The Instances of Insomnia among Adolescents in High School Addicted to Online Games

Suriah Suriah[1], Nadya Tri Wulandari Bahri[1], Muhammad Rachmat[1]

1 Universitas Hasanuddin

Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.

Abstract

Adolescents are often considered more susceptible to online gaming addiction than adults due to their inclination towards novel experiences in pursuit of personal pleasure. However, this addiction can lead to significant health risks, notably insomnia. This study aims to elucidate the prevalence of insomnia among high school students addicted to online games, employing an analytic survey method with a cross-sectional design. The research population consisted of students of State Senior High School in East Luwu the province of South Sulawesi. A sample size of 246 individuals was determined using proportionate stratified random sampling.

The research findings reveal that a majority of adolescents engage in mobile gaming for a duration of ≥ 1 hour per day (67.0%). The most frequently played online game is identified as PlayerUnknown's Battlegrounds (32.5%). Online gaming addiction among adolescents falls predominantly within the severe criteria (73.2%), paralleling the severity of insomnia experienced (72.4%). A significant association between insomnia and online gaming addiction among high school adolescents is established ($p = 0.026$). It is recommended that educational institutions establish peer educators tasked with promoting awareness regarding the adverse impacts of online gaming addiction among fellow students. By fostering literacy on this subject, schools can contribute to a healthier and more balanced gaming behavior among

adolescents.

Suriah[1], **Nadya Tri Wulandari Bahri**[2], and **Muhammad Rachmat**[3]

[1] *Senior Lecturer, Department of Health Promotion and Behavior Sciences, Faculty of Public Health, Hasanuddin University*

[2] *Bachelor Student, Faculty of Public Health, Hasanuddin University*

[3] *Lecturer, Department of Health Promotion and Behavior Sciences, Faculty of Public Health Hasanuddin University*

Keywords: Insomnia instances, high school adolescents, online game addiction.

Introduction

Adolescents are generally more inclined to engage in online gaming compared to adults, rendering them more susceptible to online gaming addiction[1]. The number of online game users in Indonesia reached 82 million individuals by 2019[2]. Adolescents represent a prime demographic for online gaming, with 56% of American adolescents aged 12-17 having played games online. Similarly, in Indonesia, teenagers dominate the country's internet users, with 54.1% of adolescents aged 15-18 experiencing online gaming addiction. Gender-wise, 77.5% of male adolescents and 22.5% of female adolescents allocate 2-10 hours per week to online gaming[2]. The count of online game users in South Sulawesi Province, particularly in Makassar City, has been continually increasing. Based on the research conducted by Kurniawan (2021)[3], it was discovered that 55 children in Makassar City spend 10-15 hours per day engaging in online gaming.

In 2020, the World Health Organization (WHO) officially recognized online gaming addiction as a mental disorder in the 11th Revision of the International Classification of Diseases (ICD-11). Online gaming addiction exhibits several distinct characteristics, including excessive time devoted to gaming, disruption of daily activities, difficulty concentrating or focusing, heightened irritability, feelings of sadness or depression in the absence of gaming, social withdrawal, and neglect of basic needs such as eating and sleeping. These manifestations of addiction can have detrimental impacts on an individual's health[4].

Online gaming addiction involves an excessive engagement in playing, where users persistently play and struggle to discontinue. The type of game being played constitutes a significant factor influencing online gaming addiction. The surge in popularity of online games is evident through the proliferation of diverse gaming applications that captivate the attention of adolescents, leading to a competitive rush to download these online gaming applications available on the internet.

The realm of online gaming boasts numerous favourites among adolescents, including titles like PlayerUnknown's Battlegrounds (PUBG), Mobile Legends, Free Fire, and Higgs Domino. Online gaming addiction can exert both physical and mental health implications on adolescents. A primary consequence is the reduction in sleep duration. Adolescents

typically require 8-9 hours of sleep per day, a need frequently unmet among those ensnared in online gaming addiction. As a result of compromised sleep time, a growing number of adolescents, particularly males enamoured with online gaming, are grappling with insomnia[5]. Insomnia, a sleep disorder characterized by difficulty initiating or maintaining sleep, poses a formidable concern. It manifests as a disruption in the duration and quality of sleep, resulting in sleep insufficiency. Notably, in Indonesia, the prevalence of insomnia among adolescents reaches approximately 67%. The ramifications of insomnia extend beyond sleep deprivation, impacting cognitive functioning and concentration. Consequently, academic performance often takes a hit[6].

The research findings of Handayani (2018) underscore a significant correlation between online gaming addiction and deteriorated sleep quality, as well as diminished sleep duration among adolescents. These outcomes substantiate the propensity for adolescents entrenched in online gaming addiction to experience insomnia[7]. Echoing this sentiment, Nurdilla (2018) reveals that adolescents ensnared in online gaming addiction tend to extend their gameplay sessions at the expense of rest and sleep, further precipitating insomnia[8]. The study by Anggraini (2021) similarly highlights a noteworthy association between online gaming behavior and insomnia in adolescents ($p = 0.040$)[5].

A preliminary observation conducted in January 2023 at State Senior High School in East Luwu revealed a discernible trend among adolescent students, wherein several were engaged in online gaming on their smartphones during school break hours. The school administration had previously permitted cell phone usage on campus to facilitate digital learning endeavours. Subsequently, an interview held on January 2, 2023, with the School Counselling Teacher revealed that several parents had expressed concerns regarding their children's persistent late-night online gaming, resulting in sleep disturbances and subsequent insomnia. Additionally, educators reported challenges stemming from decreased student engagement in the learning process, notably reduced classroom concentration. Furthermore, data acquired from teachers indicated that over the past month, 20 adolescent students consistently exhibited tardiness in waking up early. Considering this context, the current research initiative was undertaken to examine the prevalence of insomnia among adolescents addicted to online gaming at State Senior High School in East Luwu.

Methods

This research employed an analytical survey methodology employing a cross-sectional design. Data collection was conducted during the months of April to May 2023. The study was conducted at State Senior High School in East Luwu. The research population encompassed the entire student body of high school students within the specified region. The sample size consisted of 246 adolescent students, determined using the Lemeshow formula, based on specific criteria: adolescents addicted to online gaming and experiencing insomnia within the past three months. The sampling technique employed was proportionate stratified random sampling.

The data collection instrument utilized for this study was a Google Form questionnaire, distributed online for respondents to complete. The data collection process was facilitated through the Game Addiction Scale questionnaire, designed to assess the extent of online gaming engagement and habits. This questionnaire comprises 20 modified questions adapted

from Lemmens (2009)[9]. The instrument employs an ordinal scale, where responses are assigned values of 1, 2, 3, 4, or 5. The cumulative score can be categorized based on the following objective criteria:

a. No Online Gaming Addiction: Scores 1-30
b. Mild Online Gaming Addiction: Scores 31-60
c. Moderate Online Gaming Addiction: Scores 61-90
d. Severe Online Gaming Addiction: Scores 91-120

The questionnaire utilized to gauge the prevalence of insomnia was adapted from the Jakarta-Biological Psychiatry Study Group-Insomnia Rating Scale. This instrument comprises eleven questions[10]. The ordinal scale was employed in this assessment as well, wherein responses were assigned values of 1, 2, 3, or 4. The cumulative scores were subsequently categorized according to the following objective criteria:

a. No Insomnia Complaint: Scores 11-19
b. Mild Insomnia: Scores 20-27
c. Severe Insomnia: Scores 28-36
d. Very Severe Insomnia: Scores 37-44

Results

The following provides an overview of the adolescents who constituted the subjects of this study:

Table 1. Demographic Profile of Adolescents Addicted to Online Gaming

Demographic Profile	n	%
Years		
15	69	28.0
16	125	51.0
17	48	19.5
18	4	1.60
Total	**246**	**100**
Sex		
Male	179	72.8
Female	67	27.2
Total	**246**	**100**
Duration of Daily Gaming		
< 1 Hour	81	33.0
≥ 1 Hour	165	67.0
Total	**246**	**100**
Types of Games Played		
PUBG	80	32.5
Mobile Legend	72	29.2
Free Fire	42	17.0
Higgs Domino	6	2.40
Others	46	18.9
Total	**246**	**100**

Drawing from the data presented in Table 1, it is evident that the majority of adolescents addicted to online gaming were male and aged 16. Their daily gaming duration predominantly exceeded ≥ 1 hour, with PlayerUnknown's Battlegrounds (PUBG) and Mobile Legends being the most frequently played game genres. A comprehensive depiction of the categories of online gaming addiction and insomnia experienced by the respondents is provided in the following table:

Table 2. Criteria for Online Gaming Addiction and Insomnia Categories among Adolescents

Criteria for Online Gaming Addiction	n	%
Mild	66	26.8
Severe	180	73.2
Total	**246**	**100**
Kategori Insomnia		
Mild	68	27.6
Severe	178	72.4
Total	**246**	**100**

The data provided in Table 2 illustrates that the perceived online gaming addiction among adolescents predominantly falls within the severe category, comprising 180 individuals (73.2%). Similarly, the instance of insomnia is most prevalent among adolescents categorized as severely affected, with 178 individuals (72.4%) falling into this category. The correlation between online gaming addiction and the prevalence of insomnia among adolescents is elucidated in the following table:

Table 3. Relationship between Online Gaming Addiction and Insomnia Instances among Adolescents

	Insomnia Instances				Total		*p*
	Severe		Mild				
	n	%	n	%	n	%	
Online Gaming Addiction							
Severe	123	50.0	57	23.2	180	73.2	
Mild	55	22.3	11	4.47	66	26.8	**0.026**
Total	**178**	**72.3**	**68**	**27.67**	**246**	**100**	

Table 3 presents a significant correlation between online gaming addiction and the instances of insomnia among adolescents, with a notable *p* of 0.026. Therefore, it can be inferred that adolescents addicted to online gaming indeed experience insomnia.

Discussion

Adolescents often exhibit a propensity for seeking personal enjoyment, coupled with a practical outlook. This disposition

renders them less mature and experienced in exercising self-control over the potential adverse consequences arising from excessive online gaming. The study conducted by Pandey (2019) yielded noteworthy insights, revealing that the highest prevalence of insomnia among respondents who utilized mobile phones was observed in the 16-year-old age group (34.6%)[11]. This observation is congruent with the findings of the current study, where 51% of 16-year-old adolescents, who are avid players of online games on mobile phones, also experience insomnia.

Chen (2019) has proposed that there exists a distinction in the utilization of online games between adolescent males and females. When considering their usage patterns, it becomes evident that adolescent males engage in online gaming more frequently compared to their female counterparts[12]. This observation aligns with the findings of Mais (2020), who revealed that the prevalence of online gaming addiction, leading to insomnia, was notably pronounced among adolescent males, reaching 67.6%[13]. The current study further corroborates these findings, indicating a higher prevalence of online gaming addiction, coupled with insomnia, among adolescent males in comparison to their female counterparts, with a prevalence rate of 72.8%.

Long-term online gaming addiction can give rise to psychological issues such as insomnia, heightened irritability, and depression[14]. The research outcomes of Agesti (2019) revealed that adolescents addicted to online gaming for more than one hour per day encountered psychological challenges, specifically manifesting as a diminished sense of self-efficacy, accounting for 49.8%[15]. This preceding discovery resonates with the present study, where it was determined that 67.0% of adolescents were addicted to online gaming for more than one hour per day.

Despite its negative impacts, online gaming is regarded as a trend among the younger generation. Mora (2022) asserts that trends represent distinct and novel phenomena that garner significant popularity, offering a unique sense of enjoyment to those with youthful spirits[16]. Trend is a potent influencing factor that propels individuals to engage in online gaming, driven by the evolution of the times. According to Irawan (2021), environmental factors play a role in influencing adolescents' moods, particularly encouraging them to play online games, specifically games like PUBG (PlayerUnknown's Battlegrounds), in order to alleviate boredom stemming from a lack of activities[17]. Furthermore, the influence of peers is another factor that prompts joint participation in gaming activities when congregating in a particular location.

Adolescents option for engaging in online gaming due to several reasons, including seeking pleasure, recreation, stress alleviation, obtaining recognition from peers, and escaping from real-life pressures. The frequency and duration of online gaming can impact the emotional intelligence of adolescents. The factors driving the escalation of gaming levels lead adolescents to feel intrigued to continuously play at more challenging stages with new obstacles, ultimately contributing to online gaming addiction[1]. This study revealed that out of 180 adolescents, 73.2% exhibited severe online gaming addiction. Surbakti's research (2019) also unveiled that indulging in prolonged gaming sessions propels adolescents into heightened curiosity, compelling them to persist in playing, sidelining other activities and thus resulting in addiction[18]. Online games hold considerable allure, as they not only enable individuals to compete with those beside them but also facilitate gameplay with multiple participants situated in various locations globally.

Due to the engrossment in gaming, time slips away unnoticed, causing adolescents to overlook various matters, including time designated for rest or sleep. Saputra (2013) identified factors contributing to adolescent insomnia, which encompass

poor sleep patterns resulting from excessive engagement with electronic media, including gadgets, mobile phones, and the like, particularly for prolonged gaming[19]. Within this study, it was determined that adolescents experiencing severe insomnia accounted for 72.4%. Findings from Luas' research (2019), which examined 136 high school adolescents addicted to online gaming, also disclosed that 78% of them grappled with severe insomnia[20].

This study identified a correlation between the instance of insomnia and online gaming addiction among high school adolescents (p=0.026). Prior research conducted by Mawitjere (2019) also yielded findings indicating a link between online gaming addiction via gadgets and adolescent insomnia[21]. Another study by Nurdilla (2018) revealed that online gaming addiction can impact sleep quality; adolescents addicted to online gaming tend to extend their gameplay time, leading them to neglect the necessity of rest[8]. The higher an individual's addiction to online gaming, the more compromised their sleep quality becomes. Online gaming addiction is closely intertwined with sleep disturbances or issues. One of the contributing factors to insomnia is a monotonous lifestyle, where individuals prioritize gaming over fulfilling their rest and sleep needs[22].

Conclusion

The majority of high school adolescents who are addicted to online gaming and experience insomnia are males, aged 16 years. The duration of daily gaming sessions mostly exceeds ≥ 1 hour, with the most frequently played game being PlayerUnknown's Battlegrounds. Adolescents predominantly perceive their level of online gaming addiction as severe, encompassing 180 individuals (73.2%). Similarly, the instance of insomnia among adolescents is predominantly severe, involving 178 individuals (72.4%). A significant relationship is observed between online gaming addiction and the incidence of insomnia among adolescents, with a p of 0.026. Thus, it is concluded that adolescents addicted to online gaming experience insomnia. Consequently, it is recommended that educational institutions establish peer educators tasked with conducting literacy campaigns about the negative impacts of online gaming addiction, thereby aiding in the reduction of insomnia incidents among adolescents.

Research Implications

- The school's attention is required to engage parents of adolescents in a collaborative parent-student program, thereby enabling supervision of adolescents' activities beyond school hours to minimize excessive engagement in online gaming.
- Extracurricular activities could be extended beyond school hours, taking into account activities aligned with the interests and talents of adolescents.
- Discipline regarding the use of gadgets or mobile phones during school breaks could be enforced through enhanced involvement of class teachers and the student council.
- Subsequent research could consider qualitative methods to delve deeper into specific cases of online gaming addiction and insomnia incidents among early adolescents.

Research Documentation

Figure 1. Female adolescents playing an online game on their mobile phone during school break

Figure 2. A boy playing an online game on his mobile phone during school break

Conflict of interest

The authors declare no conflict of interest.

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