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Original Research Article

Lifestyle, nutrition knowledge, body dissatisfaction, and nutritional status of IPB university students in Indonesia

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ABSTRACT

Background: Adolescents experience changes as a response to concerned behaviour about body shape, leading to a restricted diet in their food consumption. It is stated that 76.56% of male students and 82.87% of female students experienced body dissatisfaction. As a result, the students are developing negative eating behaviour despite having a normal nutritional status.
Methods: This comparative cross-sectional study was conducted at IPB University dormitories. The study involved selecting samples using a systematic random sampling method. Total samples were 80 students.
Results: A significant difference was found in the diversity of food consumption between male and female subject groups (p=0.038). This research also showed other significant differences found in consumption of green leafy vegetable group (p=0.013), fruits and vegetables source of vitamin A group (p=0.000), and meat and fish group (p=0.033) within the male and female subjects. The other significant differences were also found in the frequency of exercise (p=0.000) and in the level of physical activity (p=0.027) between male and female subject groups. There was a significant correlation between nutritional knowledge and nutritional status of male (r=0.784, p=0.045) subjects, and correlation between body dissatisfaction and nutritional status of male (r=0.349, p=0.027) and of female (r=0.383, p=0.015) subjects.
Conclusions: There was a significant relationship between nutritional knowledge and nutritional status in male subjects. Furthermore, there is a relationship between body dissatisfaction and the nutritional status of the subject, where subjects with more nutritional status tend to have higher body dissatisfaction scores.

Keywords: Body dissatisfaction, Lifestyle, Nutrition knowledge, Nutritional status

INTRODUCTION

An ideal body shape is the most desirable physical appearance for almost everyone, especially teenagers. In general, adolescents experience physical, biological, and fast cognitive development.[2] Such a quick change in adolescence will cause the changing response into a very attentive-to-body-shape behaviour; meanwhile, the changes in physiological form and body composition during the transition process from adolescence to adulthood can affect perceptions in images of body size or body shape. The exaggerated body image and the tendency that lead to negative perceptions can make an individual feels insecure in their own body (in their personal opinion) or termed as a body dissatisfaction.[1]

Insecurity feeling or dissatisfaction with their body will encourage people to change their body shape or weight by going on a diet restricting their food consumption. Many teenagers are dissatisfied with their appearances, especially in their body shape (with an ideal image of a tall, slim and muscular body). It was found that 76.56% of male students and 82.87% of female students experienced body dissatisfaction.[1] The dietary behaviour

among these students tends to lead to negative dietary behaviour, such as excessive use of laxatives and letting the body starve even though they have a normal nutritional status. Those negative habits will negatively impact their nutritional status since their body lacks essential nutrients such as energy, protein, carbohydrates and other nutrients.

The causes of nutritional problems in adolescents and young adults include lifestyle changes and inappropriate eating habits causes an imbalance ratio between the actual nutrition intake and recommended nutritional adequacy. One research in Surakarta (Indonesia) showed 6.8% of students experienced obesity nutritional problems.[3] In contrast, research in Semarang city (Indonesia) showed that 41.3% had obesity problems.[4] The nutritional problem can be caused by emotional eating (changes in eating behaviour), stress, low sleep quality and nutritional intake, which causes overnutrition and nutritional problems. The adolescents' nutritional status is also influenced by their lifestyle, which tends to be unhealthy because teenagers are likely to consume food in excessive portions. Lifestyle changes will result in shifting eating habits that are dominantly high in calories, fat and cholesterol, so if the nutrition intake is not balanced with suitable physical activities, it can cause nutritional problems.[5]

Nutritional knowledge for adolescents is essential to choose nutritious or good food ingredients to fulfil a balanced nutritional intake. Nutrition knowledge can change adolescents' mindsets about food and which foods should and should not be consumed. Low nutrition knowledge in adolescents is a risk factor for nutritional problems and changes in eating habits[6]. Insufficient or low nutritional knowledge and its practice in adolescents can be seen in their selection of unhealthy food, such as junk foods and fast foods. Conversely, adolescents with better nutritional knowledge tend to choose food according to their nutritional needs. Adolescents often experience body dissatisfaction, resulting in dietary behaviour or eating habits that will affect their nutritional status. It is necessary to analyze lifestyle, nutrition knowledge, body dissatisfaction and its relationship to nutritional status in male and female students.

METHODS

Study design

This research applied a comparative cross-sectional study design and was conducted at IPB University dormitory in the 2022/2023 academic year. The data was collected from C1 and A2 building dormitories.

Study place and period

This research was conducted at IPB University dormitory from December 2022 to February 2023.

Sampling technique

This research applied a systematic random sampling method. The male dormitory consisted of four buildings, and the female dormitory consisted of five. By random selection, the C1 building dormitory and the A2 building dormitory were chosen as the research samples. C1 building has a total population of 213 male students divided by 40, and the value of k=5 is obtained. Meanwhile, the A2 building has a total population of 264 female students, which is then divided by 40 and gained the value of k=7. Based on the k values, sampling is carried out with each k order. The inclusion criteria of the research subjects were IPB University students, aged 17-20 years, physically and mentally healthy, willing to participate in the study from beginning to end. Exclusion criteria for research subjects are students who are on a special diet that can affect nutritional intake.

Data collection technique

The data was collected through interviews with research respondents (IPB University students). The students had to fill out the informed consent form. For the study purpose, the questionnaire was designed and tried out before being administered to the research respondents.

Study tool

A structured questionnaire was created with the following steps. The initial step before starting the research study was filling out the informed consent for the respondents before they answered all research questionnaires. First, data was obtained by interviewing students on the individual characteristics (age, sex, height, and weight), the family characteristics, and the economic status. Then, other data collected was nutritional knowledge of students, eating habits including 2×24 hours food recall, food frequency questionnaires (FFQ), and individual dietary diversity score (IDDS), physical activity recall (2x24 hours), and the body dissatisfaction questionnaire by using the BSQ-034 method in the form of a Likert-scale. Every BSQ-34 question has several answers, and each answer will have a score. The choice scores are as follows: never=1, seldom=2, sometimes=3, often=4, very often=5, and always=6. All answers will be accumulated into a total score and put into a categorization. A category of ‘no attention’ when it gets a total score $\leq$80, a category of ‘mild attention’ when it gets a total score of 81-110, a category of ‘moderate attention’ when it gets a total score of 111-140 and a category of ‘severe attention’ when it gets a total score of >140.

Statistical analysis

Several data analyses were performed in this research, including data coding, data entry, data cleaning, statistical analysis and creating dummy tables. The data entry section was done by Microsoft excel 2019, followed by data editing and cleaning of the research data. Data on the

sample's characteristics were analyzed descriptively, and variables between male and female students were compared by independent t test for numerical data and the Mann-Whitney test for the categorical ones. Furthermore, Pearson and Rank-Spearman correlation tests and the SPSS 26.0 statistic software were also performed for the data analysis.

RESULTS

Lifestyle

Adolescents experience psychological, cognitive, emotional, and social changes, identity formation and self-assessment that affect lifestyle. These experiences can lead to adolescent lifestyle changes that affect their nutritional status. Lifestyle changes can affect aspects of eating habits (eating frequency and breakfast habits) to physical activity. Eating habits are behaviour carried out consciously, collectively, and repeatedly to choose, consume, and use certain foods and to eat patterns as a response to social and cultural influences.[7] Due to the gender aspect, male tends to have a higher frequency of eating than a female since male does more physical activity than female.[8]

The frequency of breakfast habits was only 43.8% of students who regularly eat breakfast every day. While the number of students who regularly have breakfast was found to be higher in male subjects (18 students) than in female subjects (17 students), and the number of students who have breakfast only 1-3 times a week was found in higher number in female subjects (17 students) than in male subjects (5 students). Based on the different test analyses, there was no significant difference between the male and female students' breakfast habits (p=0.328). Snacking habits in the male subject group were dominated by snacking frequency of 3-5 times/week (50%). Likewise, for the female subject group, the snacking frequency was 3-5 times/week (62.5%), where 5% of the male subjects said they did not eat snacks. No significant difference in snack habits consumed between the male and female subjects (p=0.698).

The distribution data of food groups consumed according to IDDS showed significant differences (p<0.05) in the food groups of dark green leafy vegetables, fruits and vegetables rich in vitamin A, other fruits and vegetables, and meat and fish. Based on the nutritional adequacy level, it is known that the level of energy and protein adequacies was higher in the female group (61.8% and 68.5%). However, the higher fat and carbohydrate adequacies were in the male group (87% and 51.1%). The adequacy differences between both groups occurred due to the food consumption pattern of each individual.

According to Table 1 both subject groups (male and female students) had very light activity levels (40% and 52.5%). The male group's physical activity level had an average value of 1.46, while the female group had an average value of 1.34.

The duration of exercise in both subject groups was dominated by the less category (<30 minutes for each sport), with a percentage of 87.5% for the male subject group and 97.5 % for the female subject group. Whereas the results of the differential test showed no significant difference found (p=0.092) between the two subject groups. In addition, it was also known the frequency of exercise in both groups was dominated by the occasional category (1-3 times a week), and the result of different test analyses showed there was a significant difference (p=0.000).

Nutrition knowledge

Table 3 showed the level of nutrition knowledge from the male and female subject groups was in the sufficient category (52.5%), and the average nutritional knowledge score for the male group was 66.75 with a standard deviation of 13.5. The female subject group had an average score of 71 with a standard deviation of 13.8. There was no significant difference in nutritional knowledge between the male and female subject groups (p=0.914). Both subject groups had the same level of nutrition knowledge.

Nutritional status

Most female subjects had normal nutritional status (47.5%), while the male subjects had a thin nutritional status (40%). The male subject group's average body mass index (BMI) was 19.3 kg/m^2, with a standard deviation 3.4. The female subject group had an average BMI of 20.3 kg/m^2 with a standard deviation 3.2.

The second highest nutritional status from both groups was the normal category (37.5%) in the male subject group and a thin category (32.5%) in the female subject group. Different nutritional statuses in adolescents can be caused by gender, education level, eating habits, nutrient intake, physical activity, genetic factors, and smoking behaviour.[9]

Body dissatisfaction

Body dissatisfaction, or what can be interpreted as body dissatisfaction, is a negative view of one's body size, weight and muscle shape, which is not ideal and needs to be changed.[10] As many as 65% of the male subjects and 50% of the female subjects did not pay attention to their bodies, thus, it meant both groups did not care about their body shape, or it also can be represented as both groups were satisfied with their current body shape.

The differential test results showed no significant difference in the perception of body shape between male and female subject groups (p=0.095).

Table 1: Distribution of students based on lifestyle.

Lifestyle	Total (n=80) (%)	Male (n=40) (%)	Female (n=40) (%)	P value
Breakfast habits (per week)				
Always (6-7 times)	35 (43.8)	18 (45)	17 (42.5)	0.328
Often (4-5 times)	28 (35)	17 (42.5)	11 (27.5)	
Sometimes (1-3 times)	17 (21.3)	5 (12.5)	12 (30)	
Never	0	0	0	
Snacking habits (per week)				
Always (6-7 times)	10 (12.5)	6 (15)	4 (10)	0.698
Often (3-5 times)	45 (56.3)	20 (50)	25 (62.5)	
Sometimes (1-2 times)	23 (28.8)	12 (30)	11 (27.5)	
Never	2 (2.5)	2 (5)	0	
Consumption, according to IDDS				
Starchy staple food	79 (98.8)	40 (100)	39 (97.5)	0.602
Green leafy vegetables	71 (88.8)	39 (97.5)	32 (80)	0.013
Fruit and vegetable source of vit A	78 (97.5)	38 (95)	40 (100)	0.000
Other fruit and vegetables	65 (81.3)	25 (62.5)	40 (100)	0.008
Offal	45 (56.3)	24 (60)	21 (52.5)	0.499
Meat and fish	69 (86.3)	32 (80)	37 (92.5)	0.033
Eggs	71 (88.8)	34 (85)	37 (92.5)	0.105
Pod, beans, and seeds	59 (73.8)	33 (82.5)	26 (65)	0.075
Milk and dairy products	73 (91.3)	38 (95)	35 (87.5)	0.235
Physical activity level				
Very light	42 (52.5)	16 (40)	26 (65)	0.027
Light	26 (32.5)	16 (40)	10 (25)	
Moderate	12 (15)	8 (20)	4 (10)	
Active	0	0	0	
Mean ± SD	1.46±0.29	1.34±0.34	1.40±0.29	
Duration of physical activity				
Not sufficient (<30 minutes)	74 (92.5)	35 (87.5)	39 (97.5)	0.092
Sufficient (>30 minutes)	6 (7.5)	5 (12.5)	1 (2.5)	
Frequency of physical activity				
Always (6-7)	1 (1.3)	1 (2.5)	0	0.000
Often (4-5)	11 (13.8)	7 (17.5)	4 (10)	
Sometimes (1-3)	62 (77.5)	31 (77.5)	31 (77.5)	
Never	6 (7)	1 (2.5)	5 (12.5)	
Mean ± SD	2.09±1.40	2.35±1.48	1.83±1.28	

Table 2: Energy, protein, fat, and carbohydrate intakes of the students.

Variables	Total (n=80)	Male (n=40)	Female (n=40)	P value
Energy				
Intake (kcal)	1388±428.4	1450±434.3	1326±418.6	0.045
RDA (kcal)	2398	2650	2145	
Adequacy level (%RDA)	58.3	54.7	61.8	
Protein				
Intake (g)	45.7±21.3	47.4±25.3	44.1±16.5	0.679
RDA (g)	67	70	63.5	
Adequacy level (%RDA)	68.6	67.8	69.4	
Fat				
Intake (g)	62.5±43.3	69.6±45.7	55.4±40.1	0.620
RDA (g)	74	80	68.5	
Adequacy level (%RDA)	83.9	87.0	80.9	
Carbohydrate				
Intake (g)	208.5±68.0	212.3±70.3	204.7±66.4	0.482
RDA (g)	367	415	318	
Adequacy level (%RDA)	57.8	51.1	64.4	

Table 3: Nutrition knowledge and nutritional status of the students.

Variables	Total (n=80) (%)	Male (n=40) (%)	Female (n=40) (%)	P value
Nutrition knowledge				
Less (<60%)	26 (32.5)	15 (37.5)	11 (27.5)	0.194
Sufficient (60-80%)	42 (52.5)	21 (52.5)	21 (52.5)	
Good (>80%)	12 (15)	4 (10)	8 (20)	
Mean ± SD	68.9±13.8	66.75±13.5	71±13.8	
Nutritional status (kg/m^2)				
Severe thinness (<17.0)	9 (11.3)	6 (15)	3 (7.5)	0.148
Thin (17.0-18.49)	29 (36.3)	16 (40)	13 (32.5)	
Normal (18.5-25)	34 (42.5)	15 (37.5)	19 (47.5)	
Overweight (25.1-27)	5 (6.3)	1 (2.5)	4 (10)	
Obesity (>27)	3 (3.8)	2 (5)	1 (2.5)	
Mean ± SD	19.8±3.3	19.3±3.4	20.3±3.2	

Table 4: Body dissatisfaction of students based on sex.

Variables	Total (n=80) (%)	Male (n=40) (%)	Female (n=40) (%)	P value
No attention	46 (57.5)	26 (65)	20 (50)	0.020
Light attention	18 (22.5)	9 (22.5)	9 (22.5)	
Moderate attention	13 (16.3)	5 (12.5)	8 (20)	
Heavy attention	3 (3.8)	0	3 (7.5)	
Mean ± SD	79.1±36.6	68.8±29.4	89.4±40.5	

Table 5: Category of BMI based on students' body dissatisfaction score.

BMI (kg/m^2)	Body dissatisfaction score	
	Male (n=40)	**Female (n=40)**
Severe thin and thin	59	70
Normal	71	103
Overweight and obese	125	101

Table 6: Correlation test of students' nutritional status and other variables.

Variables	Nutritional Status			
	Male		**Female**	
	P value	**R**	**P value**	**R**
Nutrition knowledge	0.045	0.784	0.029	-0.346
Body dissatisfaction	0.027	0.349	0.015	0.383
Parents income	0.629	0.079	0.100	-0.264
Parent education	0.884	-0.024	0.003	-0.454
Family size	0.652	-0.074	0.152	-0.231

DISCUSSION

Breakfast habits of male and female students showed no significant difference (p=0.328). A study revealed that there was no significant relationship between gender and the frequency of students' breakfast.[11] The results of other studies also stated that gender had no relationship with the breakfast habit of the respondents. Since the breakfast behavior of male and female subjects is similar, many subjects choose breakfast at home rather than having snacks during the day, and the habit of both subject groups showed no significant difference.[12]

Students' low physical activity levels can caused by rapid technological advances providing various conveniences. Thus, it reduces the students' daily physical activities. Moreover, technological advancements have led to increased screen time and a sedentary lifestyle. A study showed that male and female subject groups often do activities such as lying down/napping, sitting, reading webtoons, playing online games, and watching TV or drama series. The low level of physical activity in students was due to a lack of sports facilities and low motivation to engage the physical activities.[13]

The duration of exercise in both subject groups was dominated by the less category (<30 minutes for each sport), where the male subject group had a percentage of 87.5%, and the female subject group had a percentage of 97.5%. The result of the statistical test showed no

significant difference (p=0.092) between both subject groups. Indonesia Ministry of health recommends a minimum time for doing sports is 3-5 times each week with a minimum duration of 30 minutes.[14] Laziness and lack of time for students to engage in physical activities are the reason for the less exercise duration in male and female students[15]. The result of the difference test analysis showed a significant difference (p=0.000) found in the category of exercise frequency of male and female subject groups. The results of other study also stated that men had different exercise needs than women.[16]

Men tend to do sports because they have a higher ability to exercise, physical competency, and athletic ability. With these abilities, men feel more confident and have more capabilities for the activities they carry out.[16] A significant relationship was found between the nutritional knowledge and the nutritional status (p<0.05). Nutrition knowledge is the most critical factor influencing the nutritional status of adolescents.[17] The level of an individual's nutrition knowledge influences attitudes and behavior toward food ingredients, ultimately affecting the individual's nutritional status. The higher the individual's nutrition knowledge, the better their nutritional status. Nutrition knowledge should be understood by teenagers, such as students or college students, because during this development phase, nutrient requirements will increase to help the growth and the development of the body, and following their lifestyle changes, it will affect their eating habits so they are prone to nutritional problems.[18]

Furthermore, there was a significant relationship between body dissatisfaction and nutritional status in both subject groups (p<0.05) with r value ranged from 0.30 to 0.50, which meant a moderate positive relationship existed. The result of this study aligns with the research conducted on students of one of Semarang's tertiary institutions (p=0.000), which showed nutritional status was increasingly abnormal (over nutrition) when body dissatisfaction to their bodies is higher.[19] Early adolescents often feel dissatisfied with their body shape because media and current trends easily influence them. Negative perceptions of body shape will encourage adolescents to take often dangerous actions affecting their nutritional status. Based on the literature, body dissatisfaction is experienced more by young females than young males. It happens to young females during their puberty period when there is additional fat appears in their bodies, while young males feel satisfied because, in their puberty period, they will have increased muscle mass.[17]

This study showed no significant relationship between parents' income and the nutritional status of male and female subjects (p=0.629 and p=0.100). An increase in income or higher parents' income does not necessarily follow with a higher level of children's nutritional status.[20] However, the results of another study found that there was a significant relationship between parents' income and children's nutritional status. If a family's economic and social status is higher, the family will be able to buy foods with good nutritional content for family members.[21]

This study also showed no significant relationship between the parent's education and the nutritional status of the male subjects (p=0.884). However, the parent's education of the female subjects had a significant relationship to their nutritional status (p=0.003). These results showed that the parents' formal education had a close relationship to an understanding of healthcare for the family members; education related to nutrition and improvement of nutritional health, especially mother's education.[21] A mother would allocate her financial resources to buy nutritious food and raise children.[22] This study showed no relationship between the family size to the nutritional status of both subject groups (p=0.652 and p=0.152). Family size was more closely related to the family's economic status.[23,24] This condition worsens if the family's economic status is low. In contrast, for a family with many family members but a high income, their children's nutritional status will be good.[25]

Limitations

The limitation of this study was that the IDDS calculation used the recall method, which has a weakness regarding respondents who have to remember the food consumed 24 hours ago.

CONCLUSION

Based on the findings, there was a significant relationship between nutritional knowledge and nutritional status in male subjects. Furthermore, there is a relationship between body dissatisfaction and the nutritional status of the subject, where subjects with more nutritional status tend to have higher body dissatisfaction scores.

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