

# Video/Computer Game Addiction Among University Students in Ghana: Prevalence, Correlates and Effects of Some Demographic Factors

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## Abstract

**Background:** This study represented the first investigation of video/computer game addiction in Ghana and Africa. We investigated the prevalence of video game addiction and some of its correlates. In addition, the effects of some demographic factors on video game addiction were examined.

**Methods:** A sample of Ghanaian University students (n= 263) from three public universities in Ghana were randomly selected. 136 were males whereas 127 were females. The mean age of the participants was 21.65 years.

**Results:** We found that 12.2% (n=32) of the total sample were addicted to playing video games when a monothetic approach was used (i.e., every criterion for video game addiction were met), while 31.2% (n=82) of the total sample were addicted to playing video games when a polythetic approach was used (i.e., half of the criteria for video game addiction were met). Males spent more time and were addicted to playing video games than females. Our findings also revealed that students who played online games reported being addicted to playing video/computer games than offline gamers. Video game addiction was positively related to time spent playing video games and depression. In contrast, video game addiction was negatively related to self-esteem. No relationship was found between video game addiction and life satisfaction.

**Conclusions:** Our high prevalence rates suggest that video game addiction is a problematic issue among the Ghanaian University students and needs proper attention from researchers and clinicians.

## ARTICLE HISTORY

Received: Jan 10, 2020

Accepted: Feb 18, 2020

**KEYWORDS:** video/computer game addiction; depression; life satisfaction; self-esteem

## INTRODUCTION

Playing of video/computer games has become a common leisure activity in most countries across the world [1]. Some previous studies have shown that some negative effects of game addiction include emotional disorders, obesity, suicidal ideation, tiredness, poor interpersonal relationships, poor eating and sleeping habits [1-5]. Playing of video games may be improve focus, multitasking, and working memory [6]. Although there are disagreements in defining video game addiction, it has been defined by Lemmens, Valkenburg [7] as an “excessive and compulsive use of computer or video games that results in social and/or emotional problems; despite these problems, the gamer is unable to control this excessive use.” (7, p.78). In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), internet gaming disorder has been listed as a mental disorder [8].

Previous studies conducted mostly in Western or Eastern countries have estimated the prevalence of Video/computer game addiction [1, 9-11]. For instance, in Norway, among a large sample of community-dwelling adults (N= 3389, aged between 16-74 years), Wittek, Finserås [1] reported that 1.4% were addicted gamers while 7.3% were problem gamers. Consistently, using a sample of Dutch adolescents and adults aged from 14 to 81 (N=902), Haagsma, Pieterse [12] estimated the prevalence of video game addiction to be 1.3%. The low prevalence rates reported in Wittek, Finserås [1] and Haagsma, Pieterse [12] might reflect the age characteristics of their samples as senior adults might be less interested in computer/video gaming than adolescents. In addition, discrepancies in the prevalence of video/computer game addiction across different countries may also be attributed to differences in sample sizes, measurements, and diagnostic criteria [4, 13]. Since we

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**To cite this article:** Miezah D, Batchelor J, Megreya MA, Richard Y, Moustafa AA. Video/Computer Game Addiction among University Students in Ghana: Prevalence, Correlates and Effects of Some Demographic Factors. Psychiatry and Clinical Psychopharmacology 2020;30(1):x-x, DOI:10.5455/PCP.20200320092210

found no study in the literature on the estimation of Video/computer game addiction in Ghana or any African country, the current study sought to estimate its prevalence among a sample of Ghanaian University students.

Past studies have shown the effects of some demographic variables on video/game addiction and time-spent gaming. For example, males tend to be addicted to video games and spend more time playing video games than females [1, 2, 4, 7, 14-17]. Gender differences were found regardless of whether a monothetic or polythetic approach was used. For instance, Brunborg, Mentzoni [2] reported that more males than females were addicted to video games using both the monothetic and polythetic approaches (6.1% vs. 1.8% and 26.3% vs. 7%; respectively). Age also influences video game addiction, such that younger people tend to be more addicted to video games than older individuals [1, 4]. In addition, time spent gaming was found to decrease after age 13 [18, 19]. Haagsma, Pieterse [12] found that online gamers spent more time per week playing games and had more problematic game behaviours than offline gamers (see also 20, 21). To our knowledge, whether individuals who play only online games or only offline games differ from those who play both games in terms of time spent playing the games and video/computer gaming addiction is still not yet known. The current study will therefore explore this issue.

Time spent playing video/computer games has been found to be positively related to video game addiction [9, 12, 22, 23]. In addition, video/computer game addiction positively correlated with depression [4, 5, 22-26]. Moreover, some studies have found a negative relationship between video/computer game addiction and self-esteem and also life satisfaction [22, 23, 27, 28], especially in males.

### The current study

To the best of our knowledge, no prior studies have investigated video/computer gaming addiction in African countries. Therefore, the objectives of this study were to (i) assess the prevalence of video game addiction, (ii) examine the effects of demographic variables (gender, age and type of video game played) on video game addiction and time spent gaming and (iii) investigate the relationships between video/game addiction, depression, self-esteem, life satisfaction, and time spent gaming in a sample of Ghanaian university students.

## METHODS

### Participants and Procedure

A total of 263 participants from three public universities (which were randomly selected) in Ghana were randomly selected to participate in this cross-sectional study. Table 1 shows demographic characteristics of the sample. To summarize, 136 (51.7%) were males whereas 127 (48.3%) were females. The mean age of the participants was 21.65 years ( $SD= 3.09$ ). Most of the participants were unmarried (97.0%), undergraduate students (94.3%), and Christians (92.4%). The participants reported that they spent an average of 11.62

hours per week playing video/computer games. Most of them reported that they play offline video/computer games (84.8%,  $n=223$ ). Three hundred questionnaires were distributed to participants who were randomly selected from three Ghanaian public universities (which were randomly selected) but only the 263 questionnaires from those participants which were fully completed were used in the study. We used hardcopies of the questionnaires since web-based questionnaires are relatively new to Ghanaian participants compared to other economically developed countries and likely to have low response rates. Inclusion criteria for the present study were: (i) being a registered student of any of the three Ghanaian public universities (which were randomly selected), (ii) volunteering to participate in the study and (ii) being 18 years and over (since the video addiction questionnaire we used was developed for people who are 18 years and above). After informing the students about the objectives of study, they were asked if they would be willing to participate in the study. The consents of the participants were obtained in writing prior to data collection. Data was collected over a period of one month. In order to ensure anonymity, no identifications were on the questionnaire given to the participants. In addition, privacy of the participants' responses was ensured by making students put completed questionnaires in envelopes. Ethical approval was obtained from university authorities in Ghana who read through the proposal of the study.

**Table 1.** Demographic characteristics of the sample

Variables	Mean (M)	Standard deviation (SD)	Frequency (N)	Percentage (%)
Gender				
Male			136	51.7
Female			127	48.3
Age	21.65	3.09		
Marital status				
Single			255	97.0
Married			5	1.9
Cohabitation			3	1.1
Divorced				
Educational level				
First degree			248	94.3
Master's degree			15	5.7
Religious affiliation				
Christian			243	92.4
Moslem			17	6.5
Traditional			1	.4
Others			2	.8
Game playing hours per week	11.62	10.86		
Type of video game played				
Online			25	9.5
Offline			223	84.8
Both			15	5.7

Both=Students who played both online and offline games

## Measures

### (1) The Game Addiction Inventory for Adults (GAIA; 29)

GAIA is a self-reported questionnaire involving 31 items (26 items for video game addiction and 5 items for video game engagement). On this test, respondents used a 5-point Likert scale ranging from 0 “*strongly disagree*” to 4 “*strongly agree*” to rate their gaming behaviour. Only the 26 items (meant for measuring video addiction) were administered to the participants in the present study. This test (the 26 items for measuring video addiction) measures five factors (criteria) including loss of control and consequences (e.g., “*I am sometimes late for engagements because I am playing video games*”), agitated withdrawal (e.g., “*I feel angry when I am unable to play video games*”), coping (e.g., “*I often play video games to release stress*”), mournful withdrawal (e.g., “*I feel lonely when I am not able to play video games*”) and shame (e.g., “*I feel a sense of shame about negative effects in my life resulting from my video game play*”). A score of 30 or more is considered mild-moderate while a scores of 40 or more is a significant level of problem. To enable comparison with other past studies [4], we utilised both monothetic and polythetic approaches in determining the prevalence of video game addiction as proposed by Lemmens et al. (2009). In the monothetic approach, participants had to endorse all five criteria (loss of control and consequences, agitated withdrawal, coping, mournful withdrawal and shame). In the polythetic approach, participants had to endorse at least half (three) of the five criteria on the 26-item video game addiction scale to be classified as addicted. According to the authors [29], the video game addiction score (26-items) of the GAIA has an excellent internal reliability ( $\alpha = .94$ ). Consistent with the authors [29], the coefficient alpha for the 26-items was .94 in the present study.

### (2) The Satisfaction with Life Scale [30]

This is a self-report measure of life satisfaction consisting of five items using a 7-point Likert scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Examples of the items are “*The conditions of my life are excellent*” and “*If I could live my life over, I would change almost nothing*”. Cronbach’s alpha of this scale is .87 [30] and is .79 in the current study.

### (3) Rosenberg Self-Esteem Scale [31]

This self-port questionnaire of self-esteem consists of ten items, using a 4-point Likert scale ranging from 0 (*Strongly disagree*) to 3 (*Strongly agree*). Examples of items on the scale are “*I take a positive attitude toward myself*” and “*I wish I could have more respect for myself*” Cronbach’s alpha for this scale is .77 to .88 [31] and .79 in the present study.

### (4) Depression, Anxiety & Stress Scale (DASS; 32)

The DASS is a 42-item self-reporting questionnaire measuring depression, anxiety and stress using a 4-point Likert scale ranging from 0 (*Did not apply to me at all*) to 3 (*Applied to me very much*). However, only the depression subscale was used in the present study which consisted of

14 items. Examples of items include “*I just could not seem to get going.*” and “*I felt sad and depressed.*” Cronbach’s alpha for this scale is .91 [32] and .95 in this study.

## Data analysis

Data analysis was conducted using the IBM SPSS Statistics version 20. Pearson Product Moment Correlation Coefficient was used to examine the relationships between video/ game addition, depression, self-esteem, life satisfaction, and time spent gaming (continuous variable). In addition, between-participants Multivariate Analysis of Variance (MANOVA) was used to assess the effects of demographic variables (gender, age and type of video game played) on video game addiction and time spent gaming. All statistical analysis was two-tailed with a .05 level of significance.

## RESULTS

### Prevalence of video game addiction

Table 2 shows the prevalence of video game addiction using a monothetic approach. 12.2% ( $n=32$ ) of the total sample were addicted to playing video games.

**Table 2.** Prevalence by monothetic approach

Variable	Frequency (N)	Addicted [N (%)]	Non-addicted [N (%)]
Total sample	263	32(12.2%)	231(87.8%)
Gender			
Male	136	22(16.17%)	114(83.83%)
Female	127	10(7.87%)	117(92.13%)
Type of gamer			
Online gamers	25	5(20%)	20(80%)
Offline gamers	223	24(10.76%)	199(89.24%)
Online and offline gamers (both)	15	3(20%)	12(80%)

Table 3 shows the prevalence of video game addiction using a Polythetic approach. 31.2% ( $n=82$ ) of the total sample were found to be addicted to playing video games.

**Table 3.** Prevalence by polythetic approach

Variable	Frequency (N)	Addicted [N (%)]	Non-addicted [N (%)]
Total sample	263	82(31.2%)	181(68.8%)
Gender			
Male	136	51(37.50%)	85(62.50%)
Female	127	31(24.40%)	96(75.60%)
Type of gamer			
Online gamers	25	14(56%)	11(44%)
Offline gamers	223	63(28.25%)	160(71.75%)
Online and offline gamers (both)	15	5(33.33%)	10(66.67%)

**Effects of demographic factors on Video game addiction and time spent gaming**

**Table 4.** Means and standard deviations for gender, age and type of game on time spent gaming and game addiction scores

Variable	Time spent gaming (per week)		Game addiction scores	
	Mean (M)	Standard Deviation (SD)	Mean (M)	Standard Deviation (SD)
Gender				
Male	14.18	12.48	60.85	18.93
Female	8.88	7.99	51.40	17.62
Age group				
18-21	13.08	12.86	56.08	19.34
22-44	9.70	7.10	56.56	18.34
Type of game				
Online	14.42	14.15	67.52	17.48
Offline	10.69	9.18	54.98	18.37
Both	20.76	20.29	57.00	23.32

We conducted a three-factor, between-subject multivariate analysis of variance (MANOVA). Our independent variables were gender, age and type of video game played. The dependent variables were time spent gaming (continuous variable) and video/computer game addiction.

**Table 5.** Effects of gender, age and type of game on time spent gaming and video/computer game addiction

Variables	Time spent gaming			Video/Computer game addiction		
	F	Df	P	F	Df	P
Gender	4.62	1;251	.032*	8.48	1,251	.004*
Age group	5.79	1;251	.017*	.87	1,251	.352
Game type	2.92	2;251	.055	5.48	2,251	.005*

As can be seen in Table 5, there were significant gender differences in time spent gaming ( $F_{(1, 251)} = 4.62, p < .05$ ) and video/computer game addiction ( $F_{(1, 251)} = 8.48, p < .05$ ). Males ( $M= 14.18$ ) spent more time playing video games than females ( $M= 8.88$ ). In addition, males ( $M= 60.85$ ) reported being addicted to playing video/computer games than females ( $M= 51.40$ ). A significant age difference was found in time spent gaming ( $F_{(1, 251)} = 5.79, p < .05$ ) as the younger age group ( $M=13.08$ ) spent more time playing video games than the older age group ( $M=9.70$ ). However, no significant age difference in video/computer game addiction was found between our younger and older age groups ( $F_{(1, 251)} = .87, p > .05$ ). We found no significant difference in time spent gaming ( $F_{(2, 251)} = 2.92, p > .05$ ) between the type of gamers (online, offline, both). However, there was a significant difference in video/computer game addiction ( $F_{(2, 251)} = 5.48, p < .05$ ) between the type of gamers (online, offline, both). Post-hoc comparisons adjusted by the Bonferroni test (see Table 6) showed that online gamers ( $M=67.5$ ) reported being addicted to playing video/computer games more often than offline gamers ( $M=55$ ). Moreover, our findings indicated that there was

no significant difference in time spent gaming and video/computer gaming addiction scores between students who played both online and offline games and those who played only offline games or only online games.

**Table 6.** Summary of post-hoc analysis (Bonferroni)

Dependent Variable	Gamers	Gamers	Mean Difference	SE	Sig.
Game addiction	Online	Offline	12.53*	3.81	0.00
		Both	10.52	5.90	0.22
	Offline	Online	-12.53*	3.81	0.00
		Both	-2.01	4.81	1.00
	Both	Online	-10.52	5.90	0.22
		Offline	2.01	4.81	1.00

\* The mean difference is significant at the .05 level.

**Correlates of Video game addiction**

Table 7 shows Pearson Product Moment Correlation Coefficients between video game addiction, time spent playing games (hours per week), depression, self-esteem and life satisfaction. Video game addiction positively correlated with time spent playing video games ( $r= .32, p < .05$ ) and depressive symptoms ( $r= .25, p < .05$ ). In contrast, video game addiction negatively correlated with self-esteem ( $r= -.38, p < .05$ ). No relationship was found between video game addiction and life satisfaction.

**Table 7.** Correlations

	Time (per week)	Depression	Life satisfaction	Self-esteem
Time				
Depression	.04			
Life satisfaction	-.02	-.21*		
Self-esteem	-.05	-.50*	.48*	
Game addiction	.32*	.25*	-.09	-.38*

**DISCUSSION**

Our study is the first to estimate the prevalence of video game addiction in Ghana and Africa.

We found that 12.2% of our sample of Ghanaian University students between the age ranges of 18-44 years were addicted to playing video games when a monothetic approach was used. When a polythetic approach was used, 31.2% of the total sample were found to be addicted to playing video games. Our high prevalence rates of game addiction among our sample of Ghanaian university students is not consistent with that of earlier studies [1, 4, 11, 12]. The discrepancies in the prevalence estimates of video/computer game addiction may be due to differences in the sample sizes, age range, measurement and criteria for determining video/computer game addiction in the earlier studies [4, 11, 13]. These inconsistencies may also

suggest that prevalence of video game addiction differ between countries. For example, our prevalence estimate of 12.2% is closer to 8.7% in Singapore reported by Choo, Gentile [3] and 15.6% in Hong Kong reported by Wang, Chan [9].

Another objective of the current study was to examine the effects of demographic factors on video game addiction and time spent gaming. We found that male students spent more time playing video games and were more likely to be addicted to video gaming than females. This finding is corroborated by previous studies [1, 2, 4, 15, 33]. Our results also revealed that the younger age group spent more time playing video games than the older age group consistent with other studies [18, 19]. On the contrary, no significant age differences in video/computer game addiction was found between our young and older age groups in the current study. This finding is inconsistent with that of Mentzoni, Brunborg [4] and Wittek, Finserås [1]. Since the present study and other previous studies have shown that time spent playing video/computer games was positively related to game addiction [9, 12, 22], we expected our younger age group who spent more time playing video games to have a higher incidence of video game addiction than the older age group. However, Griffiths [34] has reported that time spent gaming must not be used as the main indicator for game addiction since there are other variables such as marital status [5] and personality traits [35] which could explain why an individual becomes addicted to playing video games. The results of the current study revealed that online gamers were addicted to playing video/computer games more often than offline gamers. Our finding is corroborated by previous studies [12, 20, 21]. Furthermore, our findings indicated that there was no significant difference in time spent gaming and video/computer gaming addiction scores between students who played both online and offline games and those who played only offline games or only online games. This is a novel finding since we found no previous study which compared online or offline gamers to those who play both games in terms of time spent gaming and video/computer gaming addiction.

Some correlates of video game addiction were examined in the current study. Our findings revealed a positive relationship between time spent playing video/computer games and video game addiction. This finding suggests that individuals who spend more time playing video/computer games are more likely to be addicted to it. This finding is corroborated by past studies [9, 12, 22, 23]. A positive correlation was also found between video game addiction and depressive symptoms. This implies that individuals addicted to the playing of video games may become depressed. The results from previous studies support this finding [4, 5, 23, 25, 26]. In contrast, there was a negative relationship between video game addiction and self-esteem. Thus, addiction to playing of video games is associated with lower self-esteem and this agrees with past studies [10, 22, 23, 36]. No significant relationship was found between video game addiction and life

satisfaction. This finding is not supported by earlier studies [4, 27]. These inconsistent results may be attributed to the satisfaction with life scale we used which measures people's general satisfaction with life but does not assess satisfaction within specific life domains such as academic performance. Although, both Gaetan, Bonnet [27] and Mentzoni, Brunborg [4] used the satisfaction with life scale to find significant relationships between video game addiction and life satisfaction in different samples, it is possible we could not replicate their findings because our university students sample evaluated their satisfaction in life based on their present academic performance.

## CONCLUSIONS

Our high prevalence rates suggest that video game addiction is a problematic issue among the Ghanaian University students. This implies that clinicians and policy makers should find ways of preventing and treating the individuals who may present with such problems. The current study demonstrated gender differences in time spent gaming and video game addiction in Ghanaian university students. Ghanaian clinicians will therefore need to consider these differences when assessing, diagnosing and treating both males and females who are addicted to playing video/computer games. There is also a need to examine depression symptoms and levels of self-esteem in students who present with video/computer game addiction to Ghanaian clinicians.

## Limitations and future studies

The present study has some limitations. Since the current study examined only a sample of Ghanaian University students who played video/computer games, we recommend that future research in Ghana and other African nations should focus on examining video game addiction among children as well as older adults. By using both monothetic and polythetic approaches in estimating the prevalence of video game addiction, our study offers clinicians and policy makers a broader view of the prevalence of video game addiction among university students in Ghana who play video/computer games. However, because of the use of cross-sectional design in the current study, we cannot claim causality among the variables. We therefore recommend that future studies should focus on using experimental research designs.

**Disclosure of interest:** The Authors declare that there is no conflict of interest.

**Informed consent:** Informed consent was obtained from all individual participants included in the study.

**Ethical approval:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Funding:** The authors received no financial support for the research and/or authorship of this article.

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