

THE ONLINE GAMING BEHAVIOUR OF UNIVERSITY STUDENTS UNDERGOING SELF-QUARANTINE

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ABSTRACT

Self-quarantining is one of the coping mechanisms used during the pandemic. However, it can negatively affect the sufferer. Self-quarantine causes many students to play online games excessively. Understanding students' online game behavior during self-quarantine can help to prevent online game addiction and encourage positive self-quarantine activities. This study aims to investigate the online gaming experience during self-quarantine for university students who tested positive for COVID-19 during the pandemic. Phenomenological qualitative research was used. The study's sample consists of ten university students from Yogyakarta who tested positive for COVID-19 and played online games during self-quarantine. Purposeful sampling was utilized, and data were collected through semi-structured in-depth interviews. The Colaizzi method was then used to analyze the data. The results indicated four themes: (1) the changes in online gaming behaviors before and after being tested positive for COVID-19; (2) the influencing factors on online gaming behavior before and during self-quarantine, (3) the impacts of parenting styles on online gaming behaviors, and (4) the impacts/consequences of online gaming behaviors. Overall, during self-quarantine, the students changed their behavior during online gaming, which was influenced by internal and external factors. They also became aware of the consequences of excessive online gaming.

Keywords: *COVID-19; online gaming behavior; self-quarantine; university students*



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INTRODUCTION

The coronavirus caused the COVID-19 pandemic, which impacted a vast geographical area. This disease affected many people and became a global health concern (Hastuti & Djanah, 2020). COVID-19 had a rapid transmission rate; as a result, Indonesia implemented self-quarantine for COVID-19 patients.

Self-quarantine was a measure taken to stop the spread of COVID-19. Self-quarantine typically requires the patient to stay home or at a designated location while monitoring their condition and maintaining a distance from others (Putri & Rahmah, 2020). Self-quarantine is often performed for 14 days, during which the patient is banned from interacting with

others in person. Therefore, the patients used existing technological developments to study, work, and engage with others.

Online games are one of the internet's breakthroughs in the entertainment industry. Many individuals enjoy online gaming via the internet; consequently, it is no longer taboo for many people to play online games (Lutfiwati, 2018). However, due to the prevalence of online games, individuals can develop a dependency on them (Gewab et al., 2020). A study on online game visitors revealed that 10.15% of Indonesian teenagers were addicted to online games (Jap et al., 2013). Many kids who play video games do so to alleviate stress or pass the

time. However, online gaming without understanding when to rest or engage in other things might negatively affect gamers.

Online gaming addiction has detrimental psychological and emotional repercussions (Siregar, 2017). These issues are created when individuals use online games as an emotional coping mechanism and do not solve their problems (Gewab et al., 2020). Some teens also believe they can make many friends through media chat in-room games during online gaming (Piyeké et al., 2014).

Preliminary research on university students regarding their online gaming experience while undergoing self-quarantine revealed that several phenomena were strained due to having COVID-19 and being required to self-quarantine. University students infected with COVID-19 were restricted from leaving their homes, causing them to perform a majority of their activities at home. As a result, they preferred to spend their time relaxing and online gaming. Thus, it is crucial to understand university students' online gaming behavior during self-quarantine so that preventative steps can be taken to prevent online game addiction and positive self-quarantine activities can be designed. This study aims to investigate the online gaming behavior of COVID-19-positive university students during self-quarantine.

METHOD

Study design

A qualitative phenomenological method was used to investigate the university students' online gaming behavior during self-quarantine. The research was conducted in the special region of Yogyakarta between November 2021 and March 2022.

Participants

The participants who met the inclusion criteria were selected for this study, i.e., active university students in Yogyakarta who were undertaking self-quarantine, tested positive for COVID-19, and play online games for more than three hours each day. In-depth interviews guided by semi-structured interview rules were utilized for data collection. Data saturation was reached by the tenth respondent.

Data collection

In-depth interviews guided by semi-structured interview rules were utilized for data collection. The participants were interviewed individually for around 45-60 minutes. The researchers conducted the interviews themselves. The participants' responses were then transcribed verbatim to provide written data.

Data analysis

Data analysis was performed with the Colaizi method. We carefully reviewed the transcripts and extracted the most applicable statements for our data analysis. We obtained the meaning of statements from their significance. Next, we compiled the theme based on the identified meanings. Finally, after we organized the topics into a comprehensive narration, we returned to the respondents to validate our findings.

Trustworthiness

This study employed extension of observations, member checks, triangulation, and bracketing to conduct validity tests. Before collecting data, the researcher employed bracketing and separating the researcher's hypotheses from the respondents' responses/existing phenomena. The researchers also did a member check by having the respondents reexamine the interpretation notes. Investigator triangulation was employed in this investigation, in which two researchers created the coding and analytical judgments.

Ethical consideration

This research passed the ethics examination and was awarded certificate number 017/EC-KEPK FKIK UMY//2022 from the Health Research Ethics Commission of the Faculty of Medicine and Health Science of Universitas Muhammadiyah Yogyakarta.

RESULTS

Four themes were identified from the qualitative data analysis of in-depth interviews with 10 participants, as seen in Table 1.

Table 1. Matrix of themes

Theme	Sub-theme	Category
The changes in online gaming behaviors before and after being tested positive for COVID-19	Change in time spent online gaming	Online gaming time before self-quarantine Online gaming time during self-quarantine
	Perceptions of online gaming	Feeling lucky when online gaming with friends
	Changes in feelings toward online games	Emotions exhibited during online gaming before self-quarantine Emotions exhibited during online gaming during self-quarantine
	The changes in students' habits due to online gaming	Changes in physical habits Changes in spiritual habits Changes in study habits
Influencing factors on online gaming behavior prior to and during self-quarantine	Reasons to play internet games before self-quarantine	Friends and places to play online games The availability of facilities for online gaming
	Factors influencing the increased use of online games during self-quarantine	The places to play online games The availability of facilities for online gaming The huge amount of free time they had during self-quarantine How they spent it on online gaming

Theme	Sub-theme	Category
	Factors that contributed to the decreasing amount of online gaming time during self-quarantine	The physical and environmental conditions
The impacts of parenting styles on online gaming behaviors	Parents' indifference to the dangers of online gaming	Parents gave them the freedom to play online games
	Parents' concerns about the dangers of online gaming	Parents became angry when they played online games for a long period of time
The impacts/consequences of online gaming behaviors	Maladaptive responses during online gaming	Parents became angry when they played online games for a long period of time
	Students' indifference to the dangers of online gaming.	Responses when scolded by parents
	Perceptions of online games	Thought that online gaming excessively can cause addiction

Theme 1. The changes in online gaming behaviors before and after being tested positive for COVID-19

Theme 1 is subdivided into several subthemes based on the participant's responses: 1) the change in time spent online gaming; 2) the perceptions of online gaming; and 3) the changes in feelings toward online games; 4) and the changes in student behavior as a result of online gaming.

**1) Change in the time spent online gaming
Online gaming time before self-quarantine**

The interviews showed that the online gaming time of each participant was different. The participants revealed their shortest online gaming time and the longest online gaming times before self-quarantine and preferred parts of the day to play online games.

The following are the participants' statements about their shortest amount of online gaming time before self-quarantine:

- "It was about 6-7 hours, but mostly at least 6 hours, when I get bored." p1
- "The shortest time to play is, well, about 1-2 hours. Usually, I would play 2 matches in 1 hour but it could also be only 1 match. So, it's based on when the game is finished." p2
- "I would usually play for about 4 hours, but sometimes I get to play with kids, and it is so boring." p4
- "When I get bored and have a lot of assignments, I would spend about 4 hours. I play 2 matches that would take about an hour and then continue to play at night before I go to sleep." p6

The following are the participants' statements regarding their longest online gaming time:

- "Approximately 4 hours, based on how long the matches are, but it can be more when the time is right." p2
- "About 5 hours in a day, from the afternoon until night." p5
- "9 hours, depending on how long the matches are. When I get good teammates, the match can be done in a short time." p8
- "I play about 3-4 hours since usually I would play with my friends so it could take a long time." p9

The following are the participants' statements about their preferred parts of the day to play online games:

- "I usually play at night since my friends and I agree to play at that time." p9

- "I often play in the afternoon and at night. I often play alone in the evening but at night I would usually play with my friends." p10
- "I play in my spare time at night since I have a lot of time at night and sometimes it is hard to sleep right away too, so I would use that time to play a game p4
- "Mostly in the evening with my friends, depends on whether I have spare time." p6

Online gaming time during self-quarantine

The interviews showed that the online gaming time of each participant was different. The following are the participants' statements regarding their longest online gaming time during self-quarantine:

- "About 11 hours. Online gaming is fun so sometimes I didn't realize that it was morning already and I haven't slept." p9
- "I think it was only 1-2 hours during quarantine because I mostly felt sleepy, tired, and dizzy." p8
- "About 10 hours, since I had nothing to do except gaming and it is preferable than always sleeping which made me dizzy." p4
- "I guess it was around 6 hours, not much different from the previous time, but I could play more since I've got nothing to do." p2

The following are the participants' statements with the shortest online gaming time during self-quarantine:

- "I think it was only 1-2 hours." p8

2) Perceptions of online gaming

The following are the participants' statements when they felt lucky when online gaming with their friends:

- "I mostly play with my friends because if I play by myself, I often lose." p2
- "Honestly, playing with others often makes you win." p7
- "I play with others often because the win rate is higher." p10

3) Changes in feelings toward online games

The participants experienced changes in their sensations when online gaming during the COVID-19 pandemic. These changes were affected by the emotions they exhibited during online gaming before and during self-quarantine.

Emotions exhibited during online gaming before self-quarantine

The following are the participants' statements about feeling happy when online gaming:

"I play games only for fun when I feel a lot of pressure from assignments. Playing game makes me feel refreshed." p1
"It's fun to play games since I get to rank up in online games." p5
"It's so fun because there are a lot of challenges there." p10

The following are the participants' statements about feeling irritated when they lose:

"Usually, I feel so irritated and angry." p2
"I feel so irritated and uninterested to play again, so I often play with friends to win." p5
"Yes, it is so irritating. If I get a lose streak, I could get angry, haha." p7

The following are the participants' statements about feeling happy when winning online games:

"I usually feel so happy when winning and keep on playing, especially when playing with friends." p3
"It's quite common for me to get victories, hehe. I feel happy when I win." p8
"Yes, it made me happy and just keep on playing till I got lost in time." p4

Emotions exhibited while online gaming during self-quarantine

The following are the participants' statements about feeling unmotivated to play online games:

"I wasn't interested in playing games since I was not fit and I had no energy. I just wanted to rest." p1
"I felt dizzy and unmotivated. I was too lazy to do other things, let alone play games." p8

The following are the participants' statements about feeling happy when online gaming during self-quarantine:

"I felt happy because I have so much time to play games." p2
"I felt happy because I could play games all the time and nothing interfered with my playing time." p4

4) The changes in students' behavior due to online gaming

The results showed changes to the students' habits due to online gaming, which can be categorized into the following sub-themes: 1) changes in physical habits, 2) changes in spiritual habits, and 3) changes in study habits.

The following are the participants' statements about experiencing changes in their physical habits:

"My bedtime has changed, but honestly I've stayed up late often, so it's not a problem." p1
"Usually when I play my games, I'm too lazy to do things like taking a shower or eating meals." p2
"I would delay everything, like praying, eating, and sometimes going to bed after 12 at midnight." p5
"It has affected my eating habit. Sometimes I go to bed late because time flies when you're online gaming." p7

The following are the participants' statements about experiencing changes in their spiritual habits:

"Sometimes I miss prayers, sometimes I delay them." p3
"I delay my meals and prayers sometimes." p6
"I began to frequently delay prayers and rarely recite the Qur'an." p7

The following are the participants' statements of experience regarding changes in their study habits:

"I sleep after midnight and skip classes; sometimes I miss assignments too." p1
"I guess it takes a little longer to finish an assignment and sometimes I only start working on an assignment when the deadline is almost due." p6

Theme 2: Influencing factors on online gaming behavior before and during self-quarantine

The availability of facilities during self-quarantine was affected by several things, which can be categorized into the following sub-themes: 1) reasons to play internet games before self-quarantine, 2) factors influencing the increased frequency of online gaming during self-quarantine, and 3) factors influencing the decrease in an online gaming habit during self-quarantine.

Theme 2 is divided into several subthemes based on the participants' interview answers.

1) Reasons to play internet games before self-quarantine

The following are the participants' statements about the places to play online games:

"I mostly play at my friends' place. We play together there with the others too." p3
"I always play games in my boarding house because the Wi-Fi there is fast, so my friends usually come to my boarding house." p6

The following are the participants' statements about the availability of facilities for online gaming:

"I use Wi-Fi when my cellular signal is bad." p5
"I always use my data package because the Wi-Fi signal is not always stable." p5
"I use Wi-Fi when I'm in my boarding house, but when I'm at my friend's, I use my data package."

2) Factors influencing the increased frequency of online gaming during self-quarantine

The following are the participants' statements about the places to play online games:

"I usually play games at UNIRES." p5
"In my boarding house because I am self-isolating." p8
"I play games at home." p1

The following are the participants' statements about the availability of facilities for online gaming:

"I always use my own data package since I cannot connect to the Wi-Fi at UNIRES. I don't know why the Wi-Fi is not available on the 2nd floor." p5
"I always use Wi-Fi in my boarding house. I have paid for it, so I have to use it, right?" p8
"Sometimes I use my data package, sometimes Wi-Fi. It depends on which signal is better for playing." p2

Furthermore, the interviews revealed that the participants also played online games due to social and environmental factors.

The following are the participants' statements about social and environmental factors:

"All of my friends play it, and they would usually invite me to play along." p4
 "I was scrolling around on social media and found out about the game through an ad." p6

The interviews also showed that various factors caused the increase in the amount of time spent on online gaming during self-quarantine. The following are the participants' statements about the huge amount of free time they had during self-quarantine and how they spent it online gaming:

"Because during quarantine my symptoms were getting improving, I played even more frequently and longer." p2
 "There is nothing to do during quarantine, it is impossible to go outside and just sleeping all day makes me dizzy, so I play games since I got plenty of time." p3
 "I had nothing to do at all and had no other symptoms either. So, yeah, I just kept on playing games." p9

3) Factors that contributed to the decreasing the amount of online gaming time during self-quarantine

The following are the participants' statements about their physical and environmental conditions:

"I didn't have that much energy and had a headache too at that time. No one invited me to play along." p1
 "I still played but not so frequently since I had a bad headache if I watched the phone screen for too long." p5
 "Just watching the phone screen made me dizzy so I rarely used the phone, let alone play an online game." p7

Theme 3: The impacts of parenting styles on online gaming behaviors

The results revealed that different parenting styles affected the students' online gaming behaviors. These styles were categorized into two sub-themes: 1) the parents' indifference to the dangers of online gaming and 2) the parents' concern about the dangers of online gaming.

Theme 3 is divided into several sub-themes based on the participants' interview answers.

1) Parents' indifference to the dangers of online gaming

The following are the participants' statements whose parents gave them the freedom to play online games:

"My parents let me play games since I was in junior high school, but at the time I played PS (PlayStation) until 2 a.m." p1
 "In the beginning, my parents were often angry, but after a while, they got used to it." p4
 "My parents are silent when I play my games." p6
 "They just let me and never get angry." p10

2) Parents' concerns about the dangers of online gaming.

The following are the participants' statements about when their parents became angry when they played online games for a long period of time:

"I get scolded all the time, especially if I forget to do other things." p2

"When I play games at home, my parents will scold me, especially if I play games until late at night." p3

"Yes, I'll be scolded. That's why I don't play games when I'm home on Saturdays and Sundays." p7

Theme 4: The impacts/consequences of online gaming behaviors

The impacts or consequences of online gaming behaviors can be categorized into the following sub-themes: 1) maladaptive responses when online gaming, 2) students' indifference to the dangers of online gaming, and 3) perceptions of online games.

Theme 4 is divided into several sub-themes based on participants' interview answers.

1) Maladaptive responses during online gaming

The following are the participants' statements about their anger when they played online games for a long period of time.

"I would call out people who are troublesome in the game." p3

"Yes, I would get angry for sure, but yeah, I keep on playing." p8

2) Students' indifference to the dangers of online gaming

The following are the participants' statements about their responses when scolded by parents:

"Yeah, sometimes I obey them, sometimes I don't." p5

"Yes, but I just listen." p10

"Yes, I would say yes to them, but I would still keep playing." p7

3) Perceptions of online games

The following are the participants' statements on how they thought that excessive online gaming can cause addiction:

"If we do it too much, we may get addicted, but hopefully it won't happen to me." p5

"I guess I'll get addicted if it's too much." p2

DISCUSSION

Theme 1. The changes in online gaming behaviors before and after being tested positive for COVID-19

According to the data collected, the duration of the students spend online gaming varies between 3 to 9 hours daily. A person will continuously increase their online gaming activities because of the compulsion to continue playing games (Stockdale & Coyne, 2020). Over time, the duration of online gaming will increase within their *tolerance* criteria. This compulsion can cause students to feel more interested in *online games* and increase their playing hours.

The results showed that various factors influence students to play online games. One of which is the environment. A person's behavior is not only formed by their family but is also affected by their environment. If friends in the school environment play online games, it does not rule out the possibility that someone will also not play online games (Irawan & Siska W., 2021). Most students play online games because they are invited by friends or see friends around them online gaming, which triggers the students to start playing them.

Next, a lack of activities is one of the factors that cause a person to keep online gaming while being on their own. This is because they felt that there was no activity they could do, so online gaming became an escape for them (Irawan & Siska W., 2021). During self-quarantine, the lack of activities causes some students to increase their playing hours.

This study showed that several factors affect the decline in online gaming while undergoing self-quarantine. The participant's physical condition affected the decrease in their online gaming intensity. This aligns with a previous study that stated that a decreased physical condition could make a person experience changes in activities that they would regularly do (Nurhadi & Fatahillah, 2020). Some students that had undergone self-quarantine either at home or elsewhere experienced decreased physical condition due to COVID-19. This decline in physical condition decreased their playing hours or even caused them not to play games.

Online gaming has been shown to trigger changes in activity levels. According to Istyanto & Maghfiroh (2021), online gaming encourages players to ignore all other tasks, including learning, eating, sleeping, and engaging with the outside world. This causes students to experience various changes, including modifications to their food intake, sleeping schedule, and physical activity. According to students, their time spent online gaming disrupts their sleep patterns. As a result, many students lacked sleep because they played late at night and early in the morning.

Theme 2. Influencing factors on online gaming behavior before and during self-quarantine.

Moderate burnout is a common occurrence for nursing students (56.4%). This is due to the fact that students have a lot of demands placed on their learning activities and processes, thus they require entertainment that is readily available (Alimah et al., 2018). Research shows that the feeling of pleasure appears when students win in online game matches, and anger and annoyance appear when they lose an online game. The feelings that arise are influenced by dopamine activation and the release of the dopamine hormone, which creates feelings of pleasure and sadness (Lutfiwati, 2018). Dopamine is one of the brain's neurotransmitters that regulates feelings of happiness and mood (Denby et al., 2016). These fluctuations can cause the students' feelings to change in online gaming.

Furthermore, research has shown that pleasure and laziness can be felt when online gaming. Playing games can cause brain changes that regulate attention and control, impulses, motor function of emotion regulation, and motor coordination, which will change with dopamine release and affect the players' emotions and feelings (Weinstein et al., 2017). This causes the student's feelings to go from being happy to being lazy to play online games.

A chat feature in online games allows players to communicate with each other virtually, either with people they already know or people they do not know. The chat feature allows players to set the strategy in the game (Trianto, 2018). This affects students who prefer to play realistically because they can communicate with their team.

This research also discussed the availability of amenities and infrastructure that assist students in online gaming, including internet connection and locations for online gaming. According to Kurniawan (2019), online gaming requires an internet connection to function and connect players.

Therefore, a reliable internet connection is required to access online games. This may encourage kids who play online games to seek out an internet connection so they may play at any time.

Theme 3. The impacts of parenting styles on online gaming behaviors

This study indicates that parenting affects a person's behavior, including parental apathy toward the dangers of online gaming. Parents' lack of control exacerbates the effects of internet gaming addiction (Irawan & Siska W., 2021). As a result of feeling emancipated from their parents, students frequently engage in excessive online gaming behavior.

However, some parents are also concerned about the risks associated with online gaming. Parental supervision or monitoring is required when a child plays online games (Permana & Tobing, 2019). Doing so would demonstrate to students from a young age that their online gaming behavior may be governed by responsible parenting.

Theme 4. The impacts/consequences of online gaming behaviors

The interaction of online game players, particularly those who play violent genres, influences the intensity of adolescent violent behavior (Fahrizal & Pratama, 2021). This encourages students to frequently mimic their teammates' or friends' language during online gaming. Additionally, students participate in disputes with co-stars through chat and voice note tools.

Numerous risks are associated with excessive internet gaming (Elsayed, 2021). Today, online games are frequently played excessively and exploited as an escape from reality; hence, online gaming addiction is prevalent (Novrialdy, 2019). Many students believe that online gaming excessively may lead to addiction, but this does not stop students from playing.

Some students in this study exhibited indicators of online gaming addiction, such as anxiety or other sentiments when not online gaming and the constant desire to play online games.

Nevertheless, this research is still limited by the research location as it was conducted in a single area. Future research should include multiple locations with various participant characteristics.

CONCLUSION AND RECOMMENDATION

Self-quarantine for students positive for COVID-19 has altered their online gaming behavior. This change is due to the presence of internal and external factors that are both supportive and inhibiting. Students are also aware of the effects of excessive online gaming.

The university, parents, and students must all take preventative measures against online game addiction. Feasible measures include implementing health education to prevent addiction among students, limiting access to online games via the campus internet network, and encouraging self-quarantining patients to engage in physical activities.

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REFERENCES

- Alimah, S., Girindra Swasti, K., & Ekowati, W. (2018). Gambaran Burnout pada Mahasiswa Keperawatan di Purwokerto. *Jurnal Keperawatan Soedirman*, 11(2), 130–141. <http://jks.fikes.unsoed.ac.id/index.php/jks/article/view/709>
- Denby, K., Duffy, N., & Tausk, F. (2016). Psychoneuroimmunology in dermatology. *Integrative Dermatology*, 93–109. <https://doi.org/10.1093/med/9780199907922.003.0006>
- Elsayed, W. (2021). Covid-19 pandemic and its impact on increasing the risks of children's addiction to electronic games from a social work perspective. *Heliyon*, 7(12), e08503. <https://doi.org/10.1016/j.heliyon.2021.e08503>
- Fahrizal, Y., & Pratama, B. Y. (2021). Intensity of violent behavior in adolescents addicted to violent online games in Yogyakarta Indonesia. *Dunia Keperawatan: Jurnal Keperawatan Dan Kesehatan*, 9(1), 64. <https://doi.org/10.20527/dk.v9i1.9448>
- Gewab, B. T. P. A., Risanti, E. D., Herawati, E., & Mahmudah, N. (2020). Relationship between online game addiction and smoking with stress in adolescents. *Biomedika*, 12(2), 117–123. <https://doi.org/10.23917/biomedika.v12i2.10737>
- Hastuti, N., & Djanah, S. N. (2020). Studi tinjauan pustaka: Penularan dan pencegahan penyebaran Covid-19 (Literature review study: Transmission and prevention of the spread of Covid-19). *Jurnal Kesehatan Masyarakat*, 7(2), 70–79. <http://dx.doi.org/10.31602/ann.v7i2.2984>
- Irawan, S., & Siska W., Di. (2021). Faktor-faktor yang mempengaruhi kecanduan game online peserta didik (Factors affecting students' online game addiction). *Jurnal Konseling Gusjigang*, 7(1), 9–19. <https://doi.org/10.24176/jkg.v7i1>
- Istyanto, F., & Maghfiroh, A. (2021). Peran mikronutrisi sebagai upaya dalam pencegahan Covid-19 (The role of micronutrients as an effort to prevent Covid-19). *Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal*, 11(1), 99–110. <https://doi.org/10.32583/pskm.v11i1.1065>
- Jap, T., Tiatri, S., Jaya, E. S., & Suteja, M. S. (2013). The development of Indonesian online game addiction questionnaire. *PLoS ONE*, 8(4), 4–8. <https://doi.org/10.1371/journal.pone.0061098>
- Kurniawan, E. (2019). Pengaruh kecanduan game online terhadap pelaksanaan ibadah sholat di SMAK Negeri 1 Kecamatan Siak (The effect of addiction to online gaming on the implementation of prayer services in State 1 Siak Smak District, Sia Regency).
- Lutfiwati, S. (2018). Understanding online game addiction through a neurobiological approach. *Journal of Psychology: Anfusina*, 1(1), 1–16. <https://doi.org//dx.doi.org/10.24042/ajp.v1i1.3643>
- Novrialdy, E. (2019). Kecanduan game online pada remaja: dampak dan pencegahannya (Online game addiction in teenagers: impact and prevention). *Buletin Psikologi*, 27(2). <https://doi.org/10.22146/buletinpsikologi.47402>
- Nurhadi, J. Z. L., & Fatahillah. (2020). Pengaruh pandemi covid-19 terhadap tingkat aktivitas fisik pada masyarakat Komplek Pratama, Kelurahan Medan Tembung (The effect of THE Covid-19 pandemic on physical activity levels in the Pratama Complex Community, Medan Tembung Village). *Jurnal Health Sains*, 1(5), 294–299.
- Permana, I. M. D., & Tobing, D. H. (2019). Peran intensitas bermain game online dan pola asuh permisif orangtua terhadap tingkat agresivitas pada remaja awal di Kota Denpasar (The role of the intensity of online gaming and parenting permissive parents on the level of aggressiveness in early adolescents in Denpasar City). *Jurnal Psikologi Udayana*, 6(01), 139. <https://doi.org/10.24843/JPU.2019.v06.i01.p14>
- Piyeke, P., Bidjuni, H., & Wowiling, F. (2014). Hubungan tingkat stres dengan durasi waktu bermain game online pada remaja di Manado (The relationship between stress levels and duration of online gaming for teenagers in Manado). *Jurnal Keperawatan UNSRAT*, 2(2), 105771.
- Putri, N. W., & Rahmah, S. P. (2020). Edukasi kesehatan untuk isolasi mandiri dalam upaya penanganan COVID-19 di Kanagarian Koto Baru, Kabupaten Solok (Health education for independent isolation in efforts to handle covid-19 in Kanagarian Koto Baru, Solok Regency). *Abdidas*, 1(6), 547–553. <https://doi.org/10.31004/abdidas.v1i6.124>
- Siregar, E. (2017). *Bahaya candu gim online (The Dangers of Online Game Addiction)*. <https://www.liputan6.com/news/read/3201814/bahaya-candu-gim-online>
- Stockdale, L., & Coyne, S. M. (2020). Parenting paused: Pathological video game use and parenting outcomes. *Addictive Behaviors Reports*, 11(December 2019), 100244. <https://doi.org/10.1016/j.abrep.2019.100244>
- Trianto, Y. (2018). Virtual communication patterns in team conversations online game counter strike: Global offensive game strategy. *Jurnal Spektrum Komunikasi*, 6(1), 41–55. <https://doi.org/10.37826/spektrum.v6i1.50>
- Weinstein, A., Livny, A., & Weizman, A. (2017). New developments in brain research of internet and gaming disorder. *Neuroscience and Behavioral Reviews*, 75, 312–330. <https://doi.org/https://doi.org/10.1016/j.neubiorev.2017.01.040>