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A study of the physical aggressive behaviors due to violent video games among early adolescents in Al-Mazar Al-Janobe District in the south of Jordan

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Abstract---Violent video games (VVGs) that have clearly emerged during the spread of the COVID-19 pandemic are the reason why early adolescents are exposed to physical aggression and physical violence. This is a problem and has consequences and damages to society as a whole. Therefore, parents and teachers should pay attention to solving this problem and addressing it, so we discussed this problem in our study. This research aims to study of the physical aggressive behaviors due to violent video games among early adolescents in Al-Mazar Al-Janobe district in the South of Jordan. The method that was followed in this study is a cross-sectional study conducted in the Al-Mazar Al-Janobe district during the period from first May up to 1st August 2020 using a web-based questionnaire. The study sample consisted of (462) early adolescent pupils aged 10-13 years (boys and girls) from 61 primary schools (private and government). The results obtained were analyzed using SPSS version 21, descriptive and inferential statistics such as t-tests, chi-square, correlation and analysis of variance (ANOVA) were performed and $\alpha < 0.05$ level of significance was considered. Among the 462 early adolescents pupils were 295 boys and 167 girls, the study showed that boys are more likely to play VVGs than girls by (94.2%) and (7.2%), respectively. One of the most important results of this study is that physical aggressive behaviors due to exposure to VVGs are highly prevalent, especially among boys. This study recommended that intervention programs

should be designed by health professionals to combat the consequences of this phenomenon.

Keywords---physical aggressive, violent video games, early adolescents.

Introduction

The adolescent as The World Health Organization (WHO) stated, is a critical period of life with a particular developmental needs. Besides that, the adolescent is the time to develop knowledge and skills, learn to manage feelings and relationships, and develop the important skills that are needed to deal with the incoming adult years' (WHO, 2020). The WHO defines adolescents as those people between 10 and 19 years of age, and divided this period into early (10–13 years), middle (14–16 years), and late (17–19 years) adolescence. Right now adolescents are facing complex challenges in transitioning into adulthood. Thus; they are under a tendency to risky behavior such as aggressive and violent behavior during their transition. Aggression, as defined by Bushman and Huesmann is “a behavior that is intended to harm another person who is motivated to avoid that harm (Bushman & Huesmann, 2012). While violence, is “an extreme form of aggression that has severe physical harm (e.g., serious injury or death) as its goal” (Anderson & Bushman, 2002; Huesmann & Taylor, 2006; Bushman & Huesmann, 2012).

Violence among children and adolescent had received increased attention all over the world, particularly during the last two decades (Escobar-Chaves, & Anderson, 2008). One of the most consequences of violence is aggressive behavior in school settings which in turn lead to multiple social problems that affect population development as a whole, children and adolescent in specific (Orue et al., 2011). In 2005, the Committee on the Rights of the Child in Jordan received reports of 4438 child violence cases between the years 1999-2006 (United Nations (UN), 2008). Furthermore, aggressive behaviors, in general, advance from less to progressively serious throughout adolescent development (Loeber & Hay, 1997; Tolan et al., 2000). It is well known that Media is considered one of the most effective measures in controlling children's and adolescents' health and development (Ukoha, 2013). Unfortunately, nowadays with the development of technology; there is a large amount of violence embedded in our children's daily lives, in different attractive forms of media as TV, cell phone, videogames, movies, and the internet (Media Violence Commission, 2012; Ray & Jat, 2010).

Violence video game (VVGs) exposure is considered one of many risk factors for aggression (Barlett, 2007). A video game is any software program that can be played on a computing device, for example, a personal computer or cellphone. Computer games have been in present since the mid-1970s and have gotten progressively well known, crossing common media forms (smartphones, tablets). Interestingly, around 40% of computer games sold contain violent pictures, violent designs, and violent subjects and material (Trinkner et al., 2010). Schools are the most significant outdoor settings; it is the place where the beliefs, attitudes and behaviors of a child are influenced early in life (UNICEF, 2005).

Schools are not only interested in preventing aggressive behavior because it's unacceptable, but also because aggression interferes with learning (Kaufman et al., 2001). Nowadays; Jordan as many other countries suffers from the negative effect of new technologies, and different media forms that are considered one of the most powerful tools that influence children and adolescents' development and health.

Importance of study

There is a lack of studies regarding VVGs and their relation to aggressive behavior among adolescents in Jordan. Only one study done by Abu Baker and Ayyd was conducted among children aging 13-15 years. They found that the prevalence of aggressive behaviors due to exposure to violent video games (VVGs) was 47% and there was a positive correlation between media violence exposure and several forms of aggression among adolescents. Therefore, this study was conducted to identify the prevalence of VVGs and factors that relate to this health problem among pupils in their early adolescent life (aging 10-13) (Abu Baker & Ayyd, 2018). That may help policymakers to take preventive measures and programs to minimize the effect of video games and increase school and parents' awareness of the possible influences of VVGs on adolescents' aggression in the Al-Mazar Al-Janobe sector in the south of Jordan.

Study problem

Research and studies on the effect of video games on the behavior of early adolescents have not focused. As well as knowing the relationship of these games with physical aggressive behaviors and the impact of their long-time practice on physical abuse in adolescents. Therefore, we discussed in our study this important problem for the Jordanian society, which is the study of the Physical Aggressive Behaviors Due to Violent Video Games among Early Adolescents in Al-Mazar Al-Janobe District in the South of Jordan.

Study questions

1. Does violent video games exposure relate to physical aggression among early adolescents in Al-Mazar Al-Janobe district in the south of Jordan?
2. Is there a relationship between the duration of VVGs exposure and the level of physical aggression among early adolescents in Al-Mazar Al-Janobe district in the south of Jordan?

Study objectives

1. To detect the prevalence of VVGs exposure among early adolescents in Al-Mazar Al-Janobe district in south of Jordan.
2. To examine the relationship between VVGs exposure and physical aggression among early adolescents in Al-Mazar Al-Janobe district in the south of Jordan.
3. To identify the relationship between the duration of VVGs exposure and the level of physical aggression among early adolescents in Al-Mazar Al-Janobe district in the south of Jordan.

Study limits

Human limits: This study has been conducted on aging 10-13 years old (boys and girls) students from private and governmental primary schools.

Spatial limits: This study was carried out in the private and governmental primary schools in Al-Mazar Al-Janobe District in the South of Jordan.

Time limits: This study was applied from 1st May up to 1st August 2020.

Terminology of study

Early Adolescent: Early adolescent is operationally defined by the age group between 10 -13 years old as indicated in the demographic data section (WHO, 2020).

Violent Video Games (VVGs): VVGs are operationally defined as the range of options available to a player includes killing, maiming, or dismembering of a human being.

Aggressive behavior: Is a "behavior that is intended to harm another person who is motivated to avoid that harm" (Bushman & Huesmann, 2012).

Physical aggression: Aggression can take many "forms" including physical aggression (in which the actor uses bodily force or weapons to harm a target) (Bucolo, 2010).

Previous studies

Previous studies have confirmed that aggressive behavior has a negative effects, on aggressive children and adolescents, both in the short, and long term (e.g., anxiety, exclusion, low educational achievement) as well as on the targets of their aggressive actions (e.g. anxiety, depression, lower educational achievement, low self-esteem) (Flannery et al., 2007; Huesmann, 1994). In addition, Craig (1998), reported, that the bullied ones displayed more anxiety, isolation, depression, and peer rejection when comparing children who were bullied by other children. In schools both aggressors and targets are present, and both groups need help and interventions (Craig, 1998).

Researchers found that those aged between 8 and 18 are reported to spend more than 40 hours per week using media (television, commercial or self-recorded video, movies, video games, print, radio, recorded music, computer, and the Internet) (American Academy of Pediatrics, 2001). Many researches had been proved that violence in the computer and internet games influence adolescent's attitudes and behaviors by making adolescents 'immune' or numb to the horror of violence, encouraging them to show more aggressive behaviors and imitating the violence they see, these leading them to accept violence as a way to handle the problem (Fraser et al., 2012).

Method and Procedures

In this study, the procedures represented by the following were followed: the study population and the study sample. The current study adopted the descriptive-analytical approach, which describes the answers of the sample

members through the study tool (the questionnaire) in addition to the statistical methods.

The study population and sample

The study population and its sample consisted of (461) early adolescent students, the number boys was (295), girls were (167), from government schools (326), and private schools, numbering (136). Table 1 shows how the study samples are distributed according to the gender variable (boys and girls) and schools (government and private) and their percentages.

Table (1): Shows the study population and its sample according to study variables (early adolescents (boys, girls), governmental and private school)

Variables	Number	Percentage
Early Adolescents Boys	295	63.9 %
Early Adolescents Girls	167	36.1 %
Governmental School	326	70.6 %
Private School	136	29.4

Study tool

Regarding, the questionnaire, which is related to the VVGs exposure, and the physical aggressive behavior, this questionnaire is validated, and reliable. This questionnaire consists of two main sections, (A, B). The section A exhibits information related to VVG exposure (exposure duration; during weekdays, holidays, and last seven days, preferable reason for playing VGs, imitation of heroes. While section B containing data regarding adolescent's physical aggressive behavior that includes six items (pushing or shoving, slapping, kicking, hitting, engaging in a fight, and encouraging pupils to fight). Each item having seven responses (Likert-scale) describing the number of responses during the last week ranging from 0 (lower score) to 6+ (higher score) with a total score of 36.

Validity of the study tool

Three independent public health experts from Faculty of Medicine/ Mutah University with extensive experience in health surveys were asked to evaluate the Arabic and English language version of the questionnaire, (Appendix, II). After that, they completed content validity index (CVI) sheet, to evaluate each group of questions were used that reflect one of the following; not relevant (1), somewhat relevant(2), quit relevant(3), and highly relevant (4), the questionnaire of this study obtained a total acceptable CVI as 97%.

Study tool reliability

Kuder-Richardson KR-20 coefficient reliability (Cronbach's alpha) test has been used to measure and materialize the reliability of the questionnaire study; the value of Cronbach's alpha coefficient was high for each item of the questionnaire.

The total Cronbach's alpha coefficient of the questionnaire as high as 0.897 and the reliability is attained.

Study procedures

The questionnaire was converted into a web-based survey using Google Forms Application. The questionnaire link was posted to the potential participants by using common social media such as Facebook, WhatsApp, Instagram, and Twitter; thereafter the members who clicked the link were directed to the Google forms. On completion of the questionnaire, the participants were directed to click the submit option, and finally, the online questionnaire was sent to the drive. The participant was also told about the procedures of the study and provisions to maintain confidentiality. After three weeks, the maximum responses of 481 questionnaires were submitted from the participants. For the purpose of consistency, the researcher performed the data entry into SPSS software version 21. Data cleaning was carried out through the following techniques: visual screening of the data for possible errors. Thus, 19 of the questionnaires were discarded, as some participants were not meeting the inclusion criteria of this study, therefore a sample of 462 participants was included in this study.

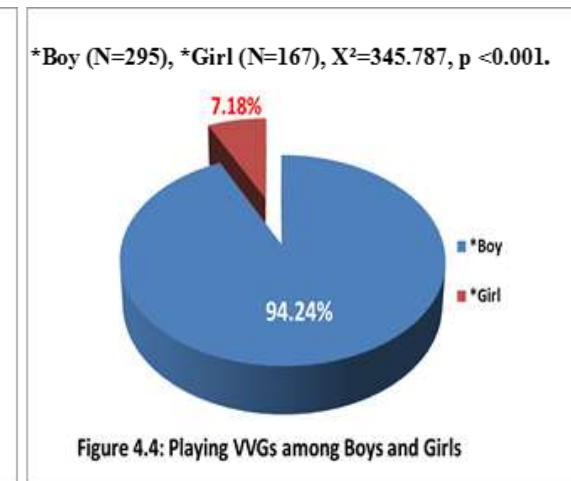
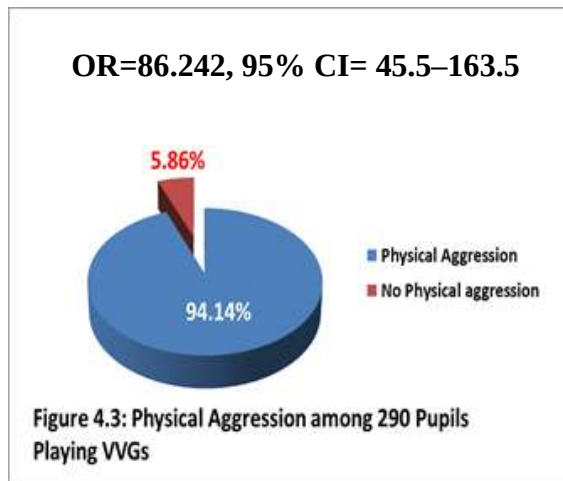
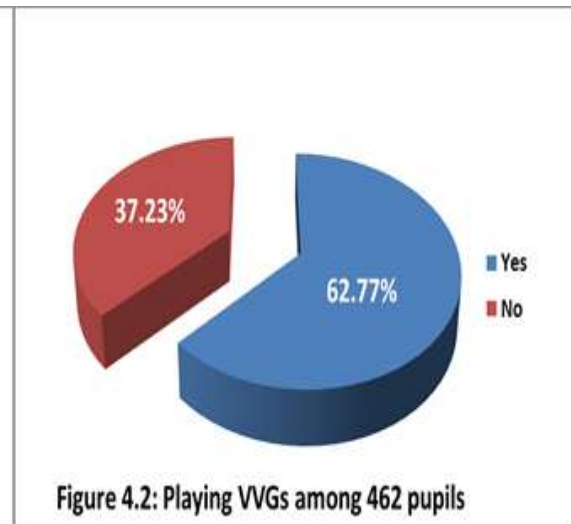
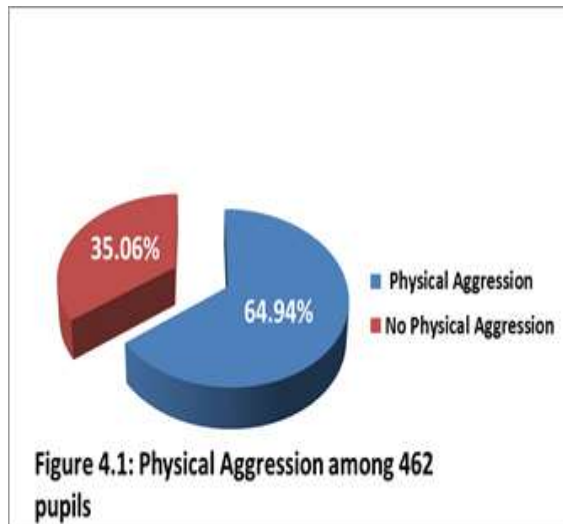
Statistical processing

Data retrieved from the online survey were entered into Microsoft Excel and then imported into the Statistical Package for Social Sciences (SPSS) version 21, and a level of significance set at < 0.05 . Descriptive statistics for the variables of the study population presented as simple frequency (n), percentage (%), mean and standard deviation (SD). The whole variables were analyzed by using One-way ANOVA (F) with Post hoc, independent two samples t, and chi-square tests were used to determine which variables associated with physical aggression behaviors, for the bivariate analysis, the odds ratio (OR) and 95% confidence interval (95%, CI) were calculated for measuring the magnitude of the association between the variables of the study and physical aggression behaviors. In addition, the Pearson correlation test was used, to detect the correlation relationship between two continuous variables. The significance level used as < 0.05 .

Results

Prevalence of Violent Video games (VVGs) exposure and physical aggression

The main objective of the current study was to identify the prevalence of physical aggression and VVGs, and to study the relation of VVGs with physically aggressive behaviours among early adolescent's pupils (aging 10-13 years) in the Al-Mazar Al-Janobe district. This issue is addressed below. Out of the total 462 adolescents, 300(64.94%) showed physical aggressive behaviours (Fig 1), and 290 (62.77%), reported they are playing VVGs (Fig 2). In another word, the prevalence of physical aggression was 64.94%, and for the VVGs playing was 62.77%. Whereas, the prevalence of physical aggression among those who were playing VVGs was 94.14% (Fig 3) in the Al-Mazar Al-Janobe district. Playing VVGs was significantly higher (278, 94.24%) among boy's participants than (12, 7.18%) girls, $X^2=345.787$, $p < 0.001$, (Fig 4).



$$X^2 = 291.75, P < 0.001$$

Relationship of VVGs exposure with the physical aggression

In studying the physical aggressive behaviors among early adolescent pupils, which is one of the aims of the present study. Therefore, this issue has been investigated, by asking each participant six questions. Each question has six options, and scaled with a six-point Likert-scale. This study found, that the highest physical aggression score was 34 and the lowest was 8 scores, with a mean of 24.08 ± 8.68 score.

To study the relation, of VVGs exposure, and physically aggressive behaviors of the early adolescents pupils, this study found, that the rate of physical aggression was (94.14%) significantly higher, among those exposed to VVGs than those who were not exposed to VVGs (15.7%), $X^2 = 291.75$, $P < 0.00$, (Fig 2). Moreover, the participants who were exposed to VVGs, showed a significantly higher mean score

(29.39 $\pm$ 4.57) of physical aggression behavior compared to (15.13 $\pm$ 6.32) those who were unexposed to VVGs, $t = 27.988$, $p < 0.001$. Besides that, this study gave evidence that those adolescents who were exposed to VVGs are significantly 86 times more at a higher risk of being physically aggressive, than those who were not being exposed to VVGs, $OR=86.242$, $95\% CI= 45.5-163.5$, (Fig 3).

To test the relationship between the duration of exposure to the VVGs, and the level of physical aggression as seen from table 4.3, the mean duration of VVGs exposure, in this study was 12.37 $\pm$ 7.14 hours/ week, ranging from 1 – 25 hours in the last seven days. By performing the Pearson correlation test, this study detected that there is a significant, very strong positive correlation between the duration of VVGs and the level of physical aggression ($r = 0.830$, $p < 0.001$). While, the duration of VVGs exposure on holidays as well as in ordinary days showed, significantly weak positive correlation with the level of physical aggression, $r = 0.380$, $p < 0.001$, $r = 0.246$, $p < 0.001$, respectively.

Table (2): Relationship between the duration of exposure to the VVGs, and the level of physical aggression among adolescents in Al-Mazar Al-janobe district in

Duration of exposure to VVGs	Level of physical aggression		
	Mean $\pm$ SD	Test of sig	P value
Duration of violent videogames exposure in last 7 days	12.37 $\pm$ 7.14	$r = 0.830$	<0.001
Duration of violent videogames exposure in week days	3.443 $\pm$ 1.387	$r = 0.246$	<0.001
Duration of violent videogames exposure in holidays	3.984 $\pm$ 1.541	$r = 0.380$	<0.001

the south of Jordan

Relations of the Pupils background with physical aggressive behaviors due to VVGs

Primary schools characteristics and its relation to physical aggressive behaviors

Regarding, the type of school, the rate of physically aggressive behaviors was higher among governmental school pupils (66.3%) than that in the private schools (61.8%), but this variation was not significant, $X^2=0.851$, $p=0.356$. Similarly, the mean score level of physical aggression was higher (24.37 $\pm$ 8.57) among the pupils of governmental schools than (23.40 $\pm$ 8.98) those in private schools. However, this difference was not significant, $t = 1.09$, $p = 0.276$ (Table 3).

Concerning, the availability of social-educational activities as well as the school's counselor, surprisingly, both issues showed availability in 456 schools, and the rate of physical aggression was 65.8% for both issues. Moreover, the mean score of physical aggression was 24.22 $\pm$ 8.66. On the other hand, there were only six schools lacking both social-educational activities and the school's counselor, and no one of the pupils belong to those six schools reported physical aggressive behavior. With regard to the availability of a school's nurse, the rate of physical aggression among pupils with no nurse in their school (67.4%) was significantly

higher than those pupils having a school's nurse (50.7%), $X^2=7.194$, $p=0.007$. Moreover, the pupils who don't have a nurse at their schools are significantly two times higher at risk of developing physical aggression than those pupils who have a nurse at their school, in another word, the school's nurse availability act as a protective factor for physical aggressive behaviors among the pupils, $OR = 0.5$, $95\% CI=0.37-0.83$.

Table (3): Relationship of the level of physical aggression with primary schools characteristics in Al-Mazar Al-janobe district in the south of Jordan

school characteristics		physical aggression		
		No (%)	Mean± SD	Test of sig
Type of school	Governmental (326)	216(66.3)	24.37 ±8.57	t= 1.09
	Private (136)	84(61.8)	23.40 ±8.98	$x^2=0.851$
*Availability of school nurse	Yes (69)	35(50.7)		$X^2 = 7.194$
	No (393)	265(67.4)		
Availability of educational counselor	Yes (456)	300(65.8)	(24.22±8.66)	
	No (6)	0(0)		
Availability of school activities	Yes (456)	300(65.8)	(24.22±8.66)	
	No (6)	0(0)		

Physical aggression behavior in relation with media and electronic devices

Concerning, the relation of the most preferable type of electronic device used by the participant, with the participant's physical aggression behaviors. As shown in the table 4, the highest proportion of physical aggression was found among the participants using a laptop 61(98.4%), followed by 97(77.6%), and 142(54.4) for those using tablets and smartphones, respectively. Statistically, a significant association was detected between these three groups, and the physical aggressive behaviors, $X^2 = 52.7$, $p<0.001$. On the other hand, only 14 participants used PlayStation and none of them claimed to have physical aggressive behavior. To investigate the relation of the adolescent's physical aggression behaviors with the most preferable reasons for playing VGs. Interestingly, those who used to play VGs as a hoppy (20) and those for liking an attack game type (33), all of them were showed that they had physically aggressive behavior. In another word, the rate of physical aggression was (100%) among those two groups. While variations in the physical aggressive rate among the remaining three groups were detected as 97.3% for liking killing and shooting, 71.3% for like fighting and boxing, and 10.5% for entertainment. Statistically, this variation was significant, $X^2 = 162.96$, $p<0.001$.

Studying the relation of imitating the heroes of VGs with the physical aggression, although, the rate of physical aggression was higher (72.9 %) among those participants who are not imitating the VG's hero than their counter group (63.8

%), this study detected no significant association between imitating the heroes of VGs with the physical aggressive behavior, $X^2 = 1.876$, $p=0.171$. Moreover, the adolescents who used VGs as a hobby or liking killing and shooting all claimed that they attempt to imitate the behaviors of VGs actors; it means that, the rate of imitating among them was 100%. While the imitating rate among those who used to play VGs for, entertainment, like attack, and like fighting and boxing as 92.4, 90.9 or 79.1 respectively, and statistically, a significant association was detected between adolescents' imitating behavior and the reason for playing VGs, $X^2=10.699$, $p=0.0049$.

Regarding the availability of the electronic device in the adolescent's bedroom, and its relation to physical aggression, this study found that the rate of physical aggression was higher (65.7%) among participants who have an electronic device in their bedrooms, than participants (62.5%), who didn't have an electronic device in their bedroom, and this variation was not significant. $X^2 =0.385$, $p=0.535$. On the contrary, the rate of physical aggression was higher (67%), among participants who didn't have a TV in their bedroom than participants, who have a TV in their bedroom (64.3%) however, this variation was not significant, $X^2 =0.253$, $p=0.615$. To study, the relation between the adolescent physical aggressive behavior, and the attitude of their parents, in limiting them from playing the VGs and/or watching TV programs. This study found that the rate of physical aggression was significantly higher (69.9%) among participants whose parents do not limit them from playing VGs than participants (37.1%), whose parents limit their playing VGs, $X^2 =27.986$, $p<0.001$. Similarly, the rate of physical aggression was significantly higher (69.3%), among participants whose parents do not limit watching TV programs than participants whose parents limit watching TV programs (52.5%), $X^2 =11.009$, $p=0.001$. In another word, interestingly, parents limiting child from watching TV programs as well as playing VGs, act as a protective factor for physical aggressive behaviors among the pupils, OR =0.498, 95% CI=0.32–0.75, OR =0.255, 95% CI=0.157–0.433, respectively.

Table (4): Physical aggression behavior in relation with media and electronic devices in Al-Mazar Al-janobe district in the south of Jordan

General information on media and electronic devices.		Physical aggression		
		No (%)	Test of sig	P value
Type of electronic device	Play station(14)	0(0)	$x^2=52.7$	<0.001
	Tablet(125)	97(77.6)		
	Smart phone(261)	142(54.4)		
	Laptop(62)	61(98.4)		
electronic devices in bedroom	Yes (350)	230(65.7)	$x^2=0.385$	0.535
	No (112)	70(62.5)		
TV in bedroom	Yes(356)	229 (64.3)	$x^2=0.253$	0.615
	No(106)	71 (67)		
*Parents limit videogames	Yes(70)	26(37.1)	$x^2=27.986$	<0.001
	No(392)	274(69.9)		
**Parents limit T.V programs	Yes(120)	63(52.5)	$x^2=11.009$	<0.001

	No(342)	237(69.3)		
Reason for playing VGs				
As a hobby (20 boys)		20(100)		
		164(71.3)		
Like fighting and boxing (160 boys, 62 girls)		72 (97.3)		
		33(100)		
Like killing and shooting (74 boys)		11(10.5)		
Like attack (33 boys)				
Entertainment (105 girls)			$\chi^2=162.96$	<0.001
Imitate hero of games	Yes(250 boys, 153girls)	257(63.8)	$\chi^2=1.876$	0.171
	No(45 boys, 14girls)	43(72.9)		

*OR =0.255, 95% CI=0.157–0.433 **OR =0.498, 95% CI=0.32–0.75

Discussion

Regarding, the mean score level of physical aggression (29.39 ± 4.57) among adolescent who exposed to VVGs in this study, is much higher than what was found (17.68 ± 3.85) in Italy by (Milani et al., 2015). Interestingly, physical aggression due to VVGs in this study among boys showed a higher rate (98.2) than that found in Iraq (45.3%), while, the girls in this study, showed much lower (0%) than that detected in Iraq (33.2%) by (Dhiaa & Tawfeeq, 2016). These findings supporting what was found by several authors, that the mean score of physical aggression due to VVGs exposure was significantly higher among boys than girls 1.05 ± 1.97 vs 0.48 ± 1.20 , (Bucolo, 2010), and 7.78 ± 3.25 vs 4.09 ± 1.77 , (Abu Baker & Ayyd, 2018), ($p < 0.001$). Many factors could be explaining this result, for example; the study population, the current study was carried out on the early adolescent pupils who are more vulnerable to the negative impact of VVGs exposure (Gogtay et al., 2004).

In addition, the participant's average time of exposure (hours /week) in the current study was (12.37 h/w) higher than what was found in china (11.13 h/w) and Iran (6.3 h/w) (Allahverdipour et al., 2010; Shao & Wang, 2019) respectively, this variation may be related to the difference in the study population, time and setting of the study. These consistent findings confirm the effect of adolescent exposure to VVGs, with the physical aggression behaviors based on the GAM theory as reported by (Bushman & Anderson, (2002); Anderson & Carnagey, (2014)), stated, that repeated exposure to the VVGs can make adolescents acquire, and reinforce aggression, including aggressive beliefs, thoughts and attitude. Moreover, the significant strong positive correlation ($r = 0.830$, $p < 0.001$), that was detected in this study, between the level of physical aggression, and the duration of VVGs exposure is in concordance with several scientists (Allahverdipour et al., (2010); Abu Baker & Ayyd, (2018)), they were found a significant positive correlation between the duration of exposure to VVGs and adolescent physical aggression ($r = 0.26$, $p < 0.001$; $r = 0.549$, $p < 0.001$; $r = 0.15$; $p < 0.05$), respectively.

Although, the rate of physically aggressive behaviors in this study was not significant, but higher among governmental school pupils (66.3%) than that in private schools (61.8%). The findings of this research can be explained by comparing the proportion of pupils from private and governmental schools, as it was found, that it is much lower in the private (29.4%) than in the governmental (70.6%) schools. Another reason is that the participants who attended private schools were most likely from higher-income families and well-educated parents who were found in this study to have a lower degree of physical aggression.

Conclusion

One of the most important results obtained during this current study is that Jordanian adolescents predominately practice violent video games (VVGs) in primary schools. Where adolescent pupils who were playing VVGs showed a significant higher rate (94.14%) of Physical aggression and they are significantly 86 times more at a higher risk of being aggressive, than those who were not being exposed $OR=86.242$, 95% $CI= 45.5-163.5$. Moreover, a significant and very strong positive correlation was detected between the duration of VVGs and the level of physical aggression, ($r = 0.830$, $p < 0.001$), while no significant association was found between the adolescent's type of school and physical aggressive behaviors. In addition, more than half of the participants used smartphones to play VGs, it was interesting that adolescents who used their laptops to play VGs showed significant aggressive behaviors.

Recommendations

- It is essential to adopt educational programs to increase the awareness of public about the risk of exposure to VVGs and TV on adolescent's behavior through the mass media and also by the leaders of the community.
- The ministry of education must organize many lectures and seminars related to violence reduction especially physical aggression inside schools, and the ways of dealing with pupils' aggressors should be educated properly and conducting studies periodically and continuously in schools to find out the needs of adolescents pupils, their desires and the most important problems they suffer from.
- Encourage the adolescents to participate in socio-educational activities as; drawing, painting, sporting, playing musical instrument, and carving in school and home, this helps adolescents to interact with peers rather than VGs.

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