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**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**Available online at: <http://www.iajps.com>**Research Article****VIOLENT VIDEO GAMES AND AGGRESSION AMONG MALE  
HIGH SCHOOL STUDENTS IN KUWAIT**

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**Abstract:**

**Background:** Rarely have studies explored the association of violent video games and aggression among adolescents in Kuwait. This study involves a random sample of high-school students in Kuwait. Specifically, examines the relationship between video game playing and aggressive behaviors, explores socio-demographic variables related to video games and aggression, and investigates factors related to use of violent video games.

**Methods:** Cross-sectional study conducted on a randomly selected population of 589 10<sup>th</sup> grade male students. This study employed a questionnaire composed of socio-demographic questions, video gaming characteristics questions, and the Buss & Perry aggression questionnaire.

**Results:** The response rate was 98.1%. The mean age of the participants was 15.21 with a standard deviation of 0.84. The majority of participants were Kuwaiti. Logistic regression analyses showed a statistically significant association between high aggression score and being attracted to fighting ( $p=0.029$ ). The number of hours of playing violent video games, whether it be during school days or weekends, as well as the number of years playing violent video games showed no statistical significance with relation to the total aggression scores.

**Conclusion:** It appears that online gameplay and longer playing hours during weekdays (2-5 hours) are associated with lower aggressive behavior. Having a lower GPA and playing video games that contain elements of fighting are each associated with aggression. Further research is needed to explain cause and effect, as well as whether frustration and competitiveness influence aggressive behavior.

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## INTRODUCTION:

Video games have become a multi-billion dollar industry due to record breaking sales of software and hardware. The top selling video games of 2013 included Grand Theft Auto 5, which sold over 22 million copies worldwide, Call of Duty Ghost and other video games which targeted for mature audiences. The current trend in the video game industry as of now consists of releasing video games which include violence, gore, mature themes developed specifically for mature audiences. This trend of violent video games first started in the 1990's with the release of Mortal Kombat and Doom and their subsequent popularity among gamers in North America. They are considered as some of the most violent video games ever created. As a result, the ESRB was created in 1994 to tackle the issue of retailers selling mature (M) rated video games to minors.

### The Grand Theft Auto Phenomena

In 2001, Grand Theft Auto 3 was released for the Playstation 2 and quickly became the best-selling video game of that year. Critics praised the revolutionary gameplay and cinematic story of Grand Theft Auto 3 and with that praise came along controversy. In the Grand Theft Auto series, players are rewarded for stealing vehicles, murdering innocent bystanders, and evading the cops. The ESRB and PEGI, which is a European video game content rating system similar to the ESRB, rated Grand Theft Auto 3 "M" for mature and "18+" respectively. However, this did not stop Grand Theft Auto 3 from being sold to minors, which proved the ineffectiveness of such ratings systems. According to The Guinness World Records 2008 and 2009 Gamer's Edition, Grand Theft Auto is the most controversial video game series in history, with over 4,000 articles published about it, which include accusations of glamorizing violence, corrupting gamers, and connection to real life crimes. Ever since video games started to include graphic violence, the effects of such content and their relationship with aggression and hostility became a matter of concern, and as a result, researchers began to do study this relation among gamers from both genders.

### Theories about effects of repeated exposure of video game violence

Several theories have been proposed regarding the relationship between violent video games and aggressive behavior. The cognitive-information processing theory (Huesmann 1988; 1998) suggests that repeated exposure to media violence results in the practice and rehearsal of aggressive scripts, and the creation and reinforcement of a hostile worldview

over time. Also, a study done by Berkowitz (1990) addressed the cognitive neoassociative-theory suggests that repeated exposure to media violence over longer periods of time can create a rich and intricate network of aggressive associations that can be more easily primed by violent media. Berkowitz' cognitive neoassociative-theory also discussed 'rumination', which is defined as a calm, lengthy, intent consideration, and how rumination can keep aggressive thoughts, feelings, and behavioral tendencies active in semantic memory for extended periods of time. For example, Bushman, Bonacci, Pedersen, Vasquez, and Miller (2005) have shown that ruminating about a provocation can increase displaced aggression against a mildly annoying target at least 8 hours later. Additionally, Bushman and Gibson (2010) did an experimental study, which involved male and female college students, about whether violent video games can stimulate aggression for an extended period of time. They concluded that men who played a violent game for just 20 min and then ruminated about it were more aggressive 24 hours later. No significant effects were found for women.

Hostile expectations, which is defined as the tendency to expect others to react to potential conflicts with aggression (Dill, Anderson, Anderson, & Deuser, 1997), was studied by Hasan, Bègue, Sharkow and Bushman (2013) and they concluded that 1) Hostile expectations mediated the effect of violent video game exposure on aggression, 2) When people expect others to behave aggressively, they are more likely to behave aggressively themselves, and 3) violent video games do cause an increase in aggression, and the effects are cumulative and can be relatively long-lasting. An interesting point was made by Calvert and Tan (1994) regarding players who play violent video games which was that the violent video-game player is an active aggressor, making aggressive behavioral choices and carrying them out. They also said that violent video game play is active, covert role-taking aggression, whereas witnessing television or movie violence is a more passive experience.

Some of the studies mentioned below (Anderson & Bushman, 2001; Anderson & Dill, 2000; Farrar, Krcmar, & Novak, 2006; Griffiths, 2000; Lynch, 1994, 1999) have used the General Aggression Model, which is defined as a dynamic, social-cognitive, developmental model that provides an integrative framework for domain-specific aggression theories. According to the General Aggression Model, aggressive behavior is best predicted by considering the person within a situation. This means

that that not all people will interpret and be affected by violent media in the same way. (Giumetti & Markey, 2007).

### **Relationship between violent video game use and aggression**

According to a meta-analysis by Anderson and Bushman (2001) which included males and females both over and under the age of 18, the act of playing violent video games increased aggressive behaviors and cognitions, increased aggressive emotions, elevated physiological arousal, and decreased prosocial behaviors. They also concluded that students who play more violent video games are more likely to have been involved in physical fights and get into arguments with teachers more frequently.

A correlational study by Anderson and Dill (2000), which involved male and female undergraduates, found that associations between violent video games and aggressive behavior and delinquency were stronger for those who were characteristically aggressive. Additionally, adolescents and children with aggressive tendencies and traits were more prone to the harmful effects of violent video games (Lynch 1994; 1999). Griffiths and Hunt (1993, 1995) have reported that when adolescents who play violent video games were asked if they thought playing such games made them more aggressive, they responded that this was the case. It was further reported that this was very significantly correlated with their frequency of playing. Griffiths (2000) also suggested that both short-term and long-term increases in aggression-related outcomes can be due to playing violent video games.

Berkowitz and Geen (1966) stated that increased exposure to media violence weakens inhibitions against engaging in aggressive behavior. Geen (1990) also found out that an increase in aggressive behavior subsequent to viewing justified aggression, which is defined as violence that takes place in the context of a justifiable motive, in a video game may occur because inhibitions against engaging in aggressive behavior are weakened when the aggression is seen as justified. Farrar, Krcmar, and Novak (2006) found that both males and females who played a violent video game with the presence of blood had higher levels of physical aggression intentions than those who played the same video game without the blood.

Regarding gender differences in the influence of violent video games, Anderson and Dill (2000) found no reliable difference in violent video game effects

on male versus female college students. Another study by Cooper and Mackie (1986) showed that both boys and girls who played high-violence games were more aggressive than those who played low-violence games. Hasan, Bègue, Sharkow and Bushman (2013) conducted a study about the cumulative long-term effects of violent video games on hostile expectations and aggressive behavior over three consecutive days among male and female university students. They did not find significant differences between the male and female students when it came to effects on hostile expectations and aggressive behavior. Barthlow and Anderson (2002) found that the male participants in their study showed more aggressive behavior than the female participants after being allowed to play a violent video game for 10 minutes. Silvern and Williamson (1987) measured aggressive free play in 4 to 6-year-old children both before and after they played a violent video game and found that it significantly increased aggressive play relative to baseline measures for both boys and girls. The above studies suggest that in terms of aggression-related to violent video game play, the difference between males and females were minimal.

A number of studies on the influence of violent video games on the behavior of young children focused on children's 'free play', which is defined as unrestricted movement, activity, or interplay, and whether their aggression increased during this 'free play' after playing violent video games for a certain period of time. Four studies (Cooper & Mackie, 1986; Irwin & Gross, 1995; Schutte et al., 1988; Silvern & Williamson, 1987) sampled young children (ages 4 to 11 years), measured aggressive free play, and found increases in aggression as a function of playing an aggressive video game.

### **Effects of Parental Control**

Gentile, Lynch, Linder, and Walsh (2003) suggested that active parental limits in children's game selection and amount of play could play an important moderating role in the effects of video games on children. Signorielli, Gerbner, and Morgan (1995) reported that by 12 years of age, the average child has witnessed more than 100,000 acts of violence on television. A survey by PEGI regarding knowledge and awareness of PEGI ratings by consumers showed that only 49% of parents found PEGI ratings useful before their purchase of any particular video games. A study by Walsh (2000) showed that nine out of ten teenagers said that their parents "never" check the ratings before allowing them to rent or buy games. Another study by Funk, Hagan, and Schimming (1999) stated that in 70% of the cases where parents named an incorrect game (or could not name any),

children described their favorite game as violent. This clearly shows that lack of parental monitoring can increase the chances of children and adolescents purchasing and playing violent video games without their parent's consent.

### Current Situation in Kuwait

In Kuwait, video games are distributed and sold in several stores without the presence of a ratings system. As a result, adolescents are able to purchase violent video games that aren't suitable for their age without their parent's approval and as a result, are

exposed to violent and mature content. Continued exposure of violent video games by the adolescent population of Kuwait may potentially contribute to aggressive behaviors. Therefore, the current research study aims to 1) Assess relationship between games and aggression in high school students in Kuwait 2) Explore sociodemographic variables related to video games and aggression 3) Investigate factors related to use of violent video games

## METHODS:

### Study design and sampling

This cross-sectional study targeted 10<sup>th</sup> grade male students in Kuwait. The Ministry of Education consists of a total of 11607 male 10<sup>th</sup> grade student (Table 1). The student statistics were obtained from the Ministry of Education. The sample was selected using a stratified random sampling method.

**Table 1: Population of 10<sup>th</sup> grade male high school students by governorate (2013)**

Governorate	Number of 10 <sup>th</sup> grade Students	Number of selected 10 <sup>th</sup> grade students
Capital	1877	136
Hawalli	1976	103
Al-Ahmadi	2250	86
Al-Farwaniya	2236	101
Al-Jahra	2050	92
Mubarak Al-Kabeer	1218	71
Total	11607	589

### Ethical Considerations

The current study was reviewed and approved by the Department of Community Medicine and Behavioral Sciences, Faculty of Medicine, Kuwait University and the HSC Ethics Committee for Student Research. Informed consent was obtained from each participant prior to data collection. This involved explaining the objectives of the study and its potential benefits as well as the fact that participation was entirely voluntary. Anonymity was also assured, and participants were informed that they could withdraw from the study at any time.

### Data Collection Instrument

A questionnaire (English and Arabic versions) was developed that comprised of several parts.

**Part 1:** Socio-demographic questions (*age, nationality, parents' educational status, number of siblings living in the household, birth order, and self-reported GPA*)

**Part 2:** Video gaming characteristics (*e.g. types of video games played, number of playing hours, location of play, person who buys the violent videogame... etc.*)

**Part 3:** The aggression questionnaire (*Buss & Perry, 1992*). It is a 29-item instrument consisting of four scales: Physical Aggression (nine items), Verbal Aggression (five items), Anger (seven items), and Hostility (eight items). Participants rate each item on a scale of 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me). The total score is obtained by adding all the endorsed items.

### Data Collection Procedure

Data collection took place October 19-23, 2014. All questionnaires were distributed by a group of 5<sup>th</sup> year medical students. Two male high schools were randomly selected from each governorate, and questionnaires were distributed to two randomly chosen classrooms of mandatory subjects within each

of these schools. However, due to unexpectedly low numbers of students in three of the schools, more classrooms were selected from these schools in order to compensate for the low numbers. The total response rate was 98.1%.

### Statistical Analysis

Data entry was done using Statistical Package for Social Sciences (SPSS) version 22. Descriptive data analysis was performed using total numbers and percentages. Application of descriptive statistical measures, such as means and standard deviations was implemented where suitable. The prevalence of socio-demographic factors, video gaming

characteristics, and the aggression score were all computed. Chi-square analyses were used to test the association of the socio-demographic factors and video gaming characteristics with aggression scores. Aggression scores were categorized into high and low. A p-value of  $\leq 0.05$  was used for statistical significance.

Multivariate logistic regression analyses were used to assess the possible confounding effects of several socio-demographic and other variables on the relationship between the playing of violent video games and aggression.

**Table 2. Socio-demographic characteristics of the study sample (n = 578)**

Variables	n(%)
Age (mean $\pm$ SD)	15.21 $\pm$ 0.84
Nationality	
<b>Kuwaiti</b>	526 (94.3)
<b>Non-Kuwaiti</b>	32 (5.7)
Governorate	
<b>Capital</b>	131 (22.7)
<b>Hawalli</b>	102 (17.6)
<b>Farwaniya</b>	97 (16.8)
<b>Jahra</b>	92 (15.9)
<b>Ahmadi</b>	85 (14.7)
<b>Mubarak Al-Kabeer</b>	71 (12.3)
Education level of fathers	
<b>No formal education</b>	6 (1.1)
<b>Primary/ Intermediate</b>	68 (12.8)
<b>Secondary</b>	188 (35.3)
<b>University and above</b>	270 (50.8)
Education levels of mothers	
<b>No formal education</b>	41 (7.8)
<b>Primary/ Intermediate</b>	58 (11.0)
<b>Secondary</b>	159 (30.0)
<b>University and above</b>	271 (51.2)
Number of siblings currently living in the same house [Median (IQR)]	5 (3)
Birth order [Median (IQR)]	3 (2)
Self-reported GPA [Median (IQR)]	83.6 (12.9)

Graph 1. Mature video games played by male high school students (n = 578)

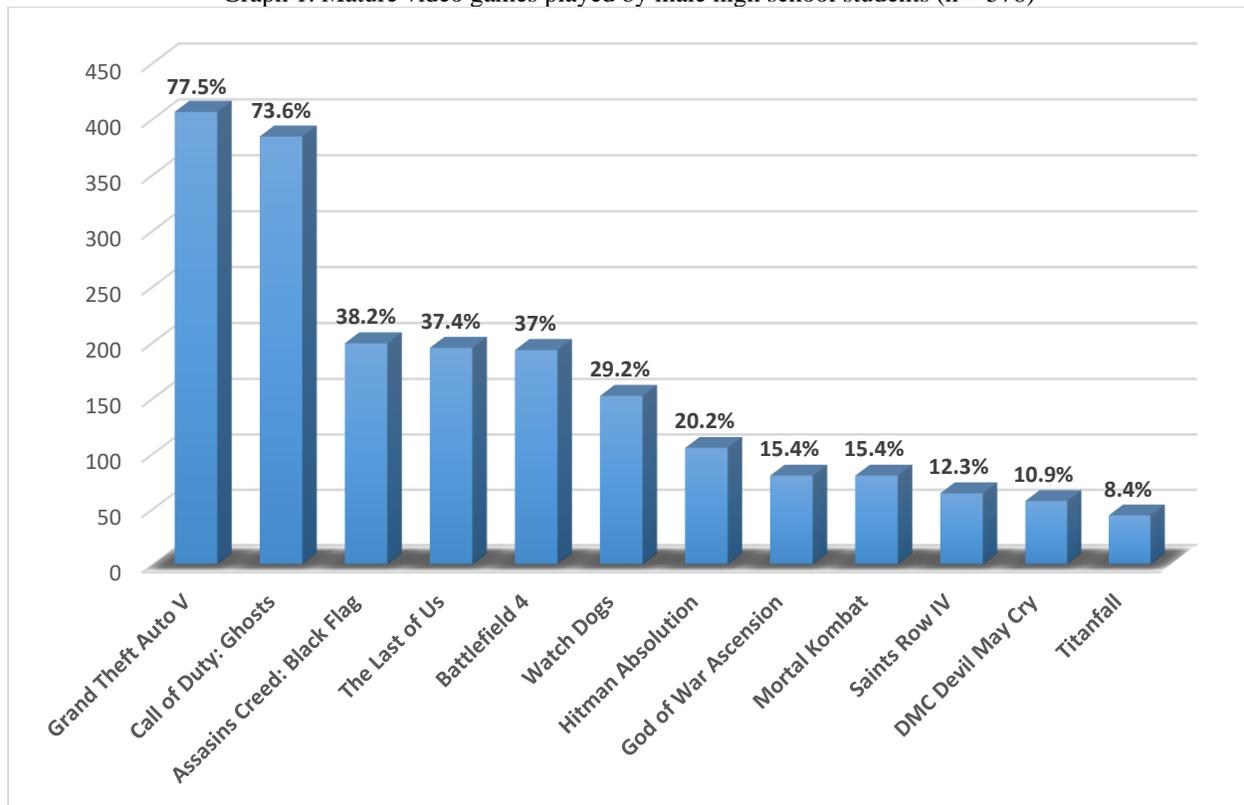


Table 3. Frequency and of video game play and high aggression scores (n= 578)

Variables	All n(%)	High Aggression n(%)	p-value
Number of years playing			0.054
<b>1 year or less</b>	19 (5.2)	8 (4.3)	
<b>2-4 years</b>	93 (25.3)	39 (21.2)	
<b>4-6 years</b>	101 (27.5)	51 (27.7)	
<b>6-8 years</b>	72 (19.6)	42 (22.8)	
<b>9 or more</b>	82 (22.4)	44 (24.0)	
Number of hours of playing during school days			0.449
<b>Not allowed to play</b>	77 (21.2)	38 (21.1)	
<b>Less than 1 hour</b>	68 (18.7)	28 (15.6)	
<b>1-2 hours</b>	116 (31.9)	60 (33.3)	
<b>2-5 hours</b>	67 (18.4)	36 (20.0)	
<b>More than 5 hours</b>	36 (9.8)	18 (10.0)	
Number of hours of playing during weekends			0.949
<b>Less than 1 hour</b>	58 (15.9)	31 (16.9)	
<b>1-2 hours</b>	99 (27.1)	46 (25.1)	
<b>2-5 hours</b>	100 (27.4)	51 (27.9)	
<b>More than 5 hours</b>	108 (29.6)	55 (30.1)	
Where playing happened			
<b>Bedroom</b>	210 (57.5)	105 (57.4)	0.951
<b>Living room</b>	99 (27.1)	51 (27.9)	0.748
<b>Diwaniya</b>	196 (53.7)	100 (54.6)	0.716
<b>Others</b>	27 (6.7)	17 (8.4)	0.167
With whom they play			
<b>Alone</b>	139 (37.9)	69 (37.3)	0.818
<b>Brothers</b>	149 (40.6)	74 (40.0)	0.814
<b>Cousins</b>	134 (36.5)	66 (35.7)	0.737
<b>Father</b>	22 (6.0)	9 (4.9)	0.358
<b>Friends</b>	176 (48.0)	93 (50.3)	0.371
<b>Online</b>	195 (53.1)	96 (51.9)	0.631

**Table 4. Characteristics of violent video games and high aggression scores (n= 202)**\* High Aggression indicates that participants received a score above the mean  $\geq 84.35$ .

^ Numbers indicate the answer options “Strongly Agree” and “Agree” together

Characteristics of the game	All n(%)	High Aggression* n(%)	p-value
<b>Genre</b>			
Action-Adventure	133 (42.2)	64 (40.8)	0.451
Role-playing (RPG)	25 (8.7)	15 (10.6)	0.301
Shooter	61 (20.1)	31 (20.4)	0.101
Simulation	23 (8.2)	11 (8.0)	0.565
Strategy	24 (8.5)	11 (8.0)	0.498
Sport / racing	199 (38.4)	66 (43.1)	0.098
<b>Content</b>			
Weapons	203 (55.6)	103 (56.0)	0.888
Blood	139 (38.1)	83 (45.1)	<b>0.005</b>
Fighting	138 (37.8)	85 (46.2)	<b>0.001</b>
Bad language	29 (7.9)	23 (12.5)	<b>0.001</b>
Online game play	196 (53.8)	88 (48.1)	<b>0.027</b>
<b>Having an opinion that violent video games cause aggression</b>	122 (33.6)	65 (36.1)	0.317
<b>Violent outbursts while playing</b>	122 (33.2)	87 (47.5)	<b>&lt; 0.001</b>
<b>Online verbal abuse</b>	83 (22.6)	53 (29.0)	<b>0.003</b>
<b>Violent reply to verbal abuse</b>	147 (40.2)	92 (50.3)	<b>&lt; 0.001</b>
<b>Accept being rewarded by committing violence<sup>^</sup></b>	198 (55.2)	105 (59.3)	<b>0.034</b>
<b>Accepting blood and violence in video games<sup>^</sup></b>	227 (62.0)	127 (70.2)	<b>&lt; 0.001</b>
<b>Preference of violent video games<sup>^</sup></b>	269 (73.3)	153 (84.1)	<b>&lt; 0.001</b>

**Table 5. Illustrating the levels of aggression among male high school students (n=578)**

Aggression	Above the cutoff n(%)	Below the cutoff n(%)
Hostility*	280 (55.4)	225 (44.6)
Verbal aggression*	269 (51.7)	251 (48.3)
Physical aggression*	261 (53.6)	226 (46.4)
Anger*	256 (50.6)	250 (49.4)
Total number of students scoring above the mean (84.35)	202 (50.1)	201 (49.9)

\*Median scores were used as the cut-off scores for the four different types of aggression,

Table 6. Illustrating the levels of aggression among male high school students scoring above the mean aggression score ( $\geq 84.35$ ) (n=202)

Level of Aggression	n(%)
Hostility	173 (85.6)
Physical aggression	170 (84.2)
Anger	164 (81.2)
Verbal aggression	144 (71.3)

Table 7. Relationship between socio-demographic variables and high aggression scores (n= 202)

\*High GPA= above the median of 83.6; Low GPA= below the median

Variables	All n (%)	High Aggression n(%)	p-value
Age			<b>0.045</b>
<b>13-14 years</b>	70 (18.0)	26 (13.2)	
<b>15 years</b>	224 (57.4)	119 (60.4)	
<b>16-18 years</b>	96 (24.6)	52 (26.4)	
Governorate			<b>0.020</b>
<b>Capital</b>	97 (24.1)	49 (24.3)	
<b>Hawalli</b>	78 (19.4)	31 (15.3)	
<b>Farwaniya</b>	67 (16.6)	31 (15.3)	
<b>Jahra</b>	54 (13.4)	38 (18.8)	
<b>Ahmadi</b>	59 (14.6)	27 (13.4)	
<b>Mubarak Al-Kabeer</b>	48 (11.9)	26 (12.9)	
Education level of fathers			0.163
<b>High school and lower</b>	188 (51.7)	102 (54.3)	
<b>University or higher</b>	183 (49.3)	86 (45.7)	
Education levels of mothers			<b>0.029</b>
<b>High school and lower</b>	196 (52.7)	99 (52.9)	
<b>University or higher</b>	176 (47.3)	88 (47.1)	
Number of siblings currently living in the same house			0.985
<b>1 or less</b>	20 (5.1)	9 (4.6)	
<b>2-5</b>	254 (64.3)	126 (64.0)	
<b>6 or more</b>	121 (30.6)	62 (31.4)	
Birth order			0.297
<b>1</b>	94 (24.1)	43 (22.3)	
<b>2-5</b>	245 (63.4)	124 (64.2)	
<b>6 or more</b>	47 (12.5)	26 (13.5)	
Self-reported GPA*			<b>0.041</b>
<b>High</b>	127 (51.6)	56 (45.2)	
<b>Low</b>	119 (48.4)	68 (54.8)	

We assessed the association between parents' educational level and parental control of their children's violent video game play. Most variables showed no statistical significance. However, a statistically significant association was found between mothers' educational level and the student playing video games in the living room ( $p=0.002$ ), and between fathers' educational level and their placing of restrictions over play of violent video games (0.049).

Table 8.1. Logistic regression analyses of the association between socio-demographic variables and total aggression scores (n=403)

\* Adjusted OR for all other socio-demographic variables and violent video games characteristics.

^ High GPA= above the median of 83.6; Low GPA= below the median

Variables	Univariate Logistic regression		Multivariate Logistic regression	
	Crude OR (95% CI)	P-value	Adjusted OR* (95% CI)	P-value
<b>Age</b>				
13-14 years	Reference	<b>0.050</b>		0.278
15 years	1.92 (1.10-3.33)	<b>0.021</b>	2.21 (0.80-6.09)	0.127
16-18 years	2.00 (1.07-3.75)	<b>0.031</b>	2.39 (0.62-9.18)	0.203
<b>Education level of fathers</b>				
University or higher	Reference			
High school and lower	1.34 (0.89-2.01)	0.162	0.69 (0.28-1.68)	0.410
<b>Education levels of mothers</b>				
University or higher	Reference			
High school and lower	1.58 (1.05-2.38)	<b>0.029</b>	1.78 (0.73-4.38)	0.205
<b>Self-reported GPA<sup>^</sup></b>				
High	Reference			
Low	1.69 (1.02-2.80)	<b>0.041</b>	2.39 (1.01-5.69)	<b>0.049</b>

\* Odds ratio adjusted for all socio-demographics variables and violent video games characteristics.

Table 8.2. Logistic regression analyses of the association between logistics of video game play and total aggression scores (n=403)

Variables	Univariate Logistic regression		Multivariate Logistic regression	
	Crude OR (95% CI)	P-value	Adjusted OR* (95% CI)	P-value
<b>Number of years playing</b>				
1 year or less	Reference	<b>0.0258</b>		0.210
2-4 years	0.99 (0.36-2.70)	0.989	0.74 (0.09-5.57)	0.769
4-6 years	1.40 (0.52-3.78)	0.503	0.79 (0.10-6.46)	0.833
6-8 years	1.92 (0.69-5.36)	0.210	0.85 (0.09-7.94)	0.885
9 or more	1.59 (0.58-4.37)	0.366	2.80 (0.33-23.97)	0.347
<b>Number of hours of playing during school days</b>				
Not allowed to play	Reference	0.630		0.259
Less than 1 hour	0.72 (0.37-1.39)	0.325	0.31 (0.07-1.30)	0.111
1-2 hours	1.10 (0.62-1.96)	0.747	0.48 (0.14-1.59)	0.229
2-5 hours	1.19 (0.62-2.30)	0.600	0.21 (0.05-0.85)	<b>0.029</b>
More than 5 hours	1.03 (0.46-2.26)	0.949	0.38 (0.08-1.76)	0.215
<b>Number of hours of playing during weekends</b>				
Less than 1 hour	1.12 (0.58-2.10)	0.757	1.19 (0.32-4.45)	0.793
1-2 hours	0.84 (0.48-1.44)	0.521	0.74 (0.23-2.44)	0.627
2-5 hours	1.00 (0.58-1.73)	0.992	0.67 (0.22-2.02)	0.479
More than 5 hours	Reference	0.839		0.778
<b>Where playing happened</b>				
Bedroom	0.99 (0.65-1.50)	0.951	0.85 (0.34-2.15)	0.735
Living room	1.08 (0.68-1.71)	0.748	0.79 (0.28-2.19)	0.650
Diwaniya	1.08 (0.71-1.63)	0.716	0.59 (0.23-1.36)	0.198
<b>Parental restriction</b>	1.06 (0.55-2.02)	0.868	0.52 (0.15-1.81)	0.364
<b>Finding ways to play if not allowed</b>	1.84 (1.21-2.78)	<b>0.004</b>	0.99 (0.44-2.24)	0.978

Table 8.3. Logistic regression analyses of the association between characteristics of video games and total aggression scores (n=403)

\* Odds ratio adjusted for all socio-demographics variables and violent video games characteristics.

Variables	Univariate Logistic regression		Multivariate Logistic regression	
	Crude OR (95% CI)	P-value	Adjusted OR* (95% CI)	P-value
<b>Content</b>				
Weapons	1.03 (0.68-1.56)	0.888	0.68 (0.28-1.65)	0.393
Blood	1.83 (1.19-2.82)	<b>0.006</b>	0.74 (0.27-2.04)	0.564
Fighting	2.07 (1.35-3.19)	<b>0.001</b>	2.91 (1.11-7.59)	<b>0.029</b>
Bad language	4.17 (1.65-10.49)	<b>0.002</b>	3.70 (0.83-16.50)	0.860
Online game play	0.63 (0.41-0.95)	<b>0.027</b>	0.39 (0.17-0.91)	<b>0.030</b>
<b>Having an opinion that violent video games cause aggression</b>	1.25 (0.81-1.93)	0.317	4.38 (1.69-11.36)	<b>0.002</b>
<b>Violent outbursts while playing</b>	3.86 (2.41-6.16)	<b>&lt;0.001</b>	3.01 (1.21-7.49)	<b>0.018</b>
<b>Online verbal abuse</b>	2.11 (1.27-3.49)	<b>0.004</b>	0.73 (0.25-2.16)	0.570
<b>Violent reply to verbal abuse</b>	2.35 (1.53-3.61)	<b>&lt;0.001</b>	0.62 (0.24-1.58)	0.314
<b>Accept being rewarded by committing violence</b>				
Strongly Agree & agree	1.84 (1.80-3.14)	<b>0.024</b>	0.82 (0.28-2.44)	0.728
Neutral	1.71 (0.92-3.21)	0.092	1.66 (0.46-6.04)	0.442
Disagree & strongly disagree	Reference	0.074		0.463
<b>Accepting blood and violence in video games</b>				
Strongly Agree & Agree	2.91 (1.56-5.45)	<b>0.001</b>	3.15 (0.73-13.62)	0.124
Neutral	1.84 (0.90-3.77)	0.093	1.54 (0.35-6.79)	0.568
Disagree & strongly Disagree	Reference	<b>0.002</b>		0.224
<b>Preference of violent video games</b>				
Strongly Agree & Agree	3.69 (1.72-7.91)	<b>0.001</b>	3.61 (0.68-19.19)	0.132
Neutral	1.30 (0.52-3.20)	0.572	0.80 (0.13-4.79)	0.809
Disagree & Strongly Disagree	Reference	<b>&lt;0.001</b>		<b>0.040</b>

**RESULTS:**

Graph 1 shows that 77.5% and 73.6% of students who play mature video games chose Grand Theft Auto V and Call of Duty: Ghosts, respectively. Titanfall was the least played video games among male high school students who play mature video games with only 8.4% of the students choosing it as one of the games they have played in the past 2 years.

Table 2 describes the socio-demographic characteristics of the study sample. The mean age of the students was 15.21years with a standard deviation

of ± 0.84. The vast majority (94%) of the sampled male student were Kuwaiti (n=526), and the remaining 5.7% were non-Kuwaiti (n=32). In terms of the governorate, 22.7% were from Capital, followed by 17.6% from Hawalli, 16.8% from Farwaniya, 15.9% from Jahra, and 14.7 from Ahmadi and 12.3% from Mubarak Al-Kabeer. In terms of the education level of the parents, the majority of fathers (86.1%) and mothers (81.2%) had attained at least a high school degree, whereas 13.9% of fathers and 18.8% of mothers had only completed intermediate

education or lower. The median number of siblings currently living in the same house was 5 with IQR of 3. The median birth order was 3 with IQR of 2. The median self-reported GPA was 83.6% with IQR of 12.9.

In table 3, we assessed the association between the frequency of video game play and total aggression scores. The number of hours of playing violent video games, whether it be during school days or on weekends, showed no statistical significance. However, a marginal statistically significant association was found between the number of years playing violent video game and the total aggression score ( $p=0.05$ ). Variables, such as the place of playing these games and the companion with whom they play showed no statistical significance.

Table 4 shows that in terms of genre, Sports/Racing was the most appealing to those with a high aggression score, and Simulation and Strategy were the least appealing to those with a high aggression score. However, the relationship between video game genre and scoring high on the aggression scale was not statistically significant. In terms of what video game content attracts the students, the availability of weapons was the popular attracting factor among students with high aggression scores, but was not statistically significant. However, there was a statistically significant association between receiving a high aggression score and being attracted to blood ( $p=0.005$ ), fighting ( $p=0.001$ ), bad language ( $p=0.001$ ) and online game play (0.03). Other factors that were significantly related to having a high aggression score were displaying violent outbursts while playing ( $p< 0.001$ ), online verbal abuse ( $p=0.003$ ), violent reply to verbal abuse ( $p=< 0.001$ ), acceptance of being rewarded by committing violence in a video game ( $p=0.03$ ), acceptance of blood and violence in a video game ( $p< 0.001$ ), and preference of violent video games ( $p< 0.001$ ).

Table 5 shows the prevalence of each type of aggression among male high school students in Kuwait ( $n=578$ ). The most prevalent type of aggression was hostility (55.4%), followed by verbal aggression (51.7%), followed by physical aggression (53.6%), and the least prevalent type was anger (50.6%). The mean of the total aggression was 84.35. The number of students scoring above the mean was ( $n=202$ ) and for ease of description have been considered as having high aggression scores.

Table 6 shows the prevalence of each type of aggression displayed by male high school students scoring above the mean aggression score ( $n=202$ ).

The mean of the total aggression score was 84.35. The number of students scoring above the mean was  $n=202$  (50.1%) and they are considered in the high aggression group. The most prevalent type of aggression was hostility (85.6%), followed by physical aggression (84.2%), followed by anger (81.2%), and the least prevalent type was verbal aggression (71.3%).

In table 7, we assessed the relationship between socio-demographic variables and high aggression scores. We found a statistically significant association between having a high aggression score and students' age ( $p=0.045$ ), mother's education level ( $p=0.03$ ), and self-reported GPA ( $p=0.04$ ). Additionally, we found that there is a statistically significant difference between Kuwait governorates in terms of scoring in the high aggression range ( $p=0.02$ ). Moreover, there wasn't any statistically significant associations with father's educational level, number of siblings living in the same house, or student's birth order.

Table 8.1 shows the multivariate logistic regression analysis of possible factors affecting the association between socio-demographic factors and total aggression score. Before adjusting for possible cofounders, the statistically significant factors were age (15 years,  $p\text{-value}=0.021$ ; 16-18 years,  $p\text{-value}=0.031$ ) education level of mothers (high school or lower,  $p\text{-value}=0.029$ ) and self-reported GPA (low GPA,  $p\text{-value}=0.041$ ). After adjustment for all other confounding variables, only self-reported GPA was statistically significant (low GPA,  $p\text{-value}=0.049$ ).

Table 8.2 shows the multivariate logistic regression analysis of possible factors affecting the association between logistics of video game play and total aggression score. Before adjusting for possible cofounders, the statistically significant factor was finding ways to play if not allowed ( $p\text{-value}=0.004$ ). After adjustment for all other confounding variables, only number of hours of playing during school days was statistically significant (2-5 hours,  $p\text{-value}=0.029$ ).

Table 8.3 shows the multivariate logistic regression analysis of possible factors affecting the association between characteristics of video games and total aggression score. Before adjusting for possible cofounders, the statistically significant factors were the content of video games (blood,  $p\text{-value}=0.006$ ; fighting,  $p\text{-value}=0.001$ ; bad language,  $p\text{-value}=0.002$ ; online game play,  $p\text{-value}=0.027$ ), violent outbursts while playing ( $p\text{-value}<0.001$ ), online verbal abuse ( $p\text{-value}=0.004$ ), violent reply to

verbal abuse (p-value=<0.001), accepting being rewarded by committing violence (strongly agree, p-value=0.024), accepting blood and violence in video games (strongly agree, p-value=0.001), preference of violent video games (strongly agree, p-value=0.001). After adjustment for all other confounding variables, the statistically significant predictors were the content of video games (fighting, p-value=0.029; online game play, p-value=0.030), having an opinion that violent video games cause aggression (p-value=0.002), violent outbursts while playing (p-value=0.018) and preference of violent video games (disagree and strongly disagree, p-value=0.040).

### DISCUSSION:

This research study was conducted to help understand the relationship between the violent video game play and aggression among male high school student in Kuwait. Today's children and adolescents have many potential sources of violence exposure which may desensitize them to the true consequences of violence, increasing the relative risk of aggression or even violence (Friedlander, 1993; Johnson-Reid, 1998; Singer, Slovak, Frierson, & York, 1998; Groebel, 2001).

#### Socio-demographic variables

Only male students were enrolled in this study since there is relatively no significant difference in the influence of violent video games between males and females (Anderson & Dill, 2000). In addition, male students are more likely than female students to be consumers of violent video games. In terms of age, we found that higher age groups received higher aggression scores. Prior to adolescence, children are still developing their moral scaffolding (Eisenberg & Fabes, 1998). So, violent content will have higher impact on children who are still developing their moral reasoning and principles. That is why the more violent content they get exposed to when they are younger, the more aggression they might display at older ages. Regarding governorates, students from the Capital governorate received higher aggression scores. This could be related to the fact that in our sample the Capital had the highest number of students enrolled in our study. Mother's education level but not father's was significantly associated with having a high aggression score. Students whose mothers' education level is high school and below had higher aggression scores. This coincides with a study by Nikken, Jansz, and Schouwstra (2007), which involved parents with one or more children. They stated that parents with a lower educational background particularly expressed more interest in four of the five content descriptors, whereas more highly educated parents tended to be somewhat more

interested in videogame age-ratings in general. This may suggest that more educated mothers may be more aware of the video game content and as a result more closely monitor their children's video game play. Regarding school performance and grades, we found an association between reporting low GPA and having a high aggression score. Similar results were also reported by Gentile, Lynch, Linder, & Walsh, (2003)

#### Table 4

##### Characteristics of video games and Aggression

Regarding video game genres and aggression, a statistically significant association was not found. On the other hand, a study by Barlett, Harris, and Baldassarro (2007), which involved male and female university students, showed that increased play of a violent first person shooter video game can significantly increase aggression from baseline. Farrar, Krcmar, and Novak (2006) have also found that males and females who played violent first person shooter video games reported greater hostility and physically aggressive intentions. In our results, the association between aggression and the presence of weapons in a video game was not statistically significant. However, Berkowitz and LePage (1967) stated that the heightened aggressive behavior in the presence of a weapon arose because viewing weapons may cause an intense aggressive reaction from the person with the gun.

There were highly statistically significant associations between aggression and types of video game content that students found most appealing, specifically the presence of blood, fighting, and bad language. Additionally, Farrar, Krcmar, and Novak (2006) said that players, regardless of the gender, who played video games with the presence of blood showed more physically aggressive intentions. The association between aggression and violent outbursts while playing were statistically significant. The same applied to violent reply to verbal abuse, accepting blood and violence in video games, and preference of violent video games when it came to their associations with aggression. This coincided with a study by Funk (1993) which examined the video-game preferences of 357 seventh and eighth-grade boys and girls and showed that half of their most preferred games were violent in nature.

#### Table 5

##### Aggression scores and cut-offs

In our study, the aggression scores for male high school students were high and the mean was 84.35. We noticed that our mean cut-off was higher than other studies. For example, a study done by

Abasiubong, Abiola, and Udofia (2011), which involved 515 university students, stated that their mean aggression score was used as the cut-off score and was incidentally coincided that of the Caucasians (77.8). Our high mean could be explained by the amount of violent video games exposure our students sample have been exposed to, the characteristics and contents of video games, or other variables (e.g. personality dimensions) that were not assessed in this study. In addition, several studies and researchers have linked or attributed aggression to several factors including environment, personality type, social situations, and family background (Akert, Aronson, & Wilson, 2005; Cant, Llop, & Field, 2008; Coyne & Archer, 2005).

#### **Table 8.1**

##### **Socio-demographic predictors for aggression among high school students**

Several predictors have been linked to increased aggression in relation with violent video games. In our study, the only positive socio-demographic predictor for aggression was low self-reported GPA. The aggression of the students with low self-reported GPA were two times the aggression of those with high self-reported GPA. The fact that violent video games affect school performance was also reported by Gentile, Lynch, Linder, & Walsh, (2003) which involved eighth and ninth grade male students. The study above showed that adolescents who expose themselves to greater amounts of video game violence performed more poorly in school.

#### **Table 8.2**

##### **Association between characteristics of playing video games and total aggression score**

In our study, students playing 2-5 hours during school days were two times less likely to experience aggression. This result was similar to the study done by Ferguson, C. J. and Rueda1, S. M. (2007), where 103 young adults were given a frustration task and then randomized to play no game, a non-violent game, a violent game with good versus evil theme, or a violent game in which they played 'the bad guy.' The results suggest that violent games reduce depression and hostile feelings in players through mood management.

#### **Table 8.3**

##### **Association between characteristics of video games and total aggression scores**

According to content which attracts students to playing video games, it was found that fighting was the better predictor of aggression and is 4 times more likely to cause aggression compared to the other content. This finding was similar to another experimental study by Irwin and Gross (1995), which involved children playing a violent video game containing fighting, and they saw that the children's

physical and verbal aggression increased after playing the violent video game. Additionally, online verbal abuse and having an opinion that violent video games cause aggression are four and three more times likely to cause aggression, respectively.

On the other hand, results showed that online game play has an opposite effect on aggression and is two times less likely to cause aggression. This does not coincide with a study by Adachi and Willoughby (2011), which involved male and female psychology university students. They found that competitiveness in a video game is associated with aggression. Competitiveness is a hallmark of online game play. This difference in result may be due to the fact that the students in our studies play cooperative online video games, which is not competitive in its nature.

The items on The Buss-Perry Aggression Questionnaire make up four types of aggression; physical, verbal, anger, and hostility. It would follow then that those same students who reported replying to verbal abuse during video game play and having violent outbursts would score higher aggression scores.

#### **Limitations:**

1. The current cross-sectional study cannot establish a temporal relationship between the playing of violent video games and aggression among male high school students in Kuwait.
2. The Buss-Perry questionnaire was translated into Arabic by the research team. No validated Arabic questionnaire was used.
3. No cut-off points (International or Kuwait) were found for the Buss-Perry questionnaire. Therefore, we could not reliably indicate the quality of aggression in our sample.
4. Data collection procedures were not obtained in the same way in each of the high schools that we visited. (e.g., some of the high schools only allowed us to give questionnaires to two classes, while others allowed multiple classes.
5. Self-reported GPA was used instead of the actual GPA from student school records.
6. Response bias may have been likely from students who did not understand some of the questions (e.g., a question about acceptance of being rewarded in a video game by committing violence) or those who did not want to spend time on the questionnaire.
7. Recall bias may have been introduced whenever students were asked about information in their distant memory (e.g., number of years playing violent video games)
8. Other variables (e.g., personality dimensions, parental monitoring, and parental style) were not

assessed in this study, and may have been strongly related to aggression.

#### **Recommendations:**

1. Future studies should look more carefully into the association between low GPA and aggression.
2. Longitudinal studies are better positioned to describe the nature of the relationship between video game play and aggression. Therefore, this type of study should be used in this area for the future.
3. Since the presence of fighting in video games is significantly associated with aggression among male high school students, more effective measures should be used or employed to restrict access of violent video games to adolescents in Kuwait.
4. A validated Arabic version of the widely used Buss & Perry Aggression questionnaire should be available and used for future researchers in this area.
5. Since the results showed higher mean aggression scores compared to other populations, future studies should explore other factors related to aggression among adolescent males.

#### **CONCLUSION:**

It appears that higher aggression is related to having lower school GPA and to playing video games that contain elements of fighting. In contrary, lower aggression is associated according to our findings with playing online gameplay and more hours of gameplay during weekdays (2-5 hours). Further research is needed to explain reverse causality; in other words whether aggressiveness leads to playing aggressive games or vice versa, as well as whether frustration and/or competitiveness influence aggressive behavior. Restrictive measures, modification to contents of video games, and parental guidance awareness can all be revised with respect to these findings.

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