

# Online Games Addiction and the Decline in Sleep Quality of College Student Gamers in the Online Game Communities in Surabaya, Indonesia

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**Abstract---** *Addiction to online games in college students can lead to problems meeting basic needs for gamers such as eating, sleeping, and resting. This study aimed to analyze the relationship between online game addiction and sleep quality. The study design was descriptive analytic with a cross-sectional approach. The study population was college student gamers in the online gaming community in Surabaya. The sample of 111 respondents were obtained using a total sampling technique. The research instrument used online game addiction questionnaires and the Pittsburgh Sleep Quality Index (PSQI). The data obtained were then analyzed using the Spearman Rho test with level of significance  $p < 0.05$ . The results showed that the higher level of online game addiction, the lower the sleep quality of college student gamers in the online gaming community ( $p = 0,000$ ;  $r = -0,751$ ). Game addiction experienced by online gaming college students has a physical impact, especially the sensory system of the body's sense of sight which causes the effects of fatigue that lead to difficulty in falling asleep and achieving good quality of sleep. College student gamers can manage their free time for playing online games so they don't develop into addictions and therefore they can have a good quality of sleep.*

**Keywords--** *Online game addiction; Sleep quality; College students; Gamers*

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## I. INTRODUCTION

The college students in the study are individuals aged 18-25 years old studying at a higher education level [1]. They have the need to be able to reach the stage of development, one of these needs is sleep [2]. The National Sleep Foundation recommends that students need 7-9 hours of sleep a night, but college students tend to experience disturbances in meeting basic needs, especially sleep [3].

The prevalence of sleep disorders in college students is higher (50%) than in the general population (20%) [4]. On average for three days a week students experience a tired and often sleepy phase and 54% of students have poor sleep quality[5]. The most common sleep disorders experienced by college students are insomnia, narcolepsy, hypersomnia, and obstructive breathing stops during sleep. As many as 27% of 1,845 experience at least one of these sleep disorders [7]. The results of a preliminary study of 10 college students in an online game community in

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Surabaya found 60% of them experienced changes in sleep patterns and have the habit of sleeping past 12pm. The delay in starting sleep is because they play online games using cell phones and laptops. The use of internet-based electronic devices, including online games before going to bed continuously for long periods of time can reduce the ability to concentrate during college lectures and indirectly impacts on the disruption of GPA values [8].

The sleep characteristics of college students are different compared to other ages, namely experiencing a shift in circadian rhythm so that sleep hours also shift [9]. They tend to have activities and high mobility in living their daily lives, such as: academic study schedules, organizing, and socializing with their respective communities [7]. These activities take up a lot of time so that they do not have enough time to sleep. In addition to diverse activities, the lifestyle of college students in the digital age is increasingly excessive in using technology. They use the internet as a means of entertainment by accessing social networks, email, chat, and playing online games.

Someone who often plays games online will have a bond with the games being played. A gamer feels the need to be online and play longer when he wants to reach or maintain the symbols contained behind an avatar in online game play. A character in the game will be seen and feared if the character has a high level and powerful equipment that is usually expensive. Thus, they are required to pursue high levels (leveling) or looking for lots of money to be able to buy powerful equipment. Gamers do not realize they have spent a long time gaming, they are too busy interacting in the world of games in leveling their virtual characters [10]. Playing online games makes college students stay up most of the night and causes progressive sleep disorders and poor sleep quality [8]. More than 40% of college students don't pay attention to their sleep. This usually happens until the student has problems with sleep.

Sleep disturbance in college students is important to be aware of from the beginning. Based on the Precede-Proceed Model developed by Green and Kreuter, a person's or community's behavior is determined or formed from three factors, namely predisposing factors, driving factors, and supporting factors [11]. Predisposing factors are explained as the need for college student gamers to be recognized, hoping to be noticed and run away from the problems faced. The driving factor is translated as the attitudes and behavior of parents and the influence of peers who are members of the online gaming community as a reference group of community behavior. One of the supporting factors is internet access and ease of purchasing gadgets. The environment also encourages college students to become addicted to online games, especially to college students without the supervision of parents who make addiction increasingly out of control. Addiction behavior of online games that are not handled can cause disruption in the quality of college students' sleep, disruption of sleep quality will indirectly have an impact on their health conditions. This study aims to analyze the relationship between online game addiction and sleep quality disorders among college student gamers in the online gaming community in Surabaya.

## II. METHODS

The study design was a descriptive analysis with cross sectional approach. The respondents were 111 students in 7 online game communities in Surabaya obtained by total sampling technique. Inclusion criteria for the sample was active second-year college students who played games. The sample excluded respondents who lived with their families, new students and students not doing their final assignments. The independent variable was online games addiction, while the dependent variable was sleep quality. The data was obtained through the chairman of the online

gaming community. Prospective respondents were given an explanation of the research mechanism and gave informed consent via a Google form. Respondents filled out questionnaires about gender, education level, age, marital status, duration of playing online games, reasons for playing online games, online game addiction questionnaire and sleep quality through the Google form. The online game addiction questionnaire was adopted from Lemmens (2009 in Mehroof, M., & Griffiths, 2010) as many as 21 question namely salience, tolerance, mood modification, withdrawal, relapse, conflict, and problem. It was scored using the Likert scale (1-5). The sleep quality instrument uses The Pittsburgh Sleep Quality Index (PSQI) developed by Buysse (1989) which modified in line with the online game concept [15]. They consisted of seven components, namely the relationship of sleep quality, ability to maintain sleep (total sleep time), quantity (duration) of sleep, sleep habits, things that disturb sleep, use of sleeping pills, and things that support during the last week before data collection (Faisal, 2018). The data obtained were analyzed using the Spearman Correlation test to determine the relationship between online game addiction and the sleep quality of college student gamers, with a significance level of  $p < 0.05$ . This study has been approved ethically by the Ethical Board Committee, Faculty of Nursing, Universitas Airlangga with number of 1889-KEPK.

### III. RESULT

Table 1 Respondent's characteristic (n=111)

| Characteristic           | Indicator                | n   | %    |
|--------------------------|--------------------------|-----|------|
| Gender                   | Man                      | 68  | 61.3 |
|                          | Woman                    | 43  | 38.7 |
| Total                    |                          | 111 | 100  |
| Age                      | 20-25 years old          | 97  | 87.4 |
|                          | 26-30 years old          | 4   | 3.6  |
|                          |                          | 4   | 3.6  |
|                          | 31-35 years old          | 2   | 1.8  |
|                          | 36-40 years old          | 4   | 3.6  |
| Total                    | >40 years old            | 111 | 100  |
| Semester                 | 3 – 4                    | 63  | 56.8 |
|                          | 5-6                      | 35  | 31.5 |
|                          | 7-8                      | 11  | 9.9  |
|                          | >8                       | 2   | 1.8  |
| Total                    |                          | 111 | 100  |
| Hometown                 | Surabaya                 | 23  | 20.7 |
|                          | Another city             | 88  | 79.3 |
| Total                    |                          | 111 | 100  |
| Duration of playing game | 1 - 2 hours/day          | 36  | 34.2 |
|                          | 3 – 4 hours/day          | 40  | 36.0 |
|                          | 5 - 6 hours/day          | 16  | 14.4 |
|                          | > 6 hours/day            | 19  | 15.4 |
| Total                    |                          | 111 | 100  |
| Reason of playing game   | Hobby                    | 36  | 32.4 |
|                          | Escape from problem      | 11  | 9.9  |
|                          | Activity in leisure time | 57  | 51.4 |
|                          | Friend invitation        | 5   | 4.5  |
|                          | Doing job                | 2   | 1.8  |
| Total                    |                          | 111 | 100  |
| Game online addiction    | Addiction                | 68  | 61.3 |
|                          | No addiction             | 43  | 38.7 |
| Total                    |                          | 111 | 100  |
| Sleep quality            | Good                     | 28  | 34.2 |
|                          | Poor                     | 73  | 65.8 |
| Total                    |                          | 111 | 100  |

Based on table 1 it can be explained that the majority of respondents 61.3% (68 respondents) are male. The age range was dominated by 20-25 year olds, with a proportion of 87.4% (97 respondents) and 79.3% (88 respondents) came from Surabaya. Most of the respondents were undergoing study in third until fourth semesters of 56.8% (63 respondents) and in fifth until sixth semesters of 31.5% (35 respondents). Nearly half of respondents played online games to fill in leisure time by 51.4% (57 respondents) and as a hobby of 32.4% (36 respondents), the majority of respondents played games for 3-4 hours / day of 36.0% (40 respondents) and 1-2 hours / day in the amount of 34.2% (36 respondents). The more than half of respondents, 61.3% (68 respondents) experienced addiction to online games. Most of them, 65.8% (73 respondents), have poor sleep quality.

Table 2 The relationship between online games addiction and sleep quality of college student gamers

| Sleep quality       | Game online addiction |              | Total     |
|---------------------|-----------------------|--------------|-----------|
|                     | Addiction             | No Addiction |           |
| Good                | 4(3,6%)               | 34(30,6%)    | 38(34,2%) |
| Poor                | 64(57,7%)             | 9(8,1%)      | 73(65,8%) |
| <b>Total</b>        | 68(61,3%)             | 43(38,7%)    | 111(100%) |
| p=0,000    r=-0,751 |                       |              |           |

Based on the Spearman-rho correlation test (table 2), the results showed  $p = 0,000$ , meaning that there was a relationship between sleep quality and online game addiction. Correlation coefficient ( $r$ ) = - 0.751 indicates a strong relationship. The negative  $r$ -value means that the higher the online game addiction experienced by college student gamers the worse the quality of sleep.

#### IV. DISCUSSION

College gaming students in this study mostly experienced online game addiction. Addiction is an unhealthy or self-defeating behavior that lasts continuously and is difficult to end [17]. Game addiction is characterized by playing games excessively as if there would be nothing to do besides playing games and as if this game were his life, and had a negative influence on the players. Respondents do the activity of playing games for 3-4 hours a day with the reason to fill spare time and stated that playing games is part of their hobbies. The duration of playing the game is long enough to make someone stay awake and be vigilant when playing. This situation stimulates an increase in the hormone adrenalin so that it becomes difficult to sleep because they want to play the game continuously [18]. Research respondents are third until fourth semester students (56.8%), who are very vulnerable to exposure to addiction to online games because there are still not many tasks and then they tend to spend their time playing online games.

Individuals with addicted behavior, including online game addiction, will experience motivational monopoly [19]. Motivational monopoly will lead to playing online games as a dominant behavior (salience) in daily life and potentially forgetting the main task as a student. Online game players cannot stop playing, because they will lose the means to achieve motive disposition when players leave online games. This period will also cause unpleasant feelings (withdrawal) in a player greater than the pleasant mood (mood modification)

obtained when playing online games. This negative effect will occur when players play back. This is the cycle that causes online game players to increase the intensity of play (tolerance). Thus so many online game players has stopped playing again, even the intensity is higher than before (relapse).

The majority of college students' sleep quality in the online gaming community is poor. Sleep quality is a measure by how easily a person can fall asleep, maintain sleep (sleep satisfaction), quantity (duration) of sleep and quality (depth) of sleep [20]. College student gamers often have difficulty going to sleep, so they can only sleep before dawn. The average sleep time is 5-6 hours because in the morning they have to do activities on campus. Poor sleep quality is most often experienced by groups of college students and is influenced by factors such as light conditions during sleep, temperature, activity, napping patterns, habits before going to sleep, and the environment in which to live [21].

The respondent predominant habit of bedtime is to play online games because they have difficulty getting to sleep. Excessive activities such as playing online games on a computer or gadget before going to sleep also aggravate the situation. The tension caused by these activities can cause fatigue in the area around the eyes, making it difficult to close them [22]. Playing online games stimulates the cerebral cortex to secrete norepinephrine and the midbrain releases the neurotransmitter dopamine. Both of these neurotransmitters are part of a reticular activation (SAR) system that functions in maintaining the awake state. Electromagnetic waves and light are also produced by gaming devices and cause the production of the hormone melatonin which is released by the hypothalamus gland whose function is decreased waking [23]. The amount of melatonin that continues to be produced makes a person unable to immediately do sleep activities. This situation will further reduce sleep time and have an impact on sleep quality.

The development of internet technology also affects the variation of online games. The games makes gamers addicted and end up playing without knowing the time, so their break time is used instead to play. College student gamers experience changes in the body's biological time and suppress the natural production of melatonin which is important for normal wake-up sleep cycles, resulting in an effect on sleep quality. Poor sleep quality of adolescents can not only interfere with concentration difficulties and memory weakness, but also affect the ability of metabolism to work well.

## **V. CONCLUSION**

College student gamers experience addiction to online games which has an impact on poor sleep quality. Game addiction experienced by college students gamers has a physical impact, especially the sensory system of the body's sense of sight which causes the effects of fatigue that lead to difficulty in starting sleep and achieving good quality of sleep. College students gamers can manage their free time for playing online games so they don't develop into addictions and have a good quality of sleep.

## **CONFLICT OF INTEREST**

No conflicts of interest have been declared

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