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The Relationship between the Intensity of Gadget Use, Eating Patterns, Mukbang Watching Habits and Changes in Eating Behavior with the Incidence of Overweight in Adolescents

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ABSTRACT

The increasing cases of overweight and obesity are caused by nutritional imbalances. Other factors such as screen time for 2 hours or more every day are studied to increase the risk of obesity by 23%. The mukbang phenomenon has also been shown to change eating behavior in a negative direction, thus risking health problems. This study aims to determine the relationship between the intensity of gadget use, eating patterns, mukbang watching habits and changes in eating behavior with the incidence of overweight in adolescents at SMA Negeri 4 Palu. This study uses a quantitative method with a cross-sectional research design. The population in this study was 392 and a sample of 195 respondents using the proportional random sampling technique. Data collection was carried out using a gadget use intensity questionnaire, FFQ and a mukbang watching habit questionnaire. Data analysis used the chi square statistical test. The results showed that 74 respondents had overweight status (37.9%) and 121 respondents had normal nutritional status (62.1%). Based on the chi square test, the variables that had a relationship with the incidence of overweight were eating patterns (p = 0.006) and mukbang watching habits (p = 0.007). Meanwhile, variables that have no relationship with overweight incidence are the intensity of gadget use (p = 0.324) and changes in eating behavior (p = 0.346). For adolescents, it is expected to avoid sedentary lifestyle habits and apply a diet according to the principles of balanced nutrition.

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- The respondents' diets were generally not diverse, they consumed less fiber-rich foods such as fruits and vegetables, and they tended to eat fast food often. Most respondents felt the impact after watching mukbang, such as increased appetite, preferring fast food, and uncontrolled meal times.
- Schools are expected to monitor students' nutritional status regularly, strengthen policies on gadget use in schools, and create policies related to the sale of ready-to-eat snacks. The community also needs to avoid a sedentary lifestyle, get used to a balanced diet, and avoid activities that can reduce focus while eating.

Introduction

Today, the world is facing a growing nutrition crisis in low- and middle-income countries, known as the "triple burden of malnutrition." This burden includes deficiencies, excesses, and imbalances in nutrient intake (1). Worldwide, approximately 1.9 billion adults are overweight, and an estimated 41 million children under the age of 5 are overweight or obese (2). The incidence of overweight and obesity in most Asian countries, including in the Southeast Asian region (ASEAN), has also increased in recent decades. The prevalence of overweight and obesity reached 17% in this region(3). If this trend continues, it is estimated that more than 70 million infants and young children will be overweight or obese by 2025, mostly in low- and middle-income countries (LMICs) including Indonesia(4).

In Indonesia, the problem of obesity is increasingly worrying. Based on Basic Health Research data (5), the prevalence of obesity in adults reached 35.4% and has continued to increase every year since 2007. In Central Sulawesi Province, the prevalence of obesity also shows a worrying trend, with an

increase from 0.85% in 2020 to 2.5% in 2022 (Central Sulawesi Provincial Health Office). In addition, in Palu City, especially in the working area of the Kamonji Health Center, the obesity rate has also increased, from 1.1% in 2020 to 2.3% in 2022 (Central Sulawesi Provincial Health Office, 2022).

Overweight is one component of the triple burden of malnutrition. Overweight and obesity are risk factors for a variety of chronic diseases, including diabetes, heart disease, and cancer. The increasing prevalence of obesity is due to nutritional imbalances, such as irregular eating patterns and excessive food consumption, especially among adolescents (6). The problem of overweight and obesity in adolescence needs to be addressed immediately because it can have a negative impact on long-term health (7). Research shows that irregular eating patterns, such as often skipping breakfast and excessive consumption of fast food, contribute greatly to obesity in adolescents. Adolescents who often consume fast food and rarely consume fruits and vegetables have a 4.15 times greater risk of becoming obese.(8).

In addition to diet, another factor that influences obesity is the duration of electronic media use, such as gadgets. Utami's research (2018) proves that screen time duration of more than 2 hours per day increases the risk of obesity by 23% (9). Exposure to electronic media, through food advertising on television and the internet, also plays a role in increasing unhealthy food consumption among adolescents(10). The mukbang phenomenon, which originated in South Korea, also has the potential to influence adolescent eating behavior. Mukbang is a live broadcast or video show that shows someone eating very large or excessive portions, often accompanied by fast food consumption. Teenagers who often watch mukbang content can be influenced to adopt unhealthy eating habits, which can eventually lead to obesity. Research shows that teenagers who are used to watching mukbang content are five times more likely to be overweight and obese (11).

SMA Negeri 4 Palu, preliminary research shows the existence of overweight problem among students. Out of 10 students surveyed, 4 people experienced overweight status, and 3 people experienced overweight, with 70% of students classified as overweight. In addition, gadget usage among students is also quite high, with low frequency of vegetable and fruit consumption. Many of them are familiar with or even often watch fast food mukbang videos at least 2-3 times per week. Based on this background, this study aims to determine the relationship between the intensity of gadget use, eating patterns, mukbang watching habits, and changes in eating behavior with the incidence of overweight in adolescents at SMA Negeri 4 Palu.

Methods

This research is quantitative research with a cross-sectional design, where data collection and measurement of independent variables and dependent variables are carried out at the same time. This research was conducted for five days including a preliminary study, namely from 17 to 21 October 2022, at SMA Negeri 4 Palu, Palu City, with a focus on grade XI students.

The population in this study were all 392 students of class XI of SMA Negeri 4 Palu. The sample was taken using the Slovin formula with an error rate of 5%, resulting in a sample size of 195 respondents. The formula was used to determine a sample size that was representative enough of the existing population. Because the number of students in each class was different, the sample selection was carried out using the proportional random sampling method, namely random sampling with the appropriate proportion in each class XI A to class XI L. After that, further sampling was carried out using the simple random sampling technique. This process is carried out by drawing lots, where each student has an equal opportunity to be selected as a respondent so that the results can be considered to represent the population randomly.

Data collection was conducted by giving questionnaires to respondents directly. The questionnaires used included: Gadget usage intensity questionnaire, which measures the frequency of use of electronic devices (such as smartphones, computers, or tablets) based on several statements. This measurement refers to the category of frequent and infrequent gadget use. The Food Frequency Questionnaire (FFQ) questionnaire was used to assess respondents' eating patterns by identifying the types of food they often consume and the frequency of consumption. This questionnaire consists of a list of foods that are usually consumed by students, as well as the frequency of consumption of each type of food (daily, weekly, or monthly) to identify whether their diet is balanced or tends to be unhealthy. The mukbang viewing habit questionnaire measures how often respondents watch mukbang content in a week, while the eating behavior change questionnaire is designed to determine the extent to which respondents' eating habits have changed due to watching mukbang videos, especially related to the

consumption of fast food or high-calorie foods. This change in eating behavior is measured by questions related to their eating habits which are more frequent in the context of consuming fast food or high-calorie foods after being exposed to mukbang videos. Respondents were asked to rate the frequency and type of changes in their eating patterns. In addition to filling out the questionnaire, physical measurements were also taken of the students, namely height measurements using microtoice and weighing using digital scales. The nutritional status of the respondents was identified by calculating the z-score value using the WHO AnthroPlus application, which assesses whether the respondents are overweight or obese based on the calculation of the Body Mass Index (BMI).

Data analysis was performed using two types of statistical tests. Univariate analysis was used to describe the frequency distribution of each research variable, both the dependent variable (overweight) and the independent variables (intensity of gadget use, eating patterns, mukbang watching habits, changes in eating behavior). While bivariate analysis was used to test the hypothesis, namely to determine the relationship between the independent variable and the dependent variable using the Chi-square test.

Results

Based on the respondent characteristics data (Table 1), it is known that out of 195 respondents, there were more female respondents, namely 134 respondents (68.7%) and more male respondents, namely 61 respondents (31.3%), the 16-year-old age group was 174 respondents (89.2%) compared to the 10.8% age group. In addition, there were more respondents with normal nutritional status, namely 121 respondents (62.1%).

Table 1. Respondent Characteristics

Respondent Characteristics	**n**	**%**
Sex		
Female	134	68.7
Male	61	31.3
Age		
> 16 Years	174	89.2
< 16 Years	21	10.8
Nutritional status		
Normal	121	62.1
Overweight	74	37.9
Total	195	100.0

Table 2: Frequency Distribution of Gadget Use, Eating Patterns, Mukbang Watching Habits, Changes in Eating Behavior

Distribution of Gadget Use, Eating Patterns, Mukbang Watching Habits, Changes in Eating Behavior	**n**	**%**
***Gadgets* Use**		
Often	185	94.9
Not often	10	5.1
Diet Pattern		
Not good	159	81.5
Good	36	18.5
Mukbang Watching Habits		
Not often	117	60.0
Often	78	40.0
Changes in Eating Behavior		
Negative	160	82.1
Positive	35	17.9
Total	**195**	**100.0**

The results of the univariate analysis showed that the intensity of gadget use was often much higher, namely 185 respondents (94.9%) (Table 2). Respondents who had poor eating patterns were much higher, namely 159 respondents (81.5%). In the habit of watching mukbang, respondents who did not often watch mukbang were much higher, namely 117 respondents (60%). Respondents with negative changes in eating behavior when watching mukbang were much higher, namely 160 respondents (82.1%).

Table 3. Bivariate Analysis

Variables	**Status Overweight**				**Total**		***p-value***
	Overweight		**Normal**				
	n	**%**	**n**	**%**	N	%	
Intensity Use of Gadgets							
Often	72	38.9	113	61.1	185	100	
Not often	2	20.0	8	80.0	10	100	0.324
Dietary habit							
Not good	68	42.8	91	57.2	159	100	
Good	6	16.7	30	83.3	36	100	0.006
Habit Watching Mukbang							
Often	39	50.0	39	50.0	78	100	
Not often	35	29.9	82	70.1	117	100	0.007
Change Eating Behavior							
Negative	27	43.5	35	56.5	62	100	
Positive	47	35.3	86	64.7	133	100	0.342
Total	**74**	**37.9**	**121**	**62.1**	**195**	**100**	

The data on the intensity of gadget use in table 3 shows that out of 185 respondents with the intensity of gadget use, there are 72 people (38.9%) who have overweight nutritional status and 113 people (61.1%) who have normal nutritional status. Then out of 10 respondents who do not often use gadgets, there are 2 people (20%) who have overweight nutritional status and 8 people (80%) who have normal nutritional status. Based on the chi-square test, the p value (0.324)> α (0.05) is obtained, which indicates that there is no significant relationship between the intensity of gadget use and the incidence of overweight.

Dietary pattern data in table 3 shows that out of 159 respondents who have poor diet, there are 68 people (42.8%) who are overweight and 91 people (57.2%) who have normal nutritional status. Then out of 36 respondents who have good diet, there are 6 people (16.7%) who are overweight and 30 people (83.3%) who have normal nutritional status. Based on the results of the chi-square test, the p value (0.006) <α (0.05) shows that there is a significant relationship between diet and the incidence of overweight.

The mukbang watching habit data in table 3 shows that out of 78 respondents who often watch mukbang, there are 39 people (50%) who have overweight nutritional status and 39 people (50%) who have normal nutritional status. Then out of 117 people who do not often watch mukbang, there are 35 people (29.9%) who have overweight nutritional status and 82 people (70.1%) who have normal nutritional status. Based on the chi-square test, the p value (0.007) <α (0.05) indicates that there is a significant relationship between the habit of watching mukbang and the incidence of overweight.

The data on changes in eating behavior in table 3 shows that of the 62 respondents who had negative eating behavior, there were 27 people (43.5%) who had overweight status and 35 people (56.5%) who had normal nutritional status. Then, of the 133 respondents who had positive eating behavior, there were 47 people (35.3%) who had overweight nutritional status and 86 people (64.7%) who had normal nutritional status. Based on the chi-square test, the p value (0.342)> α (0.05) was obtained, indicating that there was no significant relationship between changes in eating behavior and the incidence of overweight.

Discussion

The Relationship Between Intensity of Gadget Use and the Incidence of Overweight

This discussion aims to analyze the relationship between the intensity of gadget use, eating patterns, mukbang watching habits, and changes in eating behavior with the incidence of overweight in adolescents at SMA Negeri 4 Palu. The results of the study indicate that these factors have varying influences on the nutritional status of adolescents. Based on data analysis, no significant relationship was found between the intensity of gadget use and the incidence of overweight, but poor eating patterns and mukbang watching habits showed a significant influence on the incidence of obesity.

The results of the bivariate analysis in Table 3 show a p value of 0.324 ($\rho > \alpha$), which indicates that there is no relationship between the intensity of gadget use and the incidence of overweight in adolescents at SMA Negeri 4 Palu. This may be due to the fact that both students with normal nutritional status and overweight status, both mostly use gadgets with frequent intensity. Gadget use is more often used for calling, sending messages, and doing schoolwork, which may not be directly related to the incidence of overweight.

However, there are several confounding factors to consider, such as genetic factors, energy intake, and physical activity levels that may not be controlled in this study. A person with high gadget usage intensity may still undergo adequate physical activity and maintain a good diet. Therefore, this insignificant result may be influenced by the unweighting between these factors. Genetic factors can also play a role in a person's nutritional status, where even though they use gadgets intensively, a person may have a genetic tendency to have a normal weight or vice versa. In addition, bias in data collection using self-reporting questionnaires also needs to be considered. Respondents may not be completely honest or accurate in reporting their gadget usage habits, especially if there is a tendency to provide answers that are more socially acceptable or considered correct. This can lead to reporting bias, which can affect the accuracy of the results of this study.

This study is in line with previous research which showed there was no relationship between the intensity of gadget use and nutritional status Aini LN (2021) (12) because the use of gadgets can also have the opposite impact, for example, by being busy playing gadgets, someone forgets to eat or their food portions are reduced. In addition, the shortcomings of the cross-sectional research design are limited in seeing changes in the nutritional status of respondents due to the fact that the possibility of long-term effects of gadget use cannot be observed, which may only be seen when they are adults. Other research in line Ramadhani S (2018) (13) shows that there is no relationship between the intensity of children using gadgets and the incidence of overweight because both children with normal and overweight nutritional status have high intensity in playing gadgets. However, there are several studies that contradict this Rosalia TH (2022) (14) where there is a relationship between the intensity of gadget use and the incidence of overweight. The use of gadgets that are used excessively can make a child susceptible to being overweight because it can cause reduced physical activity which will reduce a person's fitness and health(15).

Other conflicting research comes from research Mahmudiono T (2020) (16) which shows a correlation between the length of gadget use and increased nutritional status. The habit of spending time in front of the television, using computers, smartphones, and other technological devices can affect nutritional status, especially related to excess weight(10). Excessive use of electronic devices can affect nutritional status, especially when sedentary lifestyle habits lead to simultaneous consumption of food and drinks while using gadgets. This can affect overall food intake and increase the risk of obesity(17). In addition, activities such as watching television, playing games, and using computers can lead to decreased physical activity, which in turn reduces the body's energy expenditure. An imbalance between energy intake from food intake and energy expended through physical activity can lead to fat accumulation, leading to obesity(18).

The Relationship between Diet and the Incidence of Overweight

The results of the univariate analysis in Table 2. show that the majority of students have poor eating patterns (81.5%) compared to good eating patterns (18.5%). This shows that on average there are still many respondents who pay little attention to their eating patterns and do not apply the principle of balanced nutrition, namely consuming a variety of foods. According to Susilowati(19), a bad diet will have a bad impact on the body, one of which can cause malnutrition and obesity. The diet in question is food that contains high levels of fat, sugar, salt, and fiber, especially from fruits and vegetables. Nutritional status is said to be good if the diet is balanced and physical activity is maintained(20).

The results of the bivariate analysis in Table 3. obtained a p value of 0.006 ($p < \alpha$) which indicates that there is a significant relationship between diet and the incidence of overweight in adolescents at SMA Negeri 4 Palu. Poor diet in respondents can be seen from the lack of consumption of fiber-rich foods such as fruits and vegetables and the tendency to often consume fast food sources where the majority of respondents' daily fruit and vegetable consumption is still relatively low, namely below 50%. In fact,

vegetables and fruits are sources of various vitamins, minerals and dietary fiber which act as antioxidants(21). The results of the study showed that students with overweight nutritional status tended to have poor eating patterns of 42.5%, while students with good eating patterns mostly had normal nutritional status (83.3%). Confounding factors in this regard include strong social and cultural influences on eating habits, especially in school environments that provide easy access to fast food. Students may not be fully aware of the impact of these eating habits on their health. In addition, poor diet may be associated with other factors such as stress or family eating habits that may affect adolescents' nutritional status. Reporting bias is also possible, as respondents may underreport their eating habits, giving more socially acceptable answers, or they may not fully remember what they consume on a daily basis. Therefore, the data obtained may not fully reflect actual eating habits.

These results are in accordance with research Heryuditasari K (2018) (22)which states that there is a significant relationship between diet and the incidence of overweight with a significance value of 0.000 because at the age of 15-18 years, teenagers still cannot control their diet and tend to be interested in fast food so that more teenagers will be found with poor diet. In this study, as previously explained, respondents are still lacking in consuming sources of fiber where the source of vegetables most consumed by respondents with frequent frequency (> 1x / day) is kale (22.5%) while the source of fruit most consumed with frequent frequency is banana (15.3%). In addition, the most widely consumed fast food with frequent frequency (1x / day) is siomay (49%). The fast food diet of students at SMA Negeri 4 Palu tends to be less good because in the school environment including the canteen there are still many fast food sellers such as siomay which makes respondents' access to unhealthy food quite easy to reach at low prices.

Meanwhile, according to the Junaidi (2016) (23)that the habit of consuming fast food is good if the frequency is 1 time a week. On the other hand, if you consume it frequently without control, it is not good for your health and must be stopped immediately. Excessive consumption of fast food will result in obesity because it generally contains high protein, high calories (fat and simple sugar), high salt, flavorings and low fiber, according to the Sunarti (2018) (24) that high fat intake and low fiber intake result in reduced bile acids excreted through feces, so that much cholesterol is reabsorbed from the remaining bile. As a result, more cholesterol will circulate in the blood, accumulate in blood vessels and inhibit blood flow, which has an impact on improving nutritional status. This research is in line with research conducted by Cangöl Sögüt S (2018)(25) in Health students in Turkey where the results of the study stated that diet can affect the incidence of obesity in adolescents because poor diet in adolescents with overweight or obese BMI was found to be higher than the diet of adolescents with normal BMI due to genetic factors and parental eating habits that are passed on to their children. However, this study is not in line with the study conducted by Sagala CO (2021) (26)where the study showed that there was no significant relationship between diet and nutritional status because most respondents with normal nutritional status had poor diet due to lack of knowledge about balanced nutrition.

In addition to fast food and fiber-rich foods, researchers saw that most respondents consumed fairly good sources of carbohydrates and protein. In this study, the source of carbohydrate food most consumed by respondents with the most frequent frequency of 1x/day was rice (74%). While most respondents never consumed sago as a source of carbohydrates. These results are in accordance with research conducted by Masitoh D (2017), where rice consumption is the highest with frequent consumption frequency proves that rice is still the staple menu of choice for every student (27).

The results of the study also showed that the source of vegetable protein most consumed by respondents with a frequency of 1x/day was tempeh (47.2%). This result is also in accordance with research conducted by Masitoh D (2017) (27)which shows that the source of vegetable protein dietary fiber commonly consumed by teenagers is tempeh and tofu. Tempeh and tofu are widely consumed by teenagers because in addition to being good for consumption at a relatively cheap price, this food is also very easy to find so that many teenagers like it. Meanwhile, the most widely consumed source of animal protein with a frequency of >1/day is fish (78%). Fish is a source of animal protein that has more complete amino acids and has better nutritional quality such as protein, vitamins and minerals because it is more easily absorbed by the body(21).

The Relationship Between Mukbang Watching Habits and Overweight

The results of the univariate analysis of mukbang watching habits in Table 2 show that the majority of respondents are more in the category of not often watching mukbang (60%) compared to respondents who often watch mukbang (40%). The results of the bivariate analysis in Table 3 obtained a p value of 0.007 ($\rho < \alpha$) which means that there is a significant relationship between the habit of watching mukbang and the incidence of obesity. Confounding factors such as mukbang viewing duration and the availability of desired foods while watching need to be considered. Longer viewing duration may influence negative eating behavior, while less healthy food availability may exacerbate this effect.

Although there was a significant relationship in this study, there was no control for these confounding factors. In addition, reporting bias and measurement bias may also occur, as respondents may report mukbang viewing habits based on their memory, which may be inaccurate.

These results are in line with research conducted by Amalia (2021) with a significance value of 0.003 where there is a significant relationship between the habit of watching mukbang and obesity (28). The study explained that the cause of watching mukbang related to negative changes in eating behavior is because by watching mukbang content, the frequency of respondents' eating becomes frequent, the portion of food becomes unbalanced, respondents prefer junk food and respondents' eating time becomes uncontrolled. This reduced focus and attention allows someone to eat more without realizing it. Mukbang often presents an attractive display of food plus supporting and fitting camera highlights that can attract and stimulate the eating center in the brain so that it can influence changes in eating patterns that cause excessive food intake(29).

The Relationship between Changes in Eating Behavior and the Incidence of Overweight

The results of the univariate analysis of mukbang watching habits in Table 2 show that most respondents experienced more negative changes in eating behavior when watching mukbang (82.1%) compared to respondents who had positive eating behavior (17.9%). The results of the bivariate analysis in Table 3 obtained a p-value of changes in eating behavior and overweight of 0.125 ($p > \alpha$) which means that there is no significant relationship between changes in eating behavior when watching mukbang and the incidence of overweight in adolescents at SMA Negeri 4 Palu, this is because based on the analysis it is known that respondents who have negative eating behavior have more normal nutritional status (56.5%) compared to respondents who have more nutritional status (43.5%).

The reason there was no relationship between changes in eating behavior and the incidence of overweight in this study was because the researchers had not looked at the length of time spent watching mukbang videos, whereas according to Nam HY (2021)(30). It is stated that longer mukbang viewing duration, which is 14 hours per week, is associated with negative eating behavior compared to people who watch mukbang for a shorter duration (<14 hours per week). It is said that someone may have a habit of watching mukbang infrequently but when the viewing duration is long, for example the difference in viewing duration on YouTube and Instagram, it is likely that people who watch via YouTube will more often cause eating stimuli with negative behavior. In addition, another thing that can cause no relationship is because when watching mukbang, there is a possibility that eating stimuli with negative behavior arise but are not balanced with the availability of desired food. In addition, researchers feel that it would be better to see changes in nutritional status using a longitudinal design to see changes in eating behavior over a long period of time.

Negative changes in eating behavior have changed significantly in respondents who watch mukbang very often, as evidenced by this study where respondents answered that when watching mukbang videos, their appetite tends to increase, they prefer fast food and the respondents' meal times become uncontrolled, namely often eating at midnight. These results are supported by the theory that the habit of watching mukbang can change a person's eating behavior because the appearance of food that looks abundant and tempting will increase visual stimuli that will stimulate the eating center in the brain, this will affect excessive food intake (31).

Conclusion

This cross-sectional study with 195 adolescents found no direct association between overall gadget use and obesity. However, the study identified a correlation between unbalanced diets, frequent mukbang viewing, and obesity. While changes in eating behavior after watching mukbang were observed, they did not directly correlate with obesity. This suggests other factors, like the duration of mukbang viewing, may be more influential. Further research is needed to explore the complex relationship between specific gadget use behaviors and adolescent obesity.

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References

1. Mayer DrAM. Indonesia's triple burden of malnutrition; A call for urgent policy change. Jember: Jember University with IIED; 2019.
2. WHO. Obesity and Overweight. Indonesia: World Health Organization. 2020;
3. WHO WHO. Adolescent obesity and related behaviours: trends and inequalities in the who Asia region, 2002-2014 : observations from the Health Behavior in School-aged Children (HBSC) WHO collaborative cross-national study. Copenhagen: World Health Organization, Regional Office for Asia; 2016.
4. WHO. Interim Report of the Commission on Ending Childhood Obesity. 2015;
5. Riskesdas. Riset Kesehatan Dasar. Kementerian RI: Badan Penelitian dan Pengembangan Kesehatan; 2018.
6. Safitri DE, Rahayu NS. Determinan Status Gizi Obesitas pada Orang Dewasa di Perkotaan: Tinjauan Sistematis. ARKESMAS. 2020;5(1):1–15
7. Utami NP, Purba MB, Huriyati E, 2018. Paparan screen time hubungannya dengan obesitas pada remaja SMP di kota Yogyakarta. Jurnal Dunia Gizi. 1(2), 71-78.
8. Ardiani H. Fast Food, Sarapan Pagi dan Kejadian Overweight pada Remaja SMA. WARTA BHAKTI HUSADA MULIA : Jurnal Kesehatan. 2019 Mar 27;6(1):1–5.
9. Zogara AU. Screen Based Activity dan Status Gizi pada Anak Sekolah Dasar di Kota Kupang. CHMK Health Journal. 2018 Sep 12;2(3):15–9.
10. Kumala AM, Margawati A, Rahadiyanti A. Hubungan Antara Durasi Penggunaan Alat Elektronik (Gadget), Aktivitas Fisik dan Pola Makan Dengan Status Gizi pada Remaja Usia 13-15 Tahun. J Nutri College. 2019 May 14;8(2):73.
11. Surat, S. , Govindaraj, Y. , Ramli, S. and Yusop, Y. (2021) An Educational Study on Gadget Addiction and Mental Health among Gen Z. Creative Education, 12, 1469-1484. doi: 10.4236/ce.2021.127112..
12. Aini LN, Sufyan DL, Ilmi IMB. Hubungan Kebiasaan Sarapan, Asupan Energi Dari Snacking, Dan Intensitas Menggunakan Gadget Dengan Gizi Lebih Pada Anak Sd Di Rw 02 Cipedak. Universitas Pembangunan Nasional Veteran Jakarta. 2021;
13. Ramadhani S, Mundiastuti L, Mahmudiono T. Aktivitas Fisik Saat Istirahat, Intensitas Penggunaan Smartphone, dan Kejadian Obesitas Pada Anak SD Full day School (Studi di SD Al Muslim Sidoarjo). Amerta Nutrition. 2018;2(1):325–31.
14. Rosalia TH, Susilowati T, Irma Mustika S. Hubungan Intensitas Penggunaan Gadget terhadap Status Gizi pada Siswa SMK Batik 2 Surakarta. Aisyiyah Surakarta Journal of Nursing. 2022;3(1):27–33.
15. Wicaksono A, Handoko W. Aktivitas Fisik dan kesehatan. Pontianak: AIN PONTIANAK PRESS; 2020.
16. Mahmudiono T, Rachmah Q, Indriani D, Nindya TS, Segalita C, Hidayah S, et al. Gadget Use, Pocket Money, and Snacking Habits of Children with and without Overweight/Obesity Problem in Surabaya, Indonesia. Systematic Reviews in Pharmacy. 2020;11(11):4.
17. Mandriyarini R, Sulchan M, Nissa C. Sedentary lifestyle sebagai risiko kejadian obesitas pada remaja SMA stunted di Kota Semarang. Journal of Nutrition College [Online]. 2017 Jul;6(2):149-155. https://doi.org/10.14710/jnc.v6i2.16903..
18. Suryadinata RV, Sukarno DA. Pengaruh Aktivitas Fisik Terhadap Risiko Obesitas Pada Usia Dewasa The Effect Of Physical Activity On The Risk Of Obesity In Adulthood. 2019;11.
19. Susilowati, Kuspriyanto. Gizi dalam Daur Kehidupan. Bandung: Refika Aditama; 2016.
20. Almatsier Sunita. Prinsip Dasar Ilmu Gizi. Jakarta: PT. Gramedia Pustaka Utama; 2011.
21. Nurholilah A. Hubungan Pola Makan Dengan Status Gizi Siswa SMK IT AN NABA Kota Bogor Tahun 2019. Jurnal Ilmiah Kesehatan Masyarakat. 2019;4(1):22–8.
22. Heryuditasari K. Hubungan Pola Makan dengan Kejadian Gizi Lebih (Studi di SMK Bakti Indonesia Medika Jombang). Jurnal Ilmu Keperawatan. 2018;2(1).
23. Junaidi, Novianda. Kebiasan Konsumsi Fast Food Terhadap Obesitas Pada Anak Sekolah Dasar Banda Aceh. Nutrition Journal. 2016;1(2):78–82.
24. Sunarti. Serat Pangan Dalam Penanganan Sindrom Metabolik. Yogyakarta: Gajah Mada University Press; 2018.
25. Cangöl Sögüt S. Determining the differences in nutrition knowledge, dietary behaviors, physical activity and self-efficacy behaviors based on obesity status among adolescents. HumanSciences. 2018 Apr 18;15(2):747.

26. Sagala CO, Noerfitri. Hubungan Pola Makan dan Pengetahuan Gizi Seimbang dengan Gizi Lebih Mahasiswa STIKes Mitra Keluarga. Jurnal Ilmiah Kesehatan Masyarakat. 2021;13(1):22–7.
27. Masitoh D. Pola Makan dan Status Gizi Siswa Program Keahlian Jasa Boga di SMK Negeri 1 Kalasan. Universitas Negeri Yogyakarta. 2017;
28. Amalia DS, Nuzrina R, Gifari N, Angkasa D, Sitoayu L. Hubungan Kebiasaan Menonton Mukbang, Pengetahuan Gizi dan Tingkat Stres dengan Perubahan Perilaku Makan Negatif Pada Penggemar Mukbang di Media Sosial Instagram. Journal of Nutrition College. 2021 Jun 30;10(2):105–11.
29. Hanwool C. Eating Together Multimodally: Collaborative Eating in Mukbang, a Korean Livestream of Eating. anguage in Society Journal. 2019;2(48):171–208.
30. Nam HY, Jung BM. A Comparative Study of the Dietary Behavior of Adults Aged 20 and Over according to the Mukbang Viewing Time. Korean J Community Nutr. 2021;26(2):93.
31. Margawati A, Wijayanti HS, Faizah NA, Syaher MI. Hubungan menonton video mukbang autonomous sensory meridian response, keinginan makan dan uang saku dengan asupan makan dan status gizi mahasiswa. JGI. 2020 Jun 2;8(2):102–9.