.7)	
	Secondary school	232 (57.0)	
	Primary school	25 (6.1)	
	No formal education	3 (0.7)	
Mother's total year of schooling			11.86±2.82
	Total	407 (100.0)	
Monthly parental income (RM; USD 1.00 = RM 3.10)			3266.19±2566.90
	Total	377 (100.0)	
Body weight status	Underweight	24 (5.9)	
	Normal-weight	307 (75.4)	
	Overweight	76 (18.7)	
	Total	407 (100.0)	
Eating companions	Eating with family members	313 (76.9)	
	Eating with peers	62 (15.2)	
	Eat alone	31 (7.6)	
	Total	407 (100.0)	

Table 2: Distribution of participants by frequency of meal consumption (n = 407)

	Daily n (%)	4-6 days/ week n (%)	2-3 days/ week n (%)	Once a week n (%)	1-3 times/ month n (%)	Never/Less than once a month n (%)
Main meals						
Breakfast	214 (52.6)	80 (19.7)	68 (16.7)	18 (4.4)	14 (3.4)	13 (3.2)
Lunch	306 (75.2)	66 (16.2)	25 (6.2)	4 (1.0)	3 (0.7)	3 (0.7)
Dinner	254 (62.4)	88 (21.6)	37 (9.1)	19 (4.7)	7 (1.7)	2 (0.5)
Snack between meals						
Morning tea	177 (43.5)	84 (20.6)	72 (17.7)	18 (4.4)	22 (5.4)	34 (8.4)
Afternoon tea	88 (21.6)	84 (20.6)	105 (25.8)	51 (12.5)	34 (8.4)	45 (11.1)
Supper	20 (4.9)	35 (8.6)	90 (22.1)	61 (15.0)	85 (20.9)	116 (28.5)

dietary supplements, largely through advice by parents (85.2%), followed by other family members (7.0%), such as their siblings. Some participants stated that they took dietary supplements without advice from others (3.9%) while some said the physicians advised them to consume dietary supplements (3.1%). Only one participant (0.8%) from this study took dietary supplements under suggestions from her friends.

Types of dietary practice: Table 6 shows general types of dietary practice by the participants in the present study. In particular, 35.1% of the participants were not

Table 3: Types of snacks consumed in between meals by participants

	Types of snacks	Participants (%)
	Foods	
1	Fruits	100 (26.9)
2	Breads	56 (15.0)
3	Local cakes (*kuih-muih)*	53 (14.2)
4	Ice-cream	37 (9.9)
5	Snack in packet	34 (9.1)
6	Biscuits	26 (7.0)
7	Fried banana (*Pisang goreng)*	17 (4.6)
8	Coconut rice (*Nasi lemak)*	14 (3.8)
9	Others	14 (3.8)
10	Noodles or Instant noodles	11 (3.0)
11	Chocolates	10 (2.7)
	Total	372 (100.0)
	Beverages	
1	Tea	74 (33.3)
2	Chocolate malted milk	62 (27.9)
3	Fruit juices	59 (26.5)
4	Milk	13 (5.9)
5	Carbonated drinks	6 (2.7)
6	Syrup	3 (1.4)
7	Others	3 (1.4)
8	Coffee	2 (0.9)
	Total	222 (100.0)

choosy on the types of food eaten and ate any food available. However, it should be highlighted that another one-third of the participants (33.4%) were trying to eat less to lose weight although no specific diet was consumed. Further, 9.1%, respectively described their dietary practices as restricting high fat foods only and restricting high fat, high sugar and red meat foods. Additionally, 6.6% of the participants not only reduced high fat foods, but also high sugar food. A small number of the participants (4.7%) followed a specific weight loss diet for their meal consumption.

Socio-demographic variables and meal skipping behaviors: Based on One-way ANOVA, no differences were found in the socio-demographic variables, namely age ($F = 1.403$, $p = 0.247$), household members ($F = 2.472$, $= 0.086$), father's total year of schooling ($F = 0.080$, $p = 0.923$), mother's total year of schooling ($F = 1.760$, $p = 0.173$), parental monthly income ($F = 0.609$, $p = 0.934$) by the meal skipping behaviors. Conversely, Table 7 shows ethnicity was associated with meal skipping behaviors ($Chi^2 = 33.827$, $p < 0.05$); Malay participants (56.8%) skipped at least one meal daily while Chinese (51.3%) and Indian (57.7%) participants never skipped any meals. Even though one in five of adolescent girls who stayed in school hostel skipped all three meals a day, living arrangement of the participants was not associated with meal skipping behaviors ($Chi^2 = 5.954$, $p = 0.051$). As for body weight status, more underweight (45.8%) than normal-weight (37.8%) and overweight (25.0%) participants never skipped any meals; however, more overweight (23.7%) than normal-weight (9.1%) and underweight (4.2%) participants skipped all three meals a day ($Chi^2 = 15.943$, $p < 0.05$). Further, eating in the presence of eating companions was found to be associated with meal skipping behaviors ($Chi^2 = 16.933$, $p < 0.05$), where a greater proportion of the participants who either ate with family (38.7%) or peers (33.3%) never skipped any meals whereas one-forth of the participants who ate alone (25.8%) skipped all three meals a day.

DISCUSSION

Consistent with previous studies (Shi *et al*., 2005; Moy *et al*., 2006; Zullig *et al*., 2006; Sjoberg *et al*., 2003; Serra-Majem *et al*., 2001), we found that meal skipping behaviors were prevalent among Malaysian female adolescents. Specifically, two in three of the participants in our study skipped at least one meal a day and breakfast (47.4%) was the most frequently missed meal. Similarly, a local study reported high rates of meal skipping behaviors among adolescents, particularly breakfast skipping (79%), followed by lunch (67%) and dinner (52%) (Rasyedah *et al*., 2003). The main reasons for breakfast skipping were lack of appetite and time, whereas dinner was missed due to lack of appetite, out of habit and to lose weight. Additionally, adolescent girls were found to be more likely than adolescent boys to skip meals, especially breakfast skipping (Moy *et al*., 2006). The possible reasons for this phenomenon were body image concerns and trying to lose weight as those who perceived themselves to be overweight tended to skip breakfast compared to their counterparts. Meal skipping behaviors, particularly breakfast skipping may affect adolescents' nutritional status, cognitive performance and quality of life, whereby female adolescents who omitted meals, particularly breakfast and lunch, were more likely to have unhealthy food choices and the poorest nutrient intake (Sjoberg *et al*., 2003). Indeed, meal skipping has been reported as one of the most common weight-control practices (Felts *et al*., 1996).

The present findings reveal that meal skipping behaviors were found to be associated with ethnicity, body weight status and the presence of eating companions, but no differences were found with living arrangement, age, household members, parent's total year of schooling, parental monthly income. In other words, those who usually skipped meals were likely to eat alone ($Chi^2 = 16.933$, $p < 0.05$), overweight ($Chi^2 = 15.943$, $p < 0.05$) and were Malays ($Chi^2 = 33.827$, $p < 0.05$). Previous studies had also identified ethnicity, body weight status and eating companions as factors associated with meal skipping behaviors including omission of breakfast (Pon *et al*., 2004; Moy *et al*., 2006; Albertson *et al*., 2007; Neumark-Sztainer *et al*., 2007; Boutelle *et al*., 2002). For instance, overweight adolescents were more likely to skip one or more meals

Table 4: Distribution of participants by location and frequency of eating away from home (n=407)

		Participant (%)
Eat at hawker centers, coffee shops or other food stalls	Never/ Less than once a month	43 (10.6)
	1 -3 times a month	168 (41.3)
	Once a week	85 (20.9)
	2-3 days a week	72 (17.7)
	4-6 days a week	31 (7.6)
	Everyday	8 (2.0)
Eat at western fast food restaurants	Never/ Less than once a month	123 (30.2)
	1 -3 times a month	222 (54.5)
	Once a week	40 (9.8)
	2-3 days a week	19 (4.7)
	4-6 days a week	3 (0.7)
	Everyday	0 (0.0)

Table 5: Distribution of participants by dietary supplement consumption

		Participant (%)
Intake of dietary supplements	Yes	128 (31.4)
	No	279 (68.6)
	Total	407 (100.0)
Sources of advice on dietary supplement consumption	Parents	109 (85.2)
	Other family members	9 (7.0)
	Peers	1 (0.8)
	Physicians	4 (3.1)
	Own decision	5 (3.9)
	Total	128 (100.0)

Table 6: Distribution of participants by types of dietary practice (n=407)

	Participants (%)
1. Eat less high fat and high sugar foods	27 (6.6)
2. Eat less high fat, high sugar and red meat foods	37 (9.1)
3. Eat less high fat foods	37 (9.1)
4. Eat according to a specific weight loss diet menu	19 (4.7)
5. No special diet menu, but eat less to lose weight	136 (33.4)
6. Not choosy on types of food and eat any food available	143 (35.1)
7. Others	8 (2.0)

Table 7: Associations between ethnicity, living arrangement, body weight status, eating companions and meal skipping behaviors (n=407)

		Never skip any meals n(%)	Skipped at least one meal n(%)	Skipped all three meals daily n(%)
Ethnicity	Malay	72 (27.1)	151 (56.8)	43 (16.2)
	Chinese	59 (51.3)	52 (45.2)	4 (3.5)
	Indian	15 (57.7)	11 (42.3)	0 (0.0)
		$Chi^2 = 33.827$, $p < 0.05$		
Living arrangement	Staying with family	124 (36.8)	180 (53.4)	33 (9.8)
	Staying in school hostel	22 (31.4)	34 (48.6)	14 (20.0)
		$Chi^2 = 5.954$, $p = 0.051$		
Body weight status	Underweight	11 (45.8)	12 (50.0)	1 (4.2)
	Normal-weight	116 (37.8)	163 (53.1)	28 (9.1)
	Overweight	19 (25.0)	39 (51.3)	18 (23.7)
		$Chi^2 = 15.943$, $p < 0.05$		
Eating companions	Family	121 (38.7)	165 (52.7)	27 (8.6)
	Peer	21 (33.3)	30 (47.6)	12 (19.0)
	Alone	4 (12.9)	19 (61.3)	8 (25.8)
		$Chi^2 = 16.933$, $p < 0.05$		

a day, particularly breakfast in comparison to nonoverweight counterparts (Pon *et al*., 2004; Boutelle *et al*., 2002). Besides body mass index, age, sex and nutritional supplements consumption were found to be associated with skipping of breakfast (Moy *et al*., 2006). Moreover, dieting predicted decreased breakfast consumption, while decreased breakfast consumption was associated with increased body mass index (Neumark-Sztainer *et al*., 2007). Similarly, breakfast skipping was found to increase over the transition from adolescence to adulthood and this has been shown to lead to weight gain from adolescence to adulthood (Niemeier *et al*., 2006). Ethnicity was associated with breakfast eating (Zullig *et al*., 2006; Videon and Manning,

2003), but studies in Malaysia are limited. Yet, the current study found that Malay adolescent girls were more likely than their Chinese and Indian counterparts to skip meals, particularly breakfast. The importance of family meals has been increasingly studied recently (Videon and Manning, 2003; Stang *et al*., 2007; Cason, 2006; Neumark-Sztainer *et al*., 2003) and the present findings showed that participants who had meals with their family members, were less likely to skip meals in comparison to those who ate with peers or ate alone. Although this study did not examine the frequency of family meals, having meals with family members more frequently has been linked to a healthier food intake, including fruits, vegetables, grains and calcium-rich foods (Videon and Manning, 2003; Neumark-Sztainer *et al*., 2003). Videon and Manning (2003) also reported that participants who ate dinner with their parents were less likely to skip breakfast.

Adolescents are increasingly more likely to graze food rather than consume proper meals (Liu *et al*., 2006) and the in-between meals contributed to the major part of energy intake, of which about half of the energy intake in-between meals was from snack foods (Sjoberg *et al*., 2003). This study found that 51.4% of the participants snacked between meals daily whereby 43.5% snacked between breakfast and lunchtime. Since most of the participants in the morning school session skipped breakfast daily, they were more likely to snack during school recess time and this would be a suitable time for them to restore their energy and nutrient needs. A number of local studies also found that snacking is a popular eating behavior among Malaysian adolescents (Moy *et al*., 2006; Foo *et al*., 2006; Lew and Barlow, 2005). As for the present study, about one in four participants (26.9%) chose fruits as snack and this is consistent with the study by Liu *et al*. (2006) who found that a large portion of snacks consumed by the Chinese children and adolescents were fruits. However, it differs from finding from other local studies, which showed that *keropok* (local chips made of shrimp/fish and rice flour), biscuits, bread and some local cakes (*kuih-muih*) were the major snacks among Malaysian adolescents (Moy *et al*., 2006; Foo *et al*., 2006). However, fruits were popular among older female adolescents than their younger counterparts (Foo *et al*., 2006).

On the other hand, eating away from home, such as eating at hawker centers, coffee shops, food stalls and even western fast food restaurants was less common, which was only about one to three times a month for about half of the adolescent girls in this study. In comparison with Singaporean adolescents' dietary practices, Malaysian adolescents were more likely to have meals at home, while Singaporean adolescents were more likely to have meals away from home, which includes western fast food restaurants (Lew and Barlow, 2005). It is worrisome that about one in ten of the adolescent girls in this study ate at western fast food restaurants, which has been associated with weight gain from adolescence to adulthood (Niemeier *et al*., 2006). Another finding that should be highlighted in the present study is the dietary practices described by the participants. In particular, about one in three of the adolescent girls ate less to lose weight and some even ate according to a specific weight loss diet despite the fact that only 18.7% of the participants were overweight and a majority (75.4%) was normal-weight. This indicated that normal-weight adolescent girls were also involved in weight-loss practices and body image disturbances may be a possible factor contributing to these dietary patterns.

Several limitations in the present study should be taken into consideration. As the present study involved only female adolescents, the current results are not generalizable to male adolescents. Furthermore, the findings are limited by the sampling location, whereby all participants were selected from secondary schools in a selected district in Malaysia. It is suggested that the scope of future studies should be broadened to include male adolescents and to be conducted in many other districts throughout the country. Additionally, the present study included only some popular eating behaviors of female adolescents, such as meal skipping, snacking and eating away from home. The study can be further improved by including nutrient intake, food choices and risk of eating disorders. Based on the current findings, determination of the association between eating behaviors and body image of female adolescents may provide a better understanding of eating behaviors of adolescent girls.

Conclusion: In conclusion, this study revealed that meal skipping, particularly breakfast, snacking and practicing various weight loss dietary behaviors were some of the unhealthy eating behaviors depicted by Malaysian adolescent girls. As adolescents are tomorrow's adults, promotion of healthy eating that stresses on the importance of regular intakes of main meals is crucial for their current and future health and well-being.

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