

**Original Article**

**The Effect Of Playing The Online Game Of Isi Piringku On Knowledge And Fiber Intake In Overweight Adolescents**

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**Abstract:**

**Objective:** Overweight in adolescents is one of the major challenges for health workers and society, which is caused by their excessive intake of food, but lack of fiber intake and lack of nutrition knowledge. To deal with it is increasing their knowledge as a preventive action by extending nutrition education

**Materials and Methods:** This research used quasi-experimental with pre-test and post-test with control design. Its samples consisted of 70 teenagers in Surakarta City. Subjects were screened by using google form first, and then adolescents who had the z-score of  $> 1$  SD were sampled

**Results and Discussion:** The results of statistical tests after nutrition education in the treatment group and the control group showed a difference in nutrition knowledge ( $p = 0.000$ ). The statistical tests showed that there was a significant effect after nutrition education on knowledge in both groups (the p-value = 0.000). Meanwhile, the statistical results on fiber intake showed no difference and effect as indicated by the p-value of  $> 0.05$

**Conclusion:** Playing isi piringku (the contents of my plate) had an effect on the knowledge in overweight adolescents, but it did not on fiber intake in overweight adolescents

**Keywords:** Isi piringku, knowledge, fiber intake

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**Introduction**

The rate of overweight in adolescents continues to increase.<sup>1</sup> The World Health Organization (WHO) states that overweight in adolescence is one of the main challenges for health workers and the community because of the increasing prevalence of overweight worldwide.<sup>2</sup>

Based on the data from the 2013 Basic Health Research (Riskesdas) the prevalence of obesity in children aged 13-15 years is 2.5%.<sup>3</sup> Overweight in adolescents is caused by their excessive intake of food but lack of fiber intake and lack of nutrition knowledge.<sup>4</sup>

It can cause risk factors for chronic diseases and increase obesity in adulthood by 50-80%,<sup>5</sup> but can be prevented by adjusting diet, physical

activity, and increasing knowledge by following nutrition education as a preventive measure.<sup>6</sup> Nutrition education is one of the community health interventions that can influence healthy behaviors,<sup>7</sup> which can be implemented in schools.<sup>8</sup> Nurmasiyita's research on nutrition education for adolescents states that nutrition education can increase knowledge and increase fiber intake.<sup>9</sup> There are many nutrition educations carried out by health workers, one of which is in the form of educational games, but no one has yet implemented the method of playing the online game of isi piringku. The online game of isi piringku (the contents of my plate) is a quiz game about the concept of the contents of food materials in my plate in which a dinner plate contains 50

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percent of fruits and vegetables, and the remaining 50 percent contain carbohydrates and protein.<sup>10</sup> Teens who take part in the game are expected to limit consumption of carbohydrates and consume more fiber so that the risk of health problems such as chronic disease can be reduced.

### **Materials and Methods**

This research used a quasi-experimental method with pre-test and post-test with control design. Multistage sampling (simple random sampling and purposive sampling) was used to determine its samples. They consisted of 70 teenagers in Surakarta City. Subjects were screened using google form first, and then adolescents who had the z-score of  $> 1$  SD were sampled.

The inclusion criteria of the samples included the following: the adolescents were aged 16-18 years; they were overweight based on the results of anthropometric screening, they had personal smartphones, and they were willing to be respondents. Meanwhile, the exclusion criteria were as follows: the adolescents were not present at the time of nutrition education, they did not participate in all research activities, and they suffered from diseases that required a certain diet (diabetes, kidney, heart disease, cancer, hypertension). The dependent variables in this study were nutrition knowledge and fiber intake while the independent variable was the online game of isi piringku.

Before the intervention in the form of playing the online game of isi piringku, the samples were observed with a pre-test and after the intervention they were observed with a post-test by using a google form. Pre-test and post-test were used to assess the nutritional knowledge of respondents. The pre-test was carried out before the intervention and the post-test was carried out after the intervention using the google form which contained 12 questions related to my knowledge of the playing the online game of isi piringku. The online game of isi piringku is the delivery of material about the contents of isi piringku through educational games.

Nutrition education material through the playing the online game of isi piringku in the form of a web-based educational application "Educandy", where this education is a game quiz containing carbohydrates, side dishes (animal protein and vegetable protein), vegetables, fruits, and added with knowledge about washing hands, drinking water, and physical activity. Nutrition

education is carried out online, where the game content application for isi piringku is developed by researchers through the "Educandy" web. The game content on isi piringku is very simple, namely by matching the answers to the questions made by the researcher before playing, the respondents read the material that is in the google classroom, this game can also be called learning while playing.

This research protocol was approved by the Ethics Committee of Universitas Sebelas Maret Surakarta through Decision Letter Number 144 / UN27.06.6.1/KEPK/EC/2020. In this study, the data were obtained and analyzed by using SPSS Version 16. The data of the research were then exposed to Wilcoxon's Test and the Kruskal-Wallis's Test to investigate the effect of playing isi piringku on knowledge and fiber intake in adolescents.

### **Results**

#### **Characteristics of research subjects**

The subjects studied were 70 overweight adolescents. The characteristics of the research subjects can be seen in Table 1.

Adolescents show that 52% of the respondents (both groups) were females, and mostly the subjects (91.7% of the treatment group and 80.6% of the control group) were aged 17 years old.

#### **Difference and influence of the online game of the contents of my plate on the nutrition knowledge and fiber intake in overweight adolescents**

The respondents of this study consisted of 70, and they were divided into two groups, 35 in the treatment group and the rest 35 in the control group. The differences and influences can be seen in Table 2.

The nutrition education in the treatment group was given once a week for a month by giving nutrition games of isi piringku where the teenagers played online games, and the nutrition education in the control group was given once a week for a month

**Table 1.** Characteristics of research subjects

Characteristics	Treatment group		Control Group	
	n	%	n	%
Gender				
Male	16	44.4%	16	44.4%
Female	19	52.8%	19	52.8%
Age				
17 years	33	91.7%	29	80.6%
18 years	2	2%	6	16.7%
n	35	100	35	100

**Table 2.** Differences and Effects of Playing the Online Game of Isi Piringku on Nutrition Knowledge and Fiber Intake

Variable	Treatment group (n=35)			Control group (n=35)			p
	Min	Max	average ±SD	Min	Max	average ±SD	
Nutrition knowledge							
-Before	18	29	24.9 ± 2.58	17	20	22.7 ± 2.26	0.000 <sup>b</sup>
-After	32	33	32.8 ± 0.38	27	32	27.4 ± 2.18	
p	0.000 <sup>a</sup>			0.000 <sup>a</sup>			
Fiber intake							
-Before	1	21.4	7.8 ± 3.4	2	18.4	8.58 ± 3.62	0.488 <sup>b</sup>
-After	3.4	31	8.1 ± 5.28	4.2	20.8	8.5 ± 2.9	
p	0.514 <sup>a</sup>			0.947 <sup>a</sup>			

<sup>a</sup>Wilcoxon Test<sup>b</sup>Kruskal-Wallis Test

by using the online lecture method (Zoom). The differences and effects of nutrition knowledge on the changes in the fiber intake level of the overweight adolescents in the treatment and control groups after the nutrition education intervention can be seen in Table 2.

In Table 2, the two groups before nutrition education more or less had the same nutrition knowledge level. Prior to the treatment, the average score ranged from 22 to 24. The results of the Wilcoxon's statistical test after nutrition education in the treatment group and in the control group showed differences in nutrition knowledge (the p-value = 0.000). The Kruskal-Wallis's statistical test showed a significant effect after nutrition education on knowledge level in both groups (p = 0.000).

Most of the mean fiber intake in the control group was greater than that in the treatment group before the nutrition education. In the treatment group, there was a change in fiber intake in which it increased significantly, but the results of the statistical test showed the p-value was greater than 0.05, meaning that there was no difference in the mean fiber intake between the treatment group and the control group. The results of the Kruskal Wallis's statistical test show that after the nutrition education, there was no effect of playing the online game of isi piringku and of nutrition lectures on the fiber intake as indicated by the p-value of > 0.05 (p = 0.488).

## **Discussion and Conclusion**

### **Nutrition knowledge**

After the nutrition intervention, there were

significant differences in knowledge and control (the p-value <0.05). The results of this study also indicated that playing the game of isi piringku had an effect on knowledge (the p-value <0.05). This shows that the knowledge of the subjects increased, and they understood the contents of the materials on the plate given. Nutrition education is a method for increasing nutritional knowledge and eating behaviors so as to prevent nutritional problems.<sup>11</sup>

The results of this study were the same as those of Nurmasyita's research on the effect of nutrition education that there were differences in the mean knowledge of the subjects after having received nutrition education (the p-value = 0.001). The results of this research were also in line with those of the research by Joyeti regarding the provision of comic education on the contents of my plate where the education given affects students' knowledge.<sup>12</sup> One's nutrition knowledge can be assessed based on the respondent's answers to the questions of questionnaire given.

### **Fiber intake**

The difference test showed no significant difference in carbohydrate intake before and after the nutrition education (the p-value > 0.05). It was probably due to the too-short time required for behavior change to occur so that it could not describe changes in adolescents' intake. In addition, their behavior was also heavily influenced by family and environmental factors. The roles of teachers and supports from parents and peers, which were carried out consistently and continuously, were needed by the students in an effort to shape the character of healthy living behaviors.<sup>13</sup> The results of this research were in line with those of Ratu's research on nutrition education on fiber consumption behavior in students, which showed no difference and influence on fiber consumption behaviors (the p-value > 0.05).

According to Khomsan (2003), one with good knowledge is not necessarily able to change his or her nutritional behaviors or eating habits. Eating habits are still difficult to change because everyone has habits and preferences for certain foods.<sup>14</sup> In addition, the low consumption of fiber (fruit and vegetables) is caused by the availability of vegetables and fruits at home and in the school canteen.

### **Conclusion**

Nutrition education using games could improve knowledge ( $p < 0.05$ ). The increase in knowledge of the treatment group was higher than that of the control group.

Fiber intake of all adolescents was still low. The nutrition education did not have any effect on fiber intake in the adolescents prior to and following the treatment (the  $p\text{-value} > 0.05$ ). It was due to several factors, one of which was the lack of or the unavailability of vegetables and fruits at home and in the school canteen.

### **Recommendations**

It is better if the school works with the parents of students and closest health workers such as the health center to provide nutrition education about the contents of my plate or balanced food so that students can change their health behavior for the better.

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### **Conflict of Interest**

Authors state no conflict of interest.

### **Author's Contribution**

Idea owner of this study: Lidia Wati

Study design: Eti Poncorini P & Sapja A

Data gathering: Lidia Wati

Writing and submitting manuscript: Eti Poncorini & Lidia Wati

Editing and approval of final draft: Lidia wati & Sapja A

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