

How to Cite:

Victor-Aigbodion, V. (2022). Gambling behavior and violent game engagement and their association with Cannabis substance abuse among in-school adolescents. *International Journal of Health Sciences*, 6(S1), 809-821. <https://doi.org/10.53730/ijhs.v6nS1.4833>

Gambling Behavior and Violent Game Engagement and their Association with Cannabis Substance Abuse among In-School Adolescents

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Abstract--There are public health issues related to gambling, violent video game participation, and substance abuse among adolescents in Nigeria. The current state of knowledge regarding the prevalence and association of these high rising maladaptive behaviors among adolescents in Nigeria is insufficient, as results from recent studies (e.g. Ede et al., 2021) have demonstrated. Therefore, it is imperative to investigate the incidence of gambling behavior and violent games engagement among adolescents in Nigeria and their association with Cannabis substance abuse. The study involved a cross-sectional analysis of survey data from 1300 in-school adolescents in Enugu state, Nigeria. Participants completed the South Oaks Gambling Screen (SOGS), Game Engagement Questionnaire (GEQ), and Cannabis Use Disorder Identification Test-Revised (CUDIT-R). The results revealed that gambling behavior and violent games engagement are common among the in-school adolescents. Additionally, the hierarchical multiple regression analysis showed a positive and significant relationship between gambling behavior and violent game engagement and cannabis use. In summary, the research suggests that a substantial amount of in-school adolescents engage in gambling and violent games, and it could be linked to cannabis abuse. It is important for non-clinical and clinical practitioners to recognize that gambling, violent games engagement, and Cannabis use are associated among adolescents, and therefore, propose possible interventions to this population.

Keywords--cannabis substance abuse, gambling behavior, violent game engagement.

Introduction

Adolescence commences with the onset of biological, hormonal, and physical changes associated with puberty and ends at adulthood, the stage at which an individual attains a stable, independent role in society. [Taylor et al. \(2013\)](#), claims that adolescence differs from adult behavior in significant ways owing to the biological and social factors defining the transition to adulthood, such as rapid development, physical growth, family and social functions. As a result of adolescents' risky behaviors, their health and well-being are consistently at risk. It has been noted by [Tymula et al. \(2012\)](#), that adolescents are just as averse to clearly stated risks as adults, however the higher level of risk-taking observed in adolescents suggests they are more willing to tolerate the unknown. In other words, adolescents are more willing to accept ambiguous conditions, i.e., situations in which the chances of winning or losing are uncertain ([Tymula et al., 2012](#)). As a result, adolescents engage in more risk-taking than adults, with a varying magnitude of age differences in risk-taking behavior ([Balocchini et al., 2013](#)). Generally speaking, adolescents and young adults are more likely than adults to binge drink, engage in substance abuse, gamble, have casual sex partners, engage in violent and criminal behaviors, and have fatal or serious accidents ([Tymula et al., 2012](#); [Balocchini et al., 2013](#); [Martins et al., 2014](#)).

Gambling behavior, violent video game engagement, and substance abuse are among the risky behaviors associated with adolescence that have attracted public health concerns due to their increasing prevalence and associated health challenges. One study found that among urban high school students ([Wickwire et al., 2010](#)), given 50 gambling outcome expectations, 14.6% showed at-risk behavior while 12.7% displayed problem gambling behavior ([Wickwire et al., 2010](#)). Identical cases have been recorded in Italy ([Bozzato et al., 2020](#)), Uganda ([Anyanwu et al., 2018](#)) and Nigeria ([Eboh, 2015](#)). In a study conducted among secondary school students in Owerri, Imo State, Nigeria, it was observed that despite the majority of the respondents (82.8%) viewing gambling as a risky activity, 27.3% viewed it as a good way of earning money quickly, and more than half (52.7%) believed that gambling offers a high return ([Aguocha et al., 2019](#)). It may have been due to this positive attitude towards gambling that its prevalence in Nigeria has continued to rise among adolescents.

Gambling behavior among adolescents is closely related to substance abuse. The number of adolescents abusing substances is on the rise. A recent review found Ghana, South Africa, and Nigeria are among the countries with high cannabis/marijuana use among adolescents in Africa with a prevalence of over 20% and an initiation age of 11 years ([Bulut & Usman, 2020](#)). A similar picture was reported in Europe, with higher lifetime prevalence rates reported in the Czech Republic and Spain, with French students being most likely to use the drug in 2016. There was also mention in the report that North America has continued to be home to cannabis/marijuana use, followed by Canada, while in South America, illicit drug abuse is high among Chilean and Uruguayan youth ([Bulut & Usman, 2020](#)).

In addition to gambling and substance abuse, violent video games are becoming increasingly popular among adolescents. The technological advances in video

game design have made them more appealing to today's adolescents in terms of features and affordances, as well as violent content. Adolescents consume unjustifiably large quantities of violent video games content, much like those who gamble and abuse substances. Based on a study involving 607 8th- and 9th-graders in the US, [Gentile et al. \(2004\)](#), found that the average amount of 8th- and 9th-grade students' video gaming time was 9 hours per week. The study also found that 59% of 8th and 9th-graders reported playing video games at least once a week. According to the survey, 62% of the games named as being their top three favorites had some violence on a 7-point scale, and 37% had violence at or above the midpoint. Among high-school students aged between 13 to 18 years in Wuxi and Wuhu, Jiangsu and Anhui Provinces in Northeast China, [Lam et al. \(2013\)](#), found that 486 (41.2 %) reported spending less than one hour per day playing online games, 342 (29.2 %) one to two hours, and 250 (21.5 %) three hours or more per day. Of those who played online games, 222 (26.0 %) reported that they primarily played combat and war games. A total of 187 (15.3%) respondents considered these online games to be moderately to severely violent.

According to the foregoing, it is evident that adolescents are increasingly engaging in gambling, substance abuse, and violent games, as well as acting positively towards them. The problem is that these risky behaviors are not being addressed in consideration of the growing evidence of health and social challenges they pose. Violence in video games, for example, is associated with higher levels of aggression over time compared to non-violent play ([Willoughby et al., 2012](#)); and with physiological desensitization to real-life violence ([Carnagey, 2007](#)). In addition, students who have been exposed to violent online games are nearly four times as likely to bully others or twice as likely to become bullied themselves (Lam et al., 2013). Adolescents who use cannabis have been associated with early casual sex, alcohol use, and bullying/victimizing behaviors ([Siziya et al., 2013](#)), and those who use heroin or morphine drugs are more likely to become aggressive ([Fauziah et al., 2012](#)). With regard to gambling, [Alimi et al. \(2020\)](#), argues that online gambling has eroded students' study time, increased their stress level through anxiety, and ultimately affected their grade point average.

Consequently, it is crucial to closely monitor the trend of gambling behavior, violent game engagement and substance abuse among adolescents, especially in developing countries like Nigeria. This would play a pivotal role in assisting in the development of an effective management plan to curb these risky behaviors among adolescents in Nigeria and to add fervor to existing efforts to curb them. This study will examine the prevalence of gambling behavior and violent game engagement among adolescents in Nigeria. In addition, it would examine the relationships between gambling behavior, violent game engagement, and cannabis abuse.

Adolescent gambling, violent video games play, and substance abuse in Nigeria

Gambling Behavior

In order to generate tax revenue, the Nigerian government did legalize certain forms of gambling in chapter 22 of the Criminal Code Act, section 236 ([Federal Government of Nigeria, 2005](#)). Under the National Lottery Act 2005, the National

Lottery Regulatory Commission regulates gambling activities in Nigeria (National Lottery Trust Fund, 2005). There is no regulation of online gambling, which is undoubtedly the most popular form and platform for gambling among adolescents in Nigeria (Oyebisi et al., 2012), regardless of the distinction between games of skill (which are legal) and games of chance (which are illegal) (Aguocha & George, 2021). Bankole (2019), noted that among Nigerian youths, sports betting (football, table tennis, basketball) on BetNaija, NairaBet, MerryBet, SureBet as well as lotteries which include lotto are the most popular forms of gambling. In Nigeria, scholars have tried to identify some physiological, psychological, and social influences on adolescents' gambling behavior. Bankole (2019), found that gambling behavior is positively correlated with being male, young (age 18-24) and depressed. Likewise, Bankole noted that financial burdens can moderate attitudes towards gambling. Nevertheless, Eboh (2015), contends that some high-income adolescent gamblers are driven by greed due to their financial background. Ayandele & Aramide (2020), found that conscientiousness, openness, extroversion, agreeableness, and neuroticism jointly predicted attitudes toward sports betting, but only extroversion independently predicted gambling behavior. In Nigeria, adolescents' attitudes toward gambling seem to be controversial. While Ayandele & Aramide (2020), claim that young Nigerians have slightly negative attitudes toward gambling (sports betting), Aguocha et al. (2019), state that most young people view gambling as an important way to earn money quickly and equally believe that gambling yields a high return on investment. The Nigerian youth gambling statistics published by Eboh (2015), indicate that 67.5% of Nigerian youth gamble, 40% of whom gamble at least once a week, and 40% of whom report experiencing happiness while playing games despite efforts to minimize this behavior.

Violent video games engagement

The Nigerian video games industry is growing steadily despite being relatively new. In 2018, the market was valued at 67 million U.S. dollars, but it is expected to rise to 176 million U.S. dollars by 2023 (Clement, 2021). A contributing factor to the expansion of the video game industry in Nigeria may be the technological boom, with devices like smartphones becoming an integral part of everyday life. This, along with increasingly user-friendly data plans, has made mobiles the most dominant gaming device in Nigeria (Vanguard, 2020). Despite the fact that studies on violent games in Nigeria are still in their infancy, those that have been conducted have focused primarily on possible associated violent behaviors developed by adolescents who engage in violent games constantly. According to recent studies, exposure to violent games and media content contributes significantly to aggressive behavior among Nigerian in-school adolescents (Eseadi et al., 2019; Nwajiuba et al., 2019). As a response to violent games play, adolescents may develop aggressive behavior depending on a wide range of factors, including family circumstance, age, and parental mediation (Anyaeibunam et al., 2019; Ojewola, 2014). The results of a study showed that moderation measures adopted by parents were usually effective at diminishing the effects of violence exposure over time (Okika & Nwakasi, 2016). It is unfortunate that parental censure is not as strong as it could be, as less than a third of parents are aware of the violent video game screen-time of their children and only a few observed certain effects of such screen-time, including hostility

and aggression, violent gestures, profanity and swearing, hateful catch phrases used by game characters, poor academic performance as well as mimicking weapon sounds (Okika & Nwakasi, 2016). As a result, the potential health risks and social repercussions of adolescents' participation in violent games have become a source of concern among scholars.

Substance abuse

A number of studies have examined substance abuse in young people and adolescents in Nigeria across different states. In an examination of substance abuse patterns among seniors in secondary schools in Oshogbo, Osun state, Atoyebi & Atoyebi (2013), found that, of the 420 respondents, 372 (88.5%) reported awareness of the existence of substances that may be abused. Analgesics, cannabis, tobacco, alcohol, and sedatives were the most commonly abused substances. Most respondents expressed positive attitudes towards substance abuse. According to the survey, 52.1%, 30.5%, and 21.7% of respondents have ever used drugs, currently use drugs, and have used drugs in the past. Shehu & Idris (2008), found that there was a prevalence rate of 9.4% of marijuana users in the Zaria local government area of Kaduna state. Smokers were more prevalent in the 15-19 age group (54.6%). Family background, peer pressure, and attendance at social events contributed to marijuana smoking. Non-smokers performed better academically (51.1%) than smokers (27.2%), and this difference was statistically significant. Mehanović et al. (2020), investigated the correlations between cannabis and other illicit drug use in secondary school adolescents in Nigeria. The study findings showed that adolescents' risk of cannabis and illicit drugs use was significantly influenced by being older, living with one parent, being in a one-parent family or in a one-parent family structure, having a parent who smokes, a parent who drinks alcohol, friends who use marijuana or other drugs, and having a low risk perception of harmful effects. Oshodi et al. (2010), reported that among secondary school students in Lagos state, the most commonly used substances were caffeine (kola nuts and coffee), mild analgesics (paracetamol and aspirin) and anti-malarial, most specifically chloroquine, with lifetime prevalence rates of 85.7%, 73.8% and 65.7%, respectively. According to the research, lifetime use rates vary from 3.8% (n=14) for Heroin and Cocaine to 85.7% (n=344) for psychostimulants, while current use rates range from 2% (n=8) to 56.5% (n= 213). As for alcohol, tobacco, and cannabis, their lifetime use prevalence rates were 9.2% (n=34), 5.2% (n=19), and 4.4% (n=16), respectively. The prevalence rates for males were generally higher than those for females, except for antibiotics, analgesics, heroin and cocaine. The main reason for using substances was stress relief (43.5% of respondents), self-medication (23.8% of respondents) to treat illness (n=96), and staying awake at night to study (14.9% of respondents). Anyanwu et al. (2016), reported that the prevalence of substance abuse among 620 senior secondary students in Abakaliki, Ebonyi state was 32.9% with alcohol the most commonly abused substance. The prevalence of substance abuse was further reported to be greater among males, older students, divorced families, and orphans. However, it was less common among those who regularly attended religious services. Manyike et al. (2016), reported that current use of psychoactive substances ranges from 0.4 to 34.9 % among boarding secondary school adolescents in Enugu, Enugu state, while lifetime use occurs at 0.8 to 63.5 %. Cannabis was the least prevalent and

kola nuts were the most prevalent. A study by [Ogunsola & Fatusi \(2016\)](#), also discovered that attending a private school, being friends with someone who uses substances, and having a mother with a tertiary education all contribute to the risk for substance abuse in adolescents. Conversely, adolescent disapproval of adult substance use, as well as parents' aversion to substance use, are protective factors in adolescent substance use.

From the foregoing, we can deduce that Nigerian scholars have made considerable efforts in order to explore the nature and dimensions of gaming behaviour, violent game engagement, and substance abuse among adolescents. This study will add to the existing literature in two ways. In the existing studies, it is evident that adolescent risky behaviors are constantly evolving, especially in terms of prevalence (which varies due to several factors). In order to be continuously updated with relevant information, it is necessary to track these changes. In this context, the present study would examine the prevalence of gambling behaviors and violent game play among in-school adolescents. In Nigeria, so far, most studies have not examined the relationship between gambling behavior, violent game engagement, and substance abuse among adolescents. The existing studies examined each independently. Through the examination of such relationships, it is hoped that the results of the present study will shed more light on the true nature, dimensions, and manifestations of adolescents' risky behavior.

Method

Ethical approval

Student recruitment was authorized by the principals of the schools involved. An informed consent letter explained the research intentions, assured participants that their responses would remain confidential and solicited their consent to participate (by filling out the questionnaires) or decline to participate. No incentives were offered to participants. To ensure the researcher got valid responses from students, teachers from each school served as research assistants to administer the questionnaires.

Study design

A descriptive survey research design was used in the study.

Study sample

Study was conducted in the southeast Nigerian state of Enugu. The state has 17 local government areas. Each local government area had one school selected at random to ensure representativeness. Seventy-eight senior secondary students were randomly selected from each of the schools. Thus, 1326 students were included in the sample. Upon screening, 1300 responses were valid. That represents a 98% response rate. Sixty-four percent of the participants were males, and 52 percent were females. The participants ranged in age from 14 to 19 years old. A total of 339 (26.1%) of the students were in SSSI, 615 (47.3%) in SSSII, and 346 (26.6%) in SSSIII.

Survey measures

South Oaks Gambling Screen: Revised for Adolescents (SOGS-RA): The SOGS-RA (Winters, et al., 1993) is a 12-item scale (dichotomous response items) that measures adolescent gambling behaviour and gambling-related problems over the past year. An example of a question from the SOGS-RA is "Have you ever felt that you would like to stop betting money but didn't think you could?" "Have you borrowed money or stolen something in order to bet or to cover gambling activities?" The present study used the classification scheme proposed by [Langhinrichsen-Rohling et al. \(2004\)](#), to categorize adolescent gambling behaviour into non-problem gamblers (0 or 1), at-risk gamblers (2 or 3), problem gamblers (4 or 5), and probable pathological gamblers (6 or larger). The SOGS-RA has previously been validated in a study ([Poulin, 2002](#)). A trial test of SOGS-RA resulted in a reliability index of $\alpha = 0.81$.

Game Engagement Questionnaire (GEQ): The GEQ ([Brockmyer et al., 2009](#)), was developed and validated to determine an individual's potential to become engaged in video game-play at various levels. The questionnaire contains 19 items that measure game players' level of engagement with violent games. A modified version of GEQ has been used in the present study, based on [Garver et al. \(2018\)](#), where items are rated on a 5 point scale of "strongly agree" = 4, "agree" = 3, "neutral" = 2, "disagree" = 1 and "strongly disagree" = 0. Higher levels of agreement correspond to higher levels of engagement. The researcher included a question asking whether respondents had played violent games once a week or more, less often than once a week, or not at all in the past year to measure the prevalence of playing violent games. In the present study, the GEQ was trial-tested and found to be reliable with a reliability index of $\alpha = 0.85$.

Cannabis Use Disorder Identification Test-Revised (CUDIT-R): The CUDIT-R ([Adamson & Sellman, 2003](#)), is a self-report cannabis misuse screening instrument using a five-point Likert scale. CUDIT-R appears to have improved psychometric properties over the original scale ([Adamson et al., 2010](#)), and is well suited to screening for problematic cannabis use within clinical populations. This scale offers a maximum score of 40. Using the Diagnostic Statistical Manual of Mental Disorders (DSM-5), a CUDIT-R score of less than 9 indicates that no diagnosis has been made, a score of 9-12 indicates mild cannabis use disorder, and a score of 13 and above indicates moderate/severe cannabis use disorder. GEQ was tested in the present study, and its reliability index is 0.79 α .

Statistical analysis procedure

Incomplete questionnaires were discarded. An analysis of the relation between the variables was performed using hierarchical regression. Descriptive statistics were used to determine the prevalence data. An analysis of the data was carried out using SPSS version 20. A 5% level of significance was applied to the statistical analysis.

Results

Table 1
Prevalence of gambling and violent games engagement among in-school adolescents

Risky behaviors	Prevalence of risky behaviors		
	Not at all	Less than once a week	Once a week or more
Gambling	709(54.5%)	362 (27.8%)	229(17.6%)
Violent Games	672 (51.7%)	25 (1.9%)	603(46.4%)

Table 1 shows that 17.6% of adolescents gamble once or more a week, 27.8% less than once a week, and 54.5% have not gambled at all in the past year. Among those who played violent games, 46.6% did so once a week or more, 27.8% did so less than once a week, and 51.7% did not play any violent games during the past year.

Table 2
Summary of hierarchical regression analysis for variables predicting Cannabis use

Predictor variables	B	β	t
Model 1			
Age	1.045	.790	16.091***
Class	.691	.220	6.190***
Gender	.583	.128	4.646***
Model 2			
Age	.808	.611	12.366***
Class	.199	.063	1.741
Gender	1.818	.398	12.071***
Gambling	.390	.214	6.140***
Violent games	.030	.402	12.204***

Note. Model 1 (Total $R^2 = .79$, $\Delta R^2 = .79$, $p < .001$). Model 2 (Total $R^2 = 0.82$, $\Delta R^2 = .025$, $p < .001$). (***) $p < .001$

Based on Table 2, a hierarchical multiple regression revealed that in Model 1, participants' demographic variables (age, class, and gender) contributed significantly to the regression model ($F(3, 1296) = 1669.32$, $p < .001$) and explained 79% of the variation in adolescent cannabis use. The addition of gambling and violent games to the model explained an additional 2.5% of variation in cannabis use, and the change in R^2 was significant ($F(5, 1294) = 1170.51$, $p < .001$). Together, the five independent variables explained 82.5% of the variance in cannabis use among in-school adolescents. Except for class ($B = .199$, $p = .082$), all variables significantly contributed to this variation.

Discussion

In this study, the prevalence of gambling behavior and violent game engagement among adolescents in Nigeria was examined. The relationship between gambling behavior and violent game engagement as well as cannabis substance use was also examined. First, the study was found that in one year 17.6% and 27.8% of

in-school adolescents gambled once a week or more and less than once a week respectively. According to an earlier study on gambling prevalence among adolescents, 80.2% of students reported gambling during the previous year, with 35.1% gambling at least one time a week (Gupta & Derevensky, 1998). This is much higher than the results of the present study. Besides the difference in time between the present study and that of Gupta and Derevensky, the differences may be due to non-identical study locations. In a study conducted among male secondary school students in Imo state in Nigeria, it was reported that 57.2% of them had gambled during their lifetimes, of which 77.6% had been gambling within the previous 12 months (Aguocha et al., 2018). The results of an all-male study are more likely to show a higher prevalence rate than those of a mixed-gender study (as in the present study); males are more inclined to gamble than females (Eboh, 2015; Wickwire, 2007; Bozzato et al., 2020). In comparison with adolescents gambling prevalence rates in other African countries, the present study suggests growing gambling behavior among in-school adolescents. Among in-school adolescents in Ghana, Odame et al. (2021), reported that 3 in 10 females and 4 in 10 males reported problem gambling in the previous 12 months. According to Anyanwu et al. (2018), 40% of in-school adolescents in Uganda admitted to gambling at least once and 17.7% were classified as having gambling disorder.

Secondly, this study found that 46.1% of in-school adolescents have played violent video games at least once a week and 1.9% less than once a week, respectively, in the past year. There is a high prevalence of violent gameplay among adolescents in school based on this result. The present study is important, given the infancy of the video game industry in Nigeria. This finding may point to a possible reality among in-school adolescents, namely, that adolescents today may have greater access to violent video games than ever before, especially with the increasing internet and broadband penetration in Nigeria and the increasing availability of mobile smartphones. Today, most violent video games can be accessed online with just a few clicks. Researchers outside Nigeria have reported findings that support the findings of the present study regarding the high inclination of adolescents to play violent video games. Gentile et al. (2004), found that 8th- and 9th-grade students spent an average of nine hours a week playing video games; and when asked to rate the amount of violence in their three favorite games, 62% of the games listed had some violence, and 37% had violence at or above the midpoint of the scale. Similar findings have been reported in Dhiaa & Tawfeeq (2016) and Olson et al. (2007).

Lastly, the study found that after accounting for demographic characteristics of adolescents such as age, gender, and class (school level), gambling behavior and playing violent games significantly predicted adolescents' cannabis use. Based on this research, it appears that, apart from the significant association between common demographic variables and substance abuse, there is also a significant positive association between substance abuse (cannabis) and gambling and violent game engagement among in-school adolescents in Nigeria. This finding is in line with a study conducted among secondary school students in Kaduna state, in which it was found that factors associated with cannabis (marijuana) use among teenagers include, age, family background, peer pressure, and attendance of social functions (Shehu & Idris, 2008). Similarly, Mehanović et al. (2020), found

that older age, living in a single parent household or in a family structure different from both parents', an alcohol-permissive household, friends' drug use, parental smoking, low-risk perceptions of harmful effects, socioeconomic status, and positive attitudes towards marijuana or drugs use were also associated with marijuana and illicit drug use by Nigerian adolescents. The results of other studies outside Nigeria have also suggested that other significant factors are associated with cannabis use among in-school adolescents, such as sexual intercourse, alcohol consumption, and bullying (Siziya et al. 2013); smoking prevalence, alcohol dependence, truancy, lack of social support, and absence of family connections and supervising (Yusoff et al., 2014). The current study extends previous findings by suggesting that cannabis use and gambling may affect adolescents' video gaming activity and their engagement with violent video content. For the present findings to be more generalizable, additional studies may be needed.

Conclusion

According to the results of this study, in-school adolescents frequently engage in gambling and violent games play. Further, it was observed that gambling behavior and violent game engagements are positively correlated with cannabis use. Since adolescents are extremely vulnerable to gambling, violent games engagement, and substance abuse, non-clinical and clinical practitioners alike should be aware of this association and provide possible interventions for this population.

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