

## Knowledge, Attitude, and Practice of Healthy Eating Among the 1st and 2<sup>nd</sup> Year Students of Universiti Malaysia Sarawak (UNIMAS)

Phyu Phyu Aung<sup>1</sup>, Chan Siew Foun<sup>2</sup>, Khairunnisa Binti Azman<sup>2</sup>, Nurul Ain Binti Zulkifeli<sup>2</sup>, and  
Yong Siew Hong<sup>2</sup>

<sup>1</sup> School of Medicine, UCSI University, Kuala Lumpur, Malaysia

<sup>2</sup> Fresh Graduates, Faculty of Medicine and Health Sciences, UNIMAS

**Abstract.** A cross-sectional university-based study was conducted from September 2008 to March 2009 with the aim of investigating knowledge, attitude, and practice of healthy eating of the UNIMAS students and to find the influencing factors on healthy eating practice of the students. A total of 358 students from Faculty of Medicine and Health Sciences (FMHS) and main campus (MC) were included. A structured questionnaire, which consisted of questions on personal data, knowledge, attitude, and practice of healthy eating, was employed as a data collection tool. Knowledge on healthy eating of the students was not satisfactory. Only one third of the students knew the recommended daily serving size of fruits, six basic nutrients could be listed by 16.8% and only 2.2% could mention food groups to be taken as per Food Guide Pyramid. Attitude of the respondents towards given statements on healthy eating was satisfactory as a whole. Practice of taking unhealthy drinks and fried foods was still prevailing among the students. Most of the students had the habit of taking milk although the frequency and amount of consumption are less than the recommendation. None of the variables (gender, faculty studying, parental occupation and education, family size, and knowledge score) tested were found to be significantly associated with healthy eating practice of the respondents. Results of the present study indicate that knowledge, attitude, and practice of the students on healthy eating should be improved and that existing health and nutrition education to the students is not sufficient to make them practice healthily.

**Key Words:** Healthy, Eating, UNIMAS, Students

### 1. Introduction

Rapid changes in diets and lifestyles that have occurred with industrialization, urbanization, economic development and market globalization have accelerated over the past decade. This is having a significant impact on the health and nutritional status of populations, particularly in developing countries and in countries in transition. Unhealthy dietary practice is an independent risk factor for many chronic diseases like - obesity, diabetes mellitus, cardiovascular disease (CVD), hypertension and stroke, and some types of cancer (Food and Agriculture Organization, 1990). Diabetes is a growing concern in Malaysia. The number of admission from diabetes showed an increase of 56% over a span of 10 years. Mortality due to diabetic had also increased from 254 deaths in 1991 to 380 deaths in 2001 which was an increase of 50%. (Ooyub *et al.* 2004). In Malaysia, the prevalence for hypertension is high as well. The prevalence of hypertension for subjects aged 15 years was 27.8% whereas the prevalence of hypertension amongst those aged 30 years had increased from 32.9% in 1996 to 40.5% in 2004 (Rampal L *et al.* 2008).

Experiences from many programmes showed that adoption of new behavior or modification of the existing behavior needs much input like knowledge, awareness of the matter, attitude, and perception. Most authors found that whilst behaviors are unlikely to change without an increase in knowledge, knowledge alone is insufficient to bring about significant improvement in preventive behavior (Wardle *et al.* 2000). Knowledge can however, influence health-related behaviors when mediated by attitudes, belief, self-efficacy, and an effective call to action (Green *et al.* 1999, Kanz *et al.* 1984).

Most of the students nowadays prefer to take fast foods, fried foods, soft drinks etc. They are busy with their work and life and do not have time to pay attention for their health. This situation can be seen clearly among Universiti Malaysia Sarawak (UNIMAS) students despite the fact that there is a healthy eating component in our medical and nursing curriculum. Presently no research study has been conducted on the knowledge, attitude, and practice (KAP) of healthy eating among the UNIMAS students and thus has prompted us to carry out KAP study on healthy eating of UNIMAS' student. The results of our study would provide the evidence-based data for the effective curriculum development on healthy eating, for construction of health education materials for the prevention of NCDs in Malaysia, and most of all, for the provision of nutrition education to the students for adoption of healthy eating among the UNIMAS' students.

## 2. Methodology

A cross-sectional university-based study on knowledge, attitude, and practice of healthy eating was conducted on the university students studying in the Universiti Malaysia Sarawak during the period from September 2008 to March 2009.

Multistage sampling was employed to recruit the subjects. From the eight Faculties of UNIMAS, three faculties were chosen. Faculty of Medicine and Health Sciences (FMHS) was conveniently chosen as the investigators were staff of Faculty of Medicine & Health Sciences (FMHS) and medical students. Two other Faculties (Faculty of Engineering and Faculty of Computer Science and Information Technology) were randomly chosen to be representative for UNIMAS. Only Year 1 and 2 students were recruited as in FMHS, year 3 and year 4 students were not out-stationed from the Faculty. Since there are only up to Year 4 in the other faculties, Year 5 students from FMHS were excluded from the study to be comparable among the Faculties. From the student's lists, a total of 360 students were expected to be recruited, but the investigators were able to get the only (358) number of students. Sample size ( $n$ ) was calculated using the formula  $n = (z^2 \times pq) / d^2$ , where  $z = 1.9$  for 95% confidence and estimated prevalence of consumption of unhealthy diets among the university students is assumed to be 65% (taken the data from the study by Chin and Mohd Nasir (2009) and margin of error was taken as 5%. The required sample size would be 180 each from FMHS and main campus. The total would be 360 students.

The data was collected using the structured questionnaire form. The questionnaire consisted of four parts which are the student's biodata, knowledge, attitude and practice regarding healthy eating. Pre-testing of the questionnaires was carried out in October 2008 among twenty students from year 4 medical students of Faculty of Medicine and Health Sciences. Necessary modifications were made to the questionnaire as per findings from the pre-testing. Students were explained about the questionnaire form before being answered (self-administered).

The data entry and analysis were done by employing SPSS version 17.0. The results of the knowledge, attitude, and practice of healthy eating among the students were descriptively presented and scores were given. Comparison between FMHS and MC were done employing Chi-square tests. Multivariate analysis was employed to explore the influence of core variables on healthy eating practice of the respondents.

## 3. Results

Knowledge of healthy eating among the study population is shown in table 1. Only the percentages of the respondents who could either completely or partially answered correctly for the given question were included in the table for simplicity sake. The rest of the students not mentioned in the table were those who answered incorrectly. Except for the knowledge on recommended amount of daily fruit intake and healthy ways of cooking, FMHS students were found to have better knowledge on the healthy eating than those from the main campus. Even then, knowledge of healthy eating among the FMHS students was not reached to the satisfactory level.

Attitude of the respondents towards given statements on healthy eating was satisfactory as a whole, except for one statement on consumption of fruits and vegetables, statement 6.

Practice of healthy eating among the respondents was shown in table (3). Higher percent of the students from main campus (24 vs. 10%) consumed high fat meat more than 3 times a week. On the other hand higher

percentage of the FMHS students consumed high fat meat sparingly (42.4 vs. 32.4 %). Higher percentage of the students from main campus took fried foods more than 3 times per week than those from FMHS, while the reverse is true for consumption of fried foods sparingly. Both fruits and vegetables were not adequately consumed by the respondents. Lower percentage of respondent from FMHS takes vegetables once a week (2.8% vs. 8.4%). Although majority of the study population had the habit of taking milk, only small percentage of them drink milk every day (daily milk intake of 2 cups a day is recommended in healthy eating).

Table 1. Knowledge of Healthy Eating among the respondents

Q	Knowledge Items Tested	No. (%) of respondents answered correctly		No. (%) of respondents answered partially correct	
		FMHS	MC	FMHS	MC
1	Identification of healthy foods	121(67.6)	109(60.8)	57(31.8)	65(36.8)
2	Composition of healthy diet	169(94.4)	161(90.0)	0	0
3	Identification of good source of fat	53(29.6)	30(16.8)	98(54.8)	88(49.2)
4	Meaning of organic foods	16(9.0)	16(9.0)	136(76.0)	144(80.4)
5	Recommended daily consumption of fruits	56(31.2)	70(39.2)	0	0
6	Healthy way of cooking	3(1.7)	8(4.5)	176(98.3)	169(94.4)
7	Importance of dietary fiber consumption	17(9.5)	12(6.8)	147(82.0)	92(51.4)
8	Identification of best source of vitamin c	140(78.2)	117(65.4)	0	0
9	Identification of good fat	21(11.8)	5(2.8)	147(82.2)	144(80.4)
10	Identification of good source of vitamin A	3(1.6)	2(1.2)	175(97.8)	172(96.0)
11	Listing basic nutrients for human	30(16.8)	5(2.8)	138(77.0)	174(76.0)
12	Listing food groups to be taken for healthy eating	4(2.2)	0.0	101(56.4)	102(57.2)
13	Listing two calcium rich foods	117(65.4)	74(41.4)	57(31.8)	76(42.4)
14	Listing three iron rich foods	46(25.6)	10(5.6)	110(61.4)	102(57.0)

Table 2. Attitude towards healthy eating among the respondents

Q	Attitude Items	No (%) of Respondents with Positive Attitude		No (%) of Respondents with Neutral Attitude	No (%) of Respondents with Negative Attitude	
		A	SA		DA	SDA
1	Unhealthy diet is a very important risk factor for various diseases	100 (27.9 %)	225 (62.8 %)	27 (7.5 %)	2 (0.6 %)	4 (1.1 %)
2	Consumption of unhealthy diet in adolescents is a problem	32 (8.9 %)	16 (4.5 %)	83 (23.2 %)	124 (34.6 %)	103 (28.8 %)
3	It is good to be aware of the calorie content of foods that one's eat	188 (52.5 %)	98 (27.4 %)	63 (17.6 %)	6 (1.7 %)	3 (0.8 %)
4	A person should eat a lot when under stress	28 (7.8 %)	14 (3.9 %)	89 (24.9 %)	148 (41.3 %)	79 (22.1 %)
5	Reading the food labeling before buying the food product is a good practice	120 (33.5 %)	202 (56.4 %)	25 (7.0 %)	5 (1.4 %)	6 (1.7 %)
		No (%) of Respondents with Positive Attitude		No (%) of Respondents with Neutral Attitude	No (%) of Respondents with Negative Attitude	
		DA	SDA		A	SA
6	Adolescents should take fruits and vegetables only to prevent from being obese	65 (18.2 %)	51 (14.2 %)	88 (24.6 %)	118 (33.0 %)	36 (10.1 %)

A=Agree, SA=Strongly Agree, DA=Disagree, SDA=Strongly Disagree

Table 3. Healthy eating practice of the respondent

No (%) of respondents	<once/wk	1-2 times/wk	3-4 times/wk	5-6 times/wk	Everyday
High fat meat					
FMHS	76(42.5)	32(17.8)	36(20.2)	17(9.4)	18(10.0)
MC	58(32.4%)	29(16.2)	31(17.4)	18(10.0)	43(24.0)
Fried Foods					
FMHS	79(44.2)	35(19.6)	35(19.6)	10(5.6)	20(11.2)
MC	53(29.6)	32(17.8)	34(18.9)	22(12.2)	38(21.2)
Fruits					
FMHS	34(19.0)	56(31.2)	52(29.0)	9(5.0)	28(15.6)
MC	67(37.4)	54(30.2)	30(16.8)	8(4.4)	20(11.2)
Vegetables					
FMHS	5(2.8)	11(6.2)	21(11.8)	35(19.6)	107(59.8)
MC	15(8.4)	17(9.4)	36(20.2)	20(11.2)	91(50.8)
Soft Drinks					
FMHS	123(68.7)	26(14.5)	20(11.2)	1(0.6)	9(5.0)
MC	83(46.4)	48(26.8)	29(16.2)	11(6.2)	11(6.2)
Milk					
FMHS	32(17.9)	35(19.6)	41(23.0)	6(3.4)	21(11.8)
MC	41(23.0)	30(16.8)	21(11.8)	13(7.2)	12(6.8)

Table 4. Factors influencing practice of healthy eating, multiple regression (adolescents and adults)

Model	Beta	SE	t value	Sig
1 (Constant)	24.836	2.883	8.613	0.000
Gender	-0.110	0.517	-0.213	0.832
Faculty	0.237	0.406	0.583	0.560
Father's occupation	-0.146	0.312	0.469	0.639
Father's education	0.430	0.273	1.575	0.116
Mother's occupation	-0.318	0.490	-0.649	0.517
Mother's education	-0.232	0.322	-0.720	0.472
Family size	-.011	.117	-.091	0.927
Knowledge Score	0.023	0.052	0.451	0.652

Dependent Variable – Practice Score

A model with core demographic variables and knowledge score of this study showed that none of the interested variable is significantly associated with healthy diet practice score. Fathers' educational attainment is most strongly associated with their children's healthy eating practice, although, it is not statistically significant

#### 4. Discussion

This study, as in other studies (Parker et al., 1992; Helman, 1997), found that university students' nutritional knowledge is inadequate. Educational attainment of the respondents' parents were low, majority of them attaining only primary and secondary school level of education despite the fact that family plays a meaningful role in a child's academic performance and development (Cornell & Grossberg, 1987; Harris, Brady, & Herman, 1996).

Parental backgrounds of the students were comparable in some aspects as most of their fathers were engaged in the private companies and most of their mothers were housewives. For those who were working, most of them were involved in teaching profession. This finding could probably reflect the fact that parents who were in teaching profession had some association with sending their children to higher education. Significantly higher percent of the fathers and mothers of the students from FMHS had higher educational attainment than those from the Main Campus. The finding agrees with the study by Heath et al. where parents of the medical students were found to be more educated and higher income earners than the other higher education fields. (Heath et al, 2002). According to that study, parents of medical students surveyed were highly educated and from higher socioeconomic groups. Income was not included in our study as it is

difficult to get the correct information on the family income, if not impossible, and taking into consideration the time and other logistic constraints, we did not include income determinant.

Except for the knowledge on recommended amount of daily fruit intake and healthy ways of cooking, FMHS students were found to have better knowledge on the healthy eating than those from the main campus. This could be explained by the facts that students from the FMHS were more exposed to the information on healthy eating from various sources – lecture, reading materials, seminars etc in the Faculty. Nutrition and healthy eating is also their part of the curriculum in their Block 5 (Nutrition, metabolism, and endocrine) in Year 1 of their study. Even then, knowledge of healthy eating among the FMHS students was not reached to the satisfactory level. Low nutritional knowledge scores were also found for questions related to the recommended daily allowance of nutrients among the medical students and medical practitioners in the study by Khawla et al (2004).

Healthy eating is actually a very important and common topic and abundant information on it is available in various media and education materials. Ministry of Health, Malaysia has developed education materials and health messages and distributed them to all regions of Malaysia, including Sarawak. This finding of lack of knowledge in health and nutrition despite widespread health and nutrition education is not surprising and similar findings were observed in the other studies (Khawla et al, 2004), while in Nazni et al study in Taiwan on the College Sportsmen, most had good knowledge of nutrition and supplements. (Nazni et al, 2010). The reasons were many for it – including lack of interest on health and nutrition information by the recipients, unclear messages and education information, failure to deliver the information and messages to the target population. (Khawla et al, 2004; Brett et al, 1986).

In the present study, many respondents did not know the correct serving size for daily fruits consumption, basic nutrients, and food groups to be taken daily for healthy eating despite that fact that food guide pyramid and the serving sizes for each food group was taught in their high school curriculum. This implied that students concentrated to study their subjects for the examination purpose and not applied to their daily lives. Similar findings could be seen in the other studies (Khawla et al, 2004; Weinsier et al, 1986) where teaching in curriculum alone is not sufficient for the students to learn and apply the knowledge in their everyday lives. It was supported by Victorian Government Health Information (2007) which stated that nutrition messages were not enough to motivate children to make healthy eating changes.

Attitude of the respondents towards given statements on healthy eating was satisfactory as a whole, except for one statement on consumption of fruits and vegetables. Majority of the respondents were aware that unhealthy diet is a risk factor for diseases. This finding indicates that most of the students were aware of the importance of diet in health. Only a small percentage of them (8.9 + 4.5 %) did not believe that consumption of unhealthy diet in adolescence is a problem. This is understandable as adolescent period is one period of lifetime where prevalence of diseases is low. Thus they thought that it was not a problem for them to consume unhealthy diet, despite having the knowledge about importance of healthy eating. But perception of an individual on the importance of a risk factor on certain disease and that he himself is susceptible to the disease if he has the risk factor is very important in changing one behavior towards health promotion (Worsley A (2002). It is quite surprise to find that 32.4% (18.2 + 14.2%) of respondent believe that “adolescents should take fruits and vegetables only to prevent from being obese” and 24.6% of the respondents remained neutral for the statement. The importance of fruits and vegetables is very widely informed.

Consumption of fried foods was found to be quite high, particularly among the students from main campus. This finding suggests that students from FMHS might know about the bad practice of consuming fried foods. Fried foods could be seen everywhere and since these kind of foods are palatable, fill stomach, and not much expensive, they are preferentially taken by people, unless they know about the undesirable effects on body from trans-fat. Practice of taking regular soft drinks and fried foods was found to be still prevailed among the UNIMAS students, although percentage of students from FMHS having the above mentioned habits was smaller than those from main campus. Milk was consumed by most of the respondents but amount taken was much less than the recommended dietary intake. This implies that even though they have sufficient knowledge regarding healthy food, they find it hard to follow the daily recommendations

similar finding was observed in the study by Croll *et al.* 2006. Thus the students need to be further educated not only on healthy eating but also the health effects of unhealthy eating.

No significant association between variables in the study and health eating practice indicates that for young adults and adolescents, eating behavior mostly follows their desire, taste and preferences, rather than choosing food for health purpose. Comparable findings could be seen in the other studies also and been stated “nutrition knowledge’ is a necessary but not sufficient factor for changes in consumers’ food behaviours. They are influenced by a number of environmental and intra-individual factors, including motivation. (Worsley, 2002).

The results of the present study indicate that knowledge, attitude, and practice of the UNIMAS students on the healthy eating should be improved. Existing health and nutrition education to the students and inclusion in the curriculum of healthy eating alone is not sufficient to make them practice in a healthy way.

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