

Research/Review

The Effect of Online Games on Physical Activity of Students Universitas Pendidikan Indonesia

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Abstract: Background The rise of digital technology has led to a higher prevalence of online game addiction, particularly among university students. This phenomenon is believed to influence several aspects of student lifestyle, including screen time, physical activity, junk food consumption, and overall nutritional status. Objective This study aims to analyze the relationship between online game addiction and variables such as screen time, physical activity levels, junk food consumption, and nutritional status among students at Universitas Pendidikan Indonesia. Method A cross-sectional approach was employed, involving 82 students chosen proportionally from nine faculties at Universitas Pendidikan Indonesia. Data were gathered using the Game Addiction Scale, a screen time questionnaire (QUEST), a Food Frequency Questionnaire for junk food, and BMI calculations to assess nutritional status. The collected information was analyzed with the Spearman correlation test. Results The findings revealed a significant negative correlation between online game addiction and physical activity levels ($p = 0.020$; $r = -0.256$). However, no direct association was observed between online game addiction and screen time, junk food consumption, or nutritional status. Conclusion Students exhibiting signs of online game addiction are more likely to have lower physical activity levels. However, the addiction does not directly impact screen time, unhealthy food consumption, or individual nutritional status.

Keywords: Junk Food Consumption; Nutritional Status; Online Game Addiction; Screen Time; University Students.

1. Introduction

The development of science and communication technology has grown rapidly, changing the interests of teenagers towards online games. Research indicates that the intensity of playing online games negatively impacts students' academic achievement. The longer they play, the lower their achievement. Indonesia is also recorded as the second country in the world with the highest number of internet users who play a lot of video games, with more than 170 million players, the majority of whom are aged 10-24 years (Design et al., 2025). Online gaming addiction among college students can disrupt social relationships and academic tasks. In addition, it contributes to a sedentary lifestyle, reducing physical activity that is important for mental and physical health.

Research conducted by R. A. Pratama et al., (2020) Revealed that several students are addicted to online games, which has the potential to disrupt social relationships and hinder the completion of academic tasks. This tendency also contributes to a sedentary lifestyle. Another effect of game addiction is high screen time. Hariani et al., (2019) research shows that most students fall into the high screen time category, which can affect academic concentration and sleep quality. High screen time, particularly before bedtime, can disrupt sleep patterns and reduce the amount of sleep required for optimal physical and mental health.

Online game addiction among individuals aged 19-24 can lead to an increased consumption of junk food. At this age, people tend to choose fast food because of the convenience and accessibility when playing games for a long time (Azizah et al., 2022). Excessive gaming habits can lead to irregular eating patterns and preferences for unhealthy foods. Unbalanced

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eating patterns due to high junk food consumption can affect nutritional status, either positively or negatively. Students who eat junk food more than three times a week tend to have a high Body Mass Index, which puts them at risk of obesity and health problems such as type 2 diabetes and heart disease (Ambariyati & Kristianingsih, 2017).

High consumption of junk food is related to obesity, especially if it is not balanced with physical activity. Online game addiction can also worsen eating patterns by ignoring meal times and choosing high-calorie snacks, which can cause fat accumulation (Fauzia, 2022).

Based on the preliminary study, this study shows that students with high junk food consumption tend to experience health problems. The study found that 85.7% of students at the Indonesian Education University engage in online gaming, with many spending more than three hours on screen time and often consuming junk food.

2. Proposed Method

This study employs a quantitative, cross-sectional approach to investigate the relationship between online game addiction scale, screen time, physical activity, junk food consumption, and nutritional status in college students. The study was conducted at the Indonesian Education University (UPI) in Bandung City. Data collection took place from January to March 2025. The population in this study were active students at the Indonesian Education University.

The sample was selected proportionally from 9 faculties at UPI, with a total of 82 students. The inclusion criteria were active students aged 19–21 years who played the online games for more than two hours. Meanwhile, the exclusion criteria were students with a history of health problems, both physical and mental, that could potentially affect the research variables. All respondents voluntarily engaged in this study without coercion.

Data collection was carried out using standardised questionnaires and anthropometric measurements, with the following details: (1) Addiction to online gaming was measured using the Game Addiction Scale (GAS) Lemmens et al., (2009) Consisting of 21 questions. Which is divided into two categories, namely low ($<$ median) and high (\geq median), (2) Screen time was measured using QUEST (Questionnaire for Screen Time of Adolescents Knebel et al., (2022). To assess the duration of electronic device use in daily activities. Physical activity is divided into two categories, namely sufficient ($<$ median) and over (\geq median), (3) Physical activity is measured based on the Physical Activity Level (PAL) according to the guidelines (FAO, 2001). Which is divided into two categories, light ($<$ median) and heavy (\geq median), (4) Junk food consumption was measured using the Food Frequency Questionnaire (FFQ Junk food), which records the frequency of fast food consumption during the past week. Junk food consumption in this study was divided into low ($<$ mean) and frequent (\geq mean) categories, (5) Nutritional status was assessed by measuring Body Mass Index (BMI) following WHO standards. For nutritional status, the four national categories are divided into two in this study, namely, no fat ($IMT < 25\text{kg/m}^2$) and fat ($IMT \geq 25\text{ kg/m}^2$). Data were analysed univariately to describe the characteristics of the subjects and the distribution of research variables. In addition, bivariate analysis was performed using the Spearman Test.

3. Results and Discussion

Based on Table 1, the majority of respondents in this study were male (56.10%). The majority of respondents were 21 years old (63.41%). Most also had pocket money worth $\geq 1,000,000$ (53.66%). In addition, most respondents lived in boarding (*kos*) or rented houses (56.10%). The majority of respondents in this study experienced high online game addiction (51.2%), spent more time in front of the screen (screen time) (6.6%), and had lower levels of physical activity (59.8%). In addition, most respondents lacked junk food (57.3%) and had a nutritional status of not being fat (57.3%).

Table 1. Subject Characteristics (and = 82).

Variable	Frequency	%
Gender		
Malem	46	56,10
Female	36	43,90
Age		
19	13	15,85
20	17	20,73
21	52	63,41
Pocket money		
≤ 1.000.000	38	46,34
≥ 1.000.000	44	53,66
Residence		
Boarding house/rental house/apartment	46	56,10
Home (With Parents or Guardians)	36	43,90
Game Online Addiction		
Low (Score <129)	40	48,8
High (Score > 129)	42	51,2
Screen Time		
Sufficient (<4530 minutes/week)	29	35,4
Over (≥ 4530 minutes/week)	53	64,6
Physical Activity		
Light (1,40-1,99)	49	59,8
Heavy (2,00-2,40)	33	40,2
Consumption of Junk Food		
Low (score < 300,73)	47	57,3
Frequent (score ≥ 300,73)	35	42,7
Nutritional Status		
Not Fat (IMT ≤ 25 kg/m ²)	64	78
Fat (IMT > 25 kg/m ²)	18	22

The results of the analysis using the Spearman test showed a significant relationship between the level of online game addiction and physical activity, with a value of ($p = 0,020$; $r = -0,256$). This indicates that the higher the level of addiction to online games, the lower the physical activity, although the strength of the relationship is relatively weak. Online gaming addiction is not related to significant with screen time ($p = 0,302$; $r = 0,115$), junk food consumption ($p = 0,330$; $r = -0,109$), and nutritional status ($p = 0,737$; $r = 0,038$) This shows that increasing online game addiction is not directly correlated with screen time, frequency of junk food consumption, and nutritional status of the subject.

Table 2. The Effect of Online Game Addiction on Screen Time, Physical Activity, Junk Food Consumption, and Nutritional Status.

Variable	Game Online Addiction				Total	P	r- correlation
	Low		High				
	N	%	N	%			
Physical Activity							
Light (1,40-1,99)	18	45	22	55	40	0,020	-0,256
Heavy (2,00-2,40)	31	73,8	11	26,2	42		
Screen Time							
Sufficient	18	14,1	22	25,9	40	0,302	0,115
Over	11	14,9	31	27,1	42		
Consumption of junk food							
Low	23	57,5	17	42,5	40	0,330	-0,109
Frequent	24	57,1	18	42,9	42		
Nutritional Status							
Not Fat	32	80	8	20	40	0,737	0,038
Fat	32	76,2	10	23,8	42		

Discussion

The Relationship Between Online Game Addiction and Physical Activity

Based on the results of the study, students who have high levels of online game addiction tend to do light physical activities. This proportion shows a significant decrease in the involvement of heavy physical activities compared to respondents who have low levels of addiction. This indicates that the higher the level of addiction to online games, the lower the tendency of students to participate in intense physical activities.

This study is in line with a survey conducted by (Nuevo & Handoyo, 2024), which revealed that students who are addicted to online games tend to reduce their participation in physical activities. The study found that the time spent on online games often reduces students' opportunities to exercise, resulting in a significant imbalance between physical and digital activities. This shows that students with high levels of addiction prefer to engage in indoor leisure activities rather than more intense physical activities (Nuevo & Handoyo, 2024).

Students who are addicted to online games tend to show a sedentary lifestyle. Respondents spend more time sitting and playing online games than engaging in more intensive physical activities. This finding is in line with research conducted by Gabrito et al., (2023) Which revealed that students with high screen time due to playing online games tend to replace the time that should be used for exercise with other passive activities, such as watching videos or scrolling through social media (Gabrito et al., 2023).

The social environment also plays a role in reducing physical activity in students who are addicted to online games. Research by Wardana, (2022) It is stated that students who actively engage in online gaming are often more connected to virtual communities, such as gamer communities or Discord, than to social activities that involve physical interaction. This can lead to a reduction in the intensity of outdoor activities. The results of this study strengthen the evidence that online game addiction contributes to decreased physical activity, which hurts overall health (Wardana, 2022).

This study found no relationship between screen time, junk food consumption, and nutritional status. Previous studies have shown a significant relationship between online game addiction and screen time in high school students, where higher addiction scores correlate with increased time spent playing games excessively Burén dkk et al., (2023). Similar findings were also reported by Agatha, (2022), who found a relationship between digital media addiction and unhealthy food consumption in adolescents in big cities, with high exposure to fast

food advertisements. In addition, Mulyaningsih et al., (2020) stated that adolescents who experience internet addiction are at higher risk of obesity due to excessive eating patterns and low physical activity. However, the differences in results found in this study can be explained by different population characteristics and cultural contexts. Respondents in this study were students who generally had a better understanding of lifestyle balance and faced high academic demands, so digital activities did not completely dominate their daily lives.

The results of this study are in line with the findings expressed by Prayogi, (2021) Showing that online game addiction does not directly impact screen time, because screen time does not only come from gaming activities, but also from other academic and social needs, such as watching learning videos, accessing social media, or participating in online discussions. Therefore, high levels of screen time do not always reflect the level of addiction to online games. The of the study show that there is no significant relationship between the level of online game addiction and junk food consumption among students. This indicates that addiction to online games does not directly affect students' tendencies in choosing fast food, although both often occur together in modern lifestyles (Prayogi, 2021).

This finding is in line with research conducted A & Prakash, (2023) which states that the frequency of fast food consumption among students is more influenced by accessibility factors and limited time to cook, compared to the habit of playing online games or other digital activities. Similar research was also revealed by Pertiwi, (2022) which showed that several students still had normal nutritional status even though the subjects' diet and physical activity did not meet ideal standards. This is due to the genetic influence of families who have thin bodies. This shows that nutritional status cannot be analysed from just one aspect of behaviour, such as online gaming habits, but must be reviewed holistically from a biological perspective and overall lifestyle (Pertiwi, 2022).

Limitation of this study is that the neurological aspects that have the potential to provide a deeper understanding of the mechanisms of online game addiction cannot be accessed in this study. This is due to limited resources, both in terms of finance and access to adequate neurological measurement tools, such as brain imaging and neuropsychological examinations. In addition, this study specifically focuses on online games and does not include other types of digital games, such as offline or console-based games. This is due to the limited scope of the study, where the primary focus of this study lies in the field of nutritional science, and this study did not screen for the clinical conditions of respondents, such as sleep disorders, pathological obesity, or ADHD, which theoretically can affect gaming activities and nutritional status.

4. Conclusions

This study reveals a negative and weak relationship between online game addiction and physical activity among college students. The direction of the relationship is negative, with a weak relationship strength, indicating that the higher the level of online game addiction, the lower the level of physical activity among the respondents. No significant relationship was found between online game addiction and screen time, junk food consumption, or nutritional status among college students.

Students are expected to improve their nutritional literacy and awareness of the long-term impacts of a sedentary lifestyle. Attending webinars or workshops on healthy living is recommended. In addition, students are encouraged to use daily activity and food intake tracking applications to monitor their nutritional intake and physical activity.

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