

RESEARCH ARTICLES

The Relationship Between Online Game Exposure and Sleep Quality in Students at SMAN 13 Medan City

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Abstract: Playing *online games* done during activities at night can come at the expense of sleep. The quality of a person's sleep is influenced by several aspects such as the duration of sleep, the time it takes to fall asleep, the frequency of waking up, and the level of sleep deprivation. Sleep disorders are a decrease in sleep quality that occurs due to daily activities, especially in adolescents. The quality of sleep can continue to decline with this bad routine continuously. This study aims to find out the effect of *exposure to online games* on sleep quality. The research is a *cross sectional research* conducted by filling out questionnaires by 81 students and students at SMAN 13 Medan City. The data obtained will be analyzed with Chi-square. Based on data analysis, $P=0.004$ was obtained where there was a relationship between exposure to *online games* and sleep quality at SMAN 13 Medan City. There is a significant relationship between exposure to *online games* and sleep quality at SMAN 13 Medan City.

Keywords: *Game online*, sleep quality, exposure level.

INTRODUCTION

Quality of sleep means a condition that an individual undergoes to get comfort and improved fitness when waking up. Sleep quality is influenced by various causes such as sleep duration, time needed to fall asleep, frequency of awakening, and sleep quality.¹ Individuals who are sleep deprived will cause a disruption in the release of serotonin which can eventually result in a decrease in

concentration and mood.² In adolescents, especially in high school students, poor sleep quality can be caused by various types of causes including stress, *lifestyle*, environment, health status and drug use.¹ Based on epidemiological research applied in Europe, it shows that 30% of adolescents aged 15-18 years complain of at least 1 complaint of sleep disorders, 20% experience dysfunction during the day,

12.4% complain of difficulty starting sleep, 13.8% complain of non-restorative sleep and 9.25% have difficulty maintaining sleep.¹

A study on sleep quality using the *Sleep Disturbances Scale for Children* method showed the prevalence of poor sleep quality in the control population of 73.4%. According to the *National Sleep Foundation* (NSF), the correct sleep time at the age of 14-17 years is 8-10 hours and for the age of 18-64 years the average good sleep is 7-9 hours.²

The impact of poor sleep quality can be described as physical health problems, impaired memory/memory and learning, a fairly high risk of obesity and problems with mental health.³ As many as 4.388 million internet users worldwide with a percentage of 57% and as many as 30% use the internet to play *games* online, the prevalence of internet addiction in adolescents is found to be more increased in the Asian continent than in America or Europe.⁴

Online games in Indonesia are ranked sixth in the internet usage category.³ *These online games* have an effect on the quality of sleep, because playing *games* is usually done at night so that it can have a bad impact on sleep time.² Insufficient sleep time, repeated obstructed wake-up processes, and sleep disorders that are common in young people and adolescents today.² Active *online game players* in Indonesia reach 10.7 million people, the number of users or game players in Indonesia is categorized based on gender of 51.43% males and 48.57% females.³ The

data available are active users of individuals who are devoted to playing *online games* every day without knowing the time.³ This *addiction to online games* can be categorized as part of a mental illness called *gaming disorder*.⁴ Teenagers spend an average of 7 hours per day using internet media such as *online games*.³

The duration of *playing online games* causes online *game* users to then have an impact on the mind, mental health, sleep quality and emotional health. The impact of adolescents who are addicted to playing *online games* causes social difficulties such as lack of communication with friends and family, loneliness, laziness in doing schoolwork and the impact on psychological aspects including anxiety, hallucinations, stress, feeling hopeless and helpless, often worried and confused.⁵ Generally, teenagers will reduce their sleep hours so that they can play *online games*.⁴

METHOD

This study is a correlation analytical study with a cross-sectional approach by filling out the *Young's Internet Addiction Test* (IAT) and *Pittsburgh Sleep Quality Index* (PSQI) questionnaires. Ethical approval was obtained from the Health Research Ethics Commission, Faculty of Medicine, University of Muhammadiyah North Sumatra No. 1020/KEPK/FKUMSU/2023. This research was conducted from June 2023 - August 2023 at the Faculty of Medicine, University of Muhammadiyah North Sumatra. This

analysis uses primary data obtained from filling out questionnaires to 81 respondents. Inclusion criteria: Students who are registered at SMAN 13 Medan City and have played *online games*, students who play online games. Exclusion criteria: Have a history of psychiatric disorders.

RESULT

Table 1. Demographic Characteristics of Respondents

	Frequency (n)	Percentage (%)
Gender		
Man	28	34.6
Woman	53	65.4
Total	81	100
Age		
15 y.o	1	1.2
16 y.o	30	37
17 y.o	47	58
18 y.o	3	3.7
Total	81	100

The distribution of research subjects was sorted based on age representing the final number of 81 students where the subjects in this study, the majority of 47 (58%) respondents were 17 years old. Then the characteristics of the respondents were sorted by gender, showing that of the 81 students who were the subjects, 53 (65.4%) of the respondents were female, while the male respondents were 28 (34.6%) respondents.

Table 2. Demographic Characteristics of Respondents Based on Online Game Exposure

	Online Game Exposure			Total
	Moderate	Frequent	Rare	
Gender				
Man	4 (14.3%)	17 (60.7%)	7 (25%)	28 (100%)
Woman	7 (13.2%)	29 (54.7%)	17 (32.1%)	53 (100%)
Age				
15 y.o	0 (0%)	0 (0%)	1 (100%)	1 (100%)
16 y.o	6 (20%)	17 (56.7%)	7 (23.3%)	30 (100%)
17 y.o	5 (10.6%)	28 (59.6%)	14 (29.8%)	47 (100%)
18 y.o	0 (0%)	1 (33.3%)	2 (66.7%)	3 (100%)

Table 2 shows that of the total 28 male respondents, the majority had "Moderate," 60.7% exposure. The age analysis showed that in the 15-year-old age group, there was one respondent (100%) who had "Frequent" exposure. At age 16, the majority had "Moderate," (56.7%) exposure, and at age 17, the majority had "Moderate," exposure (59.6%) and the majority in the 18-year-old age group was 2 students (66.7%) having "Frequent" exposure.

Table 3. Demographic Characteristics by Quality

	Sleep Quality		Total n (%)
	Poor	Good	
	n (%)	n (%)	
Jenis Kelamin			
Man	21 (75%)	7 (25%)	28 (100%)
Woman	38 (71.7%)	15 (28.3%)	53 (100%)
Age			
15 y.o	1 (100%)	0 (0%)	1 (100%)
16 y.o	24 (80%)	6 (20%)	30 (100%)
17 y.o	32 (68.1%)	15 (31.9%)	47 (100%)
18 y.o	2 (66.7%)	1 (33.3%)	3 (100%)

Table 3 illustrates in the gender group, it was found that of a total of 28 male respondents, 75% of them had "Poor" sleep quality, while 25% had "Good" sleep quality. In the group of women with a total of 53 respondents, 71.7% had "Poor" sleep quality, and 28.3% had "Good" sleep quality.

An analysis by age showed that at age 15, one respondent had a sleep quality classified as "Poor." In the 16-year-old age group, out of a total of 30 respondents, 80% had "Poor" sleep quality, while 20% had "Good" sleep quality. In the 17-year-old age group with a total of 47 respondents, 68.1% had "Poor" sleep quality, and 31.9% had "Good" sleep quality. Meanwhile, at the age of 18 with a total of 3 respondents, 66.7% had "Poor" sleep quality, and 33.3% had "Good" sleep quality.

Table 4. The Relationship of Online Game Exposure to Sleep Quality in Students

Online Game Exposure	Poor n (%)	Good n (%)	Total n (%)	P Value
Sometimes	5 (45.5%)	6 (54.5%)	11 (100%)	0,004
Occasional	31 (67.4%)	15 (32.6%)	46 (100%)	
Often	23 (95.8%)	1 (4.2%)	24 (100%)	
Total	59 (72.8%)	22 (27.2%)	81 (100%)	

Based on Table 4, it is known that of the group of students who experience exposure to *online games* "sometimes", 45.5% of respondents have "poor" sleep quality, while the majority of 54.5% of respondents have "good" sleep quality. Meanwhile, in the group of students who experienced exposure to "Moderate" *online games*, the majority with 67.4% experienced "poor" sleep quality, while 32.6% had "good" sleep quality. The other group of respondents was the group of students who experienced exposure to "frequent" *online games*, most of which was 95.8%, had

"poor" sleep quality, while only 4.2% had "good" sleep quality.

The table shows that the significance value (*P-Value*) is less than 0.05 which is 0.004, where it can be concluded that H_1 is accepted and H_0 is rejected. From the results of the tests carried out today, it can also be concluded that there is a relationship between exposure to *online games* and the sleep quality of SMAN 13 Medan City students.

DISCUSSION

The results of the study showed that there was a relationship between exposure to *online games* and sleep quality in students at SMAN 13 Medan City. This means that the higher the frequency of exposure to online games, the more likely students are to experience severe sleep disorders. If the results of this study are in accordance with the results of M. Sahlan Zamaa et al. (2022) reported that adolescents who are addicted to online games will experience insomnia. Research shows that many teens who are addicted to online games are characterized by poor sleep quality of up to 73.1% in terms of subjective sleep quality, sleep latency, sleep disturbances, sleep duration, effects of sleep patterns, use of hypnosis, and daytime dysfunction.⁵

The results of the research obtained regarding *online gaming* and its impact on individuals are very relevant. Initially, online games were created as a means to overcome fatigue and provide entertainment and relaxation of the brain after daily

activities. However, in a social context, the negative impact of online gaming addiction can be seen in the strained relationships with friends and family. The time that should be spent together becomes reduced due to the continuous activity of playing online games. Psychologically, this addiction results in constant thoughts on the games being played, interfering with concentration and productivity in daily activities.⁶

Likewise with the physical aspect, where exposure to computer radiation light while playing online games can damage the nerves of the eyes and brain. Online gaming addiction also presents the risk of lack of sleep time, which will lead to insomnia. A person who is stuck in an online gaming addiction may find it difficult to control themselves to stop playing, even at the hours they are supposed to be using to rest and sleep. Related to adolescents, lack of sleep time can have a significant impact. Unmet sleep needs can interfere with adolescent physiological and psychological functioning. Difficulty dividing time between education, social interaction, and gaming can lead to late nighttime sleepovers and waking up early, resulting in a lack of adequate sleep time. This can affect concentration, endurance, and result in higher levels of stress.⁷

Often with the growing technology and popularity of online games, it is important for individuals, especially teenagers, to understand and manage the use of such games. Awareness of potential negative impacts and efforts to maintain a

balance between gaming activities and daily life are essential to maintain physical and mental well-being.

The theories that have been expressed regarding the negative impact of *online gaming addiction* have real implications in various aspects of an individual's life, especially in adolescents. This addiction phenomenon can have a serious impact on education and productivity, where excessive involvement in playing online games can interfere with students' concentration and academic performance. In addition, the potential for mental health disruption is something that needs serious attention. Online *gaming* addiction can exacerbate stress, anxiety, and depression problems in teens, which in turn has an effect on their psychological well-being.

Social impact is also an important factor, with the possibility of losing contact with friends and family due to excessive use of the game. In addition, the risk of physical impacts such as sleep disturbances and exposure to computer radiation raises concerns for long-term physical health.

Therefore, it is important for teens to understand the need for effective time management, the importance of adequate sleep, and the importance of diverse activities outside of the gaming world for conversational personal development. It also affirms the role of parents, educators, and the community in guiding teens to use technology wisely and avoid the negative effects of *online gaming* addiction.

CONCLUSION

The conclusions of this study are:

1. Students of SMAN 13 Medan City mostly experience moderate exposure to *online games*.
2. Most of the students of SMAN 13 Medan City have poor sleep quality.
3. There is a significant relationship between *exposure to online games* and sleep quality in students at SMAN 13 Medan City

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