



Investigating Parental Perspectives of the Effects of Digital Games on Kindergarten Children's Aggressive and Social Behaviour

Hesham Alomyan^{1*}, Ali Alelaimat²

Type: Full Article. Received: 11November 2025, Accepted: 13May 2026

Accepted Manuscript, First Online

Abstract: Objective: The purpose of the present study is to investigate parental perspectives of the effects of digital games on kindergarten children's aggressive and social behaviour. **Methodology:** To achieve this objective, the study using purposive sampling technique surveyed four hundred and fifty (N=450) kindergarten parents' perspectives in Al-Mafriq province, Jordan. **Findings:** The results of the study highlighted that, according to those parents' points of view, there was a significant relationship between digital games and the emergence of socially aggressive behaviour and changes among 4-6 year old kindergarten children. Additionally, the findings showed that female children and digital game owners exhibited higher levels of aggressive behaviour than male children and non-digital game owners. Parents' educational level had no influence over children's social and aggressive behaviour. The results also elucidated that gender and digital game ownership were associated with children's social behaviour, suggesting that females and children who own a digital game were less sociable. **Conclusion:** The findings suggest that digital game use may be linked to increased aggressive behaviour and reduced social interaction among kindergarten children, underscoring the need for mindful and guided use. **Recommendations:** As per the study, it was recommended that parents should be fully acquainted with the beneficial and adverse consequences of digital games on behaviour, and thus children should be made aware of it. **Keywords:** Digital technology, digital games, aggressive behaviour, social behaviour; kindergarten children.

استقصاء وجهات نظر أولياء الأمور حول آثار الألعاب الرقمية في السلوك العدواني والاجتماعي لدى أطفال رياض الأطفال

هشام العميان^{1*}، علي العليمات²

تاريخ التسليم: 2025/11/11، تاريخ القبول: 2026/05/13

المخلص: الهدف: هدفت الدراسة الحالية إلى استقصاء وجهات نظر أولياء الأمور حول آثار الألعاب الرقمية في السلوك العدواني والاجتماعي لدى أطفال رياض الأطفال. **المنهجية:** لتحقيق هدف الدراسة، اتبعت الدراسة أسلوب العينة القصدية، وجمعت بياناتها من خلال استطلاع آراء عينة مكونة من (450) ولي أمر من أولياء أمور أطفال رياض الأطفال في محافظة المفرق، الأردن. **النتائج:** أظهرت نتائج الدراسة، وفقاً لوجهات نظر أولياء الأمور المشاركين، وجود علاقة وثيقة ذات دلالة إحصائية بين الألعاب الرقمية وظهور السلوك العدواني والتغيرات في السلوك الاجتماعي لدى أطفال رياض الأطفال الذين تتراوح أعمارهم بين 4 و6 سنوات. كما أظهرت النتائج أن الإناث والأطفال الذين يمتلكون ألعاباً رقمية أظهروا مستويات أعلى من السلوك العدواني مقارنة بالذكور والأطفال الذين لا يمتلكون ألعاباً رقمية. كذلك، لم يظهر المستوى التعليمي للوالدين أي تأثير في السلوك الاجتماعي والعدواني لدى الأطفال. وأوضحت النتائج أيضاً أن الفروق بين الجنسين وامتلاك الألعاب الرقمية يؤثران في السلوك الاجتماعي للأطفال؛ إذ كان الأطفال الإناث والأطفال الذين يمتلكون ألعاباً رقمية أقل ميلاً إلى التفاعل الاجتماعي. **الاستنتاجات:** تشير النتائج إلى ارتباط الألعاب الرقمية بزيادة السلوك العدواني وانخفاض التفاعل الاجتماعي لدى أطفال رياض الأطفال، مما يؤكد أهمية الاستخدام الواعي والموجه لها. **التوصيات:** أوصت الدراسة بضرورة توعية أولياء الأمور بالآثار الإيجابية والسلبية المترتبة على استخدام الألعاب الرقمية في سلوك الأطفال، وتعريف الأطفال بهذه الآثار بما يساهم في تعزيز الاستخدام الواعي للألعاب الرقمية. **الكلمات المفتاحية:** التكنولوجيا الرقمية، الألعاب الرقمية، السلوك العدواني، السلوك الاجتماعي، أطفال رياض الأطفال.

¹ School of Educational Sciences, The University of Jordan, Jordan.

* Corresponding author: h_alomyan@ju.edu.jo, orcid:

<https://orcid.org/0000-0001-9971-9127>

² Queen Rania Faculty for Childhood, The Hashemite University, Jordan.

¹ كلية العلوم التربوية، الجامعة الأردنية، الأردن.

* الباحث المراسل: h_alomyan@ju.edu.jo

² كلية الملكة رانيا للطفولة، الجامعة الهاشمية، الأردن.

Introduction

The use of digital technology has become one of the major developments in the contemporary world. At present, the number of digital devices has increased significantly due to their widespread availability and ease of use. This has led to a significant increase in the number of users, especially as the cost of these devices and related services has fallen. According to recent estimates offered by the International Telecommunication Union, around 82% of the global population owns a smartphone (ITU, 2025), making it easy for people of all ages, including children, to access and use it.

Digital media content can exert influence on our values and behaviour. Recent studies (e.g., Gunawardhana & Palaniappan, 2015; Greitemeyer, 2014; Przybylski et al., 2010) have indicated that the availability of violent games through digital media devices can have a negative effect on the behaviour of the users especially children. However, there is still controversy among researchers as to whether engagement in violent digital games leads to real life violence. For instance, some researchers (e.g., Greitemeyer, 2014; Willoughby et al., 2012) have suggested that viewing and/or participating in violent games can lead to negative behaviours, while others dispute and argue against these findings (e.g., Williams & Skoric, 2005; Ferguson & Rueda, 2010). Nonetheless, a growing body of research (Prot et al., 2014; Gentile et al., 2016) has found that exposure to violence in television and digital games over time can increase aggressive behaviour and affect psychological and cognitive development. Other studies (e.g., Anderson & Bushman, 2001; Burkhardt & Lenhard, 2022; Jiang et al., 2023) have showed that the impact of aggressive video games was immediate, yet long-term effects in the form of aggressive tendencies have also documented (Anderson et al., 2003; Anderson et al., 2010; Huesmann 1988).

Within this context, parents play a pivotal role in mediating the impact of digital gaming on their children by monitoring content, regulating screen time, modeling appropriate

technology use, and guiding children at the kindergarten stage toward balanced social interactions. However, the fast-paced development of digital games, coupled with limited parental awareness of their psychological and behavioural implications, presents substantial technological challenges for families. Understanding parental perceptions is therefore essential, as parents are not only primary gatekeepers of children's digital experiences but also key agents in shaping children's behavioural and social development in an increasingly digital environment. Consequently, the present study seeks to investigate the effects of digital games on kindergarten children's aggressive and social behaviour from their parents' perspective, who are considered the first socialization agents in their children's life and have a unique understanding of their behaviours.

Literature review

With the invention of the computer, researchers began to study the effect of this new technology on children, focusing mainly on children's learning and less on their behaviour and personality (e.g., Carlson & White, 1998; Elliott & Hall, 1997; Klein et al., 2000; McKethan et al., 2001). However, with the recent advancement in information and communication technologies (ICTs), new forms of digital technology have emerged, and are becoming a regular part of young children's daily life. These technologies including iPads, tablets, smartphones, iPod Touch and much more, offer digital games and interactive media. A report from the US's Common Sense Media found 40% of children had a tablet by age two and almost a quarter have their own smartphone by age eight. According to the report, gaming time increased by 65%. (CSM, 2025).

This widespread use of digital technology, especially digital games, by children has raised concerns among researchers about the potential dangers and the impact they could have on children's behaviour (e.g., Dakin & Chung,

2011; Ferguson, 2017; Hosale, 2013). Earlier studies investigated the effect of digital games on children's behaviour at schools (e.g., Milani et al., 2015; Onwukwe et al., 2017; Sherry, 2001; Sheikha, 2007; Wang et al., 2021). These studies reported a relationship between playing digital games and young children's aggressive behaviour at school.

In support of the above findings, a more recent meta-analysis by Prescott, Sargent, and Hull (2018) inspected 24 longitudinal studies involving over 17,000 participants aged 9 to 19 years. This analysis found that exposure to violent video game content was positively related to later evident physical aggression even after controlling for baseline levels of aggression, highlighting that violent gaming may contribute to the emergence of aggressive behaviour over time.

While many studies, as illustrated above, have found that digital games have a negative effect on children behaviour, other studies (e.g., Granic et al., 2014; Green & Bavelier, 2012; Kuhn et al., 2019; Parkes et al., 2014; Przybylski & Weinstein, 2019) found that such an effect was no longer there at all. These studies repeatedly concluded that the effect of such games was minimal or nil. The studies also showed that digital games of all kinds could be used as being a learning tool of fun because of their multiple benefits. They can engage with the virtual world and simulate children's desires and inclinations in an attempt to increase their motivation and skills. The inconsistency of results regarding the effects of digital gaming among studies can be attributed to differences in participants' age, content of violent gaming, and research methodology, which is generally experimental. It must be also stressed that identifying the cause-effect direction of digital games under experimental conditions *in everyday life* may be not possible and difficult to assess.

Therefore, the present study approaches the issue differently by scrutinizing the effect of digital games on kindergarten children's aggressive and social behaviour from their parents' perspective, and such a topic therefore distinguishes it from other studies. In addition,

most of previous studies have focused on elementary school-age students, adolescents, and adults, whereas this study bridges a gap in the literature when concentrating on preschool children, as being a critical developmental period. The researchers aimed to study both aggressive and social behaviour as positive behaviour promotes social harmony and reduces children's negative habits and emotional conflict. Negative and violent social behaviour can lead to social and psychological disorders that can contribute to aggressive behaviour resulting from gaming. This can create a sense of irresponsibility towards peers and society, guiding to selfishness and a lack of acceptance and tolerance towards others whereby negative and aggressive behaviour. would be noted (Belhadj, 2011; Sit et al., 2016).

Study problem and questions

In recent years, digital games have become a mean form of entertainment among children (Isikoglu et al., 2021). Many of these games are of violent content (Parkes et al., 2014). This violence can lead to aggressive behaviour and incidents that occur in schools, on the streets and in playgrounds so that it endangers children's safety and violets society' security. Bandura (1977) believes that individuals have an innate tendency to mimic the behaviour of others, even when they receive no reward or reinforcement for doing so (Al-Zahir, 2004). Bandura's theory states that much of what we have learned is resulted from observing the behaviour of others, and it also confirms that people simply tend to observe the behaviour of others to learn particular behaviours, and then employ those observations as a guide for saving them from adopting new behaviours in the future.

Although Bandura's theory is valuable in analyzing the potential impact of digital violence, it is also a general learning theory applied to other aspects of the effect of digital gaming (Nasr, 2015). Bandura points out that individuals practice their behaviour based on the reactions of others, especially those who are close to them. Moreover, individuals exercise their behaviour, whether being negative (e.g., prosocial behaviour, self-regulation and persistence) or positive (e.g., aggressive

behaviour and rule-breaking) depending on what is watched on television, and what is interacted in communication modes, or what is played in games in general. if those sorts of behaviour are rewarded, the person will repeat them and mimic others. On the contrary, when these types of behaviour are received with punishment, they can end and cannot be imitated (Al-Warikat, 2013).

Therefore, the present study adopted Bandura's theory as being the most appropriate theoretical basis. The theory helps interpret the long-term effects of digital games on children, and how these games can guide them to learn various social skills by imitating what they see. Based on Bandura's theory, the researchers aim to investigate parents' perspectives as far as the effect of digital games in general and violent games in particular on their kindergarten children's aggressive and social behaviour are concerned. More specifically, the study seeks to answer the following research questions:

- 1) What are parents' perspectives in relation to the effects of digital games on the emergence of their kindergarten children's aggressive behaviour?
- 2) What are parents' perspectives in relation to the effects of digital games on their kindergarten children's social behaviour?
- 3) Are there significant differences at ($\alpha = .05$) in kindergarten children's aggressive behaviour and their social behaviour based on gender, parental education level, and ownership of digital games?

Methodology

Participants

As shown in Table 1, a total of 450 parents (188 fathers and 262 mothers) of 4 to 6 year old kindergarten children participated in the study. These parents were responsible for supervising their children's digital game use and were therefore able to provide informed perceptions regarding the effects of digital games on their children. The study's participants were chosen from thirty-five kindergartens in Jordan's

Mafrq province. The 35 kindergartens, representing 10% of those in the province, were purposively selected and distributed across the three education directorates to facilitate access to parents of the children, which is the target age group of the study and to capture variation in children's ownership of digital games and parental education levels. While this may limit generalizability, the sample provides meaningful insights into the population. The selected kindergartens enrolled between approximately 10 and 15 children each in the second semester of the school year 2024/2025.

Table (1): Study participants.

Variable	Category	Frequency	Percentage
Parents	Father	188	41.8
	Mother	262	58.2
Total		450	100

Instrument

The study instrument was a quantitative questionnaire developed by the present researchers to examine the effect of digital games on the aggressive and social behaviour of kindergarten children from their parents' perspective. The questionnaire comprised two fields, aggressive behaviour and social behaviour, which were derived from the related literature and based on the objectives of the present study. Table 2 presents the 23 items that made up the questionnaire:

Table (2): Fields of study and the number of items belonging to each field.

Field number	Field	Item number
1	Aggressive behaviour	12
2	Social behaviour	11
Total		23

Validity and reliability of the instrument

To verify the validity of the study instrument, a group of educationalists and psychologists were asked to evaluate the instrument items, clarity of their content, and

their ability to achieve the study objectives. Based on the experts' feedback and obtained scores, the Content Validity Index (CVI) was calculated and found to be 0.82. Hence, the content of the instrument was validated. To verify the reliability of the instrument, the Cronbach Alpha equation was employed to calculate the internal consistency of the instrument, and the results are shown in Table 3.

Table (3): Reliability coefficients "Cronbach Alpha" results

Field	Alpha value
Aggressive behaviour	0.806
Social behaviour	0.913
Total degree of instrument	0.911

The instrument items were rated on a five-point Likert. The responses to the items took five degrees (strongly agree, agree, neutral, disagree, strongly disagree) and weights given were 5, 4, 3, 2, and 1 respectively. To determine the agreement level of each item, the following calculation was performed: $\text{High Score (5) - Lower Score (1)} \div 3 \text{ (number of levels)} = 1.33$. The number 1.33 is the length of the category. Consequently, as presented in Table 4 the following categories will be adopted:

Table (4): Classification of degree of Study instrument items

Category	Degree
1.00 -2.33	Low agreement
2.34 - 3.67	Average agreement
3.68 -5.00	High agreement

Procedures

Initially, a letter of consent was prepared and sent to the administrations of the kindergartens under study and the children's parents to obtain their consent for participation in the study. Subsequently, the researchers gave the questionnaire to the kindergarten children and the children passed it to their parents after seeking their permission. A total of 450 parents answered the items of the questionnaire. After

data collection, the Statistical Package for Social Sciences (SPSS) was applied to analyse the data.

Data Analysis

Data was analysed using the following methods within the Statistical Package for Social Sciences (SPSS):

- Simple statistical methods including frequencies, percentages, means, and standard deviations to describe the characteristics of the study sample
- Cronbach Alpha to measure the internal consistency of study variables and dimensions.
- Pearson correlation coefficient to test the validity of the study instrument.
- One Sample T-Test to examine the significance of differences between the mean of the answers and the mean of the hypothetical scale (3), which represents a neutral position. Likert-scale responses were treated as approximately interval data, consistent with common practice in educational and social science research, allowing for meaningful comparison of mean scores against this neutral baseline.
- An independent samples t-test to examine differences in parents' perspectives based on gender, parental education level, and ownership of digital games.

Results

The present study results are organized to cope with the research questions as follows:

Question one: What are parents' perspectives on the effect of digital games on the emergence of their kindergarten children's aggressive behaviour?

To answer the first question, a one-sample t-test was conducted to compare the mean responses for each item related to aggressive behaviour against the hypothetical mean of the scale and results reported in Table 5.

Table (5): Results of a one-sample t-test to investigate parents' perspectives on the effect of digital games on the emergence of their kindergarten children's aggressive behaviour.

Item number	Items	Mean	SD	t-value	DF	Sig. level	Degree
1	I notice my child practicing violence after the completion of the game.	3.47	1.61	6.177	449	0.000*	Average
2	My child practices aggressive movements seen in the game on the kindergarten classmates.	3.65	1.55	8.970	449	0.000*	Average
3	My child tends to play aggressive games.	3.44	1.68	5.593	449	0.000*	Average
4	My child feels like one of the players in the game.	3.19	1.67	2.424	449	0.000*	Average
5	My child loves violent digital games.	3.40	1.67	5.077	449	0.000*	Average
6	My child exchanges violent games with his friends.	3.10	1.38	1.464	449	0.144	Average
7	My likes playing on the computer more than playing with his friends.	3.27	1.42	3.978	449	0.000*	Average
8	Digital games make my child feel strong.	3.45	1.27	7.445	449	0.000*	Average
9	Digital games affect my child's acceptance of criticism.	3.26	1.35	4.114	449	0.000*	Average
10	My child does not respond to the teacher's directions in kindergarten.	3.31	1.32	5.019	449	0.000*	Average
11	My child acts aggressively with us.	3.21	1.43	3.109	449	0.002*	Average
12	Digital technology causes anxiety in my child.	3.31	1.40	4.658	449	0.000*	Average
Total score				0.84	449	0.000*	

* The differences are statistically significant at ($\alpha = .05$).

The test results, as shown in Table 5, indicate significant differences (at $\alpha = 0.05$) for most items, suggesting that parents perceive a significant relationship between digital games and their children's aggressive behaviours. For instance, the item assessing the children's observation of practicing violence after playing game had a mean score of 3.47 (SD = 1.61), with a t -value of 6.177 ($p < 0.001$). Similarly, the item related to children practicing aggressive movements against their classmates showed the highest mean score ($M = 3.65$, $SD = 1.55$), with a t -value of 8.970 ($p < 0.001$). Other notable findings include the preference for aggressive games ($M = 3.44$, $SD = 1.68$, $t = 5.593$, $p < 0.001$) and the feeling of being like a

player in the game ($M = 3.19$, $SD = 1.67$, $t = 2.424$, $p < 0.001$).

The data also reveal significant results concerning children's love of violent digital games ($M = 3.40$, $SD = 1.67$, $t = 5.077$, $p < 0.001$), their feeling of strength associated with playing game ($M = 3.45$, $SD = 1.27$, $t = 7.445$, $p < 0.001$), their difficulties in accepting criticism ($M = 3.26$, $SD = 1.35$, $t = 4.114$, $p < 0.001$), and their aggressive interactions with family members ($M = 3.21$, $SD = 1.43$, $t = 3.109$, $p = 0.002$). However, one item, which measured the children's tendency to exchange violent games with friends, did not yield significant results ($p = 0.144$), indicating less agreement among parents with this behaviour.

The total score for the factor of aggressive behaviour was also significantly different from the hypothetical mean ($t = 0.84, p < 0.001$). The notion, which digital games are perceived as influential in fostering aggression among kindergarten children, is further supported.

Question two: What are parents' perspectives on the effect of digital games on their kindergarten children's social behaviour?

Table (6): Results of a one-sample t-test to investigate parents' perspectives on the effect of digital games on their kindergarten children's social behaviour.

Item number	Items	Mean	SD	t-value	DF	Sig. level	Degree
1	My child prefers playing with digital games to going out.	3.83	1.43	12.274	449	0.000*	High
2	My child prefers playing on the computer to mixing with others.	3.76	1.47	10.898	449	0.000*	High
3	My child prefers playing with digital games to eating meals.	3.08	1.62	1.018	449	0.309	Average
4	Digital games provide relief for parents from their children's problems.	2.95	1.59	-0.652	449	0.515	Average
5	My child prefers spending time on digital games to sitting with the family.	3.01	1.64	0.086	449	0.931	Average
6	Digital games make the child active.	2.89	1.78	-1.348	449	0.178	Average
7	Digital games make children more attached to staying indoors.	2.97	1.81	-0.366	449	0.715	Average
8	Digital games contribute to isolation in children.	2.96	1.76	-0.535	449	0.593	Average
9	Digital games stimulate the child to think	3.83	1.50	11.760	449	0.000*	High
10	Children who play digital games tend to dislike playing physical games.	3.80	1.51	11.158	449	0.000*	High
11	My child prefers computer play to engaging with friends.	3.67	1.59	8.938	449	0.000*	Average
Total score		3.34	0.84	3.80	449	0.000*	Average

* The differences are statistically significant at ($\alpha = .05$).

The test results, as shown in Table 6, reveals several statistically important findings (at $\alpha = 0.05$), indicating that parents perceive a notable

To answer the second question, a one-sample t-test was conducted. The analysis compared the mean responses for each item to the social behaviour scale with the hypothetical mean of the scale and results presented in Table 6.

impact of digital games on their children's social behaviour. The item with the highest mean score, "My child prefers playing with digital games to going out" ($M = 3.83, SD =$

1.43), had a t -value of 12.274 ($p < 0.001$), suggesting a strong parental agreement. Similarly, the item "My child prefers playing on the computer to mixing with others" ($M = 3.76$, $SD = 1.47$) showed a significant t -value of 10.898 ($p < 0.001$). The preference for playing computer over physical games ($M = 3.80$, $SD = 1.51$, $t = 11.158$, $p < 0.001$) and the stimulation of thinking of digital games ($M = 3.83$, $SD = 1.50$, $t = 11.760$, $p < 0.001$) were also crucial, highlighting specific behavioural patterns.

In contrast, several items did not elucidate statistically outstanding results. These include preferences of digital games over eating meals ($M = 3.08$, $SD = 1.62$, $p = 0.309$), the perception that digital games provide some sort of parents' relief from their children's problems ($M = 2.95$, $SD = 1.59$, $p = 0.515$), and the belief that digital games contribute to make children increasingly attach to staying indoors ($M = 2.97$, $SD = 1.81$, $p = 0.715$). Other non-significant findings pertain to the contribution of digital games to children's isolation ($M = 2.96$, $SD = 1.76$, $p = 0.593$) and their role

played in increasing activity levels ($M = 2.89$, $SD = 1.78$, $p = 0.178$).

The total score for the social behaviour scale was significantly higher than the hypothetical mean ($M = 3.34$, $SD = 0.84$, $t = 3.80$, $p < 0.001$), pointing out that parents generally perceive digital games as having an influence on their children's social behaviour, with a tendency toward reducing social interaction on the one hand, and increasing preference for solitary digital activities on the other.

Questions three: Are there significant differences at ($\alpha = .05$) in the kindergarten children's aggressive behaviour and social behaviour based on gender, parental education level, and ownership of digital games?

To answer the third question, the independent samples t -test was used as follows.

First: Testing differences in the emergence of aggressive behaviour based on differences in gender, parental education level, and ownership of a digital game.

Table (7): Means, standard deviations, and the independent samples t -test results of aggressive behaviour by gender, parental level of education, ownership of digital games.

Variable	Variable category	No.	M	SD	t -value	DF	Sig. level	Effect Size
Child gender	Male	212	3.03	0.82	7.921	448	*0.000	0.74
	Female	238	3.61	0.75				
Owning a digital game	Yes	121	3.49	0.81	2.374	448	*0.018	0.26
	No	329	3.28	0.84				
Father education level	Less than BS	91	3.23	0.73	1.423	448	0.155	0.17
	Higher than BS	359	3.37	0.86				
Mother education level	Less than BS	251	3.32	0.85	0.428	448	0.669	0.05
	Higher than BS	199	3.36	0.82				

* Differences are statistically significant at ($\alpha = .05$).

Table 7 displays the results of the independent samples t -test. The findings illustrate pivotal variations attributable to gender, namely females achieve a higher score than males, and to ownership of a digital game, i. e. digital game owners exhibit more aggressive behaviour. The calculated t -values were 7.921 and 2.374, respectively, and the significance level of these values was greater

than the tabulated t -value at degrees of freedom of 448, which was 1.96. Conversely, the results did not reveal any significant differences associated with the level of parents' education.

Second: Testing differences in social behaviour based on differences in gender, parental education level, ownership of digital games.

Table (8): Means, standard deviations and the independent samples t-test results of social behaviour change by gender, parental level of education, ownership of digital games.

Variable	Variable category	No.	M	SD	t-value	DF	Sig. level	Effect Size
Child Gender	Male	212	2.77	1.09	9.392	448	*0.000	0.89
	Female	238	3.70	1.01				
Owning a digital game	Yes	121	3.21	1.16	0.543	448	0.588	0.6
	No	329	3.28	1.14				
Father education level	Less than BS	91	3.24	1.18	0.222	448	0.825	0.03
	Higher than BS	359	3.27	1.14				
Mother education level	Less than BS	251	3.24	1.08	0.444	448	0.657	0.04
	Higher than BS	199	3.29	1.23				

* Differences are statistically significant at ($\alpha = .05$).

The results of the independent samples t-test as shown in Table 8, illustrated important differences in gender whereby females show a considerable change in social behaviour. The calculated *t*-value of this difference was 9.392, which was higher than the tabulated *t*-value at degrees of freedom of 448 (1.96). However, there were no significant differences in the change of social behaviour due to differences in the level of parental education or ownership of digital games.

Discussion

The present study investigated parents' perspectives on how digital games affect their kindergarten children, focusing on aggressive and social behaviours, as well as possible differences related to child gender, parental education, and ownership of digital games. The discussion below interprets these findings within the context of existing theories and empirical evidence, while recognising the observational nature of the study.

The first research question raised in this study concerned parents' perspectives regarding the impact of video games on the development of aggressive behaviour in their kindergarten children. Children's exposure to digital games was seen by parents as positively correlated with aggressive behaviours, especially violent role-playing and imitation. These views are consistent with Bandura's

Social Learning Theory (Bandura, 1977), which states that children learn and replicate behaviours observed in their environment, including media characters. The results also support the General Aggression Model (Anderson & Bushman, 2002), which links exposure to violent media with increased aggressive thoughts, feelings, and actions but is not a cause per se. Moreover, parents' observations that their children immerse themselves in violent character roles correspond with empirical research highlighting that identification with aggressive characters may intensify emotional and behavioural responses (Przybylski et al., 2010; Kjærvik & Bushman, 2021; Gao et al., 2023).

In addition to aggressive manifestations, parents reported broader behavioural and emotional concerns observed in their children, including reduced social interaction, increased anxiety, and difficulties responding to authority. Previous studies have similarly associated extensive digital game engagement with disruption in early social and emotional development (Gentile et al., 2004; Twenge & Campbell, 2009). The non-significant finding related to children exchanging violent games with peers suggests that such behaviours may be more indicative of social bonding than aggressive tendencies. This interpretation is supported by Granic et al. (2014), who underscore the importance of social context of gaming in shaping behavioural outcomes. Overall, these findings highlight the importance of parental awareness and mediation of children's digital game use, within

the interpretive limits of an observational design.

The second research question asked in this study addressed parents' perspectives on the effect of digital games on the social behaviour of their kindergarten children. Parents reported a mild yet statistically significant negative tendency in their children's social behaviour, specifically in relation to physical activities and peer interactions. The finding that children's preference for digital games over outdoor play is consistent with empirical evidence indicating that screen-based activities may supplant socially and physically beneficial experiences during early stages of child development (Boer et al., 2020; Domoff et al., 2020; Ellis et al., 2021). At the same time, parents acknowledged potential cognitive benefits for digital gaming, such as stimulation of thinking skills. This finding ties with a recent study conducted by Maloney et al. (2022). It shows that certain types of games, particularly those requiring problem-solving or strategy, can enhance cognitive abilities and creative thinking.

The above results are consistent with the dual nature of digital games. That is, while digital games may provide cognitive stimulation and creative benefits, they also create some kind of risks concerning physical activity and social interaction. Thus, to reap the benefits of digital games, parents need to carefully monitor and balance their children gaming practices. In addition, research is encouraged to further explore the conditions under which digital games can support rather than hinder young children's social and emotional development.

The neutral responses to items related to social isolation and gaming during meals suggest that not all children are equally affected by digital games. This finding aligns with the Differential Susceptibility to Media Effects Model (Valkenburg & Peter, 2021), which theorizes that media effects depend on personal, social, and situational factors and supported with evidence highlighting the role of individual differences and situational factors in shaping the effect of gaming (Verheijen et al., 2019).

The final research question investigated whether significant differences existed in aggressive and social behaviour based on child

gender, parental education level, and ownership of digital games. Findings indicated significant differences in aggressive behaviour among kindergarten children based on gender and ownership of digital games. Parents reported higher levels of aggressive behaviour among female children. This result challenges traditional assumptions associating aggression more strongly with males. This gender disparity may be interpreted by social and environmental factors, such as differences in how children spend their time. Female children might spend more time playing digital games indoors, where exposure to aggressive content could reinforce their aggressive behaviours. Conversely, male children may spend more time in outdoor activities, which could reduce their exposure to digital games and mitigate their aggressive tendencies. However, further research is needed, particularly qualitative studies, to help unpack the specific types and contexts of aggressive behaviour observed in children.

Ownership of digital games was associated with higher perceived levels of aggression, a finding that is supported by recent meta-analytical evidence suggesting that consistent exposure to violent digital content is linked with children's increased aggression (Burkhardt & Lenhard, 2022; Prescott et al., 2018). While earlier research linked higher parental education to more regulated media environments (Bornstein et al., 2003), the absence of differences in aggressive behaviour based on parental education level found in this study could be attributed to the sample characteristics or other mediating variables, such as socioeconomic status or parental involvement whose examination is not directly conducted in this study. Therefore, these results should be interpreted cautiously.

To summarize, the above discussion highlights that parents perceive both risks and benefits of digital game use in early childhood. Digital games were associated with increased aggressive tendencies and decreased prosocial behaviour, whilst also being perceived as providing cognitive gains. It is of note that these findings show associations, not causality and must be taken in the context of a cross-sectional design. To this end, the present findings underscore the significance of balanced and guided use of digital games

through which age-appropriate game content is selected and parental supervision is employed and ultimately point to the need for future longitudinal and qualitative research to further understand the complex relationship between digital games and children's social and emotional development.

Recommendations and Implications

Based on the study findings, several important recommendations and implications can be devised for parents, educators, and policymakers, as well as researchers. First, the study highlights the likelihood of aggressive behaviours and diminished social interaction is associated with children's exposure to violent or overly immersive games. Therefore, inclusive educational interventions should be introduced to parents at all educational levels to guide them in the selection of age-appropriate games, monitor digital play, and foster positive social behaviour.

Second, kindergarten educators should incorporate media literacy and social-emotional learning experiences that allow children to make sense of behaviour showed in digital games and expand on positive behavioural models within off-screen contexts. These kinds of interventions might be able to improve children's self-regulation, cooperation, or prosocial behaviours. At the policy level, the results highlight the need for explicit guidelines and supportive structures that help families and early childhood educators to handle children's digital game exposure.

Finally, further research is recommended to explore how factors such as socioeconomic status, parental involvement, and cultural influences mediate the effects of gaming on aggression and social behaviour. Longitudinal research could offer deeper insights into how these behaviours evolve over time, while qualitative studies may uncover the specific mechanisms through which children engage with digital games. The observed gender differences and the role played by game ownership in influencing behaviour also merit extra exploration to develop gender-sensitive and context-specific strategies.

Limitations

This study has a few limitations worth noting. First, the cross-sectional design of the study relied solely on parental self-reports, without complementary data from children, teachers, or objective measures, which may be subject to social desirability bias. Second, some characteristics of digital game use, such as game type, duration of gameplay, or parental mediation strategies were not controlled, which may differentially impact children's behaviour. Finally, the sample was drawn from a single province (Mafrq), which may limit the generalizability of the findings. Despite these limitations, the study provides valuable insights and contributes to a deeper understanding of the topic within its specific context.

Disclosure Statement

- This study was not derived from a thesis or dissertation.
- **Ethical approval and informed consent:** The study was conducted in accordance with relevant ethical guidelines and standards. All participants provided informed consent before their participation in the study.
- **Availability of data and materials:** The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.
- **Author contribution:** All authors contributed equally to the writing and data analysis of this manuscript.
- **Conflict of interest:** There are no conflicts of interest.
- **Declaration of funding:** No funding was received.

Acknowledgements: The authors gratefully acknowledge the editorial board and reviewers of *An-Najah University Journal for Research – B (Humanities)* for their valuable feedback and constructive comments, which helped improve the quality of this manuscript

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