PROCEEDING BOOK

THE 4th INTERNATIONAL CONFERENCE ON HEALTH SCIENCE 2017

“The Optimalization of Adolescent Health in The Era of SDGs”

INNA GARUDA HOTEL YOGYAKARTA, INDONESIA
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Oral Presentation

PHYSICAL ACTIVITIES AND SNACK CONSUMPTIONS OF OBESE ADOLESCENTS IN BANTUL, YOGYAKARTA

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ABSTRACT

Obesity in adolescents has important implications for the health and well-being of individuals and society. It is a negative impact in increasing susceptibility to some diseases, chronic health problems, psychological disorders, increased maintenance costs each year up to early death. 2.8 million people die each year due to obesity. The increasing prevalence of obesity in adolescents allegedly associated with lifestyle changes include the decline in physical activity and increased consumption of snacks. The objective of the research is to determine the difference of physical activity and snack consumption in adolescent obesity in urban and rural areas in the district of Bantul. This study used a case control study design, with a population of high school teenagers both public and private. Cases are obese adolescents who were diagnosed at screening, while the control is not obese adolescents. Data analysis included univariable consist of frequency distribution, bivariable consist of chi-square and t-test and also logistic regression test for multivariable analysis. The result shows that the bivariate analysis showed significant association between physical activity and obesity with a value \(p < 0.05; \ OR 4.26 \ (95\% \ CI: \ 1.61 \ to \ 12.06)\). Weight snack, \(p = 0.001\) and the value of \(OR 1.8 \ (95\% \ CI: \ 1.32 \ to \ 2.48)\), the type of snacks \(p = 0.001; \ OR = 2.21; \ CI: \ 1.26 \ to \ 3.85\), as well as the amount of intake of snacks with \(p = 0.001\) by \(OR\) value of \(4.30 \ (95\% \ CI: \ 2.55 \ to \ 7.25)\). The results of logistic regression showed physical activity, frequency of snack, snack weight, kind of snack and snack intake) and dependent variable (obesity) is accompanied by variable gender and history of obesity contributes to obesity by 47%. It can be concluded that the low physical activity, high snack frequency, type of fried snacks, fried severe (> = 60 grams), and snack intake (> = 53%) are most likely to increase the incidence of obesity.

Keywords: Physical Activity, Consumption Of Snacks, Obesity, Teen

INTRODUCTION

The proportion of obesity in children and adolescents increased drastically over the last decade. Obesity in children and adolescents in the United States is more common in the age group 12-19 years. Meanwhile, in Indonesia, the prevalence of obese are more common in adolescents aged 16-18 years is, as much as 7.3%, consisting of 5.7% fat and 1.6% obese. The prevalence increased from 1.4% (2007) to 7.3% (2013). Yogyakarta is one of the provinces in Indonesia with a prevalence of obesity over the national rate of youth aged (16-18 years). The highest prevalence of obesity in the city of Yogyakarta that is equal to 6%.

Obesity is caused by an imbalance between the amount of energy in with energy expended every day. Excess accumulation of fat in adipose tissue resulting from the excessive consumption of food and beverages. This is what causes the accumulation of fat to occur obesity. In addition, lifestyle changes into sedentarian behavior contributing to obesity. This can be seen from the amount of time watching TV, the increasing number of cars per family, causing a decrease in physical activity. Transition occurs is a change in
lifestyle, which at first all the activities carried out require physical exertion humans now all facilitated by technology. Similarly, according to Hartono and Huriyati\textsuperscript{2}, that factor inactivity enormous influence on the development of obesity than overeating.

National Youth Physical Activity and Nutrition Study (NYPANS) stated that students have access to food and drinks that are less healthy school environment (Brener et al., 2013), Lack of physical activity is accompanied by the consumption of snack today become an important issue in public health because it has a negative effect on health. Moreover, these two things have a major contribution in causing obesity in rural and urban areas.

Riskesdas Yogyakarta province in 2013 showed that the highest prevalence of obesity in the province of Yogyakarta is located in Yogyakarta, namely, 12.9% fat and 6% obesity while Bantul 7.9% and 1% fat obesity. Meanwhile, in the province of Yogyakarta almost half the population of productive age less physical activity is 42.1%. Less physical activity in rural and urban areas is now not much different, less physical activity in Bantul 79.9%\textsuperscript{3}.

Research on physical activity and snack consumption among adolescents in Yogyakarta province still have not been studied, therefore the author felt the need to do research on physical activity and snack consumption in adolescent obesity in urban and rural areas in the district of Bantul.

METHODS

This is a type of observational study using case control design. Case-control design is the design of epidemiological studies that study the relationship between exposure to certain securities. Population of this research were, all of the student in senior high school in Bantul Regency. Respondent was divided by two groups, such as obese as case group and non obese as control group which choosen by class matching process. In this group of cases is high school adolescent obesity with a value of Body Mass Index (BMI) ≥ 27 kg / m\textsuperscript{2}. While the control group was high school teens who are not obese.

The study was conducted in four public high school in Bantul. Total sample of 124 people. Data analysis and statistical tests to be conducted in this study included the analysis of descriptive presented in the form of frequency distribution, percentages, and narrative and inferential analysis covering bivariable analysis by using statistical test of chi-square and t-test, and 95% confidence intervals ( CI) and a significance p value of <0.05 multivariate analysis using logistic regression.

Instrument which used in this reseach such as, microtoise and weight scale for screening obese. GPAQ (Global physical activity questionaire) and recall for measuring physical activity, and quantitative food frequency for masuring snack consumption.
RESULT

1. Respondent Characteristics

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16 years</td>
<td>25</td>
<td>20.16</td>
</tr>
<tr>
<td></td>
<td>17 years</td>
<td>40</td>
<td>32.16</td>
</tr>
<tr>
<td></td>
<td>18 years</td>
<td>59</td>
<td>47.58</td>
</tr>
<tr>
<td>2.</td>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Man</td>
<td>50</td>
<td>40.3</td>
</tr>
<tr>
<td></td>
<td>Woman</td>
<td>74</td>
<td>59.7</td>
</tr>
<tr>
<td>3.</td>
<td>Sedentary Behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>117</td>
<td>94.3</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>7</td>
<td>5.7</td>
</tr>
<tr>
<td>4.</td>
<td>Genetics (obese)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Obese</td>
<td>61</td>
<td>49.2</td>
</tr>
<tr>
<td></td>
<td>Non obese</td>
<td>63</td>
<td>50.8</td>
</tr>
<tr>
<td>5.</td>
<td>Daily money</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;=10.000</td>
<td>99</td>
<td>79.8</td>
</tr>
<tr>
<td></td>
<td>&lt;10.000</td>
<td>25</td>
<td>20.2</td>
</tr>
<tr>
<td>6.</td>
<td>Economic social</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rich</td>
<td>123</td>
<td>99.2</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>1</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Based on Table 1, in general the majority of respondents aged 18 years, was in class XII and female (59.7%). Additionally, nearly all respondents have a high sedentary behavior (94.3%) and had a history proportion of overweight parents are almost the same between parents obese and non obese. Rich socio-economic dominated most of the respondents, it is in line with the percentage of allowance of the respondents have an allowance is almost entirely (≥ 10,000 rupiah) is as much as 79.8%.
a. Relationship between physical Activities, snack frequency, snack weight, kind of snack and snack calories with obesity

Tabel 2. Chi Square analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obese</th>
<th>Non obese</th>
<th>$\chi^2$</th>
<th>$P$</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>light</td>
<td>24</td>
<td>38.7</td>
<td>8</td>
<td>12.9</td>
<td>10.78</td>
<td>0.001</td>
</tr>
<tr>
<td>Medium (R)</td>
<td>38</td>
<td>61.3</td>
<td>54</td>
<td>87.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack Frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>often</td>
<td>33</td>
<td>53.2</td>
<td>25</td>
<td>40.3</td>
<td>9.10</td>
<td>0.509</td>
</tr>
<tr>
<td>Sometime (R)</td>
<td>29</td>
<td>46.8</td>
<td>37</td>
<td>46.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kind of snack</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fried</td>
<td>52</td>
<td>83.9</td>
<td>35</td>
<td>56.4</td>
<td>11.13</td>
<td>0.001</td>
</tr>
<tr>
<td>Non fried (R)</td>
<td>10</td>
<td>16.1</td>
<td>27</td>
<td>43.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on the analysis in the table above we can conclude the existence of a significant relationship, both practically and statistically between physical activity and obesity. Obesity is more encountered 4 times greater in students with mild physical activity in comparison with students with moderate physical activity with a p-value of <0.05 with OR 4.26 (95% CI: 1.61 to 12.06). The relationship between the type of snacks and obesity also has a significant relationship both statistically and practically, namely obesity, are found as many as 2 times greater for students with fried snack consumption in comparison with students who consume non-fried snacks.
<table>
<thead>
<tr>
<th></th>
<th>Model1 OR (95% CI)</th>
<th>Model2 OR (95% CI)</th>
<th>Model3 OR (95% CI)</th>
<th>Model4 OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>3.38 (0.91 - 12.49)</td>
<td>3.32 (0.86 - 12.80)</td>
<td>2.94 (0.78 - 11.07)</td>
<td>2.93 (0.74 - 11.55)</td>
</tr>
<tr>
<td>Medium (R)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>often</td>
<td>0.67 (0.22 - 2.01)</td>
<td>0.63 (0.22 - 2.01)</td>
<td>0.65 (0.21 - 1.96)</td>
<td>0.65 (0.20 - 1.84)</td>
</tr>
<tr>
<td>sometime (R)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>121 ± 54</td>
<td>16.36 (3.23 - 82.79)</td>
<td>16.22 (3.17 - 82.89)</td>
<td>19.22 (3.58 - 103.57)</td>
<td>19.17 (3.54 - 103.71)</td>
</tr>
<tr>
<td>63.97 ± 29.40 (R)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kind of snack</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fried</td>
<td>3.56 (1.14 - 11.12)</td>
<td>3.53 (1.12 - 11.16)</td>
<td>3.06 (0.95 - 9.84)</td>
<td>3.05 (0.93 - 9.97)</td>
</tr>
<tr>
<td>Non fried (R)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack calories</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.74 ± 0.21</td>
<td>8.06 (2.80 - 23.14)</td>
<td>8.21 (2.69 - 25.05)</td>
<td>7.47 (2.57 - 21.83)</td>
<td>7.54 (2.44 - 23.26)</td>
</tr>
<tr>
<td>0.42 ± 0.17 (R)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>men</td>
<td>1.05</td>
<td>1.05</td>
<td>1.05</td>
<td>1.05</td>
</tr>
<tr>
<td>Woman (R)</td>
<td>0.33 - 3.38</td>
<td>0.31 - 3.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genetic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>obese</td>
<td>0.40</td>
<td>0.40</td>
<td>0.13 - 1.18</td>
<td>0.13 - 1.18</td>
</tr>
<tr>
<td>Non obese (R)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model 4 shows how much the relationship between the independent variables (physical activity, frequency of snack, snack weight, kind of snack and snack intake) and dependent variable (obesity) is accompanied by variable gender and obesity history together. Based on the analysis showed that there was no change OR - crude significantly in physical activity variables, frequency of snack, snack weight, kind of snack and snack intake. This indicates that the variable history of overweight parents and gender are included together did not alter the effects of the risk variables of physical activity, type of snack, heavy snack and snack intake. Rated $R^2 = 0.47$ describe the independent variables (physical activity, frequency of snack, snack weight, kind of snack and snack intake) with variable.
gender and history of overweight parents contribute to the incidence of obesity by 47%.

DISCUSSION

Obesity is mostly caused by many factors, both biological and environmental. Some studies suggest that the major contributing factors to the onset of obesity is the consumption pattern of the wrong foods and a change in physical activity. In 1977 to 1996 the percentage of teenagers who consume a snack in the National Survey increased from 76% to 88%, it also causes the average - average number of snacks consumed increased from 21% to 25%. In addition, a decline in physical activity between 1969 to 2001, the percentage of students who are cycling and walking to school declined from 41.6% to 26.4%. This is caused due to changes in lifestyle towards sedentary life.

Generally based on univariate analysis showed that study subjects had a characteristic age of 16 years to 18 years. Most obesity experienced by students aged 18 years old and sitting in class XII. Researchers assign study subjects with these criteria because at the age of 16 to 18 years, teenagers are in mid-adolescence. Where, in the mid-teens, teens tend to groups vulnerable to nutritional needs, especially nutrition excess.

Age is one factor that contributes to obesity. The increasing age of a person, would increase the risk of an increase in body fat mass. This is in line with research conducted by Ryan K. Masters consistent with previous research indicating that the effect of high BMI on mortality risk grows significantly stronger with increasing age. Although the bulk of existing public health literature has suggested that the association between obesity status and mortality risk is either age-invariable or substantially weakens with increasing age, it has not accounted for some important factors that likely distort the estimates. After we accounted for one prominent factor, namely, age-related survey selection bias, by BMI level we found that the effects of overweight, grade 1 obesity, and grade 2/3 obesity on mortality risk for US men and women grow substantially stronger with age4.

Along with age, the class becomes a factor that contributes to obesity. The higher a person's education classes are taken to increase the risk of obesity. Results of bivariate analysis showed a significant relationship (p <0.05) between physical activity and obesity. Teens with mild physical activity will likely four times greater than the obese adolescents with moderate physical activity. In this study, the majority of students have moderate physical activity patterns.

Teens ages 16-18 is more preoccupied with school activities and play with peers. Physical activity was being routinely performed by most of the respondents are routine after school activities ranging clean up, clean room, helping elderly sweeping, mopping, and sometimes cook at home after school. Forms of moderate physical activity can be found in extracurricular activities such as scouts, choirs, and other activities conducted in schools. Most respondents to sit in class XII, most students in the class had not followed the extracurricular activities and other school activities, so it is that triggers the reduction in physical activity in students in this study.

Less physical activity in adolescents contribute greatly to obesity. Teenagers who have limited activity will experience a positive direction to the energy imbalance that leads to energy storage and weight gain. This research is in line with research conducted by Thasanasuwan said that all physical activity behavior variables except for activity score were associated with obesity in Thai children. Activity during school recess time was the most sensitive factor to predict obesity. Children who reported to be inactive during break times had 2 to 3 times higher risk of obesity than children who were often or always active during recess time5.

Analysis of the results showed that most of the study subjects had a frequency of snack consumption of more than 4 times a week both adolescents in rural and urban areas. This shows that the overall teen liked the snack consumption habits. The habit of
eating snacks with frequency often has a major contribution in the increase in body fat mass. This condition becomes progressively worse with the type of snacks consumed. Adolescents usually snack with high content of sugar and fat. The high frequency of snack consumption is often supported by a habit that is watching television or using a gadget in spare time. This is according to research of Pearson dkk that television viewing has a significant role to play in adolescent unhealthy eating behaviours.

Selection of types of unhealthy snacks can lead to obesity in adolescents. Teens who like to consume snacks high in sugar and fat have a higher risk obese. Some studies suggest that snacks as unhealthy foods. Snack foods in question are high in sugar, high in fat but low in fiber. These foods contribute significantly to the intake of calories and cholesterol a day (Ezmailzadeh and Azadbakht, 2008). The results are consistent with research conducted by Ezmailzadeh and Azadbakht (2008), that there is a relationship between the subjects who consumed foods high in sugar with obesity. Teenagers who consume foods high in sugar and fat have 5.74 times the risk of obesity.

Habit of eating snacks outside is a habit that can increase the body's energy consumption. An increase in the body's energy will also increase the incidence of obesity. The high incidence of obesity seen in line with the increase in frequency of eating out in large numbers. This is in line with research conducted by K. Murakami and M. B. E. Livingstone, there is a completely positive associations between eating frequency and overweight (children only) and abdominal obesity. This is made clear by a study conducted Yusuf et al. mentions that frying foods containing 4% - 14% of the total weight. This means that the greater the weight of fried foods are consumed, the more fat it contains.

Both statistically significant correlation was also found between the practical and the type of snacks and obesity, where obesity is found 2 times greater for students with fried snack consumption in comparison with students who consume non-fried snacks. In addition, obesity is also more is found 4 times greater on students by the number of snack intake (> = 53%) of the AKG compared students who consume less than (53%). Type of fried snacks fried in oil containing saturated fatty acids. If the snack is consumed in large quantities every day will be metabolized by the body and will ultimately increase the fat in the body. Besides snacks that contain saturated fats will raise blood cholesterol levels as much as 15-25%.

CONCLUSION

1. Physical activity less, are found in obese adolescents compared with non-obese adolescents. Teens with mild physical activity four times more likely to be obese compared with adolescents with strenuous physical activity.
2. Consumption of fried snack types cause teenagers 2 times greater chance obese compared with non-fried snack consumption.
3. There are significant differences between heavy snack and snack intake of obese and non-obese adolescents.
4. The relationship between the independent variables (physical activity, frequency of snack, snack weight, kind of snack and snack intake) and dependent variable (obesity) is accompanied by variable sex and history of obesity contributes to obesity by 47%.

REFERENCES:

1. NHNES (2012) Healthy Weight, Overweight, and Obesity Among US Adults: CDC.