International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

The Impact of Playing Video Games on Cognitive Skills and Sleeping Duration Among High School Students

Dr. S. D. Fathima Banu[1], Mr. Dhanvarshan[2]

[1]M.Sc., PGDCA., M.Phil., Ph.D, Guest Lecturer, Department of Psychology. Government Arts College Trichy -22.
[2]III Yr, B.Sc. Psychology, Department of Psychology. Government Arts College Trichy -22.

Abstract:
This research examines the impact of playing video games on cognitive skills and sleep duration among high school students. This study involved 50 high school students both males and females are in equal proportion, from one government and one private school, using the Cognitive assessment questionnaire, originally called the cognitive failures questionnaire (CFQ) was developed by broadbent et al. (1982) to assess the frequency with which people experienced cognitive failures, such as absent-mindedness, in everyday life - slips and errors of perception, memory, and motor functioning. The findings indicate that there is no correlation between video game spending time and cognitive skills ($r = 0.726$, $p > 0.05$), suggesting that playing video games could not be affected by playing video games. No significant differences were found between sleeping hours and three dimensions. Additionally, there is significant relationship found between video game spending time and dimensions of forgetfulness and false triggering, nor the distractibility. These results implies that while video games play a notable role in cognitive skills, sleep duration does not affect by playing video games in this context. The study calls for future research to explore other potential influences on playing video games.

Keywords: Video games, cognitive skills, sleep duration

INTRODUCTION

Video games have become a entertaining part of our daily life. The gaming industry has developing in the field of technology. Video games has the most influential factors among children. Video games have continuously evolving many years. Most of the high school students are play video games frequently. Our cognitive abilities are highly impacted by playing video games.

Around the world, many scientists have researched about video games, how affects the human brain. When we play video games, then occurs stimulate the various part of the brain region. Neuroscientists have determined not only can influence our brain and behaviour, but also the brain structure and sleeping pattern changes.

Some Video games have stimulate creativity, visualization and imagination. Puzzle games can improve various skills such as problem solving, critical thinking, decision making, attention, perception and overall cognitive development. Educational video games can help to improve the learning, communication, negotiation, cooperation, social skills and motivation among the high school students. For educational

purposes, many topics are covered under educational video games such as history, geography, music, art, language and science.

Video games are linked to sleeping pattern and sleeping duration. Some research suggests, when we playing too much time spend in video games can highly affected the poor sleep quality, insomnia, delayed sleep schedule and overall changes sleeping patterns. When we playing video games during night time, the devices emitting blue light exposure. Blue light exposure can suppress melatonin and disrupting our sleep cycles.

HOW VIDEO GAMING IMPACTS SLEEP

Studies have found that video games are linked to later bedtimes, more difficulty falling asleep, and fewer hours of sleep. Players may also find it more challenging to wake up on time and are at an increased risk of feeling tired the following day. While a variety of studies have reinforced the link between video games and sleep problems, researchers are still exploring the potential

reasons for this connection. Experts have suggested a variety of factors that could help to explain the negative effects of video games on sleep.

PHYSICAL AND MENTAL STIMULATION

The excitement of playing a video game can stimulate the body's stress response, which triggers the release of hormones that increase a person's vitals and promote alertness. Experts have also theorized that socializing with other players within a video game may stimulate the brain and lead to sleep issues. Gamers may also experience a fear of missing out (FOMO) when playing games with others online. FOMO is an experience in which a person may lose sleep because they feel like they're missing out on important social interaction.

DELAYED SLEEP SCHEDULES

Research suggests that playing video games may lead players' to delay their bedtime or neglect healthy sleep habits, like getting enough physical activity during the day. Bedtime procrastination describes when a person sacrifices sleep for activities that they find enjoyable.

LIGHT EXPOSURE

Looking into the screen of an electronic device like a TV, computer, or handheld video game console exposes players to artificial light that can trick the brain into thinking that it's daytime. In fact, the body's internal clock is the most sensitive to light from around two hours before bedtime until one hour after waking. Screens on electronic devices emit blue light, which is the colour of light that has the most significant impact on a person's sleep patterns.

POOR SLEEP QUALITY

If you do stay up past bedtime to play video games, you may find it hard to fall asleep when you finally climb into bed. Some research even suggests that video games played prior to bedtime are significantly associated with shorter sleep duration and a greater likelihood of reduced sleep quality, daytime sleepiness, and general sleep problems.

INSOMNIA

All of the side effects of late-night gaming, from the delayed sleep schedule to the blue light exposure, can set you up for serious sleep issues. They may lead to difficulty falling asleep, reduced sleep quality, and alterations in sleep patterns, which can contribute to insomnia.

NEED FOR THE STUDY

In this modern age, video games are controversial issue. Students are prefer video games more than sports and indoor games. This research is crucial for several reasons. Because, Many high school students are not aware about how video games affect cognitive behaviour and sleeping quality. Moreover, High school students are more playing video games compared to other age category students.

Generally, students will understand the video games how impact our cognitive ability both positive and negative sides. This study assess how distracted in cognitive performance, how false triggering in cognitive ability, and how forgetfulness in cognition among higher secondary school students. This study assess the students how many hours playing video games every day. UNDERSTANDING COGNITIVE IMPACT

Some studies suggest video games can enhance cognitive abilities like problem solving, decision-making, attention, and spatial reasoning. Investigating which game genres and playing styles contribute to these benefits can inform educational strategies.

Concerns exist about potential negative impacts, such as decreased academic performance, addiction, lack of interested in doing sports activities and impaired social skills. Understanding the complex relationship between video game playing and cognition is essential to provide balanced guidance for parents, educators, and policymakers.

IMPACT ON SLEEP PATTERNS

Excessive screen time, including video games, has been linked to sleep disturbances, affecting sleep quality and duration. Research can help establish guidelines for healthy gaming habits. In many research suggests , students should play video games less than 1 hour. In this study, assess the sleeping duration (how many hours sleep everyday) among high school students.

REVIEW OF LITERATURE

Betul Orhan kilic and Dilek konuksever (2023) conducted a study on The Relationship between Playing Video Games and Sleeping Habits in Primary School Children by using online questionnaire that assessed sociodemographic information, video game playing characteristics, and the Children's Sleep Habits Questionnaire (CSHQ). A total of 141 children participated in the study. The mean age of the participants was 9.0±1.1 years. Among the children, 75.9% (n=107) reported playing video games, with 21.4% (n=23) playing for more than 3 hours.

Significant differences were observed in the sleep habits of children based on their video game playing status ($p<0.001$).

Fatimah Alsaad et al., (2022) conducted a study on Impact of Action Video Gaming Behaviour on Attention, Anxiety, and Sleep Among University Students by using demographic data, gaming behaviour, 8-item Epworth Sleepiness Scale, and 7-item Generalized Anxiety Disorders Scale. A total of 97 right-handed healthy participants were recruited. The mean age of the participants was 21 years. There was a significant difference in attention between expert and non-expert video gamers when exposed to stimuli, expert gamers displayed significantly shorter reaction times than the non-expert gamers ($p < 0.05$).

METHODOLOGY

This Chapter deals with the operational definition, research design, statement of the problem, formulation of hypotheses and a description of method, which include sample characteristics selection of tool and procedure adopted for investigation.

STATEMENT OF THE PROBLEM

The aim of the study is how video games particularly influences school students from the age category is 15-18 years and how this impact student's cognitive skills and sleep duration, both males and females. This study is how cognitive functions are affect by both positively and negatively. The students are how they are impacted by false triggering, distractibility and forgetfulness.

OBJECTIVES

To assess the cognitive skills among high school students. To measure the sleep duration among high school students.

To Identify the time of playing video games (day or night, both). To measure the spending time on video games every day.

OPERATIONAL DEFINITION

VIDEO GAMES

According to Esposito (2005) "a video game is a game which we play thanks to an audiovisual apparatus and which can be based on a story".

COGNITIVE SKILLS

According to Neisser (1967) "Cognitive skills are the processes by which sensory input is transformed, reduced, encoded, stored, recovered, and used".

TOOL USED IN THE STUDY

The cognitive assessment questionnaire, originally called the cognitive failures questionnaire (CFQ) was developed by Broadbent et al. (1982) to assess the frequency with which people experienced cognitive failures, such as absent-mindedness, in everyday life - slips and errors of perception, memory, and motor functioning. The most straightforward way to score the scale is simply to add up the ratings of the 25 individual items, yielding a score from 0-100. In this scale, the score will obtain 0 – 50 then the interpretation as low. When the score will obtain 51 – 100, then the interpretation as high. The test-retest reliability of the summated Cognitive Failures Questionnaire(CFQ) score was found to be 0.71 and validity is 0.32. This is 5 points likert scale, 0–Never 1–very rarely 2–Occasionally 3–Quite often 4–Very often

In this 3 dimensions, the scoring will obtain 0–16 then the interpretation as low. When the score will obtain 17 – 32, then the interpretation as high.

Forgetfulness (Items 1, 2, 5, 7, 17, 20, 22, and 23) "a tendency to let go from one's mind something known or planned, for example, names, intentions, appointments, and words".

Distractibility (Items 8, 9, 10, 11, 14, 19, 21, and 25) "mainly in social situations or interactions with other people such as being absentminded or easily disturbed in one's focused attention".

False Triggering (Items 2, 3, 5, 6, 12, 18, 23, and 24) "interrupted processing of sequences of cognitive and motor actions".

HYPOTHESES

1. There is significant relationship between video games spending time and cognitive skills among high school students.
2. There is significant relationship between sleeping hours and forgetfulness among high school students.
3. There is significant relationship between sleeping hours and distractibility among high school students.
4. There is significant relationship between sleeping hours and false triggering among high school students.
5. There is significant relationship between video games spending time and forgetfulness among high school students.
6. There is significant relationship between video games spending time and distractibility among high school students.
7. There is significant relationship between video games spending time and false triggering among high school students.

RESEARCH DESIGN

Descriptive research design was used in the study. Descriptive research aims to accurately and systematically describe a population, situation or phenomenon.

SAMPLING TECHNIQUES USED IN THE STUDY

Stratified random sampling technique implemented in this study. The sample was divided into strata based on educational level (High school students from age category is 15-18 years) and location (rural and urban areas).

SAMPLE DESCRIPTION

The sample for this study is randomly collected from high school students is N = 50. The number of students are not playing video games everyday is N = 16. The sample is collected from two schools in Kumbakonam city. It was conducted in one government school and one private school. Both these schools based on the criteria XI and XII std students both boys and girls were chosen in equal proportion. So, there are criteria in both schools of sample size is
25.

RESULTS

TABLE NO 1: It shows the correlation between the video game spending time and cognitive skills among high school students.

Dimensions	Mean	SD	r-value	Significant(S) / Not Significant (NS)
Video game spending time	2.28	1.19	0.726	**Not significant**
Cognitive skills	4.30	2.83		

It is evident from the above table the obtained mean value of video game spending time is 2.28, in cognitive skills is 4.30. The obtained SD value of video game spending time is 1.19, in cognitive skills is 2.83. This table was calculated r-value (0.726) is much greater than the table value is 0.05. So we rejected the alternative hypotheses (Table no 1), which states that "There will be significant relationship between

Video game spending time and cognitive skills among high school students". So, This result says that there is no significant relationship between Video game spending time and cognitive skills among high school students.

TABLE NO 2: It shows the relationship between the sleeping hours and forgetfulness among high school students.

Dimensions	Mean	SD	r-value	Significant(S) / Not Significant (NS)
Sleeping hours	2.28	1.19	0.162	**Not significant**
Forgetfulness	12.20	4.92		

It is evident from the above table the obtained mean value of sleeping hours is 2.28, in forgetfulness is 12.20. The obtained SD value of sleeping hours is 1.19, in forgetfulness is 4.92. This table was calculated r-value (0.162) is much greater than the table value is 0.05. So we rejected the alternative hypotheses (Table no 2), which states that "There will be significant relationship between sleeping hours and forgetfulness among high school students". So, This result says that there is no significant relationship between the sleeping hours and forgetfulness among high school students.

TABLE NO 3: It shows the relationship between the sleeping hours and distractibility among high school students.

Dimensions	Mean	SD	r-value	Significant(S) / Not Significant (NS)
Sleeping hours	2.28	1.19	0.210	**Not Significant**
Distractibility	16.22	3.80		

It is evident from the above table the obtained mean value of sleeping hours is 2.28, in distractibility is 16.22. The obtained SD value of sleeping hours is 1.19, in distractibility is
3.80. This table was calculated r-value (0.210) is much greater than the table value is 0.05. So we rejected the alternative hypotheses (Table no 3), which states that "There will be significant relationship between sleeping hours and distractibility among high school students". So, This result says that there is no significant relationship between the sleeping hours and distractibility among high school students.

TABLE NO 4: It shows the relationship between the sleeping hours and false triggering among high school students.

Dimensions	Mean	SD	r-value	Significant(S) / Not Significant (NS)
Sleeping hours	2.28	1.19	-0.090	**Not significant**
False triggering	9.64	3.58		

It is evident from the above table the obtained mean value of sleeping hours is 2.28, in false triggering is

9.64. The obtained SD value of sleeping hours is 1.19, in false triggering is 3.58. This table was calculated r-value (-0.090) is much lesser than the table value is 0.05. So we rejected the alternative hypotheses (Table no 4), which states that "There will be significant relationship between sleeping hours and false triggering among high school students". So, This result says that there is no significant relationship between the sleeping hours and false triggering among high school students.

TABLE NO 5: It shows the relationship between the video game spending time and forgetfulness among high school students.

Dimensions	Mean	SD	r-value	Significant(S) / Not Significant (NS)
Video game spending time	4.30	2.83	0.574	**Significant**
Forgetfulness	12.20	4.92		

****Significant at 0.01**

It is evident from the above table the obtained mean value of video game spending time is 4.30, in forgetfulness is 12.20. The obtained SD value of video game spending time is 2.83, in forgetfulness is 4.92. This table was calculated r-value (0.574**) is much lesser than the table value is 0.05 . So we accepted the alternative hypotheses (Table no 5), which states that "There will not be significant relationship between video game spending time and forgetfulness among high school students". So, This result says that there is significant relationship between video game spending time and forgetfulness among high school students.

TABLE NO 6: It shows the relationship between the video game spending time and distractibility among high school students.

Dimensions	Mean	SD	r-value	Significant / Not Significant
Video game spending time	4.30	2.83	0.129	**Not Significant**
Distractibility	16.22	3.89		

It is evident from the above table the obtained mean value of video game spending time is 4.30, in distractibility is 16.22. The obtained SD value of video game spending time is 2.83, in distractibility is 3.89. This table was calculated r-value (0.129) is much greater than the table value is 0.05. So we rejected the alternative hypotheses (Table no 6), which states that "There will be significant relationship between video game spending time and distractibility among high school students". So, This result says that there is no significant relationship between the video game spending time and distractibility among high school students.

TABLE NO 7: It shows the relationship between the video game spending time and false triggering among high school students.

Dimensions	Mean	SD	r-value	Significant / Not Significant

Video game spending time	4.30	2.83		
False triggering	9.64	3.58	0.442	**Significant**

****Significant at 0.01**

It is evident from the above table the obtained mean value of video game spending time is 4.30, in false triggering is 9.64. The obtained SD value of video game spending time is 2.83, in false triggering is 3.58. This table was calculated r-value (0.442**) is much lesser than the table value is 0.05. So we accepted the alternative hypotheses (Table no 7), which states that "There will not be significant relationship between video game spending time and false triggering among high school students". So, This result says that there is significant relationship between video game spending time and false triggering among high school students.

SUMMARY

The present study was undertaken to the how playing video games impact on cognitive skills and sleep duration among high school students. In this study the high school students (11^{th} and 12^{th} standard students) were assessed as samples from both males and females in two schools that is both one government and private school. The results shows that there is no significance between Video game spending time and cognitive skills and thus the hypotheses is rejected in these variable. Other variables are analysed and indicated as the hypotheses framed were found.

The discussion about "the impact of playing video games on cognitive skills and sleep duration among high school students" is a controversial issue in the modern world. Studies on this topic often providing insights, provide mixed results, with some researchers suggest that video games may have negative effects, while other researchers says that cognitive functions would be better if students will play video games with less time. Overall, we conclude that this findings only could not be end. Future research could further explore the role of video games in young children and adulthood stage, how could be impact their cognitive abilities.

LIMITATIONS

1. The sample is only 50. But, too many samples would bring results vary.
2. Only high school students were taken, but the research would be better if young children were involved in the study.
3. The students are not been observed by the research conductor, while distributing the questionnaire.
4. Many students are respond the same patterns in too much of questions.
5. 16 students do not play video games. Only 34 students are playing video games every day.

IMPLICATIONS

The findings of the present study boys have spending too much time on video games everyday than the girls. So, this study implied that the boys must be aware and cautious of playing video games. Among the school students, the awareness programs of psychological impact of positive and negative side of playing video games must be conducted by teachers. The parents may give to the students for playing video games less than 1 hour is better for improving cognitive functions like attention, memory, decision-making, language, perception, reasoning, planning, judgment, and visuospatial function. The parents should take

responsibility to observe the students while playing video games.

CONCLUSIONS

The study concludes that there is no significant relationship between video game spending time and cognitive skills among high school students, suggesting that playing video games does not directly affect overall cognitive abilities. Similarly, no significant relationship was found between sleeping hours and the three dimensions of memory lapses—forgetfulness, distractibility, and false triggering—indicating that sleep duration is not influenced by video game usage. However, a significant relationship was observed between time spent on video games and the dimensions of forgetfulness and false triggering, while no significant relationship was found with distractibility. Overall, these findings highlight the complexity of video game effects, showing that not all psychological factors are influenced equally and emphasizing the need for further research to better understand the varied impact of video game use among high school students.

REFERENCE

1. Akcay Duygu and Akcay, Bulent Devrim (2020) conducted a study is The effect of computer game playing habits of university students on their sleep states. Perspective psychiatry care, Volume 56(4) pages 820-826.
2. Boot W. R., Kramer A. F., Simons D. J., Fabiani M.,and Gratton G. (2008). The effects of video game playing on attention, memory, and executive control. Acta Psychologica, 129, 387–398.
3. Granic I., Lobel A.,and Engels R. C. M. E. (2014). The benefits of playing video games. American Psychologist, 69, 66–78.
4. Hollis, Sean, (2014), "Cognitive Effects and Academic Consequences Of Video Game Playing". Electronic Theses and Dissertations.1124.
5. Jeffrey A. Miskoff, Moiuz Chaudhri, and Benjamin Miskoff (2019), Does Playing Video Games Before Bedtime Affect Sleep?, Cureus, Volume.11(6).
6. Nash Unsworth, T.S. (2015). Is playing video games related to cognitive abilities? Association for psychological science, volume 26, issue 6.
7. Sushil Chandra, Greeshma Sharma, Amritha Abdul Salam, Devendra Jha, and Alok Prakash Mittal (2016), Playing Action Video Games a Key to Cognitive Enhancement. Procedia Computer Science, Volume 84, Pages 115-122