Mediating Role of Aggression with the Association of Video Gaming and Mental Health Problems Among Adolescents in Pakistan

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Abstract

This present study investigates the role of aggression in the relationship between video game use and mental health problems among adolescents in Pakistan. Adolescence is a turbulent emotional period characterized by impulsivity and increased vulnerability to various behavioural and psychological problems. While there is evidence supporting excessive gaming as associated with both aggression and mental health issues, hardly any studies have focused on this mechanism among Pakistani youths. Thus, 400 adolescents aged between 12 and 18 years were selected through convenience sampling from different schools and community settings located in Karachi-Pakistan. Their responses were measured on the Gaming Addiction Scale for Adolescents (GASA), Buss-Perry Aggression Questionnaire (BPAQ), and Depression, Anxiety, and Stress Scales-21. Aggression was evaluated for its mediation role between gaming and mental health problems. Results indicated that gaming predicted aggression, $B = 0.42$, $SE = 0.07$, $t(398) = 6.00$, $p < .001$; and also, aggression predicted mental health problems, $B = 0.38$, $SE = 0.09$, $t(398) = 4.22$, $p < .001$. The direct effect of gaming on mental health problems was still significant, $B = 0.25$, $SE = 0.08$, $t(398) = 3.12$, $p = .002$, indicating partial mediation. The bootstrapped indirect effect was $B = 0.16$, 95% CI [0.07, 0.27]. Aggression partially mediates the influence of gaming on mental health, such that excessive gaming increases aggression, which in turn increases depression, anxiety, and stress. Early screen for gaming addiction and aggression, provide school-based counselling, encourage parental monitoring, and offer interventions to promote mental health and healthy gaming.

Keywords: Video gaming, aggression, mental health, adolescents, depression, anxiety, stress

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INTRODUCTION

Adolescence is a sensitive period of development characterized by rapid, multi-dimensional changes in the physical, cognitive, and social spheres. The changes determine who they are and how their growth trajectory unfolds. According to Steinberg (2014), puberty triggers a chain in the hormonal system that brings about fundamental reconfigurations in the emotional experiences and thinking patterns of adolescents. They become more sensitive to rewarding and stressful events, leading to magnified emotional responses (Casey, Jones & Hare, 2008). The drive for independence runs up against the changing landscape of relationships-with parents, friends, and the social world outside (Eccles & Roeser, 2011). During this stage, youth experiment with different identities, ideologies, and values in creating a more stable sense of self, a concept developed by Erikson (1968). Most of this progress is, of course, dictated by the influences of peer groups, and the desire for social acceptance can yield both positive and negative behaviours well (Steinberg & Monahan, 2007).

Moreover, adolescents are most responsive to media portrayals and social expectations due to an acutely developed sense of acceptance and rejection. Over the last ten years, the video game industry has grown at a phenomenal rate and thus developed into an important part of the global entertainment economy. It is expected that, worldwide, the video game market will have attained the value of $221 billion by 2023. This growth is propelled by the increasingly widespread accessibility of gaming platforms and the increasing prevalence of mobile gaming. More than 3 billion people all over the world engage in video gaming, indicating its status as a pervasive cultural phenomenon that spans all age groups, including the considerable adolescent demographic. According to Statista in 2024, more than half of global gaming revenues are already taken up by mobile devices because of increasing access to low-cost mobile devices with high-speed internet.

Media exposure has a profound impact on the psychological and emotional development of adolescents. Indeed, the adolescent brain is more vulnerable to a variety of psychological and mental health outcomes (Casey et al., 2010). It could also be that exposure to violent or aggressive media increases violent behaviour and other psychological problems among adolescents (Anderson et al., 2017). Altogether, the adolescents are fully embedded in the current digital changes. About 80% of all children between the ages of 2 and 18 years spend considerable parts of their free time playing video games (Bain & Company, 2024). Such a statistic draws on the increasing importance of playing video games in the leisure and social involvement of adolescents. Psychologically and mentally, adolescents have a high risk during these years. According to the World Health Organization (2021), 10–20% of all adolescents globally suffer from mental health disorders, while many cases remain undiagnosed and untreated. Of particular interest in current debate have been concerns related to worry, sadness, behavioural problems, and substance use. The biological vulnerability may be further elevated by social and environmental factors (e.g., excessive engagement in video gaming) and thus enhance risks, which epitomizes the need to clarify the way adolescent behaviours are associated with specific mental health problems.

Given the growing ubiquity of video gaming, there is an increasing concern among scholars and mental health professionals about the possible effects of video gaming on psychological well-being. There is an emerging substantial body of research reporting associations between excessive or problematic gaming and outcomes such as stress, anxiety, sleep disturbances, and loneliness

(King et al., 2017; Lemola, 2015). Spending too much time playing video games, especially in the evening, could interfere with sleep and impact cognitive functioning and emotional regulation negatively (Kuss & Griffiths, 2012). Among adolescents, gaming for coping might lead to social isolation and a decline in face-to-face interaction (Rehbein et al., 2015).

The growth of the gaming industry in Pakistan is definitely significant. Current estimates show that the country contains 34 million online gamers, and predict that the number will increase to 45 million by 2025 (The News International, 2023). Exports, on the other hand, contributed more than fifty percent to the domestic video games and animation sector, which earned $300 million between 2022 and 2023, and is considered a massively growing industry (The News International, 2023). Furthermore, by 2030, the numbers are likely to increase beyond 52 million, while the revenue that Pakistan earns from gaming is projected to grow from $208.7 million in 2022 to $227.4 million in 2026 (Arab News, 2024). Unlike their Western peers, teenagers in Pakistan face different cultural, social, and environmental issues, which can greatly affect their experience of gaming and their mental wellbeing. The association of video gaming by adolescents and their mental health may be influenced by cultural norms, family structures, and societal expectations (Khan et al., 2020). Therefore, this needs to be studied in the context of Pakistan, so culturally relevant information may be provided and effective interventions may be delivered.

LITERATURE REVIEW

Playing video games involves the use of electronic gaming systems through an interactive user interface and on-screen feedback. Gaming practices and genres vary considerably. Researchers commonly distinguish between game types along functional features and game content. Important comparative differences include the distinction between violent versus non-violent games, and casual versus hardcore gaming. The objectives of competitive games are well-defined, often involve some form of ranking, and usually include player-versus-player elements, which tend to increase activity. Casual games are usually described as simple, easy to learn, and easy to use to play (Granic et al., 2014). Due to concerns about their behavioural consequences, there has been significant interest in psychology in violent video games-such as first-person shooter and combat games-since these types of games are consistently associated with physical aggression and violence (Anderson et al., 2017).

The time spent on gaming has become a pivotal determinant of its psychological influence. The more time children and teenagers spend in front of the screen, the more stress, anxiety, and depression, and the poorer the school performance they usually face. However, moderate use can be a pleasant and enjoyable type of entertainment as well (Lemmens et al., 2011). According to Gentile et al. (2011), addictive or problematic gaming influences sociability and emotionality in adolescence most strongly. Addiction refers to failing to resist chronic gaming despite its negative consequences. When analyzing the psychological impacts of gaming among adolescents, one needs to interpret motives for gaming. Standard motives include arousal or excitement by the challenges of the game, or by its violent content, socializing, most of all through the multiplayer mode or online, and escaping from real-life stressor or emotional problems. While minor quantities of the latter motive may not be harmful, there is a significant risk associated with it if it is practiced as an alternative strategy to avoid deep-seated psychological problems, such as anxiety or depression. Social gaming may result in social isolation or reduced time spent on face-to-face interaction; however, it can provide a sense of community too (Király et al., 2014). Excitement-

based motives have been found to relate to the proclivity toward rapid or impulsive acts that may foster hostility and impulsivity as well (Ferguson, 2015).

Links with behavioral problems, anxiety, and depression and increased aggression are reported in many studies into adolescence carried out by various authors (Kofler et al., 2011; Scott et al., 2016). Although there is widespread scholarly concern for aggression as a psychological construct, its manifestation is deeply influenced by cultural and social contexts. In collectivist societies, like Pakistan, overt physical aggression among young people—who are expected to maintain social cohesion—comes up against strong social disapproval nested in cultural conventions (Khan et al., 2020). Anxiety may lead to aggressive behavior, especially reactive aggression, which occurs as an impulsive, emotionally charged, and aggressive reaction to perceived threats. Younger individuals with underdeveloped emotional regulation skills may give in to bouts of aggression when frustrated with trying to deal with situations (Muris et al., 2007). Aggression, at the same time, is generally associated with behavioral difficulties characterized by patterns of consistent rule violation and disregard for authority. Adolescents with conduct disorders or behavioral difficulties are at higher risks of social malfunction and severe long-term psychiatric issues (American Psychiatric Association, 2013).

Research Questions

- Does aggression mediate the relationship between video gaming and mental health problems among adolescents?

Hypothesis

- Aggression would mediate the relationship between video gaming and mental health problems among adolescents.

METHODOLOGY

The sample consisted of 400 adolescents aged between 12 to 18 years who were selected through a convenience sampling method. The total sample, 50.0% were males (n = 200) and 50.0% were females (n = 200). Overall, the mean age of the participants was 15.18 years with a standard deviation of 1.18 years. Remaining information about demographic characteristics is presented in Table 1.

Gaming Addiction Scale for Adolescents

The Gaming Addiction Scale for Adolescents (GASA) was developed by Lemmens et al. in 2009 to specifically measure symptoms of gaming addiction in adolescent populations. The instrument consists of 21 items that reflect seven addiction criteria, such as intensity, acceptance, tolerance, and withdrawal. Robust psychometric properties for GASA were found to yield Cronbach's alpha values ranging between 0.84 and 0.91 among adolescents aged 11-17. Factor analyses confirm a seven-factor solution reflecting the multi-dimensional nature of gaming addiction. The scale has, up until now, been in wide usage with adolescent groups, thereby giving a developmentally sensitive account of risky gaming behaviours.

The Buss-Perry Aggression Questionnaire

The Buss-Perry Aggression Questionnaire (BPAQ) was developed in 1992 by Arnold H. Buss and Mark Perry, based on a theory that outlined the various components of aggression. The instrument can be administered as a comprehensive 29-item form, and it also has a short form of 12 items. It examines four components of aggression: physical aggression (hitting), verbal aggression, anger, and hostility. The BPAQ has generally demonstrated good internal consistency within adolescent samples, normally aged 11 and above, with Cronbach's alpha coefficients typically running from 0.78 to 0.89. Confirmatory factor analyses continually support its four-factor structure. The BPAQ is viewed as valid in that its scores exhibit strong associations with relevant behavioural and psychological outcomes and, thus, are considered a dependable measure through which aggression should be assessed in studies including adolescents.

The Depression Anxiety Stress Scales – 21 Items

The Depression Anxiety Stress Scales-21 Items (DASS-21) was developed by Lovibond and Lovibond in 1995 as a short form of the original 42-item DASS, which aimed to measure symptoms related to depression, anxiety, and stress. It consists of 21 items, divided into three subscales, each with seven items. The DASS-21 has demonstrated validity for adolescents aged 12 years and older, with its subscales showing strong internal consistency—Cronbach’s alpha values ranging from 0.82 to 0.93. Confirmatory factor analyses have largely supported a three-factor structure corresponding to anxiety, stress, and depression. Added to this, the scale demonstrates good discriminant and convergent validity when measured against clinical rating scales, reinforcing its position as a widely used and psychometrically robust measure of adolescent mental health status.

Procedure

Data collection for this study will be done using research questionnaires, prepared on the basis of convenience and easy accessibility for the participants. All participants were informed about the purpose of this study, and informed consent was obtained before they filled out the surveys. Only those individuals who fit the criteria for the predefined eligibility were invited to participate. The socio-demographic questionnaire items included the GASA, BPAQ, and DASS-21 and are estimated to take about 20 minutes to complete.

Ethical Considerations

They were also told in advance that withdrawal during testing was allowed at any stage and would not be considered an adverse action or a negative decision. The participants were further assured that their data would be deleted upon completion of the test results and that the data would remain confidential and not shared with any party. Throughout the research study, the researchers kept ethical considerations in respect to risk, participant autonomy, and data integrity.

Data Analysis

Data analysis was performed using the IBM SPSS Statistics, version 27. Descriptive statistics were first applied to summarize data; then, inferential statistics were used in order to test the main hypotheses of the current work.

RESULTS & FINDINGS

Table 1
Frequency Distributions for Demographic and Behavioural Variables (N = 400)

Variables	Category	n	%
Age	12–15 years	160	40.0
	16–18 years	240	60.0
Gender	Male	200	50.0
	Female	200	50.0
Education	School-going (Grade 7–12)	215	53.8
	Out-of-school	185	46.3
Birth Order	First	80	20.0
	Second	115	28.8
	Third	95	23.8
	Fourth or higher	110	27.5
Parents Alive	Both	350	87.5
	Father only	28	7.0
	Mother only	22	5.5
Family System	Nuclear	215	53.8
	Joint	185	46.3
Monthly Income	PKR < 25,000	50	12.5
	PKR 26,000–30,000	125	31.3
	PKR > 30,000	225	56.3
Video Gaming Duration	Less than 1 hour/day	90	22.5
	1–3 hours/day	180	45.0
	More than 3 hours/day	130	32.5
Mental Health Problems (Reported)	Yes	145	36.3
	No	255	63.8

Demographically, 40.0% were 12–15 years old, while 60.0% were 16–18 years old. The sample consisted of equal numbers of males and females, representing 50.0% each, showing a fair gender representation. Regarding the level of education, 46.3% of adolescents had never gone to school, while 53.8% were studying. Again, most of the participants were second-born, being 28.8%, as the fourth-born or above accounted for 27.5%. In addition, more than half of the adolescents (53.8%) came from a nuclear family and an overwhelming majority of 87.5% were living with both parents. Socioeconomically, 12.5% were from low-income backgrounds, while 56.3% had an income of more than PKR 30,000 per month. Video gaming was being practiced daily by more than 45.0% of respondents for one to three hours, while 32.5% mentioned gaming for more than three hours daily. It is important to note that 36.3% of adolescents said they were facing serious issues regarding their mental health, which justifies the investigation into the role that may be played by violence as a moderator in the relationship between video gaming and psychological health in Pakistani adolescents.

Table 2
Mediation Analysis Testing the Indirect Effect of Aggression on the Relationship between Video Gaming and Mental Health Problems (N = 400)

Path	B	SE	t	p	95% CI [LL, UL]
Video Gaming → Aggression (Path a)	0.42	0.07	6	< .001	[0.29, 0.55]
Aggression → Mental Health Problems (Path b)	0.38	0.09	4.22	< .001	[0.20, 0.56]
Video Gaming → Mental Health Problems (Direct effect, Path c')	0.25	0.08	3.12	0.002	[0.09, 0.41]
Total Effect (Path c)	0.41	0.07	5.86	< .001	[0.27, 0.55]
Indirect Effect (a × b)	0.16	0.05	—	—	[0.07, 0.27]

Note. B = unstandardized regression coefficient; SE = standard error; LL = lower limit; UL = upper limit of 95% confidence interval.

Aggression was formally examined as a mediator of the relationship between video game play and mental health problems using a mediation analysis. Video gaming significantly predicted aggression: B = 0.42, SE = 0.07, t (398) = 6.00, p < .001; while aggression significantly predicted mental health problems: B = 0.38, SE = 0.09, t (398) = 4.22, p < .001. The relationship between video gaming and mental health problems remained statistically significant (B = 0.25, SE = 0.08, t (398) = 3.12, p = .002), revealing partial mediation. The indirect effect of the amount of video game playing on mental health problems via aggression was highly statistically significant: B = 0.16, 95% CI [0.07, 0.27]. On the whole, these findings provide evidence for the role of hostility as partial explanation of the gaming-mental health problems relationship among adolescents.

Discussion

This research concluded that hostility is a major mediator between video gaming and mental health among the Pakistani youth. Teenagers who experience intensive gaming patterns have higher anxiety, despair, and emotional volatility. Exposure to video game violence may contribute to the development of mental illness. Based on the General Aggression Model (Anderson & Bushman, 2002), repeated participation in aggressive or competitive gaming is related to increased emotional arousal and growing violent cognitions. There is a substantial amount of evidence that playing violent or fast-paced games can provoke anger, frustration, and aggression. Khanshid and Batool (2020) have indicated that among Pakistani adolescents, participation in violent video games was often associated with greater aggressiveness, as similar evidence from other cultures also supports the cross-cultural involvement of gaming and aggression.

Violence and mental illness are interlinked; from Card et al. (2008) and Reef et al. (2011), it has been seen that aggression disrupts emotional regulation and increases sadness and anxiety. Social isolation and conflict might sabotage self-esteem and psychosocial functioning among those who are prone to aggression. Increased anger and impulsivity can amplify mental health issues through stress and cognitive dissonance. The current study shows that gaming is negatively related to increased aggression and psychological deterioration, with aggression as a mediator through which gaming negatively affects adolescents' mental health. Recent evidence shows that gaming increases aggression, thereby promoting harm to mental health. According to Lemmens et al. (2011) and Markey & Markey (2010), hostility may weaken the relation between violent games and emotional maladjustment. In the Pakistani context, Hassan et al. (2021) have found that fury among secondary school students is closely linked to problematic gaming and melancholia. These

findings thus show a cross-cultural influence of antagonism on adolescent mental health through gaming. Based on the view of Pakistan's cultural context, in which youths enjoy taking part in video gaming yet largely refrain from discussing mental health and emotional regulation, there is a tendency in these groups to avoid overt hostility in order to reduce internal conflict.

This passage discusses the potential relationship between gaming and mental health problems. It is suggested that thoughts of violence reflect outward aggression even as they signal inner distress. Mobile and online gaming, growing rapidly, along with a lack of parental monitoring, may increase the vulnerability of Pakistani youth to these risks. For adolescents, this is important: a reduction in aggression can decrease the psychological burden of excessive gaming. Since games can incite powerful emotions in children, schools can contribute to mental health by teaching empathy, more constructive social ways of coping, and emotional regulation. The protective factors for children include engaging in activities unrelated to screens, parental monitoring of their activities, and better time management. Possibly, increased behavioural control and clearer emotional awareness may help diminish violence and psychiatric symptoms among young gamers.

CONCLUSION

In the current study, the role of hostility linking video game use and mental health problems among Pakistani teens was found. Playing video games, therefore, relates to increased hostility and emotional distress. Although there is a direct effect of gaming itself on mental health, the indirect statistically significant effect with aggression reveals that hostility can explain part of this effect. In other words, video gaming affects adolescents' mental health both directly and indirectly by changing behaviour and emotions. The findings are in accord with various theories such as GAM, which postulate that repeated exposure to aggressive ideas would ultimately lead to specific emotional and behavioural responses. Aggression remains the critical point connecting social gaming with psychological harm. While digital access is becoming increasingly easy and public awareness of mental health problems scant, the psychological and behavioural effects of excessive gaming have become a growing concern for adolescents in Pakistan.

Recommendations

This study offers ideas for schools, parents, mental health workers, and policymakers to cut the mental and behavioural side effects of too much video game use by teens. Schools should focus on emotional intelligence and good behaviour. Programs that teach emotional control, empathy, impulse control, and how to handle conflicts can lower violence and boost mental health. Regular talks about the mental effects of gaming can encourage teens to game responsibly and watch their own behaviour. It is recommended that parents and caregivers limit the gaming time of adolescents. Parents need to restrict gaming while encouraging adolescents to read books, engage themselves in sports, and other creative activities. Much aggression and mental health problems can be prevented by communicating emotions and peer pressures openly between the parents and adolescents. Third, regular psychological check-ups for teenagers should include the assessment of gaming habits and aggression.

Cognitive-behavioural therapy, managing anger, and stress could reduce aggressiveness and stabilize mental health. School counsellors must take care of behavioural problems related to

gaming within their scope of work. Fourthly, public health and policy initiatives have to make people aware of the mental health consequences of video game addiction. Screen balance and mental health promotion initiatives can help reduce stigma and increase help-seeking among children. However, limitations on screen time and gaming exposure by governmental bodies may be considered due to the potential link between online and violent games and aggression. Longitudinal and experimental studies are needed that demonstrate the interrelationships between violence, mental health, and video game exposure. Gender, cultural context, and family environment might modify these associations. The inclusion of physiological and behavioural measures with self-report measures might provide a better explanation of video gaming behaviour among adolescents.

Competing Interests

The authors declared no known competing interests.

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