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Article

The Relationship Of Gadget Addiction And Diet Pattern To The Body Mass Index (BMI) Of Adolescents Ages 15-17 Years Old

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Abstracts

Introductions: The development of technology and information is running very fast, marked by progress in information and technology, one of which is gadgets. This affects excessive use of gadgets, and low physical activity makes eating patterns inappropriate, which can affect nutritional status in the long run. **Objectives:** To analyze the relationship between gadget addiction and eating habits on the body mass index of adolescents aged 15-17. Methods: Observational analytic, quantitative research with cross-sectional study design. The sampling technique used random simple sampling. The Chi-Square correlation test analyzed the data obtained. **Results:** The prevalence value of heavy gadget addiction in respondents was 89 people (27.6%). The prevalence value of frequent eating patterns in respondents was 146 people (45.2%). The prevalence value of the overweight body mass index in respondents was 43 people (13.3%). There was a significant relationship between addiction to playing gadgets (smartphones) and body mass index. P-value 0.004 (p-value < 0.05). There is an essential relationship between diet and body mass index. P-value p-value 0.038 (p-value < 0.05). **Conclusions:** There is a relationship between addiction to gadgets (smartphones) and eating patterns on the body mass index of adolescents.

Keywords: Addiction to Gadgets (smartphones), Dietary Habit, Body Mass Index

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Introductions

The development of technology and information is taking place very quickly, marked by progress in the field of information and technology. One of the most popular technologies today is gadgets. Overall, the number of Indonesian gadget users is swift. The Emarkter Digital Marketing Research Institute estimates that in 2018, the number of active gadget users in Indonesia is more than 100 million people [1].

Emarketer published that Indonesia's smartphone users increased by 37.1% from 2016-2019 [2]. After a re-survey, Emarketer (2018) republished the number of smartphone users from 2016 there were 65.2 million users, in 2017 there were 74.9 million smartphone users, and in 2018 there were 83.5 million smartphone users in Indonesia until the estimated year 2019 there are 92 million smartphone users. According to a survey by the Association of Indonesian Internet Service Providers in 2020, in NTB, the number of Internet users in 2019-2020 reached 3,766.404 million [3]. Social media content that is frequently visited, according to a survey by the Indonesian Internet Service Providers Association (2016), is Facebook (54%), Instagram (15%), YouTube (11%), Google (6%), Twitter (5.5%) and LinkedIn. (0,6%) [4].

Most internet users (by accessing gadgets) in Indonesia are aged 15-19. The second most users are 20-24 years old, and children aged 5-9 are also classified as Internet users. So, the data obtained from 171.17 million users who use the internet shows that teenagers or the younger generation use the internet the most [5].

Based on research, Kumala et al. (2019) said the magnitude of the benefits of technological developments still has negative impacts, such as gadget addiction. Gadget addiction impacts the development of children and adolescents [6]. Teenagers addicted to gadgets will be so preoccupied with themselves that they ignore their surroundings, which can ignore their health. There are several consequences of excessive use of gadgets in adolescents related to nutritional status. High use of gadgets and low levels of physical activity make eating patterns less suitable, affecting nutritional status [7].

From the data above, it can be seen that teenagers who like to play with gadgets tend to have nutritional problems. Food intake and irregular eating patterns are common causes of nutritional problems in adolescents. Being too focused on playing gadgets to use social media or playing online games can lead to malnutrition problems. Nutritional issues are related to physical activity, which leads to a sedentary lifestyle [8]. According to Desmawati (2019), a sedentary lifestyle is a sedentary lifestyle in which a person doesn't do much physical activity or doesn't do much movement [9]. One of the most common sedentary behaviors is playing with gadgets. Playing with gadgets is a form of inactive physical activity commonly called a sedentary lifestyle, which can increase calorie intake while using gadgets [6]. Meanwhile, the habits of teenagers who like to consume food and drink simultaneously when playing gadgets can affect overall food intake and result in overnutrition problems in adolescents [6].

Methods

This study uses an observational analytic design with a cross-sectional study. The research was conducted at State Senior High School 2 Mataram. The population of this research is State Senior High School 2 Mataram students in 2022 from class X to class XII aged 15-17 years. The sample was selected using a probability sampling technique with a simple random sampling of 323 respondents.

This research was conducted using a research instrument in the form of Smartphone Addict Scala-Short Version (SAS-SV), which amounted to 10 question items [10], a questionnaire Food Frequency Questionnaire (FFQ), which totaled 31 question items [11], and measuring the height and weight of respondents to measure Body Mass Index

(BMI). From the research results, the data will be collected and analyzed using computer software. Software Statistical Package for The Social Science (SPSS) version 22 was used. The results were analyzed using univariate analysis and bivariate analysis. Bivariate analysis in this study used the chi-square statistical test.

Results

In accordance with the sample size calculation, the number of respondents required in this study was 323. The researchers managed to get 323 respondents who were willing to fill out a questionnaire and measure their weight and height. Data was collected by visiting each student at State Senior High School 2 Mataram to distribute characteristic sheets based on age, gender, class, questionnaires, and weight and height measurements.

Based on data obtained from 323 respondents, it was found that most of the respondents were 16 years old, with the youngest age being 15 years and the oldest being 17 years. Respondents aged 15 years were 123 people (38.1%), 16 years old were 127 people (39.3%), and 17 years old were 73 people (22.6%). The characteristics of the sample based on gender from the data obtained were 174 female respondents (53.9%) and 149 male respondents (46.1%). Parts of the model based on class from the data obtained, it was found that class X research respondents totaled 119 people (36.8%), class XI research respondents totaled 130 people (40.2%), and class XII research respondents totaled 74 people (22.9%). Research subjects are presented in **Table 1**.

	Frequency	
Age (years)	**Amount (n)**	**Percentage (%)**
15 years	123	38.1%
16 years	127	39.3%
17 years	73	22.6%
Total	**323**	**100%**
Gender		
Male	149	46,1%
Female	174	53,9%
Total	**323**	**100%**
Class		
Class X	119	36,8%
Class XI	130	40,2%
Class XII	74	22,9%
Total	**323**	**100%**

Based on the data obtained from 323 respondents, 36 people (11.1%) had low addiction, 198 people (61.3%) had moderate habit, and 89 people (27.6%) had heavy dependence.

Table 2. Addiction Level to Playing Gadgets

	Frequency	
Addiction to playing gadgets (smartphones)	**Amount (n)**	**Percentage (%)**
Low Addiction	36	11.1%
Moderate Addiction	198	61.3%
Heavy Addiction	89	27.6%
Total	**323**	**100%**

Based on the data obtained from 323 respondents, 177 people (54.8%) had infrequent eating patterns, and 146 people (45.2%) had frequent eating patterns.

Table 3. Dietary habit

	Frequency	
Dietary habit	**Amount (n)**	**Percentage (%)**
Not often	177	54.8%
Often	146	45.2%
Total	323	100%

Based on the data obtained from 323 respondents, the average Body Mass Index (BMI) was 221 people (68.4%), Light Underweight BMI was 23 people (7.1%), Heavy Underweight BMI was 19 people (5.9%), Light Overweight BMI totaled 17 people (5.3%).

Severe Overweight amounted to 43 people (13.3%).

Based on the results, 23 people (63.9%) had low addictions with normal BMI, while 151 people (76.3%) had moderate habits with normal BMI, and 47 people (52.8%) had severe addictions with normal BMI. Based on the bivariate analysis conducted from 323 respondents in Table 7 below, p-value = 0.004 (p <0.05) means a significant relationship exists between the level of addiction to playing gadgets and Body Mass Index in adolescents.

Table 4. Body Mass Index

Frequency		
Body mass index (IMT)	**Amount (n)**	**Percentage (%)**
Underweight Light	23	7.1%
Underweight Heavy	19	5.9%
Normal	221	68.4%
Overweight Light	17	5.3%
Overweight Heavy	43	13.3%
Total	323	100%

Table 5. The Relationship between Addiction to Playing Gadgets (Smartphones) to Body Mass Index

	Body Mass Index (BMI)												*P-Value*
Addiction to Playing Gadgets (Smartphone)	*Underweight* Light		*Underweight* Heavy		Normal		*Overweight* Heavy		*Overweight* Light		**Amount**		
	n	%	n	%	n	%	N	%	n	%	**n**	**%**	
Low Addiction	2	5.6%	2	5.6%	23	63.9%	6	16.7%	3	8.3%	36	100%	
Moderate Addiction	13	6.6%	12	6.1%	151	76.3%	15	7.6%	7	3.5%	198	100%	0.004
Heavy Addiction	8	9.0%	5	5.6%	47	52.8%	22	24.7%	7	7.9%	89	100%	
Total	23	7.1%	19	5.9%	221	68.4%	43	13.3%	17	5.3%	323	100%	

Based on the results, 127 people (71.8%) had an infrequent eating pattern with a normal BMI, and 94 people (64.4%) had a frequent one with a normal BMI. In comparison, the results for respondents with a regular eating pattern with a BMI of 20 people (13.7%) were severely overweight. Based on bivariate analysis conducted from 323 respondents in Table 8 above, p-value = 0.038 (p <0.05) means a significant relationship exists between diet and body mass index in adolescents.

Table 6. The Relationship of Dietary Habit to Body Mass Index

	Body Mass Index (BMI)						*P-Value*
Dietary habit	*Underweight* Light	*Underweight* Heavy	Normal	*Overweight* Heavy	*Overweight* Light	**Amount**	

	n	%	n	%	n	%	N	%	n	%	**n**	**%**	
Not often	6	3.4%	13	7.3%	127	71.8%	23	13.0%	8	4.5%	177	100%	0.038
Often	17	11.6%	6	4.1%	94	64.4%	20	13.7%	9	6.2%	146	100%	
Total	23	7.1%	19	5.9%	221	68.4%	14	13.3%	17	5.3%	323	100%	

Discussions

In this study, the highest prevalence was found at the age of 16 years. Adolescents aged 15-17 are included in the Z generation group because they were born in the 1995-2010 range. An expert named Prensky (2001) said that this generation is a generation of digital natives. Generation Z is very close to technology like computers and the internet; it seems it has flowed in them since birth [12]. Generation Z has the characteristic of always wanting to be connected to the internet [13]. The same thing was also stated by Kwon, Kim, Cho, and Yang (2013) that adolescents will be more susceptible to addiction than adults [10].

From this study, it is known that the sex of women is more numerous than men; this is in line with research by Haryanti et al. (2022), which states that gender also determines the size of a person's nutritional needs because individual growth and development are very different between men and woman. The dietary requirements of boys are different from those of girls and are usually higher because boys have higher physical activity [14].

The level of addiction to using gadgets in adolescents 15-17 years. This study found that adolescents experienced a level of addiction to playing devices. This is evidenced in a survey by Mawarpury et al. (2020) that adolescents tend to be addicted to smartphones more than early adults [14]. Furthermore, Fitriana (2020) revealed that teenagers use gadgets for 5 to 7 hours or 300 to 420 minutes a day, which results in these teenagers already experiencing device addiction [14]. Using gadgets causes teenagers to be less sociable and spend most of their time playing with gadgets and carrying gadgets wherever they go [14].

The eating patterns obtained from this study were primarily infrequent. This study's results align with research conducted by Lupiana Indriyani (2022) that adolescent eating patterns indicate poor eating habits. Eating habits are habits in choosing food that include the type of food, the amount of food that enters the body, and the portion consumed. Teenagers prefer snacks and try new things; the more types of fresh snacks there are, the higher they are to try snacks [15].

Based on the results of the Body Mass Index (BMI) study, it was found that respondents had normal BMI. These results align with research by Hafiza et al. (2020) that nutritional status based on BMI shows that some respondents are in the normal category. Nutritional status is success in fulfilling nutrition for individuals indicated based on body weight and height [16]. However, it is necessary to watch out for respondents who are obese, in which the results of this study found the second most obesity results after the results. The tendency of obesity is generally closely related to diet, social status, and imbalance between body activity, eating habits, and food consumption. Although various factors play a role in the emergence of obesity, what must be considered is that the onset of obesity is more determined by too much energy intake, too little physical activity or exercise [17].

The relationship between addiction to playing gadgets and Body Mass Index (BMI) obtained a p-value of 0.004 (p-value <0.05), indicating that there is a significant relationship. This research supports the research by Pangow (2021), which states that there is a relationship between addiction to playing

gadgets and nutritional status. The results of this study noted that the incidence of malnutrition had a high prevalence in adolescents who were addicted to playing devices. Gadgets are used to access social media and online games [18]. Spending time in front of the television and using computers and other technological tools will contribute to nutritional status, especially overnutrition. This activity is a sedentary habit, which, if done for more than two hours, can be a risk factor for obesity in adolescents [6].

The relationship between diet and body mass index (BMI) obtained a p-value of 0.038 (p-value <0.05), indicating that there is a significant relationship. This study supports research by Noviyanti & Marfuah (2017) on 100 adolescents regarding the relationship between diet and the nutritional status of adolescents, showing that there are still many adolescents who have poor eating patterns (63%) [19]. This gadget has become a trend, especially among adolescents, and is done anytime and anywhere. In research by Rahmi et al. (2022), it was found that 42.5% of respondents used it while eating [20]. Gadgets at mealtimes can affect a person's eating patterns, such as the duration of eating and increasing food intake, such as when someone is replying to a message, he is not aware of the amount of food consumed [21].

This research is cross-sectional; that is, it's only examined in a limited time and only to prove the conditions that occurred at the time of the study, and the changes that may have arisen or will occur cannot be observed. This research only uses the perspective of several theories that explain the influence between variables. Still, many other theories provide different views on the topic under study with various other influencing variables.

Conclusions

This study found that adolescents at State Senior High School 2 Mataram experienced mild addiction, frequent eating patterns, and addiction to average body mass. In contrast, those who experienced heavy gadgets and had a body mass index were overweight, but the number was small. Then, the relationship between gadget addiction and diet to body mass index is significant. State Senior High School 2 Mataram must pay attention to its students to reduce the use of gadgets and adopt a good diet to prevent overweight.

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