**DIFFERENCE IN THE EFFECT OF SEDENTARY BEHAVIOR AND FAST FOOD CONSUMPTION HABIT ON BMI (BODY MASS INDEX) AMONG OBESE CHILDREN**

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# ABSTRACT

Obesity (overweight) is the basis of various non-communicable diseases such as diabetes, hypertension and cardiovascular disease which are currently still major health problems in Indonesia. In addition, other consequences that may arise are a greater risk of experiencing bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and low self-confidence. To prevent these cases, the researchers expect to change the pattern of sedentary behavior, namely in the form of behavior and the fast food consumption habit among obese children. This was a quantitative study in the form of Quasi Experiment with two groups pre-test-post-test comparison design. Treatments were applied towards the sedentary behavior group and the fast food consumption habit group. Furthermore, the conditions before and after treatment were compared. The study results revealed that the mean BMI (Body Mass Index) among children in the sedentary behavior group before intervention was **28.2** (Obesity I), and after intervention it became **19.2** (Normal BMI). Meanwhile, the mean BMI in the fast food consumption habit group before intervention was **28.2** (Obesity I) and after intervention it became **19.5** (normal BMI). The statistical test obtained a p value of 0.000 (p <0.05). Thus, it can be concluded that statistically there was a significant difference in the decrease in BMI (Body Mass Index) between the sedentary behavior group and fast food habits group. The sedentary behavior group showed a higher mean value than the fast food habit group, namely 20.0 and 19.6, respectively. Thus, it can be concluded that sedentary behavior intervention was more influential than the fast food habit intervention.

**Keywords**: Sedentary Behavior; Fast Food Consumption; BMI; Obesity

# INTRODUCTION

Obesity (overweight) is the basis of various non-communicable diseases such as diabetes, hypertension and cardiovascular disease which are currently still major health problems in Indonesia. (1) Obesity occurs due to an imbalance between the amount of energy intake and required by the body for various biological functions, such as development, movement, physical growth and health maintenance (2). If this situation continues (positive energy balance) for a long enough time, then obesity may occur. Obesity is a state when the body mass index (BMI) of a child is above the 95th percentile on a child development chart according to gender(3) In 2008, around 2.8 million adults died from obesity, around 300 million people were clinically obese which is the main contributor to degenerative diseases such as diabetes, heart disease and cancer. Obesity is a condition of increased level of body fat which is assessed based on the value of body mass index (BMI).(4)

In Indonesia, the results of Basic Health Research in 2007-2018 showed an increasing trend of obesity, namely 10.5% (2007), 14.8% (2013) and 21.8% (2018). Based on Basic Health Research in 2018, the prevalence of obesity in West Java Province was ranked 14th out of 34 Provinces in Indonesia, which increased from 15.2% (2013) to 23% (2018). Considering obesity as an entry point for various Non-Communicable Diseases, it is necessary to make efforts to prevent and deal with this problem. Prevention of obesity can be performed by balancing the amount of energy intake and output(5).Based on this case, the researcher intends to intervene with obese children who are obese through the provision of sedentary behavior and fast food consumption habit interventions.

Sedentary behavior is a risk factor for the incidence of obesity among students in Yogyakarta and Bantul which contributed about 10.95% with a risk size of 5.15 times for students with a longer sedentary duration. There were differences in activity patterns (duration, type, and frequency) between obese and non-obese students. Regarding the overall difference in activity duration, obese students had a longer duration than non-obese students. The mean difference was 49.81 minutes/day. Based on the type of sedentary behavior, obese students had a longer duration for the activities of watching TV, playing games, playing computer, board and card games, and sit longer than non-obese students (6). The results of this study are in line with a study conducted by Sherwood et al. which showed that exercise contributed to the prevention of weight gain.(7)

Fast food is often referred to as ready-to-eat food. Ready-to-eat food is a type of food that is packaged, easy to serve, practical, or processed in a simple way. These kinds of foods are generally produced by the food processing industry with high technology and contained various additives to preserve and give a taste to the product. Fast food is usually served in the form of packaged side dishes, instant noodles, nuggets, or corn flakes intended for breakfast.(8)

According to the results of a study conducted by Fraser et al. (9), it was evidenced adolescents who frequently ate at fast food restaurants consumed more unhealthy foods and tended to have a higher BMI than those who did not periodically ate at fast food restaurants. The results of this study are in line with previous study conducted by Jeffery et al. (10) which showed that eating at fast food restaurants (at least once a week) was positively related to a high-fat diet and BMI.

Based on the above background, the researcher is interested to conduct a study entitled "Difference in the Effect of Sedentary Behavior and Fast-Food Consumption Habit on BMI (Body Mass Index) among Obese Children in Siwalankerto Village, Surabaya City."

# MATERIAL AND METHODS

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| --- | --- | --- | --- |
| **Variable** | **Group** | | **p value** |
| **Sedentary Behavior**  **(n=12)** | **Fast-Food Consumption Habit (n=12)** |
| **Age (Years)** |  |  | **0.584**1 |
| Mean (SD) | 17.04 (0.767) | 16.91 (0.900) |
| Median | **11** | **11** |
| Min ± max | 5±16 | 5±16 |
| **History of Parental Obesity** |  |  | **0.236**2 |
| History of Obesity | 8.8 % | 3 % |
| No History of Obesity | 91.2 % | 97 % |
| **Maternal Education Level** |  |  | **0.238**2 |
| Attended School | 65.2% | 52.2% |
| Did Not Attend School | 34.8% | 47.8% |

This was a quantitative study in the form of Quasi Experiment with two groups pre-test-post-test comparison design (11). In this design, treatments were applied towards the sedentary behavior group and the fast food consumption habit group. Furthermore, the conditions before and after treatment were compared(12). The population in this study was all obese children aged 5-16 years in Siwalankerto Village, Wonocolo District, Surabaya City.

The samples were taken using total sampling method. Total sampling is a sampling technique where the number of samples is the same as the population.(12) According to Sugiyono, total sampling can be choses when the population is less than 100 so that the entire population can be taken as samples.(12) The incidence of obesity was assessed on an observation sheet using stature meter and a weighing scale based on general provisions for the use of anthropometric standards to classify BMI. (13)

In this study, the normality of the data was tested using Shapiro-Wilk since the data was normally distributed. The difference between before and after the sedentary behavior intervention and before and after the fast food consumption habit intervention was tested using Wilcoxon test and the comparison between sedentary behavior intervention and fast food consumption habit intervention was tested using Mann Whitney test.(14)

# RESULT

**Table 1. Characteristics of Respondents in the Intervention Groups of Sedentary Behavior and Fast-Food Consumption Habit**

**Sources:** 1Mann-Whitney Test 2Chi-Square Test

Based on table 1, it can be seen that the mean age of the respondents in the sedentary behavior intervention group was 11 years, while in the fast-food consumption habit intervention group it was 11 years. Based on the results of statistical test, it was obtained a p value of **0.584.** Thus, it can be concluded

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| --- | --- | --- | --- | --- |
| **No** | **BMI (Body Mass Index)** | **Group** | | **p value1** |
| **Sedentary Behavior**  **(n=12)** | **Fast-Food Consumption Habit (n=12)** |
| 1. | Before Intervention 1 |  |  | 0.211 |
|  | 1. Mean ± SD | 28.2±0.825 | 28.2±0.689 |
|  | 1. Min-max 2. Median | 25.0->40  29.9 | 25.0-40.0  29.9 |
| 2. | After Intervention 1 |  |  | 0.000 |
|  | 1. Mean ± SD | 19.2±0.668 | 20.5±1.310 |
|  | 1. Min-max 2. Median | 18.5-24.9  20.00 | 18.5-25.0  24.00 |
| 3 | Difference in BMI (Body Mass Index) Before and After Intervention |  |  |  |
|  | p value2 | 0.000 | 0.000 | - |
| 4. | Difference in Mean2 |  |  | 0.000 |
|  | 1. Mean ± SD | 19.6±0.793 | 20.0±1.313 |
|  | 1. Min-max 2. Median | 18.5-22.3  23.5 | 18.5-24.1  19.6 |

that there was no significant difference between the mean age between the two groups (p> 0.05), so that the age factor in this study can be controlled.

3 children (8.8%) in the sedentary behavior intervention group had a history of parental obesity, and 31 children (91.2%) had no history of parental obesity. Furthermore, 1 child (3%) in the fast food consumption habit intervention group had a history of parental obesity and 33 children (97%) had no history of parental obesity. Based on the results of statistical analysis, it was obtained a p value of **0.236**. Thus, it can be concluded that there was no significant difference between the history of parental obesity in the two groups (p> 0.05).

Based on maternal education level, (65.2%) children in the sedentary behavior intervention group had mothers who attended school and (34.8%) children had mothers who did not attend school. (52.2%) children in the fast food consumption habit intervention group had mothers who attended school and (47.8%) children had mothers who did not attend school. From the results of statistical analysis, it was obtained a p value of **0.238**. Thus, it can be concluded that there was no significant difference between maternal education in the two groups (p> 0.05).

**Table 2. Difference in the Decrease in BMI (Body Mass Index) in the Sedentary Behavior Intervention Group and the Fast Food Habit**

**Sources:** 1Mann-Whitney Test 2Wilcoxon Test

Based on table 2, it was known that the mean BMI (Body Mass Index) among children in the sedentary behavior group before intervention was **28.2** (Obesity I), and after intervention it became **19.2** (Normal BMI). From the results of statistical tests, it was found a p value of 0.000 (p<0.05). Thus, statistically there was a significant difference between before and after sedentary behavior intervention. It can be concluded that there was a decrease in the mean BMI (Body Mass Index) among children.

Furthermore, the mean BMI in the fast food consumption habit group before intervention was **28.2** (Obesity I) and after intervention it became **19.5** (normal BMI). From the results of statistical tests, it was found a p value of 0.000 (p<0.05). Thus, statistically there was a significant difference between before and after fast food consumption habit intervention. It can be concluded that there was a decrease in the mean BMI (Body Mass Index) among children.

The statistical test obtained a p value of 0.000 (p <0.05). Thus, it can be concluded that statistically there was a significant difference in the decrease in BMI (Body Mass Index) between the sedentary behavior group and fast food habits group. The sedentary behavior group showed a higher mean value than the fast food habit group, namely **20.0** and **19.6**, respectively. Thus, it can be concluded that sedentary behavior intervention was more influential than the fast food habit intervention.

# DISCUSSION

This study revealed that there were changes in behavior, namely sedentary behavior and eating habits in children before and after being given treatment. This is in line with a study conducted by Khodijah, et al, (15) which stated that there was a significant relationship between obesity and quality of life of adolescents. The results of such study found that the mean quality of life of obese adolescents was lower than adolescents with normal weight. In a study conducted by Khodaverdi, et al, (16) it was also stated that there was a relationship between obesity and the quality of life of school age children with a p value of <0.000. Such study also explained that the quality of life of obese children was lower than the quality of life of normal children.

In this study, it was evidenced that there were changes in the Body Mass Index (BMI) in the two intervention groups, which was previously Obese I then after 3 months of treatment, it became normal. A study conducted by Khairy, et al, (17) also stated that there was a significant relationship between obesity and quality of life of children, where obese children had a lower quality of life than children with normal weight.

# CONCLUSION

Based on the results and discussion of this study, it can be concluded that there were changes in BMI (Body Mass Index) before and after treatment in both intervention groups, namely the sedentary behavior group and fast food consumption habit group, which was previously Obese I then after 3 months of treatment, it became normal.

Based on a study conducted by Chan, C.M.S and Wang, W in 2013 through an interview method conducted with one of the children, the child stated that he could not do what other friends at school did, he could not ride a bicycle, could not play the piano. The child felt that other friends did not like making friends with him, and the child has difficulty getting along with his friends. An interview conducted with one of the teachers also revealed that obese children could not play certain games that could be played by other children.(18)

The most influential change regarding the incidence of obesity experienced by children in Siwalankerto Urban Village, Surabaya City was found in the sedentary behavior intervention group. Movement behavior is a physical activity that has a major influence on the incidence of obesity compared to fast food consumption habit.

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