

## Does game addiction have a relationship with adolescent sleep quality?



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### ABSTRACT

**Introduction:** Addiction to online games is one of the impacts caused by technological developments. One of the effects of online game addiction is a change in sleep quality. This study aims to analyze the relationship between the habit of playing online games with adolescent sleep quality.

**Method:** This study is a correlation analytic research design with a cross-sectional approach, the research sample was 109 respondents from 150 populations using simple random sampling. The independent variable of this study was the habit of playing online games and the dependent variable was sleep quality. The instrument used in this study is gaming disorder using the 7-item Game Addiction Scale (GAS) and sleep quality using the 10-item Adolescent Sleep-Wake Scale (ASWS). Data analysis using chi-square test.

**Results:** The result of this study, most of them (55.6%) had fairly bad sleep quality and almost half (44.4%) had very bad sleep quality. Spearman rank test results  $p = 0.000$ , which means that game addiction has a relationship with adolescent sleep quality.

**Conclusion:** Game addiction is one of the factors for adolescents' bad sleep quality. It is hoped that adolescents can reduce playing online games because bad sleep quality can interfere with health.

**Keywords:** *adolescent, game addiction, sleep quality.*

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## INTRODUCTION

Online gaming is a recreational activity that has turned into a very popular industry worldwide, especially in Southeast Asia.<sup>1</sup> In Indonesia, it is recorded that in 2021 it will reach \$641 million and it is projected that in 2025 it will increase to \$783 million.<sup>2</sup> The prevalence of Internet use climbed from 34.9% (88.1 million users) in 2014 to 51.8% (132.7 million users) in 2016 and 73.7% (193 million users) in 2019, according to data from the Association of Indonesian Internet Service Providers (APJII). Meanwhile, 16.5% of people currently play online games in 2019.<sup>3</sup>

The activity of playing games can be beneficial activity for most individuals, especially teenagers. The positive effects are demonstrating superior visual, spatial, and attention skills<sup>4,5</sup> and strong social bonds.<sup>6,7</sup> However, the negative impact of online gaming activities is very worrying.<sup>8</sup> Due to repetitive behavioral involvement, excessive online gaming develops into non-substance addiction or impulse-controlled disorder (ICD), which has been shown to have more detrimental effects.<sup>9</sup>

In addition, aberrant breaks in the orbitofrontal cortex, striatum, and sensory regions are likely to be the origin of the association between excessive internet game use and impulse control, reward processing, and somatic representation.<sup>10</sup> One of the negative effects of gaming is that it affects sleep. Where sleep is an important health behavior in maintaining one's well-being.<sup>11</sup> Lack of sleep for adolescents will have an impact on decreasing learning concentration, decreasing grades, and affecting mood and mentality.<sup>12,13</sup> The purpose of this study was to analyze the relationship between game addiction and adolescent sleep quality.

## MATERIALS AND METHODS

### Design and Sample

This study used cross-sectional research. The target population for this study is all 150 students in grade 8 at state junior high school 2 Beji, who range in age from 13 to 14 years old. The participants were then alphabetically added to a list, from which a random selection was made using

systematic sampling. 109 students in total, 53 men and 56 women, were included in the study. Participants needed to have a device that could run online game applications, such as a smartphone or gaming PC, to meet the inclusion criteria. Refusal to participate in the study resulted in exclusion.

### Data collection procedures

The instrument used in this study is a gaming disorder using a 7-item Game Addiction Scale (GAS) by Lemmens et al., (2009)<sup>14</sup> has a validity of 0.877 and reliability of 0.951.<sup>15</sup> sleep quality using a 10-items Adolescent Sleep-Wake Scale (ASWS) by Essner et al., (2015) has validity 0.80 and reliability 0.81.<sup>16</sup>

The study was conducted in August 2022 with the following stages: explain the purpose and benefits of the study, maintain confidentiality, informed consent to participate in the study, distribute questionnaires via a Google form, provide education on handling gaming disorders, and improve sleep quality.

### Data analysis

IBM SPSS Statistics was used for all data analysis. For categorical data, descriptive statistics like number and percentage were utilized; for continuous data, mean and standard deviation were computed. To compare students' gaming addiction and sleep quality, the rank-spearman exam was used. For testing, the significance level was set at 0.05.

### RESULTS

Table 1 shows that most (51.4%) of the participants were female with an average age of 13.48. almost half (42.2%) had a normal level of gamer addiction and almost half (46.8%) had very good sleep quality.

Table 2 shows 46 participants with normal levels of gamers entirely (100%) have very good sleep quality, 27 participants with levels of engaged gamers mostly (74.1%) have fairly good sleep quality, 27 participants with a level of problem gamers almost entirely (85.2 %) have a fairly bad sleep quality. Meanwhile, 4 participants with addicted to gamers level. Most of them (55.6%) had fairly bad sleep quality and almost half (44.4%) had

very bad sleep quality. Spearman rank test results  $p = 0.000$ , which means that game addiction has a relationship with adolescent sleep quality.

### DISCUSSION

The results showed that a small portion (8.3%) of participants were addicted gamers. Playing online games makes someone feel happier because getting more satisfaction from games will make players more interested in playing them.<sup>17</sup> Playing online games is entertainment and eliminates boredom with activities that have been done before. Even though they do not know specifically the driving factors and negative impacts of playing online games. The signs that usually occur in people who are addicted to online games are psychological, physical, and social. A sign of psychological disorders, teenagers experiencing addiction will continue to think about games that are often played, have difficulty concentrating in studying or work, doing anything to be able to play games again, being physically exposed to radiation from cellphones continuously can damage the nerves of the brain, and social relationships with family

and friends is reduced.<sup>18,19</sup>

The causes of teenagers playing online games excessively are due to boring routines, lack of opportunity to relax from the hectic school schedule, the atmosphere at home that is far from comfortable, and the invitation of friends to keep playing online games. This makes it difficult for adolescents to regulate good quality sleep.<sup>20,21</sup>

Table 1 shows that a small proportion (3.7%) of participants had very poor sleep quality. Poor sleep quality due to too often accessing the internet to play online games until late at night and forgetting time to rest, as well as doing school assignments and even neglecting the ideal sleep time for body health.<sup>22</sup> Good sleep quality can be influenced by a good mood, good physical condition, and a supportive environment including calm, peace, comfort, etc., a calm mind, limited naps, regular exercise, and regular diet. Sleep quality can be influenced by several factors, one of which is lifestyle.<sup>23</sup> The lifestyle of today's teenagers who cannot be separated from smartphones causes them to play games all the time, according to a questionnaire which shows that almost all respondents say they use online games all the time. The sleep process is disrupted due to teenagers who focus on playing online games until late at night and still ignoring warnings from online games when teenagers start sleeping.

Sleep is a basic human need, so it has a physiological and psychological role. The lack of fulfillment of adolescent sleep needs is caused by the inability of adolescents to divide their time between education, socializing, and playing. In this case, teenagers will sleep late at night and wake up early because of the demands of education, this results in teenagers having difficulty concentrating and decreasing endurance.<sup>17</sup>

**Table 1. Subject's Characteristics**

Variables	N = 109
Age (mean ± SD)	13.48 ± 0.502
Gender (n, %)	
Male	53 (48.6)
Female	56 (51.4)
Game addiction (n, %)	
Normal gamers	46 (42.4)
Engaged gamers	27 (24.8)
Problem gamers	27 (24.8)
Addicted gamers	9 (8.3)
Sleep Quality (n, %)	
Very good	51 (46.8)
Fairly good	24 (22.0)
Fairly bad	30 (27.5)
Very bad	4 (3.7)

**Table 2. Crosstabs between game addiction and sleep quality**

Variables	Sleep Quality				p-value
	Very good N (%)	Fairly good N (%)	Fairly bad N (%)	Very bad N (%)	
Game addiction					
Normal gamers	46 (100)	0	0	0	
Engaged gamers	5 (18.5)	20 (74.1)	2 (7.4)	0	0.000*
Problem gamers	0	4 (14.8)	23 (85.2)	0	
Addicted gamers	0	0	5 (55.6)	4 (44.4%)	

\* $p < 0,05$  Based on rank Spearman

## CONCLUSION

Game addiction is one of the factors for adolescents' bad sleep quality. That game addiction has a relationship with adolescent sleep quality. In future research, researchers will provide interventions on how to minimize the incidence of game addiction.

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## CONFLICT OF INTEREST

The authors declare no competing interests.

## ETHICAL CONSIDERATION

This research was approved by the Ethics Committee of Chakra Brahmanda Lentera institution in August with the number 077/006/VIII/EC/KEP/LCBL/2022

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## AUTHOR CONTRIBUTION

All authors contributed equally to this study.

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