



The Effect of Long-Term Addiction to Online Games on Hemoglobin Levels and Urine Sediment Crystals in Adolescents in Mataram City

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Abstract: Online gaming *addiction* has a negative impact on health, such as reduced sleep hours and changes in sleep patterns can lead to a decrease in hemoglobin levels in the blood. This decrease in hemoglobin has an impact, namely anemia. Besides that, it can also cause kidney disease, especially the formation of urine sediment crystals caused by sitting too much, not drinking enough water and moving little. Objective: To determine the effect of long-term addiction to online games on hemoglobin and urine sediment crystal levels in adolescents in Mataram City. Method: This study is an analytical *observational* research with a cross sectional approach of 24 samples. Using data in the form of blood hemoglobin and urine levels. Sampling techniques with *purposive sampling* methods and descriptive data analysis. Results: The results of the study of 7 respondents who were not addicted to online games had normal hemoglobin levels (29.16%), 9 respondents who were addicted to online games with mild anemia (37.5%) and 8 respondents with moderate anemia (33.3%). Negative (-) crystals were found in the urine sediments of 24 respondents. Conclusion: There is an effect on the hemoglobin levels of adolescents who are addicted to online games and negative crystals on urine sediments.

Keywords: Online Games; Hemoglobin Levels; Urine Crystals; Teenagers

Introduction

Adolescence is characterized by instability, meaning that he adapts to changes in circumstances easily and quickly. Teens who are addicted to online games sometimes experience impaired social and physical connections, become somewhat distracted from other activities, and become angry when they are unable to play online games (King & Delfabbro, 2018; Novrialdy, 2019). Online gaming addiction is a condition that affects people who play video games for three hours a day or more, or who spend more time than that playing games each week (Ramadhan et al., 2023; Setyowati et al., 2023). This can cause people to become less vigilant and less control over their actions to whatever is played in order to achieve the desired level of enjoyment, which in the end has the potential to have a negative impact on both

physical and mental health, especially for adolescents (Gurusinga, 2020; Mais et al., 2020).

According to Gurusinga (2020) in Indonesia, it is explained that the percentage of adolescent girls who are addicted to online games is 77.5%, while the percentage of adolescent girls who are not addicted to online games is 22.5%. These teenagers can play online games for at least three to ten hours every week (Nur Cahya et al., 2023; Surbakti et al., 2023). Excessive use of online games can harm teens. One of the most obvious signs is the appearance of health problems, such as irregular sleep patterns and irregular working hours. Blood hemoglobin levels decrease when sleep habits are poor. Anemia is a consequence of this hemoglobin deficiency (Inshani, 2020; Aritonang et al., 2023).

Anemia is a condition when the body experiences a decrease in the number of red blood

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cells caused by the loss of hemoglobin molecules. Daily physical activity is one of the factors that can affect hemoglobin levels (Minasi et al., 2021). Sleep duration that is too short can interfere with the hemoglobin production process, causing hemoglobin to be unable to meet the body's needs (Fadhilah Rizkiyah et al., 2023). Urine sediment crystals are a condition in which crystals form in the urinary tract and are excreted through the urine. If left for too long, it will turn into a urinary tract stone. Crystal formation is related to the concentration of various minerals in the urine, the metabolism of food and beverages, as well as the influence of changes that occur in the urine, such as changes in pH and temperature as well as changes in the composition of minerals in the urine during the formation process (Rizqi Nafisah & Fitrianiingsih, 2024; Widiantara, 2022).

Based on the results of the study (Gurusinga, 2020) previously it was known that from December to April 2019, when compared to those who did not have gaming experience, there were more mature players. The purpose of playing online games, according to teenagers, is to relieve stress and forget about activities they have done before. Although they don't know anything, they don't recognize the specific factors and negative impacts of online games (Halijah et al., 2023; Syahril Ramadhan & Hadikusuma

Ramadan, 2023). From the results of the study it is known that the data of respondents experienced addiction *Online Games* As many as 169 people (70.4%) and 136 people (56.7%) experienced poor sleep quality, and 33 people (13.8%) experienced good sleep quality (Matur et al., 2021).

Based on this background, the researcher was interested in conducting a study entitled "The Influence of Old *Online Game Addiction* on Hemoglobin Levels and Urine Sediment Crystals of Adolescents in Mataram City".

Method

This study is an analytical observational *study* with a cross sectional approach of 24 samples. Using data in the form of blood hemoglobin and urine levels. Sampling techniques with *purposive sampling* methods and descriptive data analysis.

Result and Discussion

The results of the research were obtained by 16 adolescents who were addicted *to online games* and 7 adolescents who were not addicted *to online games*. The results of the study on hemoglobin levels and urine sediment crystals in adolescents are as follows (Table 1).

Table 1. Results of Hemoglobin and Urine Sediment Crystal Examination of Adolescents in Mataram City

Sample Code	Addiction	Age	Urine Sediment Crystals	Hb content (mg/dl)	Anemia Rate
S1	YES	21	Negative	8,3	Light
S2	YES	20	Negative	12,5	Keep
S3	YES	21	Negative	9,1	Keep
S4	YES	21	Negative	10,6	Light
S5	YES	21	Negative	12,0	Light
S6	YES	19	Negative	12,1	Light
S7	YES	20	Negative	11,9	Keep
S8	YES	20	Negative	8,5	Light
S9	YES	19	Negative	12,1	Light
S10	YES	21	Negative	11,2	Keep
S11	YES	21	Negative	9,7	Light
S12	YES	20	Negative	11,5	Keep
S13	YES	21	Negative	10,0	Light
S14	YES	22	Negative	12,8	Light
S15	YES	19	Negative	9,7	Keep
S16	YES	19	Negative	9,2	Keep
S17	YES	20	Negative	11,0	Light
S18	NOT	22	Negative	16,8	Usual
S19	NOT	20	Negative	15,7	Usual
S20	NOT	20	Negative	16,0	Usual
S21	NOT	20	Negative	13,6	Usual
S22	NOT	21	Negative	14,3	Usual
S23	NOT	22	Negative	13,0	Usual
S24	NOT	21	Negative	16,2	Usual
Average			-	12.4mg/dl	

Based on Table 1, it shows that there is a tendency between the influence of the long time of game addiction on Hb levels while the sediments were not found to have crystals in the urine. Of the 24 samples, 16 people were addicted to *online games* with low hemoglobin levels, while 7 people were not addicted to normal hemoglobin levels, and the results of the urine sediment crystal examination on the 24 samples were negative. The Effect of Prolonged Addiction to Online Games on Adolescent Hemoglobin Levels in Mataram City with 24 respondents can be seen in Table 2.

Table 2. Anemia Levels in Respondents in Mataram City

Information	Frequency /Person	Percentage (%)
Normal	7	29.16
Mild Anemia	9	37.50
Moderate Anemia	8	33.30
Severe Anemia	0	0

Based on the results of the research in Table 2, the results of the examination of normal Hb levels were obtained for 7 respondents, mild anemia for 9 respondents and moderate anemia for 8 respondents. The results of the study obtained normal hemoglobin (Hb) levels as many as 7 respondents with a presentation of 29.16% not addicted to *online games*. There are several factors that affect hemoglobin levels to normal (Djannah et al., 2021; Ghadam et al., 2023; Lorenza et al., 2021). In particular, certain adolescents have a high level of understanding of the dangers of staying up late, so they can meet their daily needs for a healthy diet and avoid consuming high-fat foods (Khoirunisa & Wirjatmadi, 2023; Rieny et al., 202 C.E.; Retnaningsih et al., 2020)

Meanwhile, the results of the study in Table 2 show that adolescents who are addicted to *online games* have low hemoglobin levels with anemia levels, namely mild anemia as many as 9 respondents with a presentation of 37.5% and moderate anemia as many as 8 respondents with a presentation of 33.3%. Several factors can affect hemoglobin levels, such as physical activity during the day, poor sleep quality, the type of vitamins, and a person's ability to concentrate. (Prabowo et al., 2022; Hafizah & Yuliawati, 2023; Atik et al., 2022). Adolescents who are addicted to online games have lower hemoglobin levels because they often stay up late at night to play, which can inhibit the process of red blood cell formation. Age and gender also affect hemoglobin levels. A person's hemoglobin levels can be affected by age, as hemoglobin levels will decrease with age. Sex can also affect hemoglobin levels, with males typically having

higher hemoglobin levels than females (Wisma Wati, 2013; Welkriana et al., 2022; Yuvita et al., 2024).

Sleep is one of the essential needs for humans that must be met. Adequate sleep is beneficial for health, whereas insufficient sleep can negatively impact the body. Teenagers experiencing anemia may be due to poor sleep habits, which disrupt hormone balance and the breakdown of red blood cells, leading to an imbalanced metabolism (Zahrani, 2022; Ravyts & Joseph, 2024).

Age and gender also affect hemoglobin levels. A person's hemoglobin level can be influenced by age, as it tends to decrease with aging. Gender also impacts hemoglobin levels, with males typically having higher hemoglobin levels compared to females (Fadilah & Adriani, 2023; Wijaya et al., 2024). Physical activity greatly affects hemoglobin levels in the blood, and people who exercise often have higher hemoglobin levels because their tissues need more oxygen during exercise (Kurniasih et al., 2021).

This statement is also in line with research conducted by Gurusinga, (2019) stating that adolescents who are addicted to online games are more than adolescents who are not addicted to online games with the results of addiction as many as 49 people (71.0%) and 20 people who are not addicted (29.0%). The results of the examination of urine sediment crystals in adolescents showed that of the 24 samples were negative, which means that no crystals were found in the urine sedimentation of adolescents who were addicted to online games or were not addicted. The absence of crystals in the sedimentation of the urine indicates that there is no stone formation in the urinary tract.

The presence of crystals in the urine can indicate the presence of an infection that can cause urinary stones. Stones in the urinary tract can appear along with urine crystals (Gita Isnaini, 2024; Orno et al., 2024). Consume foods that contain less than eight grams of calcium, phosphorus, grains, and protein per day. Having a slight increase in acidic pH puts you at a higher risk of developing calcium formation through the urine (Anggraeny et al., 2021a; Silalahi, 2020).

Based on the results of the questionnaire that has been filled out by the respondents, teenagers who are addicted to online games have the awareness to consume enough water with at least 8 glasses per day (Anggraeny et al., 2021b). This shows that adolescents have good fluids so as to minimize the biggest risk in the stone formation process due to a decrease in the amount of urine volume. Teenagers also consume nutritious food and do not have the habit of holding back urination.

Conclusion

From the results of the study The Influence of Old Online Game Addiction on Hemoglobin Levels in Adolescents There is an effect on hemoglobin levels in adolescents who are addicted to online games and crystal negative in urine sediments.

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Conflicts of Interest

The author declares no conflict of interest

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