Prevalence and correlates of video gaming addiction among Nigerian in-school adolescents

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Abstract: Video gaming has become a popular phenomenon among in-school adolescents in many parts of the world due to rapid development of the gaming industry in the 21st century. Resultantly, in-school adolescents have access to a broad spectrum of video games with diverse potentials and capabilities for maximal user experience. Whilst video gaming can provide some benefits for in-school adolescents, it can also pose some dire challenges. Thus, video gaming addiction has come to public attention and is gaining traction amongst stakeholders in the Nigerian school system. Hence, this study investigated prevalence rates and correlates of video gaming addiction among in-school adolescents randomly selected from public and private secondary schools in Kwara State, Nigeria. A total of 850 in-school adolescents were sampled from twenty secondary schools. The independent variables (gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function) were assessed using a bio-data form and standardized scales respectively while the dependent variable (video gaming addiction) was examined using the *Game Addiction Scale*. Data were subjected to frequency counts, percentage, correlation analysis and multiple regression. The results of this study showed that a majority of the respondents (74%) played offline and online video games, while 13.5% of the respondents were identified as having a video gaming addiction. Gaming addiction was significantly correlated with peer influence, gender, academic performance, executive function and life satisfaction. It was recommended that effective preventive measures should be put in place to curb the menace of video game addiction and its associated effects among Nigerian adolescents.

Keywords: video gaming addiction, in-school adolescents, prevalence, correlates

Education is the bedrock of individual and national development in any nation. Thus, the *National Policy on Education* (FRN, 2013), clearly indicates that Nigeria's philosophy of education is based on the belief that education is an integral tool for national development and social change. Hence, education is a fundamental right of every Nigerian, regardless of

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individual and socio-cultural differences. To this end, Nigeria currently runs the 9–3–4 system of education. By implication, formal education in Nigeria covers 9 years of basic education, 3 years of senior secondary education and 4 years of higher education. Specifically, the 9 years of basic education consist of three levels, which includes the lower basic education (primary 1–3), the middle basic education (primary 4–6) and the upper basic education (junior secondary school 1–3). Senior secondary education, which covers a duration of three years, is designed to develop the cognitive, psychosocial, and socio-economic abilities of Nigerian adolescents.

Essentially, the curriculum for senior secondary school education comprises of various fields of studies, such as science subjects, technology studies, humanities, business studies, and compulsory cross-cutting subjects that are tailored to achieve various objectives in line with the national goals of education (FRN, 2013). It is, however, an indisputable fact that, the extent to which the laudable objectives of secondary school education are being achieved in Nigerian secondary schools is a function of a broad spectrum of factors. For instance, digital technology has significantly changed the daily lives of many people in Nigeria, especially the in-school adolescent community, who are generally referred to as "digital natives". As such, there is no gainsaying that in-school adolescents in Nigeria utilize various forms of digital devices and gadgets within and outside the school environment for learning, entertainment, social networking, recreation, and a host of others (Ajike & Nwakoby, 2016; Ali & Aliyu, 2015; Alufohai, 2019; Okika & Agbasi, 2015; Okim-Alobi & Ogbu, 2017; Onivehu et al., 2018; Yusuf et al., 2012).

For instance, digital technology is increasingly being used for playing video games on gaming consoles, computers and mobile devices among in-school adolescents in contemporary Nigerian society. Essentially, in-school adolescents could play video games for academic, entertainment, fun, competition, companionship, emotional coping, and economic reasons. In other words, video games could contribute positively to the development of in-school adolescents in various ways. Nonetheless, many in-school adolescents could become excessively immersed in their video gaming behavior, which could result in video game addiction, with its associated physical, psychosocial, educational and career problems (Okika & Nwakasi, 2016; Onyemaka et al., 2017).

Video game addiction is a contemporary phenomenon among in-school adolescents in Nigeria, due to the popularity of video game playing as a trending form of recreation among Nigerians. Given the importance of the period of adolescence to the lifespan development of an individual, gaining a good insight into the prevalence and correlates of video game addiction among in-school adolescents in Nigeria, would play a germane role in the design of effective prevention programs to curb the menace of video game addiction in Nigerian society. Thus, the main purpose of this study was to examine the prevalence and correlates of video game addiction among in-school adolescents in Nigeria.

1 Statement of the problem

Nigerian society is undergoing a significant shift, which is largely attributed to technological explosion, accessibility of internet services, and digital technology. Video gaming appears to be a germane contributor to the technological shift in Nigerian society, acting as a powerful agent of entertainment, relaxation, education, and information. With the rapid advancement in video gaming technology, Nigerian in-school adolescents play a plethora of offline and online video games for diverse purposes. Nonetheless, uncontrolled playing of video games could lead to video gaming addiction among in-school adolescents, especially in view of the various undesirable effects of video gaming addiction on the cognitive, behavioural, physical, psychosocial, and moral development of in-school adolescents. It is, therefore, germane for stakeholders in the Nigerian school system, as well as mental health professionals from other fields, to gain an insight into the prevalence and correlates of video gaming addiction among Nigerian in-school adolescents, so as to facilitate the development of effective prevention and treatment measures. In this wise, Okika and Nwakasi (2016) focused on the violent video game screen time of children in Akwa Urban, Nigeria. Likewise, Onyemaka et al. (2017) investigated the relationship between undergraduate males' video game addiction and academic performance in a Nigerian private university. However, there is a paucity of related studies on the prevalence and correlates of video game addiction among in-school adolescents in Nigeria. Thus, in order to fill the identified problem in the extant literature, the present study investigated the prevalence and correlates of video game addiction among in-school adolescents in Nigeria.

1.1 Concept of Video Game

A video game could be defined as an electronic or digital based interactive entertainment system, which facilitates play or mutual interaction with a user interface, to produce audio-visual feedback on a plethora of display devices such as television screen, computer monitor, mobile devices (laptops, smartphone, tablet PCs), hand-held systems, such as the Game Boy, Nintendo DS and Playstation Portable and emerging forms of immersive interfaces, that are increasingly being developed to cover most of the sensual modalities of gamers, such as vision, hearing and tactile interaction, in ways similar to what is obtainable in the real or physical world (Gentile et al., 2012; Miezah et al., 2020). Traditionally, a video game consists of hardware and software. The hardware is often called a video game console. A video game console is a small box with game pads, which is often designed to display various forms of software. The commonest examples of video game consoles include the Sony's Playstation, Nintendo's Switch and Microsoft's Xbox. However, some specialized video games, like arcade games are typically coin-operated and housed in a large complex. Conversely, the software for a video game is designed with embedded forms of lighting, animation, graphics, colour and a host of other visual and sound effects, and it is usually available in the forms of direct internet downloads, standardized cartridges and Blu-ray discs. However, the new generation of games, such as the PS4, Xbox Series, as well as the handheld systems (PSP and DS), has in-built online functionality and wireless internet access, which enables gamers to play games virtually. Thus, gamers are enabled to engage in downloading of new game contents and entire games, as well as multiplayer gaming. More so, the exponential increase in the availability, accessibility, affordability and capability of mobile devices, has significantly improved the rate at which gamers leverage the use of smartphones, tablet PCs as modern forms of video game consoles to play several offline and offline games (Gentile et al., 2012; Kweon & Park, 2012; Miezah et al., 2020; Monke, 2009).

1.2 Concept and prevalence of video gaming addiction

The term "addiction" refers to the continued excessive use of a substance irrespective of detrimental personal, occupational, physical, health, or social consequences. Although addiction has been applied to other forms of behavioural addiction, video game addiction is a recent addition to the list of behavioural addictions. Given that video gaming addiction has similar

features, effects and neurophysiological characteristics with other forms of behavioural addictions, such as sex addiction, pathological gambling, substance addiction, and internet addiction, several attempts have been made by different scholars to define the meaning of video gaming addiction.

Nonetheless, the exact meaning of video gaming addiction is highly debated among various scholars in the extant literature (American Psychiatric Association, 2013; Kuss & Griffiths 2012). For instance, Lemmens et al. (2009) defined video gaming addiction as the excessive, compulsive, and uncontrolled use of video or computer games, even when it is obvious that the gamer is exposed to socio-emotional problems. Video gaming addiction also refers to the continued pattern of video gaming, which could result in maladaptive functioning. Video gaming addiction is, therefore, a maladaptive psychological dependence on video games, which is often manifested in an obsessive-compulsive pattern of gaming at the expense of other essential activities (King et al., 2013; Petry et al., 2018).

From a more professional standpoint, the American Psychiatric Association (2013) averred that video gaming addiction is the persistent and recurrent use of video games for at least a period of 12 months, which could result in clinically significant impairment or distress. Specifically, the proposed criteria for the inclusion of video gaming addiction or disorder in the DSM-5 includes excessive engagement with video games, tolerance, withdrawal symptoms, failed attempts to reduce the level of involvement with video games, continued use of video games, regardless of evident psychosocial problems, loss of interest in other forms of relaxation or leisure, use of video games as a form of escapism from stressful or challenging life conditions, loss of relationship and career opportunities and being deceptive about the extent of one's video gaming behavior (American Psychiatric Association, 2013).

There is a growing body of studies on the prevalence of video gaming addiction in different countries. Nonetheless, findings on the prevalence rates of video game addiction remain inconsistent and inconclusive across studies. For instance, Lenhart et al. (2008) carried out a nation-wide study to assess the level of teen video game play and of teen video gaming and civic engagement among American adolescents aged 12–17 years and found that 97% of the respondents played video games. In a related study, Boak et al. (2016) carried out a longitudinal study on the mental health and well-being of Ontario students from 1991–2015 and found that about 12.5% of Grades

7 to 12 students in Ontario, Canada were addicted to video games. Likewise, Achab et al. (2011) investigated the prevalence rate of massively multiplayer online role-playing games by comparing characteristics of addict versus non-addict online recruited gamers in a French adult population and found that 27.5% of subjects were addicted to video games in France. In another study carried out by Haagsma et al. (2012) among Dutch adolescents and adults aged from 14 to 81 years, the prevalence of video game addiction was found to be 1.3%. Suchá et al. (2019) examined the prevalence of digital game playing among adolescents, aged 11–19 years in the Czech Republic and reported that 36.49% of the respondents were addicted to computer video games.

Festl et al. (2013) investigated problematic game by administering the *Gaming Addiction Short Scale* (GAS) on 580 adolescents, 1866 younger and 1936 older adults, similar to the risk factors for video game addiction. In a related study, Pápay et al. (2013) revealed that 8.2% of secondary school students in Hungary were addicted to video games. In Australia, Porter et al. (2010), reported that 7.6% of the adolescents were problematic gamers. Tejeiro et al. (2012) investigated the psychosocial characteristics of adolescent video game abusers among Spanish adolescents aged between 12 and 17 years and found that 37.3% of the respondents were problem gamers.

In Hong Kong, Wang et al. (2014) administered the GAS to a sample of 920 respondents selected from four secondary schools across different districts in Hong Kong and found the prevalence of gaming addiction to be 13 %. Wittek et al. (2016) investigated the prevalence rates and predictors of video game addiction in a sample of gamers, randomly selected from the National Population Registry of Norway. Findings indicated that there were 1.4 % addicted gamers, 7.3% problem gamers, 3.9% engaged gamers, and 87.4 % normal gamers. Saquib et al. (2017) examined the video game addiction and psychological distress among expatriate adolescents in Saudi Arabia and found out that 16% of the respondents were addicted to video games.

In the African setting, Onyemaka et al. (2017) examined the relationship between undergraduate males' video game addiction and academic performance among 250 male undergraduates selected from a Nigerian private university. The study found that video game addiction had a significant effect on the academic performance of undergraduate students. Similarly,

Miezah et al. (2020) examined the prevalence of video game addiction and some of its correlates among university students in three public universities in Ghana and found that 12.2% of the respondents were addicted to playing video games, while 31.2% of the respondents were addicted to playing video games, when a monothetic approach (i.e., every criterion for video game addiction was met), and a polythetic approach (i.e., half of the criteria for video game addiction were met) were used respectively.

1.3 Correlates of video game addiction

Clearly, there is a growing body of literature on the prevalence of video game addiction among the adolescent population. It is, therefore, not surprising that several studies have been carried out by different scholars to explore the influence of a plethora of independent variables, such as bio-data characteristics, psychosocial factors, home-related factors, school-related factors and a host of others. Of great importance in this regard, is the roles being played by gender, self-esteem, life satisfaction, perceived level of stress, peer influence, academic performance and executive function in the formation of video gaming addiction among adolescents.

Gender is a major characteristic of an individual. Essentially, gender entails the socially constructed and accepted behaviours of men and women in a given society. Gender could also be viewed as the status, roles, responsibilities, duties, advantages, disadvantages, and power being accorded to men and their women counterparts in society. By and large, the influence of gender on the usage of a vast arsenal of technological devices has been the prime focus of many studies in extant literature. To this end, the gender-based evaluation of the phenomenon of video game addiction is saturated with a plethora of mixed findings.

On the one hand, a stream of findings indicated that male adolescents are more addicted to video games than their female counterparts. In other words, there is a significant or meaningful difference in video game addiction among adolescents based on gender (Kweon & Park, 2012; Miezah et al., 2020; Wittek et al., 2016). On the other hand, the findings of some studies indicate that gender has no significant difference on the prevalence of video game addiction (Demirtaş et al., 2015; Rehbein & Mößle, 2013).

Self-esteem is one of the prime or essential needs of humans. In other words, self-esteem is essential for the achievement of personal goals, success, and

social competence among humans, especially among adolescents, who are at the critical stage of identity formation (Sepahi et al., 2015). Given that adolescence is a time in which adolescents experience significant psychosocial changes, self-esteem plays a key role in the way adolescents carry out self-approval or disapproval. In other words, the self-esteem of an adolescent, which could be either positive or negative, is formed based on the mental evaluation of the abstract information related to the entirety of the adolescent's life. Hence, adolescents with a positive self-esteem have a greater likelihood to be better off psycho-socially (Adegunju et al., 2017). Conversely, adolescents with negative self-esteem could manifest greater levels of mental health challenges such as anxiety, depression, suicidal ideation, and video game addiction. For instance, extant findings indicate that video game addiction constitutes a significant challenge to the psychosocial development of adolescents, especially with regards to its related negative self-esteem (Beard & Wickham, 2016; Miezah et al., 2020; Van Rooij et al., 2011).

Life satisfaction is an individual's self-appraisal of his/her past and current living conditions. Life satisfaction, therefore, refers to the prime indicator of an individual's general wellness and positive functioning (Lewis et al., 2011). Life satisfaction plays an integral role in the quality of life, well-being, positive functioning and general mental health of adolescents, especially in view of the importance of the period of adolescence to the development of life satisfaction in an individual. Thus, among the in-school adolescent population, life satisfaction might be related, but not limited to, the extent of satisfaction with self, family, friends, environment and the generality of living. In the field of addiction research, life satisfaction is increasingly being reported to be linked to the prevalence of video gaming addiction (Forrest et al., 2016; Lemmens et al., 2009). Nonetheless, the findings of a longitudinal study carried out by Lemmens et al. (2011) indicated there was no significant relationship between internet game addiction and lower life satisfaction. In a similar manner, Miezah et al. (2020) found that there was no significant relationship between video game addiction and life satisfaction among public university students in Ghana.

Stress is an unavoidable component of human life. Thus, stress is a common phenomenon among adolescents. In other words, adolescents are generally prone to personal, physiological, emotional, and psychosocial reactions to a broad spectrum of stimulus from the environment, which could be internal

or external. Mróz (2015) defined perceived stress as the feelings or thoughts of an individual about the extent of stress they are experiencing at a specific time or over a period of time. Perceived stress is a broad concept that has to do with how a person feels about a stressful situation and how he/she is able to harness coping strategies to handle the stress. Thus, numerous studies indicated a significant relationship between stress and video game addiction (Griffiths et al., 2012; Wenzel et al., 2009).

Adolescence is a transitional period, which is generally characterized by an increased quest for independence among adolescents. Thus, adolescents tend to make more friends among their peers in order to improve their social capital. By so doing, the positive or negative effects of peer pressure become more pronounced or visible among in-school adolescents. In other words, peer pressure is a germane social factor or variable, which could mediate the behavior of in-school adolescents. For instance, in-school adolescents could benefit immensely from the effects of positive peer pressure, especially in terms of improved academic performance, study habits, prosocial behavior, physical activity, social competence, well-being and a host of others. However, the formation of addictive behaviours, such as video gaming addiction has been related to the negative effect of peer pressure (Wang et al., 2014).

Academic performance has played a prime role in the educational community for decades. Resultantly, the outcome of the teaching-learning process, which is generally called academic performance, has been of utmost concern to various stakeholders in the Nigerian educational system for decades (Adegunju et al., 2017; Onivehu et al., 2018; Onivehu & Ohawuiro, 2018; Onivehu, 2020). Given the propensity of Nigerian in-school adolescents, to engage in video game playing as a form of entertainment, relaxation and competition, the academic performance of in-school adolescents might be positively or negatively influenced by video games usage. From a positive perspective, non-excessive playing sessions have a positive influence on the mathematics and reading skills of in-school adolescents (Bowers & Berland, 2013; Blum-Dimaya et al., 2010). Nonetheless, several studies indicated that video game addiction has significant negative effects on the academic performance of adolescents, especially in terms of school attendance, class participation and study habits (Gentile, 2009; Haghbin et al., 2013; Onyemaka et al., 2017; Schmitt & Livingston, 2015). However, the findings of Drummond and Sauer (2014) indicated that increased playing of single player or multiplayer video games had no significant effect on academic performance

of students in science, mathematics and reading in a comprehensive study carried out in twenty-two countries. On the contrary, some findings indicate that video game addiction could cause decreased academic performance among adolescents (Anand, 2007; Gentile, 2009; Skoric et al., 2009).

Executive functioning plays an integral role in adolescent development, especially with regards to self-regulation, socio-emotional development, well-being and academic achievement. Executive function is a broad term for several neurologically-based skills that are essentially involved in mental control and self-regulation. Although, there is no universally accepted definition of executive functions, there is a consensus among scholars that executive functions are a set of related, but distinct, processes that consists of inhibitory control, working memory, and attentional control, which drives purposeful, goal-directed, and problem-solving behaviours (Toplak et al., 2013). Thus, executive functioning is an indispensable buffer against various forms of addictive behavior among adolescents. For instance, executive function could be harnessed by an adolescent to plan and control his or her actions, especially in the video gaming environment. While a significant body of research into the relationship between executive function and video gaming exists, findings appear to be inconclusive and mixed. Across various age cohorts, findings have indicated video gaming contributes positively to the development of executive function (Blumberg et al., 2008; Maillot et al., 2012). Conversely, others have found a decreased level of executive functioning among respondents due to video game playing and addiction (McDermott et al., 2014; Vallett et al., 2013).

1.4 Effects of video gaming addiction

With the invention of video games, a new channel of entertainment and relaxation has emerged. This new channel of entertainment and relaxation has significantly changed the daily lives of many people across the world. In this respect, students, especially in-school adolescents, are generally prone to dedicate a significant part of their time to playing video games for various purposes. Towards this end, the effects of video games among in-school adolescents are generally two-folded. Video games provide gamers with a plethora of benefits. Essentially, a video game is a form of entertainment or relaxation for in-school adolescents. More so, video games playing could lead to improved spatial visualization abilities; increased prosocial behavior; social capital; enhanced creativity; problem-solving skills; and

academic performance (Adachi & Willoughby, 2013; Calado et al., 2014; Green & Bavelier, 2012; Suchá et al., 2019; Utz et al., 2012; Wilms et al., 2013; Zhong, 2011).

Video games, however, could also pose dire risks for in-school adolescents, especially those who are addicted. Essentially, video game addiction causes some significant health issues for adolescents, such as musculoskeletal pains, sleep deprivation, insomnia, poor personal hygiene, sedentary lifestyle (American Psychiatric Association, 2013; Foti et al., 2011; Suchá et al., 2019).Video gaming addiction could also be associated with personality impairments, aggressive behaviours, hyperactivity, learning disorder, anti-social behavior, anxiety, depression, loneliness, social phobia, increased violence or crime incidence, substance abuse, low self-esteem, poor academic achievement, low life satisfaction and a host of others (Hsu et al., 2009; Lemmens et al., 2011; Suchá et al., 2019).

2 Methods

This study adopted the correlational method of descriptive research. The population for the study comprised all in-school adolescents in Ilorin, Kwara State, Nigeria while the target population was all in-school adolescents in public and private senior secondary schools. Simple random sampling technique of fish bow method was used to select the sample, which consists of 850 in-school adolescents. To collect data, the researcher approached selected schools in Ilorin Metropolis, Kwara State, Nigeria. Thereafter, permission was obtained from the principals to conduct the study. The researcher then sought the consent of the respondents to be a part of the study. The confidentiality of elicited responses was assured to the respondents. The instrument used in this study was a self-developed questionnaire which consisted of seven sections (A, B, C, D, E, F, G). Section A elicited students' biographic information (gender, school type, age), pattern of video gaming (years of video gaming, frequency of video gaming, gaming partners, categories of most played games and categories of most used gaming platforms) and academic performance.

Section B consisted of the *Game Addiction Scale*, which is a 21-item scale adapted to measure in-adolescents' degree of addiction to computer and video games. The scale is based on the criteria for pathological gambling found in the DSM-IV. The original scale consists of three items for each of

the following seven criteria: salience, tolerance, mood modification, relapse, withdrawal, conflict, and problems. However, the shortened 7-item version of the scale, which consists of the items with the highest measurement loadings from each of the seven first-order factors were used for the present study. Section B was patterned in a Likert scale format of *very often* (VO) = 5 points, *often* (O) = 4 points, *sometimes* (S) = 3 points, *almost never* (AN) = 2 points, *never* (N) = 1 point. The items included questions such as "how often during the last six months did you think about playing a game all day long?" The scale was evaluated according to the polythetic format as applied in the DSM-4. Hence, respondents who scored 5 points or ticked very often (VO) on at least four of the seven items were considered to be addicted to video games. By so doing, respondents who scored 1–19 points were adjudged to be low on video gaming addiction or non-video gaming addicts, while respondents who scored 20–35 points were classified as high on video gaming addiction or video gaming addicts. This scale is found suitable for this study as it yielded Cronbach Alpha of 0.75.

Section C consisted of the *Satisfaction with Life Scale* (SWLS) adapted from Diener et al. (1985), which is a five-term self-report. The SWLS asks respondents to indicate the extent to which they agree with statements about their life on a 7-point Likert style scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Example item: "In most ways, my life is close to my ideal". The scale is scored by summing scores on each item with the following cut-offs to be used as benchmarks; 31–35, extremely satisfied; 26–30, satisfied; 21–25, slightly satisfied, 20 neutral, 15–19, slightly dissatisfied; 10–14, dissatisfied; and 5–9, extremely dissatisfied. However, for the present study, the possible range of scores is 5–35, with a score 5–20 indicating the respondent is extremely dissatisfied with life, while scores between 21–35 indicate the respondent is extremely satisfied with life. The Cronbach alpha for the scale was .89, indicating that the scale has high internal consistency, thereby indicating a high level of suitability for the present study.

Section D consisted of the *Executive Skills Questionnaire for Students* (ESQS), which was adapted from Dawson and Guare (2010). The original scale, which measures 11 different executive skills consists of 33 items. However, the adapted version that was used for this study consists of 15 items which measure some executive skills, such as response inhibition, emotional control, sustained attention, time management and goal-directed persistence. Example item: "I don't jump to conclusions". Items are rated on a

7-point Likert-scale for a total point value of 105, with a high score indicating weaker executive functioning. For the purpose of this study, respondents who score 15–60 were deemed to have a high level of executive functioning, while respondents who score 61–105 were deemed to have a low level of executive functioning. This scale is found suitable for this study as it yielded Cronbach Alpha of 0.71.

Section E consisted of the *Peer Pressure and Conformity Scale* (Santor et al., 2000). Thus, the peer pressure sub-scale, which consists of 11 items, was adopted for the present study. Example item: "At times, I have broken rules because I have been urged to." Reponses are provided on a five-point Likert scale from *strongly agree* (1) to *strongly disagree* (5). The scale has Cronbach's Alpha coefficient of 0.74, which was deemed to be sufficiently reliable for the present study.

Section F comprised of the *Rosenberg Self-esteem Scale*, which is a 10-item self-report instrument to measure self-esteem. Example item: "On the whole, I am satisfied with myself." The items on the *Rosenberg Self-esteem Scale* are rated on a 4-point Likert scale format of *strongly agree* (SA) = 4 points, *agree* (A) = 3 points, *disagree* (D)= 2 points, *strongly disagree* (SD) = 1 point, with values ranging from 0–30, with 30 indicating the highest score possible. Thus, respondents who score 20–30 points were taken as high self-esteem respondents. On the other hand, respondents who score 1–19 points were deemed to have low self-esteem. This scale is found suitable for this study as it yielded a Cronbach Alpha of 0.82.

To measure the level of perceived stress, Section G consisted of the *Cohen Perceived Stress Scale*, which is a 14-item self-report measuring level of perceived stress among respondents during the past month. Thus, items in Section G were patterned in Likert scale format of *very often* (VO) = 5 points, *fairly often* (FO) = 4 points, *sometimes* (S) = 3 points, *almost never* (AN) = 2 points, *never* (N) = 1 point. Example item: "In the past month, how often have you been upset because of something that happened unexpectedly?" The items on the Cohen Perceived Stress Scale are rated on a 5-point Likert scale with values ranging from 14–70, with 70 indicating the highest score possible. Thus, in the present study, respondents who score 14–42 points had a low level of perceived stress, while respondents who score 43–70 had a high level of perceived stress. A Cronbach's Alpha coefficient of 0.85 was obtained for this study, which was deemed to be

sufficiently reliable. Frequency counts, percentage, correlation analysis and multiple regression were used for the analysis of data.

2.1 Research questions

The present study examined the prevalence and correlates of video game addiction among in-school adolescents in Nigeria. Specifically, the study sought to answer the following research questions: What is the pattern of video gaming among in-school adolescents in Kwara State, Nigeria?; what is the level of video gaming addiction among in-school adolescents in Kwara State, Nigeria?; what is the relationship among academic performance, life satisfaction, self- esteem, peer influence, perceived level of stress and executive function and video gaming addiction among in-school adolescents in Kwara State, Nigeria.

2.2 Research hypothesis

Ho1: There is no significant relationship between academic performance and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

H1: There is a significant relationship between academic performance and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

Ho2: There is no significant relationship between life satisfaction and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

H2: There is a significant relationship between life satisfaction and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

Ho3: There is no significant relationship between self-esteem and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

H3: There is a significant relationship between self-esteem and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

Ho4: There is no significant relationship between peer influence and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

H4: There is a significant relationship between peer influence and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

Ho5: There is no significant relationship between perceived level of stress and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

H5: There is a significant relationship between perceived level of stress and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

Ho6: There is no significant relationship between executive function and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

H6: There is a significant relationship between executive function and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

Ho7: Life satisfaction, self-esteem, peer influence, perceived level of stress and executive function cannot be used to predict video gaming addiction of in-school adolescents in Kwara State, Nigeria.

3 Results

Table 1

Demographic distribution of respondents by gender, class and age

Variables	Frequency	Percentage (%)
Gender		
Male	435	51.18
Female	415	48.82
Total	**850**	**100.0**
School Type		
Public School	472	55.53
Private School	378	44.47
Total	**850**	**100.0**
Class		
SS1	385	45.29
SS2	252	29.65
SS3	213	25.06
Total	**850**	**100.0**
Age		
Less than 15 years	398	46.82
15 years and above	452	53.18
Total	**850**	**100.0**

Table 1 shows respondents' gender, out of 850 respondents that were sampled, 435 (51.18%) of the respondents were males while 415 (48.82%) were females. Thus, male in-school adolescents and their female counterparts were fairly equally represented in the study. This finding could be attributed to the importance attached to the education of male and female children in secondary schools by parents and other caregivers in the metropolitan city of Ilorin, Kwara State, Nigeria, which is a city renowned for the availability of government-owned or public secondary schools. Furthermore, this fair gender representation of students in the present study could be as a result of the fact that the present study covered public and private secondary schools, which provide education for students of mixed gender. In other words, the study covered secondary schools that admit male and female students. However, it should be noted that some public and private secondary schools in Kwara State, Nigeria are designed to cater for the educational needs of a single sex of students. For instance, some government-owned or private secondary schools in Kwara State are for boys only or girls only.

Table 1 also indicates that 472 (55.53%) of the respondents are public school students while 378 (44.47%) of the respondents were private school students. Given that public secondary school education is highly subsidized by the Nigerian government, it is possible that parents and caregivers would give their in-school adolescents more opportunity to attend public secondary schools due to the fact that the school fees is generally more affordable than what is obtainable in private secondary schools.

With regards to the class representation of the respondents, Table 1 also shows that 385 (45.29%) of the respondents are Senior Secondary School 1 students; 252 (29.65%) of the respondents are Senior Secondary School 2 students while 213 (25.06%) of the respondents are Senior Secondary School 3 students. In the Nigerian educational system, Senior Secondary School 1 is the lowest level of the senior secondary school, which is often meant for students, who have passed the Basic School Certificate Examination (BECE). Hence, it is not surprising that most of the respondents were SS1 students.

In a like manner, SSS1 students who have passed and met the prescribed requirements at the SSS1 level get promoted to SSS2 and SSS3, respectively. Hence, the in-school adolescents in SSS2 and their counterparts in SSS3 are generally given more priority and responsibility in Nigerian secondary

schools. For instance, most of the school prefects, school assembly coordinators, intramural sports girls and boys, clubs and societies leaders in Nigerian secondary schools belong to the SSS2 and SSS3 classes. On the whole, it is deducible from Table 1 that SSS2 and SSS3 students also participated fairly in the study, with more respondents belonging to the Senior Secondary School 2 class.

Age wise, 398 (46.82%) of the respondents are less than 15 years old while 452 (53.18%) of the respondents are 15 years and above old. This finding might be attributed to the accelerated development of in-school adolescents and the propensity of some Nigerian parents to facilitate the educational progress of their children or wards, irrespective of age differences. In like manner, prior academic performance is given priority over age in the promotion of a student from one academic class to another in Nigerian secondary schools, and as such it is possible that the age distribution of students could vary from academic class to academic class.

3.1 Research question one: What is the pattern of video gaming among in-school adolescents in Kwara State, Nigeria?

Table 2 indicates respondents' video gaming pattern. Hence, 321 (37.77%) out of 850 respondents that were sampled, had played video games for 1–5 years, while 529 (62.33%) of the respondents have played video games for more than 5 years. This finding indicates that a sizeable percentage of in-school adolescents in Kwara State, Nigeria have been playing video games from the period of childhood. In a like manner, some of the in-school adolescents that have been playing video games for the past five years might have acquired some mobile devices, such as Smartphones, Tablet Pcs and Laptops in recent times.

Table 2 also shows that 409 (48.11%) of the respondents played video games for 5 or more times a week, 210 (24.71%) of the respondents have played video games for 1–4 times a week, while 231 (27.18%) of the respondents played video games once a month. Given that Nigerian in-school adolescents stay in school for about 8 hours on weekdays, it is possible that a significant part of the remaining 16 hours is used for playing video games. Similarly, the gaming time of in-school adolescents might increase in the weekends, outside the structured and controlled environment of the school.

Table 2

Demographic distribution of respondents by pattern of video gaming

Variables	Frequency	Percentage (%)
Years of Video Gaming		
1–5 years	321	37.77
More than 5 years	529	62.23
Total	**850**	**100.0**
Frequency of Video Gaming		
5 or more times a week	409	48.11
1–4 times a week	210	24.71
Once a month	231	27.18
Total	**850**	**100.0**
Gaming Partners		
Siblings	123	14.47
Friends	356	41.88
Solo Play	298	35.06
Others	73	8.59
Total	**850**	**100.0**
Categories of Most Played Games		
Sports	103	12.12
Action/Adventure	71	8.35
Puzzle	26	3.06
Fighting Games	109	12.82
First-Person Shooters	65	7.65
Strategy	48	5.65
Educational Games	58	6.82
Music/Party	30	3.53
Online	119	14.0
Others	221	26.0
Total	**850**	**100.0**
Categories of Games Platforms Used		
Mobile Phones	385	45.29
Desktop/Laptop computer	112	13.18
Tablet Pc	97	11.41
Gaming console (PSP, Xbox, PS4)	206	24.24
Others	50	5.88
Total	850	100.0

With regards to the gaming partners of the respondents, 123 (14.47%) of the respondents played video games with siblings, 356(41.88%) of the respondents played video games with friends, while 73 (8.59%) of the respondents played video games with others forms of partners. These findings show that in-school adolescents tend to engage in gaming with other people, which includes their family members and peers. However, some in-school adolescents might also play video games with other people in a broad spectrum of gaming shops that are available in the locality of the respondents.

Furthermore, Table 2 showed the categories of most played games among in-school adolescents in Kwara State, Nigeria. Thus, 103 (18.0%) of the respondents played sports games, 71(8.35%) of the respondents played action/adventure games, 26 (3.06%) played puzzle games, 109 (12.82%) played fighting games, 65 (7.65%) played first-person shooters, 48 (5.65% played strategy games, 58 (6.82%) educational games, 30 (3.53%) played music/party games, 119 (14.0%) played online games, while 221 (26.0%) played other forms of games.

In relation to the gaming platforms utilized by in-school adolescents in Kwara State, Nigeria, 385 (45.29%) of the respondents played video games on mobile phones, 112 (13.18%) played video games on desktop/laptop computer, 97 (11.41%) played video games on Tablet Pc, 206 (24.24%) played video games on a gaming console (PSP, Xbox, PS4), while 50 (5.88%) played video games on other forms of platforms.

3.2 Research question two: What is the level of video gaming addiction among in-school adolescents in Kwara State, Nigeria

Table 3

Distribution of respondents by levels of video gaming addiction

Levels of Video Gaming Addiction	Frequency	Percentage (%)
High	115	13.53
Low	735	86.47
Total	850	**100.0**

Table 3 shows that 115 (13.53%) of the respondents rated themselves within the high level of video gaming addiction while 735 (86.47%) of the respondents had low levels of video gaming addiction. This implies that about

13.53% of the respondents answered four or more of the seven items that measured video gaming addiction positively. In other words, approximately every 14th in-school adolescent in Kwara State, Nigeria is prone to the negative effects of video gaming addictions.

By implication, these are in-school adolescents who might think about playing a video game all day long, spend increasing amounts of time on video games, play video games to forget about real life, have made unsuccessful attempts to reduce the use of video games, have felt bad when they were unable to play video games, have had fights with family, friends and significant others over excessive video game playing, and have neglected other important activities, such as school, work, sports to play games. Given that video gaming addiction is a more subtle or invisible form of addiction, especially in relation to other forms of addiction, such as pathological gambling and substance addiction, it is possible that the in-school adolescents, parents, teachers and significant others in the environment of the respondents might not even be aware of the addictive implications of video games.

In a similar vein, this finding could be attributed to the fact that some of the respondents could be latch-key kids, who spent a significant part of the daytime on weekdays alone at home, without appropriate parental supervision. Hence, such in-school adolescents have a higher tendency to play video games as a form of relaxation or entertainment while their parents are at work. Given the propensity of adolescents to engage in risky behaviours in a group, some of the in-school adolescents who are addicted to video games, might be motivated to engage in excessive playing of video gaming by some of their peers in the school and the home environment. Many in-school adolescents in Nigeria have social media accounts and access the internet for various purposes. Thus, the reported level of video gaming addiction among the respondents might be attributed to accessibility of various video games on social media and the Internet.

3.3 Research question three: What is the relationship among, academic performance, life satisfaction, self-esteem, peer influence, perceived stress and executive function and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria?

Table 4

Pearson correlation matrix for the relationship among academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress,

executive function and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria

	1	2	3	4	5	6
Video gaming addiction	1					
Academic performance	.54**	1				
Life satisfaction	.35**	.53**	1			
Self-esteem	-45**	-.13**	- .38**	1		
Peer influence	.52**	.47**	.17**	.59**	1	
Perceived stress	-.38**	-.28**	-.33**	-.25**	-.34**	1
Executive function	. 41**	.32**	.51**	.33**	.29**	.32**

** = *Significance at p < 0.01*

Table 4 indicates the relationships among academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function and the risk of video gaming addiction among in-school adolescents in Kwara State, Nigeria. There was a significant positive correlation between video gaming addiction and some of the predictor variables (academic performance, life satisfaction, peer influence and executive function). However, self-esteem and perceived stress were negatively correlated with video gaming addiction. The interpretation for this is that if self-esteem and perceived stress increases, there is a corresponding decrease in the level of video gaming addiction among in-school adolescents in Kwara State, Nigeria. Therefore, it is possible that in-school adolescents have a high level of self-esteem, hence they deem it fit to stay focused in their academic pursuit rather than engaging in excessive and uncontrolled playing of video games. In a similar vein, it is possible that in-school adolescents in Kwara State, Nigeria tend to cope with higher levels of perceived stress by leveraging the social support of family members, peers, teachers, school counselors, engaging in religious activities, participating in others forms of relaxation that are not based on video games, such as watching movies, listening to music, sports and a host of others More so, all of the correlations are statistically significant at a 0.01 significance level.

3.4 Hypothesis testing

Table 5

Regression analysis showing relationship among gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress, executive function and video gaming addiction among in-school adolescents in Kwara State, Nigeria

Model	Sum of squares	df	Mean squares	Calculated F-value	Sig	Decision
Regression	2456.193	7	2715.64			
Residual	1413.743	842	316.18	57.13*	0.000	Rejected
Total	3869.93	849				

a. Critical level of sig = 0.05

b. Independent variables: gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function

c. Dependent variable: Video gaming addiction

Table 5 indicates that the calculated F-value is 57.13 with significant probability value of 0.000 which is less than the alpha value of 0.05. Since the probability value is lesser than the alpha value, the null hypothesis was rejected. Thus, gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function can predict video gaming addiction among in-school adolescents in Kwara State, Nigeria. To examine the contributions of the independent variables (gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function) to the model (video gaming addiction), R-square was computed, and the output reveals thus:

Table 6

Model summary showing the contributions of gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function to the video gaming addiction of in-school adolescents in Kwara State, Nigeria

Model	R	R square	Adjusted R square	Std Error of the Estimate
1	0.623	0.421	0.290	0.750

Table 6 revealed that the independent variables (gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function) jointly contributed a coefficient of multiple regression of 0.623 and a squared multiple correlation of 0.421. Implicit in this result is the fact that, the seven predictor variables (gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function) accounted for 42.1% variation the level of video gaming addiction among in-school adolescents in Kwara State, Nigeria, which is highly significant as also indicated by the F-value (57.13). In order to examine the contributions of each of the independent variables, Beta weight and t-values were computed and output is illustrated below:

Table 7

Contributions of the independent variables on the dependent variable

Model	Unstandardized Coefficients		Standardized Coefficients	t-value	Sig.
	B	Std. Error	Beta		
(Constant)	17.350	.312		32.031	.000
Gender	3.227	.814	.392	4.420	.000
Academic Performance	1.816	.945	.405	5.022	.000
Life Satisfaction	.371	.045	.347	3.285	.000
Self-Esteem	-.093	.531	-.361	-2.034	.006
Peer Influence	.067	.674	.450	5.395	.000
Perceived Level of Stress	-.196	.018	-.121	-1.374	.021
Executive Function	.391	.640	.356	3.634	.000

Table 7 shows the contributions of each independent variable (gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function) to video gaming addiction. The results of the relative contributions of the independent variables to the prediction of in-school adolescents' video gaming addiction was that peer influence accounted for the largest amount of unique variance in in-school adolescents' video gaming addiction (β = .450, t = 5.395, p < .001), while academic performance made the next largest contribution to the prediction of the dependent variable (β = .405, t = 5.022, p < .001). Gender (β = .392, t = 4.420, p < .001) also made a positive contribution to the prediction of video gaming addiction.

Executive function made the next positive contribution (β =.356, t = 3.634, p<.001) to the prediction of dependent measure. Life satisfaction made the next positive contribution *(*β =.347, t = 3.285, p < .001) to the prediction of dependent measure. Nonetheless, self-esteem made a negative contribution to the prediction of the model (β =-.361, t = -2.034, p = .006), while perceived level of stress accounted for the least amount of unique variance in prediction of the dependent measure (β =-.121, t = -1.374, p = .021). This indicates that peer influence contributed the highest t-value of 5.395, while perceived level of stress contributed the lowest t-value of -1.374. Thus, this implies that peer influence is the strongest predictor of video gaming addiction among in-school adolescents in Kwara State, Nigeria.

4 Discussion

Video gaming addiction is a contemporary mental health challenge that has been widely studied in various climes by different researchers. Nonetheless, there is a dearth of related studies on the prevalence and correlates of video gaming addiction among Nigerian in-school adolescents. Towards this end, the present study examined the prevalence and correlates of video gaming addiction among in-school adolescents in Kwara State, Nigeria. Based on the research questions answered and hypothesis tested, it was revealed that 13.53% of the respondents were addicted to video games.

The prevalence of video gaming addiction could be attributed to the availability of various mobile devices and other gaming platforms in the locality of in-school adolescents in Kwara State, Nigeria. Similarly, Nigerian in-school adolescents also have access to gaming consoles and sites in various commercial gaming shops that charge various fees from gamers. In a like manner, this finding might be attributed to the pervasiveness of online games on the internet and social media among Nigerian in-school adolescents. In any case, this finding concretizes extant findings on the prevalence of video gaming addiction among the adolescent population (Achab et al., 2011; Miezah et al., 2020; Saquib et al., 2017; Suchá et al., 2019; Wang et al., 2014).

The results displayed in Table 6 showed that 42.1% of the variance in in-school adolescents' video gaming addiction was accounted for by the predictor variables (gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function) taken together. Thus, the predictor variables, when taken together, predicted

to some extent, video gaming addiction among the respondents. In other words, the strength of the predictive power of the combined independent variables (gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function) on the dependent variable (video gaming addiction) was strong and significant to indicate the linear relationship between the seven predictor variables and the total variance in in-school adolescents' video gaming addiction.

In relation to contribution of each of the independent variables to the explanation of variance in in-school adolescents' video gaming addiction, Table 7 revealed that all the seven independent variables made a statistically significant contribution to the variance in in-school adolescents' video gaming addiction. However, peer influence was the best predictor of video gaming addiction, while the perceived level of stress was the weakest predictor of video gaming addiction among in-school adolescents in Kwara State, Nigeria. By implication, the level of video gaming addiction among Nigerian in-school adolescents would increase in tandem with an increase in the level or extent of peer influence (Wang et al., 2014). In other words, Nigerian in-school adolescents who are easily influenced by their peers tend to engage in excessive and uncontrolled sessions of video gaming within and outside the school environment.

It is pertinent to note that, academic performance also made a significant contribution, to the prediction of video gaming addiction among Nigerian in-school adolescents. Thus, it is possible that in-school adolescents, who are addicted to video games, might not dedicate adequate time and efforts, to effectively participate in various academic activities, such as attendance of regular school classes or extra-mural lessons, personal study, completion of assignments and a host of others. This result is consistent with previous findings (Onyemaka et al., 2017; Schmitt & Livingston, 2015). Nonetheless, this finding is at variance with that of Drummond and Sauer (2014), who found no significant effect of increased playing of single player or multiplayer video games on academic performance of students in science, mathematics and reading in a comprehensive study carried out in twenty-two countries. The discrepancy in these findings could be attributed to the differences in the socio-cultural profiles of the respondents, as well as the benchmark used for measuring academic performance in the various studies.

The results also indicated that gender made a positive contribution to the level of video game addiction among Nigerian in-school adolescents. It is plausible that this finding is as a result of the gender roles that are attached to being male or female in Nigerian society. For instance, male in-school adolescents in Nigeria are characterized by independent living, while their female counterparts are protected with more direction, rules and supervision by parents, elders, family members, teachers, school administrators, religious institutions and the generality of the society. Hence, male in-school adolescents in Nigeria might play more video games in commercial video gaming shops, cybercafés, and even on mobile devices or personal gaming consoles than females, and therefore face higher levels of video gaming addiction. This result is in line with extant findings (Miezah et al., 2020; Suchá et al., 2019; Wittek et al., 2016). Conversely, this finding contradicts that of some studies, which found that gender had no significant difference on the prevalence of video game addiction (Demirtaş et al., 2015; Rehbein & Mößle, 2013).

The findings in Table 7 further show that there was a significant relationship between executive function and the level of video gaming addiction among Nigerian in-school adolescents. This finding corroborates findings of some studies in extant literature which indicates that there is a relationship between executive functioning and video game playing and addiction (McDermott et al., 2014; Vallett et al., 2013). Thus, it is expected that Nigerian in-school adolescents, who are addicted to video games might not make a judicious use of cognitive resources, such as executive functioning to regulate their behavior in the gaming environment. Nonetheless, moderate and appropriate usage of video games could also develop the executive functioning of Nigerian in-school adolescents (Blumberg et al., 2008; Maillot et al., 2012).

Table 7 also indicates that life satisfaction had a significant positive relationship with the level of video gaming addiction among Nigerian in-school adolescents. These results are consistent with previous findings (Forrest et al., 2016; Lemmens et al., 2009). Nevertheless, this finding is at variance with the finding of Miezah et al. (2020), which found no significant relationship between video game addiction and life satisfaction among public university students in Ghana. The differences in these findings could be attributed to the differences in the demographic and academic profiles of the respondents.

As it is shown also in Table 7, self-esteem made negative contribution to the prediction of the level of video gaming addiction among in-school adolescents in Kwara State, Nigeria. In support of this finding, a plethora of studies have found a negative relationship between self-esteem and video gaming addiction (Beard & Wickham, 2016; Miezah et al., 2020; Van Rooij et al., 2011).

As Table 7 shows, there was a negative relationship between perceived level of stress and video gaming addiction among in-school adolescents in Kwara State, Nigeria. Thus, the level of video gaming addiction among Nigerian in-school adolescents tends to increase as the perceived level of stress decreases. This finding could be as a result of the fact that some in-school adolescents who use video games to escape from stressful life situations, might become addicted to video gaming (Griffiths et al., 2012; Wenzel et al., 2009).

4.1 Implications of findings for prevention and treatment of video gaming addiction

This study has revealed that video gaming is a common behavior among in-school adolescents in Nigeria, video gaming addiction is a prevalent mental health challenge among Nigerian in-school adolescents, and gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function are robust predictors of video gaming addiction among in-school adolescents in Nigeria. Since the prevalence of video gaming addiction among Nigerian in-school adolescents was found to be 13.5%, it shows that more emphasis should be placed on preventing the menace of video gaming addiction among the adolescent population in Nigerian secondary schools. In a like manner, it is germane for stakeholders in the Nigerian educational system to make concerted efforts towards the treatment of video gaming addiction among in-school adolescents.

Therefore, the prevention of video gaming addiction among Nigerian adolescents could be achieved through the use of abstinence-based contingency management programmes. In other words, a system of rewards and punishments could be used by parents, teachers and school administrators to make a video gaming addiction-free lifestyle more rewarding than addictive lifestyle for in-school adolescents in Nigeria. Another possible approach to the prevention of video gaming addiction among Nigerian in-school adolescents is the use of cognitive-behavioural relapse prevention strategies to enable in-school adolescents to deal with the underlying causes

of video gaming addiction. Information campaign, social norms marketing and advocacy on mass/social media could also be leveraged to raise the level of awareness of video gaming addiction, especially with the intent of motivating in-school adolescents to avoid high risk video gaming.

Given that video gaming addiction, is a novel form of addiction in the Nigerian educational system, it is germane for decision makers in the ministry of education, as well as owners of private secondary schools to provide capacity building training on video gaming addiction for in-service and prospective teachers and other school personnel who work with in-school adolescents in Nigeria. Therapy and counseling could also be used to boost the coping skills as well as to facilitate the effective use of executive function to regulate video gaming behavior. Given that peer influence was the best predictor of video gaming addiction among Nigerian in-school adolescents, there is an urgent need for parents, teachers, school administrators and other stakeholders in the Nigerian educational system to strengthen the social support network of in-school adolescents in Nigeria. This could be achieved through the provision of effective and vibrant team-based extracurricular activities such as sports, clubs and societies, as well the utilization of group-based learning methods and assessment practices. By so doing, Nigerian in-school adolescents would be more motivated to reduce their video gaming time.

For the treatment of video gaming addiction among Nigerian in-school adolescents, there is a need for psychologists, counselors and other mental health professionals to employ a broad spectrum of psychotherapies, counseling techniques. At the family level, more emphasis could be placed on the role of family, siblings and peers in motivating in-school adolescents with pathological video gaming to get into treatment and stay in treatment. To this end, a family or community-based approach could play a great role in the treatment of video gaming addiction among Nigerian in-school adolescents.

5 Conclusion

Based on the data collected, analyzed and interpreted, it is the submission of the researcher that video gaming addiction is prevalent among Nigerian in-school adolescents. It is also concluded that gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function are significant predictors of video gaming addiction among in-school adolescents in Nigeria.

5.1 Recommendations

Based on the findings of this study, it is recommended that:

1. School psychologists, guidance counselors, parents, teachers, and school administrators should provide assistance to Nigerian in-school adolescents in all areas of self-regulation, prevention and treatment of video gaming addiction.
2. The school administrators and teachers should leverage the forum of the Parents Teachers Association (PTA) meetings to give in-depth talks on the causes, consequences, correlates and prevention of video gaming addiction among Nigerian in-school adolescents. This would enable, parents, teachers, school administrators and significant others to know or modify various misconceptions about video gaming addiction and thus advise their children/wards on how to deal with menace of video gaming addiction.

5.2 Limitations of the study

1. The results of this study should be considered with several limitations. This study covered a relatively small sample of in-school adolescents in a Nigerian state. It is therefore imperative for future studies to cover a larger sample across states in all the geo-political zones of Nigeria, so as to provide a more accurate estimation of the association of the outcome variable with other predictors in the model.
2. Given that self-report measures were adopted for the study, it is plausible that a certain degree of bias is introduced by the respondents. Thus, future studies could employ the use of robust methods in order to provide more detailed information on the dynamics of video gaming addiction among Nigerian in-school adolescents.
3. This study was cross-sectional in nature, thereby limiting the ability of the researcher to carry out a detail study of video gaming addiction among Nigerian in-school adolescents for a long period of time. To remedy this limitation, future studies should consider studying the prevalence and correlates of video gaming addiction among Nigerian in-school adolescents in a longitudinal manner. More so, the focus of future studies should be tailored towards adolescents in other settings apart from the school.

4. Extant literature had indicated a broad spectrum of variables that could mediate the development of video gaming addiction among in-school adolescents. However, the present study focused on the role being played by gender, academic performance, life satisfaction, self-esteem, peer influence, perceived level of stress and executive function in the formation of video gaming addiction among Nigerian in-school adolescents. It is therefore germane for future studies to focus on other correlates or predictors of video gaming addiction, such as personality, depression, loneliness, social competence, internet addiction, substance abuse, sleep quality, subjective well-being, emotional intelligence, self-regulation strategies and a host of others.

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Výskyt a korelace závislosti na videohrách mezi nigerijskými školu navštěvujícími adolescenty

Abstrakt: Hraní video her se stalo populárním fenoménem mezi školu navštěvujícími adolescenty po celém světě, především z důvodu rychlého rozvoje herního průmyslu v 21. století. Proto má tato populace přístup k širokému spektru videoher s rozdílným potenciálem a možnostmi pro maximální hráčský zážitek. Na jedné straně mohou videohry přinést adolescentům jisté výhody, na straně druhé s sebou nesou i nebezpečí. Závislost na videohrách se dostala do popředí zájmu veřejnosti i aktérů v rámci nigerijského vzdělávacího systému. Tato studie má za cíl prozkoumat výskyt a korelace závislosti na videohrách mezi školu navštěvujícími adolescenty, kteří byli náhodně vybráni ze státních a soukromých škol ve státě Kwara (Nigerie). Studie se zúčastnilo 850 adolescentů z 20 středních škol. Nezávislé proměnné (gender, akademický výkon, životní spokojenost, sebevědomí, vliv vrstevníků, vnímaná hladina stresu a kognitivní exekutivní funkce) byly zachyceny pomocí standardizovaných škál. Nezávislá proměnná (závislost na videohrách) byla zkoumána pomocí *Game Addiction Scale*. Data byla zpracována do podoby absolutních a relativních četností, dále byla provedena korelační a regresní analýza. Výsledky studie ukazují, že většina

respondentů (74%) hraje online i offline videohry. 13,5% respondentů spadají do kategorie závislých na videohrách. Závislost na videohrách významně koreluje s vlivem vrstevníků, genderem, akademickým výkonem, kognitivními exekutivními funkcemi a životní spokojeností. Na základě těchto zjištění lze doporučit využití preventivních opatření proti vzniku závislosti na videohrách a s ní souvisejícími jevy mezi nigerijskými adolescenty.

Klíčová slova: závislost na videohrách, školu navštěvující adolescenti, výskyt, koreace