

Short Communication

Online Game Addiction and Its Impact on Social-Emotional Development: A Study of Elementary School Children in Sidoarjo

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ABSTRACT

Background: The increasing popularity and accessibility of online games among schoolchildren, particularly through smartphones, has raised concerns about potential addiction, which may adversely affect their social-emotional development. The factors contributing to this issue include insufficient parental supervision and a lack of awareness. **Objective:** This study aimed to examine the relationship between online game addiction and social-emotional development in children. **Methods:** This study employed an analytical observational design with a cross-sectional approach. The sample consisted of 171 respondents selected through a proportionate stratified random sampling method. The study utilized the Gaming Addiction Scale (GAS) and the Strengths and Difficulties Questionnaire (SDQ) to assess the levels of online game addiction and social-emotional development, respectively. Spearman's rho correlation test was applied for data analysis. **Results:** Most respondents (52.6%) were categorized as having moderate online game addiction, whereas 91.2% exhibited abnormal social-emotional development. A statistically significant relationship was found between online game addiction and social-emotional development in school-age children, with a p value of 0.001 and a moderate correlation coefficient of 0.310. **Conclusion:** Online game addiction significantly affects the social-emotional development of children. It is crucial to monitor children's game usage and its potential impacts. Prevention efforts should focus on educational interventions, support parents and schools.

KEYWORDS

Internet gaming disorder, social behavior, emotional development, school-age children, parenting

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INTRODUCTION

Social and emotional development is a crucial aspect of childhood, significantly influencing behavior, control, adjustment, and rule adherence. A child's ability to adapt to their environment plays a vital role in enhancing their social and emotional functioning [1]. The advancement of technology, supported by internet connectivity, has led modern individuals to follow trends, including the increasing popularity of online games [2]. Consequently, schoolchildren who engage in online gaming are at risk of facing social and emotional problems [3]. This issue is also evident among public elementary school children in Cemeng Bakalan Village, Sidoarjo, where children often gather to play online games.

According to the World Health Organization (WHO), 5–25% of schoolchildren experience developmental issues, whereas 8–9% face social-emotional difficulties such as anxiety, trouble with management and adaptation, poor socialization, and aggressive behavior [4]. In Indonesia, 13–18% of children encounter developmental challenges, with approximately 9.5% to 14.2% dealing with social and emotional issues that hinder both their growth and academic performance. Data from the 2018 Basic Health Research indicate that 69.9% of Indonesian children have experienced some level of socioemotional development, although failing to address underlying triggers can impede their progress [5].

A preliminary study was conducted through interviews with 20 students from SDN Cemeng Bakalan 1 and 2 in Sidoarjo, Indonesia. The results revealed that 95% of the students owned personal smartphones and frequently played games. Of these, 75% play for more than 3 hours a day, motivated by the desire to complete game levels, and often feel annoyed when interrupted. Additionally, 60% of these children were involved in arguments or fights due to online games. The gaming industry continues to expand, with the number of gamers projected to reach 2.7 billion by 2021. According to the latest data from the Indonesian internet Service Association, video game content ranks as the second most accessed type of entertainment, accounting for 17.1% of all internet traffic [6].

The COVID-19 pandemic led to the temporary suspension of face-to-face teaching in schools, causing many students to shift to online learning environments. Consequently, children spend more of their free time engaging in online games [7]. The latest edition of the International Statistical Classification of Diseases (ICD) by the WHO now includes online game addiction as a mental and emotional disorder characterized by habits that disrupt social interactions, resulting in behavioral changes in children [8]. Concerns about the effects of online gaming, initially seen as a means of stress relief, have now grown owing to its potential for addiction, which can lead to emotional problems and aggressive behaviors, such as anger toward other players [3].

One possible solution to this issue is to implement educational programs in schools in collaboration with local health center nurses and nursing students to increase awareness and provide guidance for managing online game addiction. This initiative aims to help children regain control over their gaming habits while ensuring that they maintain a balanced lifestyle without interference from excessive gaming.

MATERIALS AND METHODS

Study design

This study employed an analytical observational research design with a cross-sectional approach, allowing the analysis of both the independent and dependent variables simultaneously through one-time data collection. This design is suitable for identifying correlations between variables without manipulation, as recommended in educational and behavioral research [9].

Study setting, sampling and population

The population in this study consisted of all students from grades 1 to 6 at SDN Cemeng Bakalan 1 and 2, Sidoarjo, totaling 298 students aged 6–12 years. The sample size of 171 respondents was determined on the basis of the following inclusion criteria: students who play online games, are cooperative, and are willing to participate. The exclusion criteria were students who were absent during data collection or had special needs that may have affected their

questionnaire responses. Sampling was conducted via probability sampling with a proportionate stratified random sampling method, ensuring equal representation across different grades. The independent variable in this study was online game addiction, and the dependent variable was social-emotional development.

Instruments

Three instruments were used for data collection: (1) demographic Questionnaire: This questionnaire collected information such as age, gender, class, smartphone ownership, internet access (Wi-Fi), types of games played, and parental responses to the game; (2) gaming Addiction Scale (GAS): Developed by Lemmens et al. (2009), this validated scale consists of seven indicators: salience, tolerance, mood modification, relapse, withdrawal, conflict, and problems. Each item was rated on a Likert scale [10]; and (3) strengths and Difficulties Questionnaire (SDQ): Developed by Goodman (1997), this tool measures social-emotional development through 25 items grouped into five subscales: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behavior [11].

Data collection procedure

Prior to data collection, the researchers coordinated with the school principals and teachers to obtain institutional permission. Informed consent was obtained from the guardians of each student. The respondents were then guided to complete the questionnaires under the supervision of the researchers. Incentives were provided as tokens of appreciation. All completed questionnaires were checked for completeness prior to data entry.

Statistical analysis

After verifying the data completeness and accuracy, the responses were coded and categorized numerically. The data were processed via SPSS version 25.0 (IBM Corp.). Descriptive statistics were used to identify the frequency distributions. Spearman's rho correlation test was applied to determine the relationship between online game addiction and social-emotional development, with a significance level set at $p < 0.05$.

Ethical considerations

This study was conducted in accordance with the Declaration of Helsinki and received ethical approval from the Ethics Committee of Sekolah Tinggi Ilmu Kesehatan Hang Tuah Surabaya (ethical clearance number: PE/33/VI/2023/KEP/SHT).

RESULTS

Demographic population

The study enrolled 171 students aged 6-12 years from SDN Cemeng Bakalan 1 and 2 Sidoarjo, surveyed in June 2023 (Table 1). The age distribution was concentrated in the 11-13 bracket (55.6%), with males comprising 57.9% of the participants. Smartphone ownership reached 77.2% for personal devices and 22.8% for shared parental phones, indicating widespread digital access in this population. Wi-Fi availability was split nearly evenly at 54.4% versus 45.6%, creating potential disparities in usage patterns. Parental oversight remained predominantly lenient, with only 5.4% implementing restrictions or prohibitions and 30% adopting permissive or passive approaches. Student reactions to device deprivation revealed emotional dependency, with anger (39.8%) and withdrawal (36.3%) being the most common responses, collectively suggesting addiction-like attachment in 62.6% of cases. Regarding academic behavior, 80.7% of students completed homework at school, either frequently or occasionally potentially reflecting limited educational smartphone use at home or a preference for institutional learning environments.

Online game addiction and social-emotional development

Table 2 presents the distribution of online game addiction levels and the state of social-emotional development among the respondents. Most students (52.6%) were categorized as

having a moderate level of online game addiction, while a significant majority (91.2%) had abnormal socioemotional development.

Correlation analysis

The relationship between online game addiction and social-emotional development was analyzed via Spearman's rho correlation test. A statistically significant correlation was found ($p = 0.001$), with a moderate correlation coefficient of $r = 0.310$, indicating that higher levels of online game addiction were associated with poorer social-emotional development (Table 3).

Table 1. Demographic characteristics of the respondents (n=171)

Characteristics	Frequency (n)	Percentage (%)
Age (years old)		
5-7 years old	17	9.9
8-10 years old	59	34.5
11-13 years old	95	55.6
Gender		
Male	99	57.9
Female	72	42.1
Smartphone ownership status		
Personal	132	77.2
Parent	39	22.8
Wi-fi availability		
Yes	93	54.4
No	78	45.9
Parent response		
Allow	27	24.5
Understand	6	5.5
Limit	4	3.6
Forbid	2	1.8
Response when losing		
Shut up	62	36.3
Angry	68	39.8
Cry	2	1.2
Talking Rough	39	22.8
Doing homework at school		
Often	59	34.5
Sometimes	79	46.2
Never	33	19.3

Table 2. Levels of online game addiction and social-emotional development

Custom Data	Frequency (n)	Percentage (%)
Online Game Addiction		
Light	1	0.6
Currently	90	52.6
Heavy	80	46.8
Social-Emotional Development		
Normal	1	0.6
Border	14	8.2
Abnormal	156	91.2

Table 3. Spearman correlation between the NLR and severity of DHF

		Social-Emotional Development
Online Game Addiction	Correlation coefficient	0.310
	Significance (2-tailed)	0.001***
N		171

Remarks: significant at the 95% confidence level ($p < 0.05$)

DISCUSSIONS

Most respondents in this study had moderate to severe online game addiction. This aligns with previous research that associated increased accessibility to smartphones and internet access with an increase in screen-related addictive behaviors among children [12,13]. Children with moderate addiction often report using games as a coping mechanism for stress, a pattern also highlighted by Joy [14], where stress and emotional distress were found to trigger prolonged gaming as an emotional outlet.

These children reported frequent gaming behaviors such as playing to feel better, thinking about games constantly, or difficulty stopping once they started. These are core indicators of behavioral addiction [10] and reflect the emotional regulation difficulties that may accompany problematic gaming. The fact that many children in this category became angry or irritable when lost further suggests the presence of underlying frustration tolerance issues, a trait also observed in studies on gaming and aggression [15]. The study also revealed that children who owned their smartphones were more likely to be in the moderate-to-severe addiction group [16]. Previous studies have indicated that unsupervised access to digital devices contributes to excessive use, especially when not balanced with parental guidance [17]. Furthermore, gender differences were apparent, with boys dominating the severe addiction category. This finding is consistent with that of King et al. [18], who reported that males are more drawn to competitive and reward-based gaming environments, increasing their risk of prolonged use and subsequent behavioral addiction.

This study revealed that 91.2% of the respondents had abnormal social-emotional development, raising concerns about behavioral and emotional regulation in this age group. According to Wenar and Kerig [18,19], healthy social-emotional development enables children to adapt, regulate emotions, and form positive peer relationships [20]. Deficits in this area may manifest as increased irritability, withdrawal, or inappropriate responses in social settings. Children in the 11–13 age group dominated the abnormal development category, aligning with the developmental psychology literature, which identifies this phase as a transitional stage to early adolescence characterized by identity exploration, emotional instability, and a growing sense of independence [21]. Aggressive or emotionally charged responses when losing a game were prevalent among children with abnormal socioemotional functioning. This finding supports previous findings that online gaming can amplify impulsive behaviors and emotional outbursts, particularly when individuals are invested in virtual achievements or experience frustration during failure [22].

A statistically significant moderate correlation was found between online game addiction and social-emotional development ($\rho = 0.001$; $r = 0.310$). This suggests that as addiction levels increase, so do emotional and behavioral regulation problems [23]. These findings are supported by those of Paulus et al. [13], who reported that internet gaming disorder in children is associated with emotional dysregulation, irritability, and difficulties in forming healthy social bonds [24].

Children in the severe addiction group demonstrated behaviors such as withdrawal from family, preference for solitary activities, and reduced interest in real-life interactions [24]. These behaviors reflect symptoms of social-emotional detachment and were also observed in research by Gentile et al. [25], where excessive gaming was linked to decreased empathy and emotional sensitivity. Furthermore, the tendency to respond with anger or harsh words when losing in games—reported by more than 20% of respondents—can be interpreted as reduced emotional resilience [3]. Given these findings, collaborative efforts between parents, educators, and mental health professionals are essential. Structured routines, screen-time regulations, and the promotion of alternative activities (e.g., sports, arts, and social clubs) can help mitigate the risk of addiction. Educators can play a role in identifying early signs of social-emotional challenges and implementing classroom-based SEL programs [26,27].

Public health implications

The high prevalence of abnormal social-emotional development among children with gaming addiction necessitates population-level interventions. School-based screening programs should incorporate digital behavioral assessments in addition to routine developmental evaluations.

Public health campaigns should educate parents on monitoring device usage and recognizing early signs of addiction. Community health centers should integrate gaming disorder prevention into child mental health services, and policymakers need to establish age-appropriate screen time guidelines backed by enforcement mechanisms.

Limitations

The use of self-report questionnaires may have introduced response bias. The cross-sectional design prevents causal inference between gaming addiction and social-emotional development. The geographic restriction to Sidoarjo limits the generalizability of these findings. Future longitudinal studies with diverse samples and qualitative methods are needed to understand the mechanisms underlying children's gaming behavior and emotional development trajectories.

CONCLUSIONS

This study revealed a statistically significant moderate correlation ($r = 0.310$, $p = 0.001$) between online game addiction and social-emotional development among elementary school children in Sidoarjo, Indonesia. Most respondents exhibited moderate-to-severe addiction levels (99.4%) and abnormal social-emotional functioning (91.2%), indicating widespread developmental concerns in this population group. Children with higher addiction scores demonstrated increased emotional dysregulation, aggressive responses, and social withdrawal. These findings underscore the need for multilevel interventions incorporating parental monitoring, school-based screening programs, and digital literacy education to mitigate the adverse effects on children's socioemotional well-being and long-term developmental outcomes.

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

AUTHOR CONTRIBUTIONS

Conceptualization: MF, FF, NM; Methodology: MF, FF, NM, DS; Formal analysis: MF, FF, NM; Data curation: MF; Visualization: DS; Supervision: NM, DS; Project administration: MF, FF; Writing original draft: MF, FF; Writing review and editing: FF, NM. All the authors have read and approved the final manuscript.

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DECLARATION OF ARTIFICIAL INTELLIGENCE USE

We hereby confirm that no artificial intelligence (AI) tools or methodologies were utilized at any stage of this study, including during data collection, analysis, visualization, or manuscript preparation. All work presented in this study was conducted manually by the authors without the assistance of AI-based tools or systems.

REFERENCES

- [1] Tussyana E, Trengginas R. *Analisis perkembangan sosial-emosional tercapai siswa usia dasar* (Eng: Analysis of social-emotional development achievement in elementary school age students). *J Iventa* 2019;3:18–26. <https://doi.org/10.36456/inventa.3.1.a1804>
- [2] Putra AR, Rusli D. *Hubungan intensitas bermain game online dengan kecenderungan perilaku agresif pada remaja* (Eng: The relationship between online gaming intensity and aggressive behavior tendencies in adolescents). *JurnalUnp* 2021;2021.
- [3] Sari DA, Nurjanah AL. *Hubungan game online dengan perkembangan emosional anak usia 5-6 tahun* (Eng: The relationship between online games and emotional development in children aged 5-6 years). *Obs J Pendidik Anak Usia Dini* 2020;4:994. <https://doi.org/10.31004/obsesi.v4i2.344>.
- [4] Hasanah I, Kurniatun N. *Gambaran perkembangan sosial anak yang menggunakan telpon genggam (gadget)* (Eng: Overview of social development in children using mobile phones (gadgets)). *J Keperawatan* 2019;63–7. <https://ejournal.lppmdianhusada.ac.id/index.php/jk/article/view/93>
- [5] Sulistiawati Y, Supratman VA, Nugroho TA. *Pengaruh penggunaan gadget terhadap perkembangan sosial anak pra sekolah di Kabupaten Pesawaran Lampung* (Eng: the effect of gadget use on social development of preschool children in Pesawaran Regency, Lampung). *Wellness Health Mag* 2019;1:255–60.
- [6] Sholihah B, Naviaty E. Relationship between intensity of playing video games with the emotional development. *J Perawat Indones* 2021;6:11. <https://doi.org/10.32584/jpi.v6i1.1037>.
- [7] Fiscarina C, Soetikno N, Idulfilastri RM. *Kajian meta analisis alat ukur internet gaming disorder* (Eng: Meta-Analysis study of internet gaming disorder measurement tools). *J Muara Ilmu Sos Humaniora dan Seni* 2020;4:504. <https://doi.org/10.24912/jmishumsen.v4i2.9503.2020>.
- [8] Fadila E, Handayani TY, Robbiyanto NS. *Pengaruh game online terhadap perubahan perilaku remaja di Kayu Tinggi RT 04/RW 03 Jakarta Timur* (Eng: The influence of online games on changes in adolescent behavior in Kayu Tinggi RT 04/RW 03 Jakarta Timur). *J Ilm Kedokt dan Kesehat* 2022;1:15. <https://doi.org/10.55623/au.v4i2.239>
- [9] Sukmawati AS, Hermawan IMA, Saputra EK, Adnyana IMDM, Aldyza N, Slamet NS, Hidayat B, Pandawa RM, Hamdani R, Maisura, Dara W, Sembodo A. *Metodologi Penelitian*. Bandung: CV. Media Sains Indonesia; 2024, p. 214.
- [10] Lemmens JS, Valkenburg PM, Peter J. Development and validation of a game addiction scale for adolescents. *Media Psychol* 2009;12:77–95. <https://doi.org/10.1080/15213260802669458>.
- [11] Goodman R. The strengths and difficulties questionnaire: A research note. *J Child Psychol Psychiatry* 1997;38:581–6. <https://doi.org/10.1111/j.1469-7610.1997.tb01545.x>.
- [12] Fuster H, Carbonell X, Pontes HM, Griffiths MD. Spanish validation of the internet Gaming Disorder-20 (IGD-20) test. *Comput Human Behav* 2016;56:215–24. <https://doi.org/10.1016/j.chb.2015.11.050>.
- [13] Paulus FW, Ohmann S, von Gontard A, Popow C. Internet gaming disorder in children and adolescents: A systematic review. *Dev Med Child Neurol* 2018;60:645–59. <https://doi.org/10.1111/dmcn.13754>.
- [14] Joy EA. The relationship between online gaming, emotional regulation, and impulsivity in adolescents 2024;12. <https://doi.org/10.25215/1204.116>.
- [15] Anderson CA, Bushman BJ. Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: a meta-analytic review of the scientific literature. *Psychol Sci* 2001;12:353–9. <https://doi.org/10.1111/1467-9280.00366>.
- [16] Di Nicola M, Benarous X. Internet gaming disorder in adolescents with psychiatric disorder: two case reports using a developmental framework. *Front Psychiatry* 2019;10:1–9. <https://doi.org/10.3389/fpsy.2019.00336>.

- [17] Nikken P, Schols M. How and why parents guide the media use of young children. *J Child Fam Stud* 2015;24:3423–35. <https://doi.org/10.1007/s10826-015-0144-4>.
- [18] King DL, Delfabbro PH, Zwaans T, Kaptsis D. Clinical features and axis I comorbidity of Australian adolescent pathological internet and video game users. *Aust N Z J Psychiatry* 2013;47:1058–67. <https://doi.org/10.1177/0004867413491159>.
- [19] Abdun Nasir MF, Ichsan I. *Perkembangan sosial-emosional siswa broken home di usia sekolah dasar (Studi kasus: analisis siswa kelas II Mi Roudlotus Saidiyyah Semarang)* (Eng: social-emotional development of broken home students at elementary school age (case study: analysis of grade II students Mi Roudlotus Saidiyyah Semarang)). *J Guid Couns* 2021;5:269. <https://doi.org/10.21043/konseling.v5i2.12066>.
- [20] Xie Y, Tang L. The symptom network of internet gaming addiction, depression, and anxiety among children and adolescents 2024; 14:29732. <https://doi.org/10.1038/s41598-024-81094-7>
- [21] Steinberg L. Adolescence. 2016. <https://www.mheducation.com/unitas/highered/sample-chapters/9781260058895.pdf>
- [22] Gentile DA, Choo H, Liau A, Sim T, Li D, Fung D, et al. Pathological video game use among youths: a two-year longitudinal study. *Pediatrics* 2011;127:e319-29. <https://doi.org/10.1542/peds.2010-1353>.
- [23] Sholihah B, Naviati E. *Hubungan intensitas bermain video game dengan perkembangan emosional anak usia sekolah dasar* (Eng: The relationship between video gaming intensity and emotional development among elementary school-aged children). *J Perawat Indones* 2023;7:1387–97. <https://doi.org/10.32584/jpi.v7i2.1302>.
- [24] Yuliani AP. *Dampak game online terhadap perkembangan sosial dan emosional peserta didik sekolah dasar* (Eng: The impact of online games on social and emotional development of elementary school students) 2023;08:2384–93. <https://doi.org/10.23969/jp.v8i2.9972>.
- [25] Vandewater EA, Shim M, Caplovitz AG. Linking obesity and activity level with children's television and video game use. *J Adolesc* 2004;27:71–85. <https://doi.org/10.1016/j.adolescence.2003.10.003>.
- [26] Savitri IAGW, Adnyana IMDM, Wahyudi IW, Dewi GAPWP, Ariastuti I, Sundari NLPA, et al. Exposure to electromagnetic waves for reducing brain health: A bibliometric analysis. *Svāsthya Trends Gen Med Public Health* 2024;1(1):e12. <https://doi.org/10.70347/svsthya.v1i1.12>
- [27] Xie Y, Tang L. The symptom network of internet gaming addiction, depression, and anxiety among children and adolescents. *Sci Rep* 2024;14:29732. <https://doi.org/10.1038/s41598-024-81094-7>.