The Relationship between Video Games Usage and Cognitive Functions among Adolescents in Qassim Region, Kingdom of Saudi Arabia (KSA).

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Abstract

Background: In recent decades, adolescents and children use video games as a source of entertainment most of the time. In some children it may reach level of addiction. Video games usage may be beneficial or harmful for adolescents and children. The influence of video gaming on numerous cognitive processes is being studied more thoroughly. **Objectives:** To determine video games usage, assess cognitive function levels and study the relationship between adolescent video game use and cognitive function levels, Qassim region, KSA. **Subjects and Methods: Research design:** A cross-sectional research design was conducted at intermediate girls′ schools, Qassim region, KSA. **Subjects:** A multistage stratified random sampling of studied adolescents from one academic year. **Setting:** The study was conducted at four intermediate girls′ schools (the Sixth Intermediate girls′ school, the Ninth Intermediate girls′ school, the First Intermediate girls′ school and the Fifth Intermediate girls′ school). **Tools of data collection**: The Socio-demographic sheet, playing electronic games scale and Mindfulness Attention Awareness Scale were completed by 300 students. **Results:** Most of adolescents (75%) liking video games and (41%) practice video games every day. There was a statistically significant negative correlation between cognitive function level and video game usage ($r = -0.701$ and $P = 0.001$*). **Conclusion:** Video gaming was appreciated by the highest percentage of students and there was a statistically significant negative correlation between cognitive function level and video game usage. **Recommendations:** Developing scientific video games to assist teens in developing computer and cognitive talents that are proportional to cognitive functions. Schools should develop social activities for adolescents so they catch social skills and develop their cognitive functions instead of video games.

Keywords: Video Games Usage, Cognitive Functions, Adolescents

Introduction

Recent technological improvements have elevated video gaming to the top leisure activity for youngsters, who are especially vulnerable to addiction. Video games are rapidly becoming the most popular sort of pastime among youngsters worldwide **(Özçetin et al., 2019).** When a person feels driven to engage in a rewarding action, even if the results are adverse to his or her physical, emotional, social, or financial well-being, this is referred to as behavioral addiction **(Lopez-Fernandez et al., (2019)**. mainly, the phenomenon growth of computer games obsession reveals a severe and a possibly a new obstacle for the ordinary solution and protection means, necessitating greater investigation, particularly in the juvenile population **(Wartberg et al., 2020).**

Due to technological advancements, urbanization, and a shortage of playground area, traditional gaming activities are migrating to digital games **(Farchakh et al., 2020).** Regardless of genre, a single player battles against the machine in traditional videogames. However, as the internet has grown in popularity, so has interest in online gaming. online video games are quickly becoming the top kind of played games throughout the world. consequently, daily time spent on video games playing have increased considerably **(Choi et al., 2020).**

The growing popularity of digital media has increased public concern about potential negative implications, such as the possibility of addiction to video games **(André et al., 2020).** Despite the fact that several research has been

undertaken to explore the impact of video games on cognitive functioning and academic success in children, the matter is still highly contested. However, little is understood about the brain mechanisms that underpin such cognitive gains. In almost every case, the conclusions of those investigations on that subject disagree **(Zayeni et al., 2020).** Although some studies show that playing video games has a positive effect on cognitive performance, others show no meaningful difference between players and non-players **(Estevez et al., 2019).**

Regardless of the positive effect of the video games, such as extroversion and enjoyment, clinical and empirical studies proved that extreme use of video games can influence negative impact in a variety of aspects regarding the psychological development and can result in addiction in a small percentage of gamers. Impaired game control, as well as increased precedence over routinely chores and other life tasks, might be symptoms of gaming addiction **(Adelantado-Renau et al., 2019 & Penuelas-Calvo et al., 2020).**

Admitting that video games is a pleasurable action, it may impair certain children's attention abilities. There is a strong bond between inattention and internet/gaming addiction, according to research. Furthermore, numerous other studies have found a remarkable relationship between the stage of inattention in attention deficit hyperactivity disorder (ADHD) and internet/gaming addiction, even after treating the consequences or the symptoms of depression and anxiety, as well as personality traits **(Donati et al., 2021).** Unsurprisingly, developments in video gaming have sparked concerns among parents and educators that excessive time spent by children on video games may result in learning deficiencies and retarding academic performance **(Smirni et al., 2021).**

Significance of the study:

Video games have become a mean to intertain youngsters and teens. Video games have the potential to be both a blessing and a curse. Adolescents can acquire positive traits including self-verification, competitiveness, and cognitive capacity increase. They may also acquire negative behaviors such as inactivity and poor attention and attentiveness. Video games have been connected to the development of adolescent cognitive function levels. We should expand intellectual programs for adolescents to keep them occupied and reduce their reliance on video games.

Aim of the study:

The study was intended to determine the relationship between video games usage and cognitive functions among adolescents, in Qassim region, KSA.

Research questions:

The research questions for which the researchers tried to find out the answers were:

1- What is the prevalence of video games usage among adolescents in Qassim region, KSA?

2- What are cognitive function levels among adolescents in Qassim region, KSA?

3- Is there relationship between adolescent video game use and cognitive function levels in Qassim region, KSA?

Subjects and methods

Research design:

A cross-sectional study design was utilized in this study.

Study setting:

The study that was conducted in intermediate girls′ schools, Qassim region, KSA.; from Buraidah city (the sixth Intermediate girls′ school), Al-Rass city (the ninth Intermediate girls′ school), Al-Bukayriyah city (the first Intermediate girls′ school) and Almozanab city (the fifth Intermediate girls′ school).

Research subjects: A multistage stratified random sampling technique was utilized**;** where schools constituted the strata of the first stage and the school grades the strata of the second stage. One class from each grade (1,2,3) was selected randomly from selected

schools (4 Intermediate girls′ schools selected randomly) at Qassim region, KSA.

Sample size: Number of students at intermediate girls′ schools in Al-Qassim region are 30906 students, prevalence of high cognitive functions among adolescent was 27% **(Mahmoud, et al 2022)** confidence level 95% , and power of test 80%,for a sample of 300 students , calculated by open epi soft- ware. open epi soft ware, version 3.0.3.

Data collection sheet:

The sheet was made based on school visit which was assigned with the school director for a couple of days. the students were indvidualy interviewed. in this interview they answered the self-report questionnaire**,** which is composed of three parts including; Socio-demographic sheet, playing electronic games scale and mindfulness attention awareness scale:

1.Socio-demographic sheet:

This was designed to explore students' demographic data such as age, year of study, parents' employment, family size, income, and so on.

2.Playing electronic games scale was developed by **Yunus and Almharama (2017):**

This approach composed of twenty-two items to assess the level of practicing electronic games. A five-point scale (always, frequently, occasionally, rarely, never) was used to score the responses.

The scoring system:

-Low: Scores ranged from (1) to (2.33).
-Medium: Scores ranged from (2.34) to (3.67).
-High: Scores ranged from (3.68) to (5).

3.Mindfulness Attention Awareness Scale (MAAS) developed by Brown & Ryan (2003):

This scale composed of 15 reversed phrases plus the "Mindful Attention Awareness Scale (MAAS) with Internal Consistency and validity for University Students," a unidimensional scale that is also composed entirely of inverted phrases. The answers are scored on a six-point scale, from "almost always" to "almost never." Higher scores suggest a more considerate mentality.

The scoring system:

Calculate the mean of the 15 items to score the scale.

-Low: Scores falls between (1) to (3).
-Medium: Scores falls between (3.1) to (3.8).
-High: Scores falls between (3.9) to (6).

Reliability

Scale	Cronbach's Alpha
Video usage score	0.942
Cognitive function	0.923

Pilot study: About 10% of the study subjects participated in a pilot study to evaluate the tools' applicability, viability, and practicability. The required adjustments were subsequently made in light of the results of the pilot research.

Procedure:

A multistage stratified cluster sample was used for participants collection. After enlisting girls intermediate school students in Qassim region. Administrative approval was granted by the directorate of education in Qassim, who provided the researcher with a list of schools and the number of students at each level, after that, four cities from Qassim region were selected randomly; from Buraidah city (the sixth Intermediate girls′ school), Al-Rass city (the ninth Intermediate girls′ school), Al-Bukayriyah city (the first Intermediate girls′ school) and Almozanab city (the fifth Intermediate girls′ school). A stratified cluster random sampling was conducted to randomly choose a class from each grade within each school. Finally, 300 randomly selected students from 12 classes participated in the study. An appointment with school directors was arranged; schools were visited on separate days. All the participants were interviewed in their schools., the questionnaire (need 30-35 minutes to be filled), The researcher met students on Monday, Wednesday, from 9 am to 12 pm of each week. The data sheet was completed at the same time of distribution. The implementation

phase was executed in one month starting on September 2023, and was completed by the end of it.

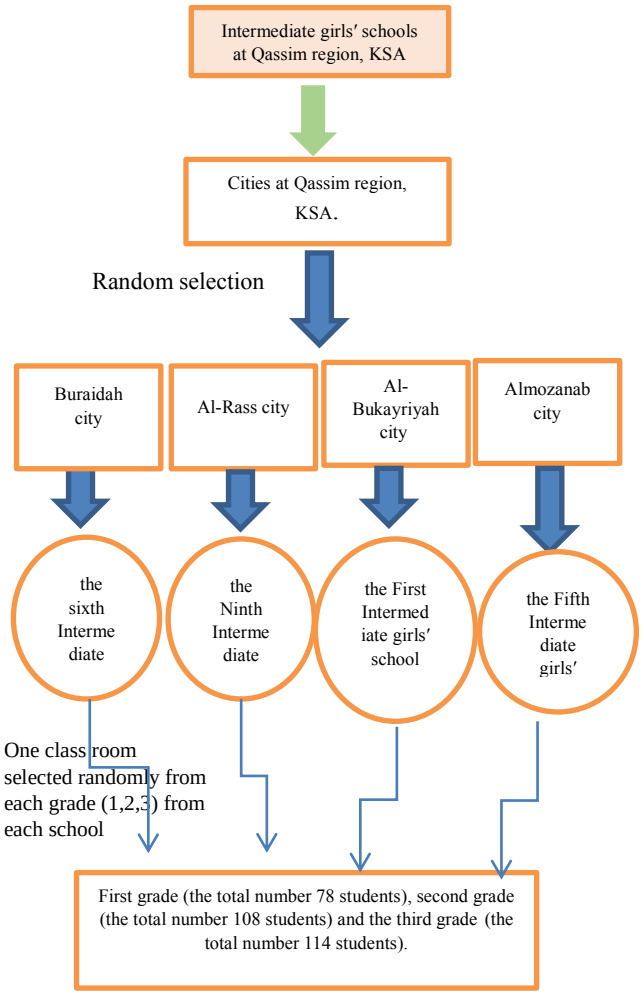

Figure (1): Flowchart representing technique for selecting schools & students

Ethical considerations:

The proposal for this study was submitted to the Research Centre Committee (RCC) (number of ethical acceptance was 23-41-17) of the College of Nursing at Qassim University. After the selected schools' directors' approval, an informed consent was obtained from student′s parents before starting collection of data through schools' WhatsApp groups. the importance of the study was investigated for the participated students and oral agreement was obtained from them. Confidentiality and privacy were secured for the whole participants and their freedom to decline or withdraw at any time.

Statistical Analysis

SPSS 20.0 for Windows was used (SPSS Inc., Chicago, IL, USA). To show quantitative data, the mean, standard deviation, and median (range) were employed, whilst absolute frequencies (number) and relative frequencies (%) were utilized to convey qualitative data. The t-test was used to compare two sets of normally distributed data, whereas the ANOVA test was used to compare quantitative data that was normally distributed over more than two groups. The Spearman's rank correlation coefficient was used to examine the relationship between the various research variables. In addition, step-wise multiple linear regression was utilized to evaluate the factors that impact GPA. To test the internal reliability and consistency of the scales, the Cronbach alpha coefficient was determined. Statistical significance is defined as a p-value of 0.05.

Results:

Table (1) shows that there were (48%) aged 11 to 13, and (52%), with a mean age of 13.53 years. There were (26%) first grade students, second grade students (36%), and third grade students (38%). The majority of their fathers (90%) and nearly half of their mothers (43%), worked. Approximately (96%) of families had enough money. The majority of families (82%) had four to seven members. In terms of birth order, more than two fifth of students (33%) were born first, 24% second, and 43% third or higher.

Table (2) shows that video gaming was appreciated by (75%) of students. Approximately half of teens (41%) play video games every day, (27%) play video games on vacation. There were (66%) who spent 1-2 hours playing video games, (55%) prefer to play video games on mobile devices and (64%) of participants played video games at home. The highest percentage (71%) thrill of victory influenced video game popularity. Video games were used for leisure time by (62%) of students. In terms of excellent acquired video game behaviors, there were (64%) acquired Self-verification. There were (69%) who had

acquired eye difficulties, (38%) who had acquired poor focus and attention.

Figure (2) shows that (55%) of students had moderate level of video games usage.

Figure (3) indicates that (68%) of participants had high level of cognitive functions.

Table (3) shows that video games usage is associated with adolescents who liking video gaming, frequency of video gaming practicing, the length of time spent playing video games, the locations that they prefer to play them in, what draws them to them, and the detrimental behaviors that they've picked up as a result.

In teenagers who regularly play video games, there is a statistically significant correlation between the frequency of playing video games and the increased high video game consumption. In teenagers who play video games for between one and two hours each day, there is a statistically clear association between the number of hours spent playing and the number of games played. Teenagers who play video games at home are more likely to use them frequently, and there is a statistically significant association between this and the specific locations where they play these games. The correlation between playing video games and what attracts people to them is statistically significant, and among teenagers who play video games for fun, this relationship is even stronger. There is a statistically remarkable link between playing video games and developing bad video game habits, with teens who play video games frequently having more of a tendency to sit still.

Table (4) shows that cognitive function level is associated with adolescents who liking video gaming, the regularity of video gaming practice, favoring alternatives to video games, focusing on the locations where teenagers play video games, and understanding the factors that draw people to video games.

There was statistically significant relationship between cognitive function level and frequency of video gaming practicing with increased high video games usage among adolescents who practice video gaming every day. There was statistically significant relationship between cognitive function level and preferring methods to playing video games with increased high video games usage among adolescents who practice video gaming on mobile. There was statistically significant relationship between cognitive function level and specific locations where teenagers play video games with increased high video games usage among adolescents who practice video gaming at home. There was statistically significant relationship between cognitive function level and causes of attraction to video games with increased high video games usage among adolescents who practice video gaming seeking for pleasure of wining.

Table (5) shows that cognitive function level is associated with video games usage illustrating that low cognitive function is more common among adolescents with high video game usage.

Table (6) shows that there was a statistically significant negative correlation between cognitive function level and video game usage.

Table (7) demonstrates that, duration of video, birth order and income were significantly positive predictors of cognitive function level among adolescents. while there was a statistically significantly negative predictor of cognitive function level and video usage score, father job, number of family members and age.

Table (1): Frequency and Percentage Distribution of Socio-Demographic Characteristics of Participant Adolescents (n=300).

Socio-Demographic Characteristics	NO.	%
Age (years)		
11-<13	144	48.0
13-16	156	52.0
Mean± SD	13.53±1.15	
Grade		
First	78	26.0
Second	108	36.0
Third	114	38.0
Father job		
Work	270	90.0
Not work	30	10.0
Mother job		
work	129	43.0
not work	171	57.0
Family income		
enough	288	96.0
Not enough	12	4.0
Number of family members		
1-3	18	6.0
4-7	246	82.0
>8	36	12.0
Birth order		
First	99	33.0
Second	72	24.0
Third or more	129	43.0

Table (2): Frequency and Percentage Distribution of Practicing Video Games among Participant Adolescents (n=300).

Practicing Video Games	NO.	%
Liking video gaming		
Yes	225	75.0
No	75	25.0
Frequency of video gaming practicing		
On vacation	81	27.0
Once per month	21	7.0
Once per week	54	18.0
Twice per week	21	7.0
Every day	123	41.0
Duration of video gaming usage		
<1 hour	21	7.0
1-2 hours	198	66.0
3-4 hours	60	20.0
>5 hours	21	7.0
Preferring methods to playing video games		
Mobile	165	55.0
Computer	51	17.0
Video games devices	60	20.0
Video games hall equipment	24	8.0
Target places adolescents use to play video games		
At Home	192	64.0
At School	6	2.0
At Friends house	3	1.0
In the Street	3	1.0
Video games hall	96	32.0
Causes of attraction to video games*		
Exciting	93	31.0
Pleasure of wining	213	71.0
Music and drawing	66	22.0
Man	39	13.0
Colors and photos	21	7.0
Uses of video games*		
Hobby development	117	39.0
Curiosity	60	20.0
Spending Leisure time	186	62.0
Attraction to special	87	29.0
Entertainment	18	6.0
Communication	42	14.0
Positive acquired behaviors of video games*		
Self-verification	192	64.0
Sole of competition	141	47.0
Brain abilities development	117	39.0
Cooperation	123	41.0
Negative acquired behaviors of video games*		
Social isolation	120	40.0
Eye problems	207	69.0
Decreased concentration and attention	114	38.0
Sleep disorders	75	25.0
Lack of movement	132	44.0
Stress	114	38.0
Time loss	21	7.0

*: multiple answer

Figure (2): Pie chart showing distribution of video games usage among participant adolescents

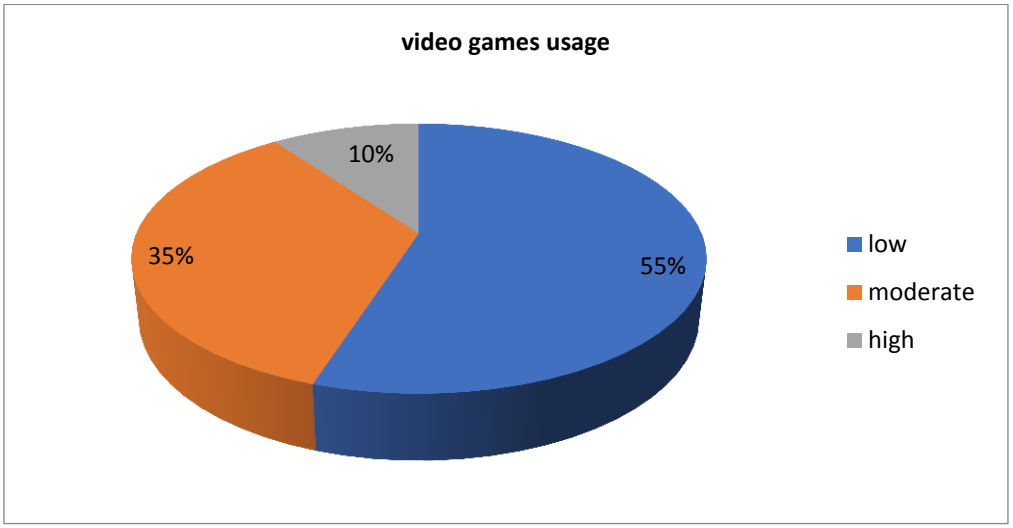

Figure (3): Pie chart showing distribution of cognitive function levels among participant adolescents.

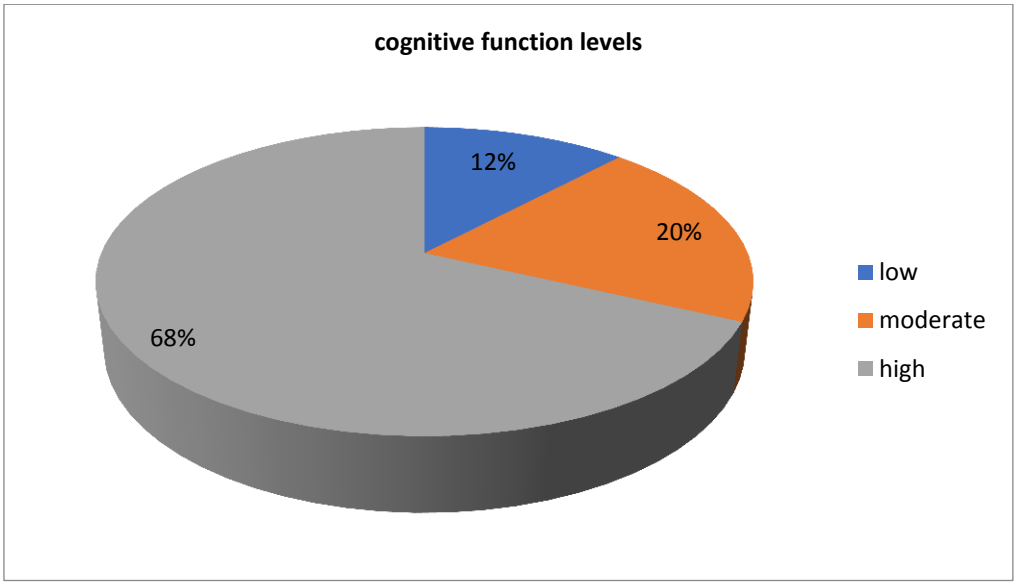

Table (3): Relation between Practicing Video Games and Video Games Usage among Participant Adolescents (n=300).

Practicing Video Games	Video game usage						χ^2 (p-value)
	Low (N=165)		Moderate (N=105)		High (N=30)		
	no	%	no	%	no	%	
Liking video gaming							
Yes	105	63.6	90	85.7	30	100.0	27.792 **(0.001**)**
No	60	36.4	15	14.3	0	0.0	
Frequency of video gaming practicing							
On vacation	60	36.4	18	17.1	3	10.0	69.831 **(0.001**)**
Once per month	18	10.9	3	2.9	0	0.0	
Once per week	36	21.8	18	17.1	0	0.0	
Twice per week	15	9.1	6	5.7	0	0.0	
Every day	36	21.8	60	57.1	27	90.0	
Duration of video gaming usage							
<1 hour	15	9.1	6	5.7	0	0.0	76.735 **(0.001**)**
1-2 hours	135	81.8	51	48.6	12	40.0	
3-4 hours	15	9.1	36	34.3	9	30.0	
>5 hours	0	0.0	12	11.4	9	30.0	
Preferring methods to playing video games							
Mobile	93	56.4	54	51.4	18	60.0	10.342 (0.111)
Computer	21	12.7	21	20.0	9	30.0	
Video games devices	38	23.0	20	19.0	2	6.7	
Video games hall equipment	13	7.9	10	9.5	1	3.3	
Target places adolescents use to play video games							
At Home	126	76.4	45	42.9	21	70.0	50.558 **(0.001**)**
At School	6	3.6	0	0.0	0	0.0	
At Friends house	3	1.8	0	0.0	0	0.0	
In the Street	0	0.0	3	2.9	0	0.0	
Video games hall	30	18.2	57	54.3	9	30.0	
Causes of attraction to video games							
Exciting	60	36.4	21	20.0	12	40.0	44.673
Pleasure of wining	114	69.1	84	80.0	15	50.0	**(0.001**)**
Music and drawing	30	18.2	27	25.7	9	30.0	
Man	6	3.6	24	22.9	9	30.0	
Colors and photos	6	3.6	15	14.3	0	0.0	
Uses of video games							
Hobby development	57	34.5	48	45.7	12	40.0	17.859 (0.057)
Curiosity	24	14.5	27	25.7	9	30.0	
Spending Leisure time	99	60.0	72	68.6	15	50.0	
Attraction to special	36	21.8	36	34.3	15	50.0	
Entertainment	15	9.1	3	2.9	0	0.0	
Communication	21	12.7	15	14.3	6	20.0	
Positive acquired behaviors of video games							
Self-verification	105	63.6	75	71.4	12	40.0	4.324 (0.633)
Sole of competition	66	40.0	60	57.1	15	50.0	
Brain abilities development	66	40.0	42	40.0	9	30.0	
Cooperation	63	38.2	51	48.6	9	30.0	
Negative acquired behaviors of video games							
Social isolation	69	41.8	36	34.3	15	50.0	27.460
Eye problems	126	76.4	63	60.0	18	60.0	**(0.001**)**
Decreased concentration and attention	60	36.4	45	42.9	9	30.0	
Sleep disorders	45	27.3	27	25.7	3	10.0	
Lack of movement	66	40.0	45	42.9	21	70.0	
Stress	51	30.9	45	42.9	18	60.0	
Time loss	18	10.9	3	2.9	0	0.0	

χ 2: Chi square test, non-significant ($p>0.05$),**: statistically highly significant ($p<0.001$).

Table (4): Relation between Practicing Video Games and Cognitive Function Levels of Adolescents (N=300).

Practicing Video Games	cognitive function levels						χ^2 (p-value)
	Low (N=36)		Moderate (N=60)		High (N=204)		
	NO	%	NO	%	NO	%	
Liking video gaming							
Yes	33	91.7	36	60.0	156	76.5	12.769
No	3	8.3	24	40.0	48	23.5	**(0.001**)**
Frequency of video gaming practicing							
On vacation	9	25.0	21	35.0	51	25.0	26.883
Once per month	0	0.0	0	0.0	21	10.3	**(0.001**)**
Once per week	9	25.0	3	5.0	42	20.6	
Twice per week	3	8.3	9	15.0	9	4.4	
Every day	15	41.7	27	45.0	81	39.7	
Duration of video gaming usage							
<1 hour	0	0.0	6	10.0	15	7.4	12.335
1-2 hours	21	58.3	36	60.0	141	69.1	(0.055)
3-4 hours	9	25.0	12	20.0	39	19.1	
>5 hours	6	16.7	6	10.0	9	4.4	
Preferring methods to playing video games							
Mobile	21	58.3	36	60.0	108	52.9	13.937
Computer	12	33.3	6	10.0	33	16.2	**(0.030*)**
Video games devices	2	5.6	12	20.0	46	22.5	
Video games hall equipment	1	2.8	6	10.0	17	8.3	
Target places adolescents use to play video games							
At Home	24	66.7	15	25.0	153	75.0	74.862
At School	0	0.0	6	10.0	0	0.0	**(0.001**)**
At Friends house	0	0.0	0	0.0	3	1.5	
In the Street	0	0.0	3	5.0	0	0.0	
Video games hall	12	33.3	36	60.0	48	23.5	
Causes of attraction to video games							
Exciting	6	16.7	18	30.0	69	33.8	27.407
Pleasure of wining	24	66.7	42	70.0	147	72.1	**(0.001**)**
Music and drawing	15	41.7	15	25.0	36	17.6	
Man	12	33.3	6	10.0	21	10.3	
Colors and photos	3	8.3	9	15.0	9	4.4	

χ 2: Chi square test, non-significant (p>0.05), *: statistically significant (p<0.05),**:statistically highly significant (p<0.001).

Table (5): Relation between Cognitive Function Levels of Participant Adolescents and Their Video Games Usage (n=300).

	Cognitive function levels						χ^2 (p-value)
	Low (N=36)		Moderate (N=60)		High (N=204)		
	NO	%	NO	%	NO	%	
Video game usage							120.220 (0.001**)
Low (N=165)	3	8.3	18	30.0	144	70.6	
Moderate (N=105)	15	41.7	30	50.0	60	29.4	
High (N=30)	18	50.0	12	20.0	0	0.0	

χ 2: Chi square test, **: statistically highly significant (p<0.001).

Table (6): Correlation between Cognitive Function Levels of Adolescents and Their Video Games Usage (N=300).

	Cognitive function levels	
	r	p-value
Video game usage	-0.701	0.001**

**: statistically highly significant (p<0.001), r: correlation coefficient.

Table (7): Step Wise Multiple Linear Regression for Predicting Factors which Affect Cognitive Function Score of adolescents.

	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(Constant)	8.396	.607		13.821	.000	7.200	9.591
Video usage score	-1.126	.057	-.838	-19.837	**0.001****	-1.238	-1.014
Duration of video	.436	.075	.247	5.783	**0.001****	.288	.584
Father job	-.899	.182	-.222	-4.932	**0.001****	-1.258	-.540
Birth order	.226	.059	.161	3.826	**0.001****	.110	.342
Income	.042	.013	.136	3.136	**0.001****	.016	.069
No of family member	-.376	.121	-.130	-3.104	**0.001****	-.614	-.137
Age	-.084	.041	-.079	-2.028	**0.043***	-.165	-.002

**: statistically highly significant (p<0.001), R-square= 0.598, ANOVA: F= 61.928 , P<0.001
Variables entered and excluded: grade, mother job, video liking, Frequency of video gaming practicing, Preferring methods to playing video games and place.

Discussion

Video games are a sort of digital medium whose primary goal is to facilitate human play. One of the roles played by video games in the modern world is their capacity to swiftly and effectively satiate the human drive for play. The correlations between video games and their ability to shape culture are now plainly discernible, more so than was previously believed during the early years of gaming. Video games have an impact on adolescents' cognitive and behavioral development **(Ponce-Blandón et al., 2020).**

The ojectives of this research were to determine video games usage, assess cognitive function levels and study the relationship

between adolescent video game use and cognitive function levels.

Concerning the first study objective, according to the current study, most of adolescents played video games at a medium level. Adolescents who play video games at home consume more video games on average, according to a statistically significant association between video game usage and where the kids play them. This outcome can be made clearer by that most age group interested in video games are adolescence especially with advancement and facilities that made child able to install the game on his mobile phone or computer. Also, video gaming companies try to attract children by applying attractive options to the game like sound effects. Internet help in spread of video games as child can play with his friends online even if they were in another country. These results were compatible by **Yunus et al. (2017)** who revealed that the level of video game practice and its relationship with social isolation among Jordanian secondary and high school students indicated that the level of electronic game practice among Jordanian preparatory and secondary school students was medium.

In terms of the second study objective, the distribution of cognitive functions among teenagers by the current study revealed that 60% of them had an intermediate cognitive function. This result may be clarified through that adolescence age group is a period full of pressure and burdens. It is the period when he first starts to deal with people on the real life. At this stage he start to build his character and determine his priorities like what he want to be when he grow up. More and more things have impact on adolescent cognitive functions at this age. Between the ages of 12 and 18, a child's cognitive growth goes through a significant period. They transition from formal logical procedures, which demand higher levels of reasoning, to real-world logical procedures. In agreement with our findings, **El said et al. (2018)** conducted a study on cognitive function and its connection to life satisfaction in a sample of teenage boys and girls, and discovered that both sexes had average cognitive function. **Yüksel Doğan et al. (2023)** discovered that there were strong positive relationships between cognitive functions, social skill, self-esteem, and life satisfaction. **Wang et al. (2020)** stated that benefits like increased physical and mental health, higher levels of life satisfaction, and improved emotion control are linked to higher degrees of the cognitive functions.

The current study discovered a statistically significant relationship between video game usage and frequency of video gaming practicing with increased high video game usage among adolescents who practice video gaming every day. This result may be clarified through that easy accessibility and availability of the source of video games with adolescents. Mobile phone made it easy to practice video games every day and at any time and place. matching our findings, **Boublota et al. (2020)** illustrated that playing video games was a continuous daily action on the majority of students which reflect on their behavior. **Drummond et al. (2014)** reported that it's vital to consider other factors including physical activity, social connections, and academic responsibilities despite the statistically substantial association between high video game use and regular gaming among adolescents. Maintaining a balanced attitude and making sure that playing video games doesn't conflict with other aspects of life or lead to excessive screen time are essential for general wellbeing.

The current study found a high association between video game usage and duration of video gaming usage among youths who play video games for 1-2 hours. This conclusion could be explained by during the game they feel enjoyment and excitement to a degree that they become not aware about the time. Competitive games may consume more time prompting them to play again to win more and achieve more good performance. This study is inconsistent with the study of **Eaqib et al. (2019),** who investigated the impact of video games on adolescents in Algeria revealed that about thirty percent of adolescents spent more than two hours playing video games.

In terms of the link between video game usage and preferred ways of play, the current study discovered that, although having a high level of video game consumption, the majority of the tested teens preferred to play video games

on mobile phones. This discovery might be attributed to the simplicity of use and travel to any area and the ability to download any video games from app store. Similar results were obtained by **Eaqib et al. (2019)** reported that due to the extensive use of smartphones, mobile games have grown in popularity. Users may play games on the go thanks to its portability and convenience.

The current study illustrated that vast majority of the adolescents played video games at home. This result may be cleared through that home provide a lot of facilities that encourage adolescents to play like internet connection for online games. In agreement with our findings, **Rami et al. (2019)** demonstrated that the overwhelming majority of adolescents played electronic games at home as gaming halls require high expanses.

The present research discovered a significant relationship among frequency of video gaming practice and cognitive function level with increased high video game usage among adolescents who play video games on a daily basis. This conclusion may be attributed to that design of the game based on challenge to attract kids to play more and more. **Chaarani et al. (2022)** stated that on tests of cognitive skills like impulse control and working memory, children who played video games for three hours or more each day did better than children who had never played them. This was in accordance with **Boukadoum et al. (2019)** who researched the impact of computer games on primary school children's isolation in Alegria through cell phone and observed that over half of the students played video games. **Li et al. (2022)** noted that teenagers spent on average 0.69 hours each week playing video games. Video game use among teenagers was strongly linked to poorer mental health. With each additional hour spent playing video games, the likelihood of suffering from severe or worse symptoms increased.

The current study discovered a significant relationship between cognitive function level and adolescents who practice mobile video gaming. The result may be cleared through that the simplicity of use smart phones due to it is easy to access the internet by mobile phones. Because of the internet in mobile, people are less required to go cyber café for using the internet, or even they don't have to sit in front of computers for accessing the internet. It is easy to access high-speed internet through mobiles. These results were compatible with **Hani et al. (2019),** who illustrated that mobile is the most common way of communication and present almost at each home so overwhelming majority of adolescents practice electronic games on mobile phone.

In terms of the third study objective, there was a statistically significant negative link between cognitive function level and video game intake. This could be because a substantial of evidence shows that video games can impair focus, reduce empathy and assistance, and impede academic success. This was in accordance with **Shahbaz et al. (2019)** illustrated the effects of video gaming on cognitive functions, duration of playing video games is negatively correlated with cognitive functions. **Bediou et al. (2018)** showed that regular action game players had better cognitive performance, especially in vision, spatial cognition, and top-down attention. Playing video games was associated with improved working memory and reaction inhibition, according to **Chaarani et al. (2022).** Neurocognitive development may be significantly impacted by the cognitive training provided by video games. However, **Sala et al. (2016)** observed that only game-specific talents are strengthened; these skills are particularly context-dependent and difficult to generalize across scenarios. Overall, the relationship between action video games and neurocognitive function is inconclusive, owing to small sample sizes, the fact that most previous studies only looked at extreme groups, and a lack of research on children and adolescents.

Conclusion

Based on the findings of the current study, it can be concluded that video gaming was appreciated by the highest percentage of students, there was a statistically significant relationship between cognitive function level and frequency of video gaming practicing with increased high video games usage among adolescents who practice video gaming every day and there was a statistically significant

negative correlation between cognitive function level and video game usage.

Recommendations

Prospective and interventional studies are needed to verify the results. Developing scientific video games to assist teens in developing computer and cognitive talents that are proportional to cognitive functions. Schools should develop social activities for adolescents so they catch social skills and develop their cognitive functions instead of video games. Parents should be aware about hazards of over-gaming.

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