



**THE RELATIONSHIP OF FOOD CONSUMPTION THROUGH ONLINE FOOD ORDERING FEATURE WITH THE NUTRITIONAL STATUS OF ADOLESCENTS DURING A PANDEMIC IN DEPOK HIGH SCHOOL**

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**ABSTRACT**

Nutritional status is the state of the body, resulting from the balance of intake and utilization of nutrients. The direct cause of an individual's nutritional status was food consumption. The Covid-19 pandemic had a huge impact on lifestyle changes, one of which was food consumption through the online food ordering feature. The study aimed to determine the relationship between meal consumption and snack consumption through the online food ordering feature, and the nutritional status of adolescents during a pandemic at Senior High School of Depok City. This study was a quantitative study with a cross-sectional design approach by using chi-square test and Fisher's Exact test. The population in this study were teenagers at Senior High School of Depok City, the sample was 79 people taken by simple random sampling method. The analysis showed that meal consumption through the online food ordering feature had a relationship with the nutritional status of adolescent during a pandemic in at Senior High School of Depok City ( $p = 0,003$ ). There was no significant relationship between the consumption of snack through the online food ordering feature and the nutritional status of adolescent during a pandemic in at Senior High School of Depok City ( $p = 1,000$ ). The conclusion obtained was that the majority of respondents had high consumption meals through the online food ordering feature, consumption of snacks through the online food ordering feature was not high in calories, and had normal nutritional status. Respondents were advised to always choose foods that supported body health, monitor weight and height regularly in order to know the nutritional status.

Keywords: Food consumption, nutritional status, adolescent

**Introduction**

Nutritional status is the state of the body, resulting from the balance of intake and utilization of nutrients.<sup>1</sup> The balance between energy intake and expenditure created normal nutritional status. However, if this situation did not occur, it caused nutritional problems, both malnutrition problems, and overnutrition problems. The nutritional status of adolescents needed to be considered because this period was a critical period in growth which created an increase in food consumption. An increase in BMI was associated with the risk of suffering from diabetes mellitus where a BMI that was overweight has 3 times the risk of suffering from diabetes mellitus.<sup>2</sup> Obesity was a gateway for many degenerative diseases such as heart disease, hypertension, diabetes mellitus, to cause premature death. A person's nutritional status was caused by many factors such as infectious diseases, gender, knowledge, physical activity, economy, and food consumption.

The overweight incident according to BMI/U in the category of adolescents aged 16-18 years in Depok ranked as the first at the West Java Province level, which was 18.13%, while the

prevalence of obesity was 5.75%.<sup>3</sup> Adolescents with more nutritional status were more commonly found in the group with more energy intake, which was 43.8% compared to those with no more energy intake. The study stated that there was a significant relationship between energy intake and nutritional status.<sup>3</sup>

The changes in food consumption occurred during a pandemic. The use of the food delivery feature provides many advantages, especially during a pandemic, consumers felt safe using online food delivery services because they reduced contact with many people. There were several online food delivery features in Indonesia; GoFood, GrabFood, and Shopee Food. Based on data from the Central Statistics Agency (BPS) for 2018, online food orders in West Java increased 5.51% from the previous year. Lifestyle changed like this could affect a person's nutritional status. Research in Lithuania stated that 31.5% of adolescents had increased their weight and 73.4% of adolescents who had experienced weight gain admit that snacking had increased during the pandemic.<sup>4</sup> During the pandemic, 53% of students experienced an increase in body weight with the highest weight gained until reaching 9 kgs.<sup>5</sup>

The preliminary survey resulted that researcher conducted by interviewing 10 high school students in Depok who ordered food online, found an increase in ordering food online before and during the pandemic. As many as 6 people who ordered before the pandemic 1x/month became 1-2x/week, 2 people who previously ordered 1x/week became 3-4x/week, and as many as 2 people had never ordered food online through the online food ordering feature before, during the pandemic ordered 1 – 3x/month. Therefore, this research needed to be conducted at Depok City High School in order to find out the relationship between food consumption through the online food ordering feature on the nutritional status of adolescents during a pandemic at Depok City High School.

## Methods

This research was an observational study in the terms of cross-sectional design by using a quantitative approach. The sample was 79 students from grade X and XI, their ages was from 16-18. They used online food delivery feature in the last 3 months, the sample was taken by using simple random sampling. The population of this study was Depok City Senior High School with sub-populations of Kasih High School, Budi Utomo High School, and Genesis Medicare High School.

The characteristic data was taken by using a questionnaire that was filled out by the participants. Food consumption data was obtained using the Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ) instrument using the interview method. Main food consumption was the amount of main food consumption both frequency and type consumed through the online food ordering feature during the last 1 month, they were categorized into two; more ( $\geq$ median) and less ( $<$ median) while snacks were defined as food outside the main meal (snacks) which were

categorized as high in calories ( $\geq 10\%$  RDA of energy) and not high in calories ( $< 10\%$  RDA of energy). The list of main types of food and snacks in the questionnaire was based on the results of a preliminary study through interviews with 30 high school students in addition to the research sub-population.

The data based on nutritional status were obtained from weighing by using digital scales, and measuring height using a microtoise. Nutritional status classification was divided into three; overnutrition ( $> +1$  SD), good nutrition ( $-2$  SD to  $+1$  SD), good nutrition ( $-2$  SD to  $+1$  SD), and undernutrition ( $< -2$  SD).

Univariate analysis was to describe the distribution of data on subject characteristics such as age, gender, and pocket money, as well as each variable from the research results. Data analysis was carried out by using the Chi-Square test to see the relationship between main food through the online food ordering feature to the nutritional status of adolescents during a pandemic at Senior High School of Depok City, and also the Fisher Exact test to see the relationship between snack food through the order of online food feature to the nutritional status of adolescents during a pandemic at Senior High School of Depok City of Depok City.

## Results

### a. The Characteristics of Adolescents at Senior High School of Depok City

The results of the univariate analysis were to provide an overview of the frequency distribution of the respondents' characteristics; gender, age, pocket money, consumption of main meals and snacks through the online food ordering feature, and nutritional status. The results of this study (Table 1) showed that the majority of students were female (60.8%), aged 16 years (62%), earned an allowance of  $\geq 20$  thousand per day (67.2%), consumed main meals through online food ordering feature high online (50.6%), consumption of street food through the online food ordering feature was not high in calories (93.7%), and good nutrition (72.2%).

**Table 1. Distribution of Respondent Characteristics**

| Characteristics        | Amount (n) | Percentage (%) |
|------------------------|------------|----------------|
| Gender                 |            |                |
| Male                   | 31         | 29,2           |
| Female                 | 48         | 60,8           |
| Age                    |            |                |
| 16 years               | 49         | 62             |
| 17 years               | 25         | 31,6           |
| 18 years               | 5          | 6,3            |
| Pocket Money           |            |                |
| $\geq$ Rp20.000,00/day | 53         | 67,2           |
| $<$ Rp20.000,00/day    | 26         | 33,1           |

### b. The Relationship Between Consumption Meals Through The Online food ordering Feature With Nutritional Status

The results of the bivariate analysis (Table 2) showed that there was a relationship between main food consumption through the online food ordering feature and the nutritional status of adolescents during a pandemic at Senior High School of Depok City (p-value 0.003). the proportion of adolescents who had more nutritional status with the main food consumption through the high online food ordering feature is 0.5% lower than adolescents with the low main food consumption category through the online food ordering feature. Then, the proportion of adolescents who had poor nutritional status with high main food consumption through the online food ordering feature was 0.5% higher than adolescents with low main food consumption categories through the order of online food feature.

The results of the bivariate analysis illustrated that there was no relationship between snack food consumption through the online food ordering feature and the nutritional status of adolescents during a pandemic at Senior High School of Depok City (p-value 1,000). 16 respondents with excess nutrition, there was 1 respondent who was included in the category of snack food consumption through the high-calorie online food ordering feature, while 15 respondents (20.3%) were included in the not-high-calorie category. The proportion of respondents with poor nutrition who were included in the category of consuming snacks through the online food ordering feature was not high in calories by 80% while the low category was 79.7%.

**Table 2. The Relationship to the Meal and Snack Consumption Through The Online food ordering Feature**

| Variable   | Nutritional Status |      |      |      | Jumlah |     | P-value |
|--|--------------------|------|------|------|--------|-----|---------|
|  | More               |      | Less |      |        |     |         |
|  | n                  | %    | n    | %    | n      | %   |         |
| Consumption of Main Foods Through the Online food ordering Feature |                    |      |      |      |        |     |         |
| High   | 8                  | 20   | 32   | 80   | 40     | 100 | 0,003   |
| Low  | 8                  | 20,5 | 31   | 79,5 | 39     | 100 |         |
| Consumption of Main Foods Through the Online food ordering Feature |                    |      |      |      |        |     |         |
| High Calorie   | 1                  | 20   | 4    | 80   | 5      | 100 | 1,000   |
| Low Calorie  | 15                 | 20,3 | 59   | 79,7 | 74     | 100 |         |

## Discussion

The results of the analysis showed that there was a relationship between main food consumption through the online food ordering feature and the nutritional status of adolescents during a pandemic at Senior High School of Depok City. Adolescents who had poor nutritional status with high consumption of main meals through the online food ordering feature were 0.5% higher than adolescents with low consumption of main foods. This was caused by respondents still

consuming main food even they also consumed snacks. Snack consumption was only to complement the main meal and snack was not a substitute for the main meal. In accordance with a good diet where in a day, 3 main meals and 2 times snack. Snacks were done after every main meal (breakfast and lunch).<sup>6</sup>

In line with research, there was a relationship between the type of food consumed and ordered online and obesity (p-value = 0.001). The study also stated that the amount of food consumed through online food delivery could be related to a person's nutritional status.<sup>7</sup> In contrast to Harahap's research stated that there was no relationship between the type of food (high or low calorie) ordered online and obesity with a p value = 0.072. This was because the incidence of obesity did not occur immediately, but took a long time.<sup>8</sup>

The main types of food that were the respondents' favorite were chicken noodles, *geprek* chicken rice, fried-chicken rice, and fried-chicken. This was in line with Grab Analytics research, the menu that was most in demand by consumers during PPKM was fried chicken and various noodles.<sup>9</sup> This was also supported by the research of Harahap, showed that the majority of types of food consumed through online food delivery were incomplete, such as fast food.<sup>8</sup>

The results of this study found that there was no significant relationship between snack food consumption through the online food ordering feature and the nutritional status of adolescents during a pandemic at Depok City High School. The proportion of adolescents who had more nutritional status by consuming snacks through the high online food ordering feature was lower by 0.3% compared to the consumption of main foods which were included in the low category. 8% of daily energy needs. In accordance with Anggraeni's research stated that there was no relationship between snack food consumption and nutritional status in school children (p = 0.755). In this study, it was seen that respondents adjusted their consumption of snack foods with high activity or high-intensity sports and participated in extracurricular activities at school and outside of school so energy expenditure was balanced.

The types of snacks ordered through the online food ordering feature that were most in demand were pizza, French fries, cheese *martabak*, and brown sugar. Pizza and French fries were fast food snacks, which were generally high in calories and saturated fat. According to Suswanti in Alifa's research, stated that fast food, which was known for its practical food presentation, delicious taste, and frequent consumption of fast food, had a different "value" in the eyes of adolescents, making social status rise and being considered keeping up with the times.<sup>10</sup> Brown sugar boba milk tea, which was a favourite drink among teenagers, had a high number of calories, every 1 473 mL glass contains 299 kcal of energy and 38 grams of sugar.<sup>11</sup> The Ministry of Health of the Republic of Indonesia recommended sugar consumption to be a maximum of 10% of total energy or the equivalent of 50 grams/day. Snacks that contained high sugar and fat were closely

related to the incidence of overweight. Bad eating habits such as consumption of snacks where these snacks contain high fat, calories, and sugar which caused obesity.<sup>12</sup>

## **Conclusion**

Based on the results of this study, it was concluded that there was a relationship between main food consumption through online food ordering feature and nutritional status. There was no relationship between the consumption of street food through the online food ordering feature and the nutritional status of adolescents at Senior High School of Depok City. Students should always choose foods that could support a healthy body, monitor their weight, and height regularly, so they find out the nutritional status of their own youth. Future researchers were expected to examine other supporting variables such as energy adequacy of food consumption at home, physical activity, nutritional knowledge, which were related to nutritional status.

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## **Conflict of Interest**

The authors declared that they had no conflict of interest.

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