Conference Paper

The Relationship among Breakfast Habits, Calorie Intake and Nutritional Status of Sumedang Government's Nursing Academy Students

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Abstract

In young adults age group breakfast is the meal time most often skipped. The purpose of this study was to determine the relationship between breakfast habits, calorie intake and nutritional status of the students of Sumedang government's nursing academy. This study employed a cross sectional study method design which includes nutritional status as its the dependent variable and breakfast habits and calorie intake as its independent variable. The sample taken were 83 persons of freshman and sophomore of nursing students of the 2016-2017 academic year. The sampling was organized by using proportional random sampling method. Nutritional status was assessed by employing BMI. Breakfast habits were assessed by employing breakfast habit questionnaire in one week. Calorie intake was assessed by using a 1x24 hours food recall questionnaire. Furthermore, calorie intake was analyzed by using Nutri Survey software and compared with the 2012 Energy Adequacy Rate for Indonesia population. For bivariate analysis this study used Pearson chi-square test with a significance degree of 95% and p-value <0.05. The characteristics of nutritional status of the respondents classified as Normal weight status (61.4%), Thin (19.3%), and Fat (19.3%). Most respondents have good calorie intake (53.0%) and have regular breakfast habits (54.2%),/it can be concluded that there is a significant relationship between calorie intake and nutritional status (p=0.001) and breakfast habits with nutritional status (p = 0.033). Conclution that healthy breakfast habits in young adults are a good lifestyle that should be pursued to fulfill daily energy needs to achieve normal nutritional status.

Keywords: Breakfast habits, Calorie intake, Nutritional status

1. Introduction

Young adulthood around the age of 18-25 years, is a unique developmental phase which is defined as a period of transition and development of independence [1]. During this time, individuals develop the skills needed to engage and practice the behaviors, such as eating healthy and preparing for the next life [2]. Research shows that young adults are involved in poor eating behavior, such as low consumption of fruits and vegetables

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[3], consumption of energy-density snacks [4], and often skip breakfast for reasons such as lack of time, cost and weight control [5].

Skipping breakfast, has been linked to poorer quality diets [6], lower intake of total energy, vitamins and minerals [7], increased risk of prevalence of central obesity [8], markers of insulin resistance and metabolic risk factors for cardio [9, 10].

Total daily energy intake is one of the factors related to a person's nutritional status. Nutritional status is a condition caused by a balance between nutrients intake from food and the nutrients needed for body's metabolism [11]. The description of the nutritional status of the Indonesian population over the age of 18 years is as follows: underweight (5%), normoweight (54.6%), overweight (14.6%) and, obese (25.8%). Then the description of nutritional status in West Java in the same age range, showed underweight nutrition status (5.7%), normoweight (49.2%), overweight (14.4%), and obese (30.7%) [12].

Calorie intake can be assessed by comparing a day's calorie intake with the amount of energy adequacy according to age and sex. In Indonesia, the amount of energy sufficiency for women aged 19 to 29 years is 2250 kcal/day and for men is 2725 kcal/day [12]. Based on 2014 Total Diet Study data, the average level of energy adequacy of the Indonesia population aged 19-55 years in urban and rural areas is 73.8% and the average level of energy sufficiency for the same age range in the province of West Java is 73.7% [13]. This shows that the level of energy sufficiency of Indonesia population aged 19-55 years is inadequate.

Breakfast is part of daily consumption which is considered important in meeting nutritional needs, increasing healthy eating patterns and allowing for healthier food choices[14]. Breakfast includes eating and drinking activities carried out before 9 am to meet 15-30% of daily nutritional needs, as part of balanced nutrition in order to realize a healthy, fit, active, and smart life [13]. According to the research, 55% of students have irregular breakfast habits [14]. Regular breakfast consumption during adolescence and young adults provides adequate protection from obesity [15]. On the other hand among young adults who skip breakfast have a lower total daily energy intake than those who eat breakfast [16].Despite the significant health implications of skipping meals and their higher prevalence among young adults, studies that have investigated the correlation of these unhealthy eating behaviors are still limited. Based on the description above, the author is interested in conducting further research on the relationship between breakfast habits, energy intake and nutritional status of students at Sumedang Nursing Academy. This study aims to find out nutritional status characteristics, breakfast habits, and calorie intake of respondents, and to find out the relationship among breakfast habits, calorie

intake, with nutritional status of Sumedang Regency Government Nursing Academy students.

2. Methods

2.1. Study design and samples

This research was conducted at Sumedang Regency Government Nursing Academy, from August to December 2016. This type of research was an observational descriptive study with a cross-sectional research design. Sampling is done by proportional random sampling. The sample involved 83 freshmen, sophomore and junior students of the 2016-2017 academic year, which consisted of 27 male and 56 female aged 19-23 years. Breakfast habits were measured by using the breakfast frequency questionnaire a week before. Assessment of daily calorie intake using a 1x24 hour food recall questionnaire. Assessment of nutritional status using anthropometric data based on body mass index (BMI). The inclusion criteria for this study were active as Sumedang Nursing Academy students, present at the time of data collection processes and willing to be respondents by filling out informed consent sheets. Exclusion criteria: fasting, dieting for certain diseases.

2.2. Instrument

Breakfast habits were measured by using a breakfast frequency questionnaire of one week before and breakfast time, respondents who had breakfast frequencies 7 days a week and meal times at 05.00 to 09.00 am [16], including into the classifications of having regular breakfast habits. Feeding intake data were collected by an interview through a questionnaire of 1 x 24 hours food recall consisted of questions about meal times, menus, foodstuff, quantities eaten in household size and converted into grams with the help of a food model. Twenty-four-hour dietary recall method is conducted by recording the type and amount of food consumed in the past 24 hours. Respondents were asked to tell everything that was taken and consumed within 24 hours on the previous day. Starting from wake time in the morning to bedtime at night [17]. Then the calorie intake data collected was calculated by nutri Survey 2005 software and compared with the 2012 Energy Adequacy Rate for Indonesia population. Calorie intake data were grouped based on the 2004 National Food and Nutrition Widyakarya, which classified the calorie adequacy rate as it follows the calorie intake is insufficient (<80%),

good (80-110%) and over- sufficient. (> 110%) [18]. Nutritional status data obtained by measuring body weight using by using Camry digital scales with a capacity of 150 kg and with 0.1 kg level of accuracy. In measuring body height, the researcher used Microtoise with 2 meters capacity and 0.1 cm level of accuracy. Nutritional status was measured based on Body Mass Index (BMI) and classified based on the Departement of Health classification (2003), namely: Thin (BMI $\leq$18.5), normoweight (BMI> 18.5 -25), Fat (BMI> 25). Thin consists of severe weight loss (BMI < 17), mild weight loss (BMI 17-18,5). Fat consists of mild fat level (BMI > 25-27), heavy Fat (BMI >27) [19]

2.3. Data collection procedure

Data collection includes the following stages: submitting a research permit to the government of Sumedang District (Bappeda) and the Director of Nursing Academy. Determining a number of respondents through a proportional random sampling method. Requesting written informed consent from the respondent, accompanied by the explanation of the purpose and benefits of the research. Respondents fill out the questionnaire of self- identification and breakfast habits. Data on body weight and height are measured. Doing the interview to find out one-day food intake by employing a 24-hour food recall questionnaire.

2.4. Data analysis

Univariate analysis was performed to describe the characteristics of the respondents while bivariate analysis was carried out to determine the relationship of the independent variables with nutritional status by employing Pearson chi-square test with a significance degree of 95% and p-value <0.05 [20].

3. Results

There were 83 respondents who took part in the study and met the inclusion and exclusion criteria.

Sample characteristics

All respondents are freshmen, sophomore and junior nursing academy students of the 2016-2017 academic year The total sampling were 83 students. The characteristics of the respondents can be seen in table 1 below:

TABLE 1: Respondent frequency distribution based on nutritional status, age, gender, energy intake, breakfast habits, and residence.

Variable	Category	n	(%)
Age (Year)	19	40	48.2
	20	33	39.8
	21	7	8.4
	22	2	2.4
	23	1	1.2
Residence	Dormitory	10	12.0
	Parents	51	61.4
	Room rent	22	26.5
Sex	Male	27	32.5
	Female	56	67.5
Calorie Intake	Insufficient (< 80% AKG)	39	47.0
	Good (80-110% AKG)	44	53.0
Breakfast Habits	Regular	45	54.2
	Irregular	38	45.8
Nutritional Status	Thin (BMI $\leq$ 18.5)	16	19.3
	- Severe weight loss (BMI <17)	5	6.0
	- Mild Fat Level (BMI 17-18.5)	11	13.3
	Normal (BMI > 18.5 s/d 25)	51	61.4
	Fat (BMI > 25)	16	19.3
	- Mild Fat Level (BMI > 25-27)	4	4.8
	- Heavy Fat (BMI >27)	12	14.5

The age of respondents ranged from 19-23 years with an average age of 19.7 years with a standard deviation of $\pm$ 0.8 years. Most respondents were women of 19 years old, living with parents. The average daily calorie intake is 1922.8 $\pm$ 361.2 Kcal (95% CI: 1843.9-2001.6 Kkal), with a minimum calorie intake of 1195.5 KKal and a maximum of 2837.2 Kcal. When compared with the energy adequacy rate, the average level of calorie intake is 80.0% $\pm$ 13.7%. (95% CI: 77.0-83.0), the level of energy intake ranged from 53.1% - 108.5%. Most respondents have good calorie intake and have regular breakfast habits. The results of the nutritional status assessment showed that the average body weight of the respondents was 56.8 $\pm$ 15.8 kg (95% CI: 53.4–60.3), body weight ranged from 37.3 - 122.3 kg. The average height is 159.7 $\pm$ 8.1 cm, the height ranged from 149.9 - 182 cm. After calculating the BMI, the BMI average is 22.1 $\pm$ 5.0. The lowest BMI was14.6 and the highest was 39.5. Most respondents have normal nutritional status.

Based on table 2, it can be seen that respondents' type of food for breakfast is mostly rice + animal side dishes i.e. 19 people (42.2%).

Relationship between breakfast habits and calorie intake with nutritional status

TABLE 2: Frequency distribution of breakfast food types.

Types of Breakfast Food	n	%
rice + animal side dish	19	42.2
rice + vegetables	3	6.7
nasi + animal side dish+ milk	3	6.7
Serabi + Tempe snack + *Ciki* 1 2.2	1	2.2
rice + animal side dish + vegetable side dish	4	8.9
rice + vegetable side dish	2	4.4
Milk	1	2.2
Lontong Sayur	1	2.2
rice + animal side + fruit	1	2.2
rice + animal side dish + coffee	1	2.2
rice + animal side dish + vegetables	5	11.1
rice + noodles/rice vermicelli	2	4.4
rice + animal side dish + vegetable side dish + milk	1	2.2
rice + animal side + *energen*	1	2.2
Total	45	100.0

TABLE 3: Relationship of breakfast habits and calorie intake with nutritional status.

Variable	Category	Nutritional Status						Total		P-*Value**
		Thin		Normal		Fat				
		n	%	n	%	n	%	n	%	
Breakfast Habit	Irregular	6	15.8	20	52.6	12	31.6	38	100	0.033
	Regular	10	22.2	31	68.9	4	8.9	45	100	
Calory Intake	Insufficient	14	35.9	20	51.3	5	12.8	39	100	0.001
	Good	2	4.5	31	70.5	11	25.0	44	100	

*Pearson Chi-Square Test

Table 3 revealed the relationship between breakfast habits and nutritional status. The Pearson Chi-Square test obtained p-value = 0.033, thus, it can be concluded that there are differences in the proportion of nutritional status among irregular breakfast respondents with regular breakfast. There is a significant relationship between breakfast habits and nutritional status. The relationship between calorie intake and nutritional status tested by Pearson Chi-Square test obtained p-value = 0.001, so it can be concluded that there are differences in the proportion of nutritional status between respondents with insufficient calorie intake and respondents with good caloric intake. There is a significant relationship between calorie intake and nutritional status.

4. Discussion

Characteristics of the study respondents were mostly female students, aged in the range of young adults, and living with their parents not so far from campus. Most students have regular breakfast habits, good calorie intake, and normal nutritional status. However, judging from the characteristics of the nutritional status, there are two nutritional problems namely malnutrition and over nutrition which is also a public health problem. The assessment of nutritional problems as a public health problem in an area is assessed by comparing the types and magnitude of nutrition problems with universally agreed-upon cut-offs. If the magnitude of the nutritional problem in an area is above the specified threshold, then the problem is considered a public health problem. The cut-off threshold for public health problems if the prevalence of nutritional problems is $\geq$ 5% [19]. The description of the respondent's nutritional problems is almost the same as the nutritional problem of the research respondents at the Nursing Academy Of Manado Hospital Type III [21] and nutritional problems of research respondents / Semester 2 students in the Nursing Science Study Program Faculty Medicine of Sam Ratulangi University Manado [22].

Most respondents regularly do breakfast, this is supported by the place where most respondents live with their parents and the distance of the house is not too far from campus, so that they have a lot of time for breakfast. Then respondents who live in the boarding house are more likely to eat breakfast regularly, because breakfast, lunch, and dinner services are available. From gender clasification most respondents are women, and women factually are mostly more concerned with breakfast than men. The results of this study are in line with the research of Pendergast, Livingstone, Worsley, & McNaughton [5], that lack of time is consistently correlated with skipping meals. Skipping breakfast is more common in men than in women. The results of this study are also in line with the research results of Akhtar, Zareen, & Sarmad [23], most female respondents at Lahore Pakistan Medical College, have a habit of eating breakfast every morning. Likewise with Hanif's research [24], the majority of nursing students respondents at the FKIK UIN Syarifhidayatullah, had a breakfast habit.

Based on respondent,s breakfast menus, the food consisted on rice and animal side dishes (eggs/ fried eggs/ fried chicken), the choice of breakfast menus type was more related to practicality in preparing the food. A good breakfast will contribute 15-30% of total energy needs in a day so that it will help meet the energy needs of the day. A good breakfast consists of carbohydrate foods, side dishes, vegetables or fruits and drinks [25]. The results of research from Kant, Andon, Angelopoulos, & Rippe [26], food

choices recommended for breakfast are foods with low energy density. According to the British Nutrition Foundation [26], low energy density provides fewer calories per gram of food. This means that with a low energy content it will provide satisfying food portions.

Most of the respondents' calorie intake is good or has already met sufficient needs. This is in line with the results of Arraniri, Desmawati & Aprilia [14] research on medical students, most of the respondents had good daily calorie intake. Muchlisa, Citrakesumasari, & Indriasari, [26] research in female students at the Faculty of Public Health, University of Hasanudin Makassar, the energy intake of most respondents is sufficient.

The relationship between breakfast habits and nutritional status can be seen from the differences in the proportion of nutritional status among respondents who take regular and irregular breakfast. The proportion of normal nutritional status tends to be higher in respondents who have regular breakfast habits. While the proportion of Fat nutritional status is likely higher in the respondents who do not regularly have breakfast. This is in line with the research of Merten, Williams, & Shriver [28] which states that adolescents who have breakfast habits have a tendency to keep from being obese.

Literature studies reveal that breakfast has a good effect on nutritional status, by preventing obesity or overweight. Breakfast can contribute to satiety through various metabolic effects associated with glycemic and insulin responses which caused lower daily energy intake [6]. Having breakfast is associated with better overall food quality, as a healthy lifestyle that can increase the possibility of maintaining normal body weight. The energy contribution of breakfast to total daily energy intake is important in maintaining body weight. Longitudinal analysis of overweight adolescents found that skipping breakfast was not associated with a decrease in BMI in the following year. In contrast, among adolescents with normal weight, there is a tendency to gain weight after skipping breakfast [29].

Skipping breakfast in adults can reduce physical activity and exercise performance throughout the day [30]. So, it is related to energy expenditure which affects the increase in body weight in adults.Skipping breakfast can interfere with the distribution of daily calorie intake, resulting in an increase in food consumption later on, including more snacking between meals [31]. Snacking sometimes makes it easy to adjust energy intake with needs. Conversely, snacking sometimes facilitates overeating and weight gain especially in children and obese adults. In addition to choosing energy-dense foods, eating in the absence of hunger in response to external non-physiological cues, in an irregular manner, in a context that does not support the awareness to the act of eating, may be important factors that determine the nutritional effects of snacking [33].

The results of the study are in line with the theories which state that a balanced intake of nutrients and based on the needs will help achieve optimal body growth and development. The imbalance between needs or adequacy will lead to nutritional problems both in the form of over-nutrition and malnutrition [32]. A lack of calorie intake will cause the body to experience a negative energy balance. As a result, underweight can cause damage to body tissue. Conversely, the calorie intake that exceeds the needs, in the long run, will cause overweight [34].

The results of this study are also pursuant to the research of Muchlisa, Citrake-sumasari, & Indriasari [35] which states that there is a significant relationship between energy intake and nutritional status in adolescent girls in FKM University of Hasanuddin Makassar. Likewise with the results of the research of Ubro, Kawengian, & Bolang,[36] which states that there is a significant relationship between energy intake and nutritional status in students of the 2013 medical education study program at the Faculty of Medicine, Samratulangi University.

5. Conclusion

There is a significant relationship between breakfast habits and calorie intake with nutritional status. Healthy breakfast habits in young adults is a good lifestyle, which should be pursued to fulfill daily energy needs, to achieve normal nutritional status. Suggestions for further research, the relationship between eating pattern and central obesity status in young adulthood, in which eating patterns can include breakfast, lunch, dinner, and snack eating habits.

Disclosures

The authors report no real or perceived vested interests that relate to this article that could be construed as a conflict of interest.

Acknowledgements

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