

An Assessment of College Students' Knowledge of Nutrition and Its Effects on Eating Behaviors in Surabaya

Sienny Thio

Department of Hotel Management,
Petra Christian University, Indonesia
E-mail: sienny@peter.petra.ac.id

Regina Jokom

Department of Hotel Management,
Petra Christian University, Indonesia
E-mail: regius@peter.petra.ac.id

Abstract

College students in Surabaya were surveyed to examine their knowledge of nutrition and its effect on their eating behavior. The number of meals eaten was recorded weekly and evaluated based on gender, age, hometown, whom they live with, and the monthly expenditure. College students were asked about their beliefs and knowledge about different foods for their nutritional value and their intentions of eating these foods. Questionnaires were distributed to the college students from three private universities. The study revealed that college students with different gender, age group, whom they live with, and expenditure have different knowledge of nutrition. While, a difference in ages does not affect eating behavior. In addition, knowledge of nutrition was related with eating behaviours'.

Key words: knowledge of nutrition, eating behaviors, college students.

Introduction

Nowadays, food nutrition and health are having a great concern all over the world. Many nutrition and health authorities offer guidance for people to avoid health problems associated with over or under-consumption of certain foods. However, it largely depends on the attitude of the people to their food intake and health (<http://ezinearticles.com/?Food-and-Health-Concerns-Among-People&id=4487405>, 28 Jan 2011).

Insufficient intake of food or of certain nutrients can cause nutrition disorders, an inability of the body to absorb and use nutrients. Another meaning is

overconsumption of certain foods, such as obesity caused by excess energy intake, anemia caused by insufficient intake of iron, and impaired sight because of inadequate intake of vitamin A. Nutrition disorders can be particularly serious in children, since they interfere with growth and development, and may predispose to many health problems, such as infection and chronic disease (WHO, http://www.who.int/topics/nutrition_disorders/en/, 28 Jan 2011). In fact, older adults are probably more nutrition-minded because they have more health problems, such as heart disease and high blood pressure, and are more likely to have to change their diet for health reasons. Beside that, people with higher income and educational levels also tend to think about nutrition more often when choosing what to eat (Drummond, 2010, p. 5). On the other hand, young adults who go to college also face the challenge of not eating unhealthy foods. As teenagers leave home, they become more responsible for themselves and their eating habits. College students can be stressful and lead to poor eating choices (Drummond, 2010, p. 2).

This fact has led to significant interest in determining influences on college student's eating habits. Korinth, Schiess and Westenhoefer (2009) found in their study that knowledge of nutrition affect food choices and food consumption. They found that students with high nutrition knowledge, tend to restrict their food intake in order to control their weight, but they do not have more disturbed or disordered eating patterns than the other students. Moreover, during the course of their studies, they adopt slightly more healthy food choices and decrease their tendency to be obsessive in their eating behavior. Bordi, et al. (2006) observed that attitudes were significantly related with intention, and nutritional beliefs were marginally related with attitudes, and, intentions were marginally related to meals eaten by middle school children

In Indonesia, obesity and eating behavior become the important issue to be concern. Based on World Health Organization data, in 2011, 32.9% or 78.2 millions Indonesian are obese. Siloam Hospital physician nutrition specialist, Oetoro states that this high percentage of obesity is due to several factors. One of the factors is changes of Indonesian lifestyle. Furthermore, Oetoro says that now eating junkfood becomes a trend especially for young people (Jawa Pos, 14 August 2011).

Knowledge of nutrition and a positive attitude toward nutrition may translate into nutritious eating practices. For some people, knowledge is enough to stimulate new eating behavior, but for most people, knowledge is not enough and change is difficult (Drummond, 2010). Therefore, the objectives of this

study were to (1) examine the knowledge of nutrition among college students in Surabaya as well as where they obtained information that led to this knowledge, (2) investigate eating behaviors of college students as well as their attention in food calories they consumed, (3) investigate the correlation between college students' knowledge of nutrition and their eating behaviors

Literature Review

World Health Organization on its site stated that nutrition is the intake of food, considered in relation to the body's dietary needs. Good nutrition – an adequate, well balanced diet combined with regular physical activity – is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity. (<http://www.who.int/topics/nutrition/en/>, 29 Jan 2011). Drummond K. and Brefere L. (2010) also stated that nutrition is a science that studies nutrients and other substances in foods and in the body and the way those nutrients relate to health and disease. Nutrients are the nourishing substances in food that provide energy and promote the growth and maintenance of the body. Puspitorini (2011, p. 4) clarified that It is not good for health that every day people consume specific food in certain quantities, due to maintain their performance. Moreover, Gordon-Davis & Rensburg (2002) described nutrition as the study of the relationship between people and their food. While, Drummond and Brefere (2010) stated that women and older adults tend to consider nutrition more often than do men or young adults when choosing what to eat. Whereas, people with higher incomes and educational levels also tend to think about nutrition more.

Nutrition for Teenager and Young Adult

Teenagers have specific nutritional needs, especially after reaching puberty. Growth rate is high, and if coupled with vigorous exercise, then need for nutrients and energy is very high. Furthermore, this is a period of doubt, confusion and peer pressure for many teenagers, and they might not want to conform to previously accepted food routines. Eating foods providing adequate calcium to attain maximum bone density is very important in helping prevent osteoporosis and bone fractures in later life. (Gordon-Davis & Rensburg, 2002). Girl during adolescence should be encouraged to eat plenty of iron-rich foods since iron losses occur due to menstruation and therefore requirements are high. (Gaman & Sherrington, 2002)

Eating Behavior of Teenager and Young Adult

The number of meals teenagers miss and eat away from home increases from early adolescence to late adolescence, reflecting the growing need for independence and time away from home. The evening meal appears to be the most regularly eaten meal of the day. Females are found to skip the evening meals, as well as breakfast and lunch, more often than males. Breakfast is frequently neglected and is omitted more by teenagers and young adults under 25 years of age than by any other age group in the population. A likely explanation as to why females are more apt to miss breakfast than are males is the pursuit of thinness and frequent attempts at dieting. Many teenage girls believe that they can control their weight by omitting breakfast or lunch. Young women who are dieting should be counseled that this approach is likely to accomplish just the opposite. By midmorning or lunchtime they may be so hungry that they eat more than if they had had at least simple foods in the early morning. (Worthington-Roberts & Williams, 1996).

Methodology

A total of 742 college students from 3 private universities in Surabaya, namely Petra Christian University, Surabaya University and Widya Mandala University took part in fulfilling the questionnaire. Of the respondents, (1) 56.1 percent were females, and 43.9 percent were males; (2) 19.8 percent were in the age of 16-28, 68.7 percent were in the age of 19-21 and 11.5 percent were in the age of 22-24; (3) 50.3 percent had monthly expenditure less than 1 million Rupiahs excluding accommodation, 30.1 percent, 13.7 percent, 5.9 percent had monthly expenditure between 1 million – 1.5 million, 1.5 millions – 2 millions and more than 2 million Rupiahs ; (3) 55.8 percent were originally from Surabaya and 64.3 percent of them lived with their family. The data collected from the questionnaire was analyzed by using descriptive statistics to calculate frequency distribution in order to investigate eating behavior in a week of college students. The questions were categorized into 5 groups which are "never", "1-2 times", "3-4 times", "5-6 times" and "more than 7 times". As for investigating the knowledge of college students, the questions were categorized into 3 groups which are "agree", "disagree" and "don't know". In addition, nonparametric test by using Mann Whitney and Kruskal Wallis test were used to compare the difference between gender, age, hometown, whom they live with, expenditure with their eating behavior and knowledge of nutrition. Furthermore, in this paper, it was also shown the correlation between nutrition knowledge and eating behavior by using cross tabulation.

Results

About 30% of College students in Surabaya obtain much of their nutritional information from their school or university. While Media and internet contributed equally about 17% as college students source of information to learn about nutrition. About 80% of respondents admits that they know a lot about knowledge of nutrition while only 6,8% said that they did not know anything about nutrition. On the other hand, more than 90% of college students believe that it is important to learn about nutrition.

College students of private universities in Surabaya were asked 12 statements about their knowledge about nutrition. The scoring system was used to indicate the level of nutritional knowledge of college students from high, middle, and low. The result showed that about 60.6 percent of college students had high level, 33 percent and 6.1 percent had middle and low level of nutritional knowledge respectively.

Results of the Mann Whitney test from table 1 indicated that there is a difference in nutritional knowledge between male and female especially in perception on "consumption of fast food, fried food, and canned food/frozen food", "the food eaten affect healthy", "less fat consumption" at the 0.05 level of significance. Male more tolerable than female that fast food and fried food can be consumed often, canned/frozen foods are just as good as fresh foods, the food eaten did not affect healthy, and not necessary to eat less fat.

In addition, there is no difference in nutritional knowledge among those whose hometown was from Surabaya or outside Surabaya. It means that nutritional knowledge of college students are not affected by their hometown. However, there is a difference between whom the college students live with and their nutritional knowledge. College students living with their family were more tolerable (95%) that exercise is just as important as the food eaten than those who did not live with their family (90%).

Table 1. Mann Whitney test of nutritional knowledge

Nutrition Knowledge	Asymp. Sig. (2-tailed)		
	Gender	Hometown	Living with
Additional protein can make you stronger	0.411	0.824	0.681
Fast Foods are okay to eat everyday	0.034(*)	0.550	0.877
Processed foods have less nutritional content than fresh foods	0.228	0.094	0.682
Fruits can be consumed as much as the preferred	0.433	0.148	0.116
Fried foods can be consumed as often as possible	0.000(*)	0.947	0.226
Canned and frozen foods are just as good as fresh foods	0.007(*)	0.531	0.878
Milk is good for strong bone	0.958	0.119	0.958
Exercise is just as important as the food you eat for staying healthy	0.817	0.753	0.025(*)
The food you eat affects your healthy	0.022(*)	0.496	0.871
To stay healthy you should eat less fat	0.002(*)	0.662	0.972
Foods like sweets and ice cream are okay to eat, but not all the time	0.339	0.083	0.656
Fruits and vegetables are low fat and low calories	0.422	0.475	0.463

*Correlation is significant at the 0.05 level (2-tailed)

The results of Kruskal Wallis test in table 2 indicated that there is a difference in nutritional knowledge among age group of 16-18, 19-21 and 22-24 especially in opinion of "fast food and fried food consumption", "canned and frozen foods are just as good as fresh foods". From the data surveyed, it can be shown that the age group of 16-18 had a higher percentage of disagree about the frequent consumption of fast food and fried food. It shows that the younger ages was more aware about nutrition in particular about "frequent consumption of fast food and fried food" and also the perception that "frozen foods are just as good as fresh foods". As for expenditure, there is a difference in nutritional knowledge among the college students' expenditure especially in the statement that "processed foods have less nutritional content than fresh foods" and "Fried food can be eaten as often as possible". College students who had expenditure less than 1 million Rupiahs was more tolerable than those whose expenditure was higher than one million Rupiahs

Table 2. Kruskal Wallis test of nutritional knowledge

Nutrition Knowledge	Asymp. Sig.	
	Age	Expenditure
Additional protein can make you stronger	0.888	0.438
Fast Foods are okay to eat everyday	0.020(*)	0.062
Processed foods have less nutritional content than fresh foods	0.053	0.014(*)
Fruits can be consumed as much as the preferred	0.811	0.416
Fried foods can be consumed as often as possible	0.000(*)	0.004(*)
Canned and frozen foods are just as good as fresh foods	0.016(*)	0.051
Milk is good for strong bone	0.053	0.360
Exercise is just as important as the food you eat for staying healthy	0.250	0.613
The food you eat affects your healthy	0.087	0.140
To stay healthy you should eat less fat	0.281	0.330
Foods like sweets and ice cream are okay to eat, but not all the time	0.171	0.379
Fruits and vegetables are low fat and low calories	0.477	0.530

*Correlation is significant at the 0.05 level

Eating Behaviors of College Students

Only 8,9% of college students in Surabaya have the attention of food calories they consumed. While 50.4 percent of them didnot pay any attention and 40.7 percent only sometimes pay attention to food calories they consumed. From the data collected, it was revealed that more than 5 times in a week, 46.3 percent of college students were eating out and 32.5 percent were eating vegetables. Furthermore, it was indicated that less than 3 times college students were eating out (26 percent), eating breakfast (51.9 percent), eating after 9 pm (56.9 percent); eating fast food (74.8 percent), eating canned/frozen foods (79.9 percent), eating fried snack (52.8 percent), eating fruit (47.2 percent), eating vegetables (35.8 percent), and drinking milk (54.2 percent). These findings were surpising because only 33.1 percent, 32.5 percent, 23.9 percent, 21.2 percent of college students were eating breakfast, vegetables, drinking milk, and eating fruit more than 4 times a week respectively.

The results from Mann Whitney test indicated that there is a difference in eating behavior between gender with eating behaviour especially in "eating after 9 pm", "consuming canned/frozen food" and "eating fruit". Males had the tendency to eat after 9 pm often and consume less canned/frozen food than female. While female had eating fruit more often than male. This finding might

be considered to support the research from Cooke and Wardle (2005), which showed that girls like fruit and vegetables more than boys did.

Furthermore, from table 3, it also can be seen that there is a difference in eating behavior between hometown in "eating out", "having breakfast", "consuming canned/frozen food", "eating fruits", "eating vegetables". Those whose hometown were not from Surabaya had more often in eating out but less in having breakfast, consuming canned/frozen food, eating fruits and vegetables compared to those who were from Surabaya. This is due to the data collected that about 60 percent of college students who do not live Surabaya were lived independently in a boarding house. Therefore, they tend to eating out more, having less breakfast, fruits, as well as vegetables. As mentioned by Sharma B., et al. (2009) that students who lived in family home consumed more helpings of both fruit and vegetables every day, compared with young adults who lived independently.

In addition, there is a difference in eating behavior between whom college students live with particularly in "eating out", "having breakfast", "eating fruits" and "eating vegetables". As previously mentioned that those who did not live with their family were more often to have eating out, but less to have breakfast, eating fruit and vegetables.

Table 3. MannWhitney test of eating behavior

Eating Behavior	Asymp. Sig. (2-tailed)		
	Gender	Hometown	living with
Eating out	0.124	0.000(*)	0.000(*)
Having breakfast	0.644	0.000(*)	0.000(*)
Eating after 9 pm	0.003(*)	0.389	0.482
Eating fast food	0.365	0.800	0.875
Consuming canned or frozen food	0.049(*)	0.041(*)	0.645
Having a fried snacks	0.936	0.781	0.750
Eating fruits	0.012(*)	0.000(*)	0.000(*)
Eating vegetables	0.248	0.009(*)	0.000(*)
Drinking milk	0.275	0.466	0.073

*Correlation is significant at the 0.05 level (2-tailed)

The results of Kruskal Wallis test of eating behaviors indicated that there is a difference between age group in their eating behaviour particularly in "eating vegetables". More than 5 percent of college students in all ages had never eating vegetable. There is also a difference between expenditure especially in "eating out", "eating after 9pm", "eating fast food", "consuming canned/frozen foods", and "having fried snacks". College students whose expenditure per month were less than one million Rupiahs tend to have less eating out, eating after 9pm, eating fast food, consuming canned/frozen food, having fried snack compared to those whose expenditure were higher than 1 million Rupiahs. These findings were supported by Davis' (1982) that provide strong evidence suggesting interaction between socioeconomic factors and the income-food expenditure relationship, while these interactions affect household nutritional consumption.

Table 4. Kruskal Wallis test of eating behavior

Eating Behavior	Asymp. Sig.	
	Age	Expenditure
Eating out	0.910	0.000(*)
Having breakfast	0.433	0.119
Eating after 9 pm	0.383	0.035(*)
Eating fast food	0.277	0.000(*)
Consuming canned or frozen food	0.070	0.031(*)
Having a fried snacks	0.988	0.014(*)
Eating fruits	0.201	0.544
Eating vegetables	0.038(*)	0.354
Drinking milk	0.16	0.055

*Correlation is significant at the 0.05 level

Correlation between Nutritional Knowledge and Eating Behaviors

A correlation between nutritional knowledge and eating behaviours was observed by Bordi et. al, (2006). The study found that students' nutritional beliefs influence their attitudes, and their attitude influences their intentions, and their intentions, in turn, influence their dietary behaviour. This current study supports the previous study that the level of knowledge of college students about nutrition influences their eating behaviour. Those who have higher nutritional knowledge have lesser consumption (<3 times a week) of fast food,

canned/frozen food, as well as fried snack. In other words, the higher the level of nutritional knowledge of college students, the higher the percentage of having less consumption of eating fast food, canned/frozen food and fried snack. Furthermore, from the table 5, it can be seen that the higher level of nutritional knowledge, the more frequent of college students to have breakfast more than 4 times a week. However, the higher the knowledge of nutrition, the lesser the percentage of eating after 9 pm less than 3 times a week compared to the middle and the low level of knowledge. It was also indicated that the low level of nutritional knowledge has the lowest percentage in consuming fruit and vegetables more than 4 times a week. It means that those who have low level of knowledge about nutrition consumed less frequent of fruit and vegetables.

Table 5. The correlation between nutritional knowledge and eating behaviors

Eating Behavior	Level of Nutritional Knowledge								
	Low			Middle			High		
	<=2	3-4	>=5	<=2	3-4	>=5	<=2	3-4	>=5
Eating Out	42.2	15.6	42.2	26.3	28.4	46.3	25.9	27.9	46.2
Having Breakfast	57.8	22.2	20	50.7	15.7	34.4	53.8	11.7	34.4
Eating after 9 pm	60	26.7	13.3	59.6	21.4	19	50.6	29.1	20.2
Eating Fast Food	60	31.1	8.89	74.6	19	6.55	78.9	13.8	7.29
Consuming canned/frozen food	60	31.1	8.89	78.8	15.1	6.11	85.4	12.1	2.43
Having Fried snacks	42.2	44.4	13.3	52	34.9	13.1	56.7	30.4	13
Eating Fruit	40	46.7	13.3	46.7	30.1	23.1	49.8	31.2	19
Eating Vegetables	42.2	44.4	13.3	37.1	28.8	34.1	32.8	33.6	33.6
Drinking Milk	42.2	28.9	28.9	57.2	19.7	23.1	61.8	24.7	23.5

Conclusion

This study assessed the knowledge of nutrition and eating behavior among college students at private universities in Surabaya. They can be regarded as having high knowledge of nutrition, it can be seen from their eating pattern that they consumed less fast food, canned/frozen food, fried snack as well as eating after 9 pm. However, surprisingly, they consumed less fruit, vegetables, and milk which were less than 3 times a week. Although some relationships or correlation are unclear and still need further investigation, this study provides

some insight regarding the knowledge of nutrition and eating behavior among college students in Surabaya. The result of this research study supports the need for effective nutrition information to young people, in order to create a better eating habit. Since this study suggests that college students rely on school/universities for nutritional information, educators have an obligation to improve the nutritional information possessed by college students. This information will hopefully influence nutritional belief, attitude, and dietary behavior, leading to the development of healthier eating behaviors and better overall health. Finally, more detail research focusing on college students is needed to explore further, particularly the factors that influence their perception towards healthy eating.

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