DIETARY HABIT AND LIFESTYLE PRACTICES AMONG NORMAL AND OVERWEIGHT/OBESE IIUM KUANTAN STUDENTS: A COMPARATIVE STUDY

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ABSTRACT

Introduction: The prevalence of overweight and obesity has been increasing throughout the year among all age groups including young adult. Young adults who recently entered university life are prone to become overweight /obese due to their unhealthy eating behaviour and lifestyle practices. Hence, this study was conducted to estimate the prevalence of overweight/obesity and determine the association of eating habits and lifestyle practices between BMI status of students in International Islamic University Malaysia (IIUM) Kuantan campus. **Methods:** A total of 120 students from IIUM Kuantan Campus participated in this study. Their weight and height were measured, and self-reported questionnaires adapted from a previous study on eating habits, lifestyle practices and knowledge of food pyramid were collected (Yun, A, David, & Quee, 2018). Then, the data was compared between normal and overweight / obese participants. **Results:** The prevalence of overweight and obesity among IIUM Kuantan students was 42.5% (51 out of 120) (95% CI : 24.2%, 26.1%). Most participants reported to snacks in between meals, had frequent intake of vegetables and fried foods, and low intake of fruits in their diet. However, it failed to prove significant association between these dietary practices with BMI status. The preferences of having cheaper food was significantly higher in overweight / obese ($p=0.001$). Less than half of the participants (41.7%) exercised every day or frequently. The result showed significant association between exercise and BMI status ($p = 0.049$), whereby a higher proportion of normal weight population (28.3%) exercised every day or frequently **Conclusions:** There is high prevalence of overweight and obesity noticeable among the IIUM Kuantan students and most of them had poor dietary habit and unhealthy lifestyle practices. For future research, formulating suitable intervention to improve lifestyle behaviour among university students is highly needed.

KEYWORDS: Dietary habit, Lifestyle practices, Overweight/Obesity, Young Adults, University Students

INTRODUCTION

Recently, obesity ranked as the major public health issue throughout the world. The prevalence of obesity has been noticeably worsening over the globe as it showed an increment of the prevalence from 4.8% to 9.8% among men and 7.9% to 13.8% among women from year 1980 to 2010 (Rezali, Chin, Nisak, & Yusof, 2012). Furthermore, Rezali et al. (2012) mentioned that 70% to 80% of obese adolescents remain in an obese state when entering the adulthood phase. Therefore, this unhealthy weight increment from adolescent to adulthood is concerning as it may make them vulnerable to non-communicable diseases such as diabetes, cardiovascular diseases and high blood pressure.

Several factors such as personal, society and environment have been remarked as the prime cause of obesity (Centre for Disease Control and Prevention, 2017). Personal factors such as behaviour may affect a person's dietary pattern, and physical activity. The external factors such as environment and society that we live in may also influence our daily lives. Eating habits and lifestyle practices may cause obesity or overweight. Unhealthy dietary habits in terms of skipping meals, irregular mealtimes, increase consumption of fast food, soft drink and occasionally snack in between the meals are commonly reported among the young adults (Boo et al., 2015; Lew & Barlow, 2005). Besides, bad relationships with friends and poor academic performance are the main sources of stress among students (Abdul, Kutty, Ru, Hwang, & Chiang, 2015; Lew & Barlow, 2005). It may also give an impact on the eating behaviour, snacking and lifestyle practices of these young adults.

Young adults started to be responsible to their lifestyle practices as they entered the university life. They are also predisposed to negative adjustment of eating behaviours in terms of fruits and vegetable consumption, mealtimes and frequency of food intake as they entered the university (Lupi et al., 2015). This adjustment is impactful to their weight and health conditions. Hence, this study was warranted mainly to identify the pattern of dietary habits and lifestyle practices between normal and overweight/obese IIUM Kuantan students.

METHODS

Subjects

A total of 120 students from IIUM Kuantan Campus had participated in this study. They were recruited in this study if they aged between 19 and 24 years old attending six Kulliyyahs in IIUM Kuantan. Those who were underweight and having chronic illnesses were excluded from this study. The study protocol was approved by the Kulliyyah Postgraduate and Research Committee (KPGRC) and the International Islamic University Malaysia Research Ethical Committee (*IREC 2020 KAHS/NS1*).

Anthropometry and BMI classification

The weight and height of the participants were recorded. Participants were weighed using electronic weighing scale (Brand: TANITA). Meanwhile, their height was collected using a stadiometer (Brand: SECA). Then, the BMI calculation was calculated using the

formula of weight (kg) / height squared (m^2). The classification of BMI was based on the BMI cut-off point from the WHO which is stated in Table 1.

Table 1. BMI cut-off points for body weight classification (WHO, 1998)

BMI (kg/m^2)	NUTRITIONAL STATUS
Below 18.5	Underweight
18.5-24.9	Normal weight
25.0-29.9	Overweight / Pre-obesity
30.0-34.9	Obesity class I
35.0-39.9	Obesity class II
Above 40	Obesity class III

Dietary habit and lifestyle practices questionnaires

Dietary habit and lifestyle practice questionnaires are a self-report measures that assess the eating pattern and lifestyle practices of young adults (Yun et al., 2018). This questionnaire has been proven valid and reliable to be used among the population of university students (Yun et al., 2018). It consists of three domains with twenty-five items which include dietary habit, lifestyle practices and knowledge or views on dieting.

Each of the questions was allocated with 2 or 3 choices that were descriptively analysed. For example, eat meals regularly on daily basis (yes or no) and number of regular meals (less than 3 meals per day, 3 meals per day and more than 3 meals per day). The results were obtained by referring to the percentage of each items according to normal and overweight/obese students.

Statistical analysis

The data collected from the questionnaires were entered and analyzed using the IBM SPSS software (Version 21). The statistical analysis included the descriptive test to identify the prevalence of overweight and obesity among IIUM Kuantan students and chi-square test to determine the association of dietary habit, lifestyle practices and knowledge on dieting between normal and overweight/obese. Significant values were at $p<0.05$.

RESULTS

Characteristics of the Participants

A total of 120 students aged between 19 and 25 years old from IIUM Kuantan campus participated in this study, of which 55 (45.8%) were male and 65 (54.2%) were female. Mean age of the participants was 21.5 years old (SD = 1.33). Table 2 indicates the sociodemographic data of the participants.

Table 2. Sociodemographic characteristics of participants (n = 120)

Characteristics	N (%)
Gender	

Male	55 (45.8)
Female	65 (54.2)
Faculty	
KAHS	53 (44.2)
KOS	31 (25.8)
KOP	12 (10.0)
KOM	19 (15.8)
KON	2 (1.7)
KOD	3 (2.5)
Year of study	
Year 1	38 (31.7)
Year 2	32 (26.7)
Year 3	50 (41.7)
Financial status	
JPA	34 (28.3)
PTPTN	32 (26.7)
Self-sponsored	34 (28.3)
Others	20 (16.7)

Prevalence of Overweight / Obesity among IIUM Kuantan Campus Students

The mean BMI was 25.2 kg/m^2 (SD = 5.16). According to the WHO classification of BMI, 57.5% of the students was categorized as normal weight (n = 69). Meanwhile for the overweight / obesity students was 42.5% (51 out of 120) (95% CI : 24.2%, 26.1%).

According to Table 3, 25 overweight / obese students (20.8%) were male whereas 26 (21.7%) were female students. The results showed that female students (21.7%) have higher percentage of overweight / obesity compared to male (20.8%). However, there was no significant association between the BMI status among both genders (p = 0.547).

Table 3. BMI status according to gender among the participants

WHO International BMI Classifications					
BMI (kg/m2)	BMI category	Male N = 55 (%) Mean (SD)	Female N = 65 (%) Mean (SD)	Total N = 120 (%) Mean (SD)	p-value
	All	25.76 (5.74)	24.65 (4.59)	25.16 (5.16)	0.547
18.5-24.9	Normal	30 (54.5)	39 (60.0)	69 (57.5)	
≥ 25	Overweight / Obese	25 (20.8)	26 (21.7)	51 (42.5)	

Dietary Habit of the Participants

Out of 120 participants, 105 (87.5%) reported eating meals on regular basis with 45.8% (n=55) consume breakfast daily. Majority (90.0%, n=108) of the participants consumed less than three meals per day, meanwhile only 12 (10.0%) of them consumed three and more meals per day. In addition, most of the participants consumed vegetables and fried foods

every day or frequently for about 3 to 5 times per week (76.7% and 83.3%, respectively). Sixty-four (53.3%) participants consume fruits rarely in their diet.

Table 4 compares dietary habits between BMI categories. No significant associations between the dietary habit variables and BMI status ($p > 0.05$).

Table 4. Association between dietary habits and BMI status of the participants.

Variables	n = 120 (%)	Normal n = 69 (%)	Overweight/ obese n = 51 (%)	X^2 statistics (df)	p-value
Eat meals on regularly on daily basis					
Yes	105 (87.5)	60 (50.0)	45 (37.5)	0.044 (1)	0.834
No	15 (12.5)	9 (7.5)	6 (5.0)		
Number of regular meals					
< 3 meals/day	108 (90.0)	63 (52.5)	45 (37.5)	0.307 (1)	0.580
≥ 3 meals/day	12 (10.0)	6 (5.0)	6 (5.0)		
Eat breakfast every day					
Yes	55 (45.8)	32 (26.7)	23 (19.2)	0.019 (1)	0.889
No	65 (54.2)	37 (30.8)	28 (23.3)		
Snack in between regular meals					
Yes	78 (65.0)	46 (38.3)	32 (26.7)	0.198 (1)	0.656
No	42 (35.0)	23 (19.2)	19 (15.8)		
How often do you eat vegetables?					
Everyday & 3-5 times/week	92 (76.7)	54 (45.0)	38 (31.7)	0.231 (1)	0.631
Rarely	28 (23.3)	15 (12.5)	13 (10.8)		
How often do you eat fruits?					
Everyday & 3-5 times/week	56 (46.7)	32 (26.7)	24 (20.0)	0.005 (1)	0.941
Rarely	64 (53.3)	37 (30.8)	27 (22.5)		
How often do you eat fried food?					
Everyday & 3-5 times/week	100 (83.3)	58 (48.3)	42 (35.0)	0.061 (1)	0.804
Rarely	20 (16.7)	11 (9.2)	9 (7.5)		
Daily water intake					
< 2L	71 (59.2)	39 (32.5)	32 (26.7)	0.470 (1)	0.493
> 2L	49 (40.8)	30 (25.0)	19 (15.8)		

Lifestyle Practices of the Participants

Most of the participants (95.0%) prepare or cook their meals less frequently and very few (18.3%) ate a balanced meal which consists of all food groups such as rice, meat, vegetables, and fruits. As much as 97.5% (115 out of 120) of all participants usually eat or buy lunch at the campus cafeteria or restaurants in town on typical weekdays. Out of 120

participants, 85 (70.8%) reported that they prefer to choose food that are cheaper rather than healthy or nutritious food. This was significantly (p = 0.001) higher among overweight or obese population (36.7%).

As for physical activity, 74.2% (89 out of 120) walked around the campus when going to classes or for an evening walk. However, for the frequency of weekly exercise, fifty participants (41.7%) exercise every day or frequently, while others rarely or less frequently to exercise (58.3%). This practice was significantly (p = 0.049) associated with the BMI status, where a higher proportion of normal weight population (28.3%) exercise every day or frequently (Table 5).

Table 5. Association between lifestyle practices and BMI status of the participants.

Variables	n = 120 (%)	Normal n = 69 (%)	Overweight /obese n = 51 (%)	X^2 statistics (df)	p-value
Do you bring lunch to campus?					
Yes	11 (9.2)	9 (7.5)	2 (1.7)	2.931 (1)	0.114
No	109 (90.8)	60 (50.0)	49 (40.8)		
Where do you get lunch on typical weekday?					
I don't eat my lunch	3 (2.5)	2 (1.7)	1 (0.8)	0.123 (1)	1.000
I eat/buy lunch at campus cafeteria or restaurants in town	115 (97.5)	65 (55.1)	50 (42.4)		
Do you prepare/cook your own meals?	114 (95.0)	67 (55.8)	47 (39.2)	1.509 (1)	0.400
Less frequent	6 (5.0)	2 (1.7)	4 (3.3)		
Always/ frequent					
What do you usually eat when you had to prepare/cook your own meals?					
Rice, meat, vegetables and fruits	22 (18.3)	12 (10.0)	10 (8.3)	4.160 (3)	0.245
Rice and meat/vegetables	46 (38.3)	29 (24.2)	17 (14.2)		
Meat/vegetables/fruits only	8 (6.7)	2 (1.7)	6 (5.0)		
Instant noodles/ any noodles	44 (36.7)	26 (21.7)	18 (15.0)		
How often do you eat out in restaurants?					
< 3 times per week	84 (70.0)	48 (40.0)	36 (30.0)	0.015 (1)	0.904
3 or more times per weeks	36 (30.0)	21 (17.5)	15 (12.5)		
How often do you eat fast foods (Mcd, KFC, Burger King, Dominos)					
< 3 times per week	115 (95.8)	66 (55.0)	49 (40.8)	0.013 (1)	1.000
3 or more times per weeks	5 (4.2)	3 (2.5)	2 (1.7)		
How often do you visit cafes (Starbucks, Coffee Bean)?					
< 3 times per week	116 (96.7)	66 (55.0)	50 (41.7)	0.519 (1)	0.636

3 or more times per weeks	4 (3.3)	3 (2.5)	1 (0.8)		
How often do you order food takeaways/ deliveries?					
< 3 times per week	111 (92.5)	64 (53.3)	47 (39.2)	0.015 (1)	1.000
3 or more times per week	9 (7.5)	5 (4.2)	4 (3.3)		
Do you choose food that cost less over healthy/nutritious food or the other way around?					
Healthy/nutritious food	35 (29.2)	28 (23.3)	7 (5.8)	10.236	0.001
Food that cost less	85 (70.8)	41 (34.2)	44 (36.7)	(1)	
Do you eat more when feeling stressed?					
Yes	92 (76.7)	52 (43.3)	40 (33.3)	0.154 (1)	0.694
No	28 (23.3)	17 (14.2)	11 (9.2)		
How often do you exercise?					
Rarely/ Less frequent	70 (58.3)	35 (29.2)	35 (29.2)	3.867 (1)	0.049
Everyday/ Frequently	50 (41.7)	34 (28.3)	16 (13.3)		
Do you walk around campus?					
Yes	89 (74.2)	51 (42.5)	38 (31.7)	0.005 (1)	0.941
No	31 (25.8)	18 (15.0)	13 (10.8)		

*Chi-square statistical analysis with significance at $p < 0.05$

Dieting, Balanced Nutrition and Self-body Image

Majority of participants were well-informed about the food pyramid (99.2%) and the concept of balanced nutrition (95.8%) which is a diet including meat, vegetables, and other variety of foods (Table 6). Out of 120 participants, 86 (71.7%) of the participants had tried dieting (p=0.001). The main reason for dieting (42.5%) was to be strong and healthy.

Table 6. Knowledge and views on dieting, balanced nutrition and self-body image

Variables	n = 120 (%)	Normal n = 69 (%)	Overweight /obese n = 51 (%)	X^2 statistics (df)	p-value
Do you know the "Food pyramid"?					
Yes	118 (99.2)	67 (56.3)	51 (42.9)	0.756 (1)	1.000
No	1 (0.8)	1 (0.8)	0 (0.0)		
What is balanced nutrition?					
A diet consisting mainly fruits and vegetables	4 (3.3)	3 (2.5)	1 (0.8)	1.855 (2)	0.396
A diet consisting of meat, vegetables, and other variety of foods	115 (95.8)	66 (55.0)	49 (40.8)		
Others	1 (0.8)	0 (0.0)	1 (0.8)		
Are you concerned about your body size and physical appearance?					
Yes	109 (90.8)	61 (50.8)	48 (40.0)	1.149 (1)	0.351
No	11 (9.2)	8 (6.7)	3 (2.5)		
Have you tried dieting before?					
Yes	86 (71.7)	39 (32.5)	47 (39.2)	18.339 (1)	0.001
No	34 (28.3)	30 (25.0)	4 (3.3)		
Reasons for dieting?					
To be strong and healthy	51 (42.5)	36 (30.0)	15 (12.5)	6.855 (3)	0.077
To be slim/thin and confident	32 (26.7)	14 (11.7)	18 (15.0)		
To look beautiful in clothes	9 (7.5)	4 (3.3)	5 (4.2)		
To maintain my weight	28 (23.3)	15 (12.5)	13 (10.8)		

DISCUSSION

This study found that 42.5% of students in IIUM Kuantan were overweight or obese. Lifestyle factors includes preferences of cheaper food compared to healthy or nutritious food and frequency of exercise were found to be significantly associated with the BMI status.

In regards to the overweight and obese prevalence, when compared to the National Health and Morbidity Survey 2019, the current percentage was slightly lower than the obesity rate among Malaysian adults which was 19.7% (National Institution of Health & Ministry of Health Malaysia, 2019). However, the prevalence of overweight or obesity in this study were slightly higher compared to other studies conducted in Malaysia among university students and young adults (Rezali et al., 2012; Boo et al., 2015; Tee et al., 2018).

In addition, the prevalence of overweight / obesity was higher among female students compared to males. In contrast, a study conducted in the UniKL Royal College of Medicine Perak (UniKL RCMP), where the male participants were more overweight or obese with higher percentage of 21% compared to female (10.7%) (Sugathan & Bagh, 2014). This may be due to the unhealthier eating behavior and sedentary lifestyle that has been practiced by male populations. However, this study failed to show significant differences between the prevalence of overweight/obesity among genders.

Eating meals regularly with the intake of breakfast on daily basis is considered as healthy eating habit. The results from this study showed that majority of participants eat meals regularly but only 45.8% consume breakfast daily. This result is similar to the finding from a study conducted by Abdul and collegues (2015) which is 43.0%. The researchers found that medical students tend to consume breakfast rather than non-medical students (Abdul et al., 2015). Thus, eating breakfast regularly was very important to ensure adequate energy intake for the medical students to overcome fatigue due to their busy learning schedule. Anuar and Masuri (2011) emphasized that irregular mealtime was associated with obesity and overeating was usually related to skipping breakfast. Therefore, the habit of having breakfast every day and snacking between meals towards the BMI status were unclear.

In this study, the results show that the daily consumption of fruits was less than half and most of participants frequently eat vegetables and fried foods. However, there was no association between the daily consumption of fruit, vegetables, and fried foods with BMI status. A study conducted by Anwar and collegues (2015) among the undergraduate students in UiTM Puncak Alam, Selangor, Malaysia found that less than half of the participants consumed vegetables daily and only 14.8% of participants reported eating fruits every day. However, more than half of the participants consumed fried food every day which indicates an unhealthy eating behavior among the students.

Nowadays, the occurrence of global nutrition transition is arising whereby the diets are changing from home cooked foods to outdoor processed food that are high in fats, salt and sugar (Popkin, Adair, & Ng, 2011). In this study, majority of participants (97.5%) prefer to eat or buy lunch at the campus cafeteria or restaurants in town which indicate their dependency towards outside foods. However, it failed to prove significant association

between preferences of eating lunch with the BMI status. In addition, most of them were more likely to consume instant noodle when they need to cook their meals, while a few would eat a balanced meal which consist of rice, meat, fruits and vegetables. This may be due to several limitation that has been encountered by the students pertaining to making their own meals such as lack of knowledge on preparing healthier food, restriction of time or money and lack of utensils or accommodation to make their own food in the student's residency.

More than half of participants favored cheaper foods compared to healthy or nutritious food, this practice showed significant association between the BMI status ($p = 0.001$), where higher proportion of overweight/obese (36.7%) prefer cheaper foods. Students usually search for foods that are quick, convenient, and cheaper which are often considered as food that contain higher fat content, calorie-dense foods that are prepackaged or fast food which are easily found and available at the university's food court and vending machines (Lacaille, Dauner, Krambeer, & Pedersen, 2015). These types of food are closely related to overweight and obesity.

Physical activity is a vital aspect in maintaining ideal BMI status. In addition, people who are physically inactive and practice poor diet has higher chances of being overweight and obese (Anuar & Masuri, 2011). In this study, more than half of participants walk around the campus but only 41.7% of participants frequently do exercise. An association between frequency of exercise and BMI status was identified where higher percentage of normal weight participants were engaged with frequent exercise ($p = 0.049$).

The potential weaknesses of this study rely on its study design which was non-randomized. In addition, this study only involves one university, hence the results may not represent the whole population for young adults.

CONCLUSION

In conclusion, this study showed that the prevalence of overweight/obesity among the IIUM Kuantan Campus students is high. Lifestyle practices particularly preferences for cheaper food as well as physical activity are significant factors affecting their BMI status. Based on the findings, it is time for future researchers to propose suitable intervention focusing on heathy lifestyle among students in the universities or other tertiary education institution in Malaysia.

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