

# Artikel 23

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# Relationship of socio-demographic factors, knowledge, attitude, and food consumption behavior among vocational high school students during COVID-19 pandemic, Indonesia

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## Abstract

**Background:** Maintaining a nutritious eating behavior for school children is one of the important health issues to be carried out during the current COVID-19 pandemic. The roles of parents, teachers, and health workers are necessary for school children.

**Objective:** This study aimed to determine socio-demographic factors, knowledge, attitude, and food consumption behavior among vocational high school students during the COVID-19 Pandemic in the Municipality of Sleman, Indonesia.

**Methods:** Cross-sectional design was employed among 84 students selected using purposive sampling. Data were collected in September 2021 using validated questionnaires. Chi-square test and multi logistic regression were used to examine associations between independent variables and food consumption behavior.

**Results:** The majority of the respondents were females (94%), and the range of age of all the respondents was 15-18 years old. The multi logistic regression showed that the students who had low family income (Adj. OR = 4.38, 95% CI = 1.26-15.19), poor knowledge (Adj. OR = 8.39, 95% CI = 2.10-33.52), and had no roles of parent (Adj. OR= 5.45, 95% CI = 2.37-23.43) statistically significantly had poor food consumption behavior.

**Conclusion:** The main variables that significantly influenced food consumption behavior in vocational high school students were level of knowledge, family income, and the role of parents. This study may serve as input for public health decision-makers to improve health promotion to the students in the school.

Keywords: food consumption behavior; knowledge; student; COVID-19

## Background

Human life changed after the COVID-19 pandemic occurred worldwide (Alzueta et al., 2021; Birditt et

al., 2021; Kabasawa et al., 2021; Tosepu et al., 2021). Every affected country implements the obligation to wear masks, maintain distance, and avoid crowds (Maleki et al., 2020; Yanti et al., 2020). Many people have been lost their jobs due to the

decline in the selling value of the company's products In the COVID-19 pandemic era (Tantrakarnapa et al., 2020). Office and school activities that were initially offline suddenly turned online (Meulenbroeks, 2020; Tran et al., 2020). The change is challenging for students to accept, causing stress when studying in class (Agarwal & Kaushik, 2020; Lazarevic & Bentz, 2021).

The behavior of consuming nutrition also plays an important role in keeping antibodies stable (Huber et al., 2021). Adolescence is an important stage of human development when several psychological and social changes occur and the acquisition of new life habits, which are determinants of health status in adulthood (Wu et al., 2019). Eating habits among adolescents are influenced by biological, social, cultural, and economic factors, and evidence suggests that food consumption habits formed during adolescence remain the same into adulthood (Haddad & Sarti, 2020). In addition, parental education, household socioeconomic conditions, and the number of people in the family are social determinants that could shape adolescent health behavior (Irnaningsih et al., 2021; Ruiz-Roso et al., 2020; World Health Organization, 2013).

School is also considered a predictor of knowledge on food consumption for handling malnutrition (Charles Shapu et al., 2020). The level of nutritional knowledge affects attitudes and behavior towards food choices (Adiba et al., 2020). Women tend to show more concern with taste and better nutritional knowledge than men. This gender difference may be due to the fact that girls pay more attention to the quality of food, while boys eat out more often with their peers (Hu et al., 2016).

Considering that the world has been experiencing the COVID-19 pandemic for almost two years, studying food consumption in school adolescents is necessary. Moreover, schools in Indonesia, which is still implemented limited meetings, will cause little interaction. It will indirectly affect food consumption behavior in adolescents because they represent potential risk factors for non-communicable diseases in the future. So, this study aimed to determine the socio-demographic factors, knowledge, attitudes, and behavior of food consumption in healthy secondary students during the COVID-19 period.

## Methods

### Study Design

This study employed a cross-sectional approach. The respondents were the students at Health Vocational Schools Binatama, Sleman, Yogyakarta, Indonesia.

### Participants

The population of this study was 277 students. The samples were taken using the purposive sampling technique. The number of participants was 84 students after calculated using Slovin's formula, with the inclusion criteria: 1) active student, 2) available to be a respondent (sign the informed consent), 3) understand Bahasa Indonesia, 4) could communicate. On the other hand, the exclusion criterion was the seriously ill students and unable to participate.

### Instruments

Food consumption behavior refers to eating patterns according to balanced nutrition guidelines to regulate a balanced and safe daily diet to achieve and maintain optimal food and health status. Foods contain fruit, vegetables, protein, plus physical activity and food safety aspects of reading food labels and choosing safe snacks.

There are six parts of the questionnaire, including food consumption behavior (6 questions), knowledge (10 questions about nutrition conception behavior), attitude (8 questions about nutrition conception behavior), the role of parents (5 questions), the role of the teacher (4 questions), and role of health worker (4 questions). Each correct answer in each part of the question was scored "1," and the wrong answer was scored "0". The total score of each part was classified into two groups using media as a cut-off point: good/yes if score > median and poor/no if total score ≤ median. All questions were originally designed in Bahasa Indonesia. The questions in the questionnaire were the closed-ended type. The result of the validity of each variable was nutrition consumption behavior (0.364), knowledge (0.367), attitude (0.382), the role of parents (0.390), the role of teachers (0.458), and the role of health workers (0.696). From these results, it could be concluded that the calculated R-value on all items has a value greater than the T table, so this research questionnaire was valid.

Kurder Richardson 20 (KR-20) was used for the reliability test of the nutrition consumption behavior (0.819), knowledge (0.759), attitude (0.819), the role of parents (0.885), the role of teachers (0.926), and the role of health workers (0.974) in the pre-test. In addition, the pre-test of 30 students was conducted in other areas similar to the study area. These results show that the questionnaire was reliable, with all alpha values >0.60.

#### Data Collection

Data were collected in September 2021 by the researchers using the validated questionnaires after obtaining ethical permission.

#### Data Analysis

Outcome measurement was food consumption behavior (good, poor). Descriptive statistic was used to determine the frequency and percentage for all variables. Chi-square test and multi logistic regression were used to examine associations between independent variables and food consumption behavior. The IBM SPSS Statistics 26 Gadjah Mada University license was used to analyze the data.

#### Ethical Considerations

The Ethical Approval for this study was obtained from Ahmad Dahlan University Yogyakarta ethics committee office (Certificate of Approval No. 012107047). Each respondent was signed informed consent prior to data collection.

## Results

**Table 1** below describes the general information of the respondents. The majority of respondents were females (94%). The average age of the respondents was 16 years old. More than three-fourths of all respondents had a working parent and attended a high education level (84.5% and 78.6%, respectively). More than half of respondents had a family income of more than or equal to Rp.1,500,000.

While **Table 2** explains the characteristics of knowledge and attitude of respondents. More than half of them had a good level of knowledge (64.3%). The same proportion was shown for those who had good and poor attitude levels. Most of the respondents also had a parent's role in food consumption, teacher's role, and health worker's role

(65.5%, 61.9%, 67.9%, respectively). More than half of them also had a good food consumption behavior (53.6%).

**Table 1** Distribution of respondents by socio-demographic factors

Socio-demographic factors	Frequency	Percent
<b>Sex</b>		
Male	5	6
Female	79	94
<b>Age (years), n = 421</b>		
Mean ± SD (min-max)	16.14 ± 0.9 (15-18)	
<b>Working status of parents</b>		
Yes	71	84.5
No	13	15.5
<b>Education of parents</b>		
High	66	78.6
Low	18	21.4
<b>Family Income</b>		
≥Rp. 1,500,000	47	56
< Rp. 1,500,000	37	44

**Table 2** Characteristics of knowledge and attitude of the respondents

Variables	Frequency	Percent
<b>Level of knowledge</b>		
Good	54	64.3
Poor	30	35.7
<b>Level of attitude</b>		
Good	42	50
Poor	42	50
<b>Role of parent</b>		
Yes	55	65.5
No	29	34.5
<b>Role of teacher</b>		
Yes	52	61.9
No	32	38.1
<b>Role of health worker</b>		
Yes	57	67.9
No	27	32.1
<b>Food consumption behavior</b>		
Good	45	53.6
Poor	39	46.4

**Table 3** shows the variables that had a significant correlation with food consumption behavior of students, such as family income, level of knowledge, level of attitude, the role of parent, and role of health worker. Family income was significantly associated with food consumption (p-value 0.010). The Chi-

Square test results also revealed that the level of knowledge and role of parents were significantly associated with food consumption (p-value <0.001,

<0.001, respectively). The level of attitude was also significantly associated with food consumption, with p-value of 0.004.

**Table 3** Association between each independent variable and food consumption behavior

Independent variables	n	Food consumption behavior		Crude OR (95% CI)	p-value
		Good	Poor		
<b>Sex</b>	84				0.766
Male	5	3	2	1	0.767
Female	79	42	37	1.321 (0.209-8.345)	
<b>Working status of parents</b>	84				0.073
Yes	71	41	30	1	0.083
No	13	4	9	0.325 (0.091-1.156)	
<b>Education of parents</b>	84				0.732
High	66	36	30	1	0.732
Low	18	9	9	1.200 (0.423-3.406)	
<b>Family Income</b>	84				<b>0.010*</b>
≥Rp. 1.500.000	47	31	16	1	<b>0.011*</b>
< Rp. 1.500.000	37	14	23	0.314 (0.128-0.771)	
<b>Level of knowledge</b>	84				<b>&lt;0.001***</b>
Good	54	40	14	1	<b>&lt;0.001***</b>
Poor	30	5	25	0.070 (0.022-0.218)	
<b>Level of attitude</b>	84				<b>0.004**</b>
Good	42	29	13	1	<b>0.005**</b>
Poor	42	16	26	3.625 (1.469-8.945)	
<b>Role of parent</b>	84				<b>&lt;0.001***</b>
Yes	55	38	17	1	<b>&lt;0.001***</b>
No	29	7	22	7.025 (2.521-19.578)	
<b>Role of teacher</b>	84				0.157
Yes	52	31	21	1	0.159
No	32	14	18	1.898 (0.778-4.628)	
<b>Role of health worker</b>	84				<b>0.037*</b>
Yes	57	35	22	1	<b>0.039*</b>
No	27	10	17	2.705 (1.050-6.964)	

\*p-value <0.05, \*\*p-value <0.01, \*\*\*p-value <0.001

**Table 4** describes the result of multiple logistic regression. After adjusting all the independent variables, it was found that family income, level of knowledge, and role of the parent had significant correlations with food consumption behavior. In detail, compared to those from families with income >Rp.1,500,000, those from families with income < Rp.1,500,000 were 4.4 times more likely to have poor food consumption behavior. In terms of the level of knowledge, compared to those who had a good level of knowledge, those who had a poor level of knowledge were 8.4 times more likely to have poor food consumption behavior. Furthermore, compared to those with the role of parent, those without the role of parents were 5.4 times more likely to have poor food consumption behavior.

## Discussion

The COVID-19 pandemic has been influencing everyone's daily life worldwide. The government's lockdown policy had significantly changed a person's food intake (Huber et al., 2021). This study was the first one that explored food consumption behavior during the COVID-19 pandemic to students in Indonesia. This study found that 46.4% of respondents had poor food consumption behavior. The majority of their sex was female (94%), and all the students were in the age range of 15-18 years old.

**Table 4** Full model of multiple logistic regression of food consumption behavior

Independent variables	Adj. OR	Adj. OR (95% CI)		p-value
		Lower	Upper	
<b>Sex</b>				
Male	1			0.898
Female	0.769	0.014	42.907	
<b>Working status of parents</b>				
Yes	1			0.153
No	3.534	0.625	19.983	
<b>Education of parents</b>				
High	1			0.495
Low	1.777	0.341	9.257	
<b>Family income</b>				
≥Rp. 1.500.000	1			<b>0.020*</b>
< Rp. 1.500.000	4.385	1.265	15.197	
<b>Level of knowledge</b>				
Good	1			<b>0.003**</b>
Poor	8.386	2.098	33.518	
<b>Level of attitude</b>				
Good	1			0.187
Poor	2.280	0.670	7.761	
<b>Role of parent</b>				
Yes	1			<b>0.023*</b>
No	5.452	1.268	23.435	
<b>Role of teacher</b>				
Yes	1			0.309
No	0.412	0.075	2.276	
<b>Role of health worker</b>				
Yes	1			0.278
No	2.682	0.452	15.930	

*p-value <0.05, \*\*p-value <0.01, \*\*\*p-value <0.001*

#### Family Income

Family income in this study was significant to food consumption behavior. The lower family income level tends to have poor food consumption behavior. The result of this study was in line with a study in Zambia, which found that richer families tend to use the supermarkets and hypersmart with the various type of foods and ultra-processed food (Khonje & Qaim, 2019). Another study in Ghana also found that the income level of the family had a negative relationship with food consumption (Mensah et al., 2013). In other words, it could be explained that higher income tends to choose healthy food instead of street food. In terms of the income level in the household, it may relate to the point of view of buying the food. Particularly, the study in China described that the lowest-income households were more sensitive to price, and they tended to be responsive to meats, aquatic products, and dairy products (Ren et al., 2018). As a result of food consumption patterns, the income level might be indirectly related to the BMI (Body Mass Index) (Ren et al., 2019).

Another reason was explained by the study that revealed that the high-income family tends to visit healthy shops more often than the lower-income family (Blok et al., 2015). If the lower-income family tends to visit the unhealthy shop more often because of the cheaper price, the health outcome could be worse than the higher-income family. Furthermore, the consumption of meats has an impact on the income since it has contradictory effects on each (Marques et al., 2018). Therefore, the family income could influence the food consumption in the way of the food selection and the trend of food shops. The lower family income might have no sufficient budget to buy healthy and various kinds of food in terms of quantity and quality.

#### Level of Knowledge

The level of knowledge had a significant association with food consumption. Those who had a poor level of knowledge tend to have poor food consumption behavior. It is similar to a study in Iran that found the knowledge could be a factor affecting the pattern of

food consumption practice (Talatappeh et al., 2012). In contrast, the study in Slovenia revealed that formal education could improve children nutrition knowledge but could not influence healthy eating habits and nutrition behavior (Kostanjevec et al., 2012). Similar findings were found from the study in India, which found inadequate knowledge about food and the effect of fast food. As a result, they tend to choose fast food and delicious taste (Kostanjevec et al., 2012). Therefore, the level of knowledge might have a correlation with the attitude of purchasing healthy food. On the other hand, if they have a high level of knowledge, they tend to choose healthy and safe food to have a high health status.

### The Role of Parents

This study found that the role of parents tends to influence the children to have poor food consumption behavior. A significant association is also found from a study which showed the relationship between parent and child report of parental role modeling fruit at dinner (Draxten et al., 2014), which focuses on fruit and vegetable only. The parental feeding practice had an association with the intervention success of food consumption (Holley et al., 2016), particularly to reduce fussiness in order to increase vegetable consumption. The parental modeling also had a strong association with healthy and unhealthy food consumption (Yee et al., 2017). However, it makes sense that the parent is the closest person in the child's life who can control the food consumption of all household members. The same food pattern in the family is also related to having the same food consumption behavior among family members. In addition, the role of the parent is also shown with the toys offered; for instance, after controlling to parent food consumption, the toys offered are significantly associated with fast food consumption (Longacre et al., 2016). The parent takes the most of children lives since they spend most of their time together. If the parents could control the family members' food consumption, the parent is the most influential for children's food consumption.

### Conclusion

In sum, the most significant variable influencing food consumption behavior in students was student knowledge, followed by other supporting factors, such as family income and the role of parents. From the findings, there were three recommendations for public health programs: 1) improving counseling for

parents in order to teach their children to have good food consumption behavior, 2) Adding outreach programs to schools on nutrition consumption behavior for school children, and 3) Implementing a nutritional food assistance program for poor households.

### Declaration of Conflicting Interest

All of the authors declare no conflict of interest in this study.

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### Author Contribution

N.H., S.N.D., & D.S. conceived of the presented idea of this study. N.H., & S.N.D., developed the theory and designed the method. N.H., was collecting the data and S.N.D., verified the analytical methods. D.S., supervised the findings of this study. D.S. and S.N. reviewed, revised the manuscript, edited the manuscripts and publications. All authors have agreed on the manuscript's final draft before submitting it for publication.

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