

Virtual Battlefields, Real-Life Consequences: Exploring the Impact of PUBG Addiction on Aggression, Depression, and Suicidality Among Adolescents in Pakistan

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Abstract

Background: Player Unknown's Battlegrounds (PUBG) is becoming a popular game among young people and has been raising concerns about its effects on their mental health in the developing world, including Pakistan.

Objectives: The aim of this study was to determine the relationship between PUBG addiction and aggression, depression and suicidality among adolescents in Pakistan. It also analyzed the mediating effect of aggression and depression between the relationship of PUBG addiction and suicidality.

The present study was designed on a cross sectional design and 100 male students (Age 15-25) of educational institutions of Khyber Pakhtunkhwa were taken as the sample. The participants were administered the Game Addiction Scale (GAS), Buss-Perry Aggression Questionnaire (BPAQ), Beck Depression Inventory (BDI), and Beck Scale for Suicidal Ideation (BSSI). Data was analyzed using correlation, independent samples t-tests and mediation analysis using the PROCESS macro in SPSS.

There was a significant positive relationship between PUBG addiction and aggression, depression and suicidality (all $p < .01$). Participants with higher addiction levels were significantly more depressed and had higher ideation for suicide than those with lower addiction levels. The results of mediation analysis revealed that aggression and depression partially mediated the relationship between PUBG addiction and suicidality.

This suggests that in Pakistan, overuse of PUBG is correlated with negative psychological consequences in adolescent. To reduce the risk of suicidality in this population, interventions that address gaming addiction, depression, aggression could be utilized. A longitudinal study is suggested to validate these results.

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Introduction

Young people's entertainment, socialization, and identity formation have all changed as a result of the digital technology revolution. The Player Unknown's Battlegrounds (PUBG) is one of the popular battle royal games launched in 2017 and has been one of the most popular battle royal games in the world especially amongst adolescents (Ahmad, 2022). Its addictive, competitive, and violent nature has gained millions of users, especially involving a considerable amount of adolescent population in Pakistan (Ahmed et al., 2022). PUBG offers fun and social interaction through the

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internet, but there is also increasing evidence that excessive gaming can have a detrimental effect on physical, social and psychological health.

PUBG is a game that is easily accessible on smartphones, which in Pakistan has caused the game to be played for longer periods of time by adolescents. Overuse of games has been linked to a wide range of physical health issues, including headaches, eye strain, obesity, musculoskeletal pain and sleep disorders (Kuss & Griffiths, 2012). The COVID-19 pandemic further aggravated gaming behaviour, keeping everyone is under lockdown, and gaming induced some adolescent suicides in Pakistan which added to gaming addiction's potential seriousness during this period of social isolation (Mamun et al., 2022).

In addition to physical health, high levels of PUBG can also cause low levels of social interaction in real life, even while it promotes online social interaction (Cole & Griffiths, 2007; Bavelier et al., 2011). Psychologically, problematic gaming has been associated with impulsivity, aggression, anxiety, depression, stress and poor academic performance (Evans et al., 2018; Sandhiya Priyadarshini et al., 2019; Wang et al., 2005; Yamak Saini, 2020). The above concerns highlight the need to understand the psychological effects of PUBG addiction especially in developing countries among the youth.

Theoretical Framework

This study is based on three supporting theories.

Social Cognitive Theory (SCT) (Bandura, 1986) states that behavior is shaped through the interaction of persons, behavior and the environment. Overexposure to violent video games can result in diminished self-control and the observation of aggressiveness.

According to the General Aggression Model (GAM) (Anderson & Bushman, 2002), playing violent video games allows for repetitive rehearsal, reinforcement, and desensitization to violence, which in turn increases violent thoughts, feelings, and behaviors. Because PUBG is an interactive game, players' rewarded aggressive behavior may exacerbate these consequences (Anderson & Dill, 2000).

According to Brand et al. (2019), the Interaction of Person-Affect-Cognition-Execution (I-PACE) Model explains how personal traits, affective reactions, cognitive processes, and executive functions combine to cause gaming addiction. Problematic gaming may result from emotional dysregulation, cognitive control issues, and unfavorable coping mechanisms (Lin et al., 2023).

When taken as a whole, these models suggest that PUBG addiction may indirectly influence suicidality by encouraging hostility and depressive symptoms.

PUBG Addiction and Aggression

Many studies have shown that violent video games are positively correlated with aggression (Anderson et al., 2010; Burkhardt et al., 2022). Physical aggression, verbal aggression, anger, and hostility have been known to be significant factors linked with gaming addiction among the

Pakistani PUBG players (Ahmed et al., 2022). Similarly, Hassan et al. (2023) identified that there was an increase in aggression among PUBG players with higher involvement in the game, especially males.

According to experimental studies, passive exposure to violent media has less of an impact on aggressive behavior, emotional arousal, and aggressive cognition than do violent video games (Anderson & Bushman, 2001). Additionally, repeated exposure might increase moral disengagement and desensitize the audience to empathy, which can normalize aggressive behavior (Anderson & Dill, 2000; Teng et al., 2019). The same is shown in online gamers with specific personality features (Alvi et al., 2023) and in Pakistani teenagers during the COVID-19 era (Nazir, 2021).

PUBG Addiction and Depression

Depressive symptoms have been consistently associated with problem gaming (Männikkö et al., 2020). According to research done in Pakistan, teenagers who are hooked to PlayerUnknown's Battlegrounds are also considerably more depressed and have worse emotional health (Ahmed et al., 2022; Akram & Rahman, 2024).

This association may be influenced by sleep disturbance, low self-esteem, social isolation, and maladaptive coping (Kowert et al., 2015; Měniký et al., 2020; Lovibond & Lovibond, 1995). Additionally, it has been discovered that emotion dysregulation is a crucial mediator between depression and gaming addiction (Lin et al., 2023).

The Addiction and Suicidality of PUBG. Addiction and Suicidality in PUBG.

There is growing evidence that suicide thoughts and behaviors are associated with gambling issues. According to Lee et al. (2025), gaming had a favorable impact on Korean college students' suicidal thoughts and acted as a protective factor for social support and self-esteem. Similarly, loneliness played a role in mediating the relationship between gaming addiction and suicidal thoughts in Turkish adults (Tuncturk et al., 2023).

The COVID-19 pandemic exacerbated the issue of severe gaming addiction in Pakistan, resulting in several high-profile incidents of suicide linked to PUBG. The COVID-19 pandemic has worsened the situation of excessive gaming in Pakistan, and some cases of suicide have been linked to PUBG (Mamun et al., 2022). In addition, a meta-analysis by Cheng et al. (2018) also showed that there is a significant relationship between internet addiction and suicidal behaviors. Yu et al. (2020) also found that there was a mediation effect between Internet gaming disorder and suicidal ideation among adolescents, with insomnia and depression as mediators.

Mediating Mechanisms

The mediating role of depression and aggression in the relationship between gaming addiction and suicidality has been supported by research growing in number. Depression has consistently been identified as a mediator between gaming related stressors and psychological distress (Mun, 2023;

Seo et al., 2020). Likewise, it has been suggested that aggression is an essential mechanism in the association between violent video games and suicidal behavior, in line with the General Aggression Model (Tunc Turk et al., 2023). The results suggest that the study of depression and aggression as mediators of the linkage between PUBG addiction and suicidality is warranted.

Pakistani Context

In Pakistan, there are some context-specific factors which can make adolescents more susceptible to PUBG addiction. High academic pressure, a lack of leisure activities, stigma associated with mental illness, and inadequate mental health care can all contribute to online gaming dependency (Mun, 2023; Alvi et al., 2023; Baloch et al., 2021). Positive family dynamics and religious participation, on the other hand, may provide protective factors that result in improved coping mechanisms and self-control (Hassan et al., 2023; Lee et al., 2025).

Rationale for the Study

Several studies have been conducted on the relationship between online gaming and psychological well-being, but there is scanty data focusing on the relationship between PUBG addiction and psychological well-being in the Pakistan context. Gaming behaviors and psychological effects of gaming on other cultural, educational and social variables can vary from the Western population. Moreover, only a few studies have investigated the mechanisms of suicide ideation and/or suicidal behaviors as a result of PUBG dependency.

For this reason, this study examines the relationship between PUBG addiction, aggression, depression and suicidality among adolescents of Pakistan with an examination of mediating effect of aggression and depression. Understanding these connections can help reduce the psychological harm associated with gaming through culturally appropriate interventions, mental health awareness campaigns, and public health regulations.

Objectives:

1. Research the link between the addiction of PUBG and aggression.
2. To understand the link between depression and PUBG addiction.
3. 3. Examine the relationship between suicidality and PUBG addiction.
4. 4. Talk about the connections between suicidality, depression, and aggression.
5. Test whether aggression and depression are mediators between PUBG addiction and suicidality.

Conceptual Framework

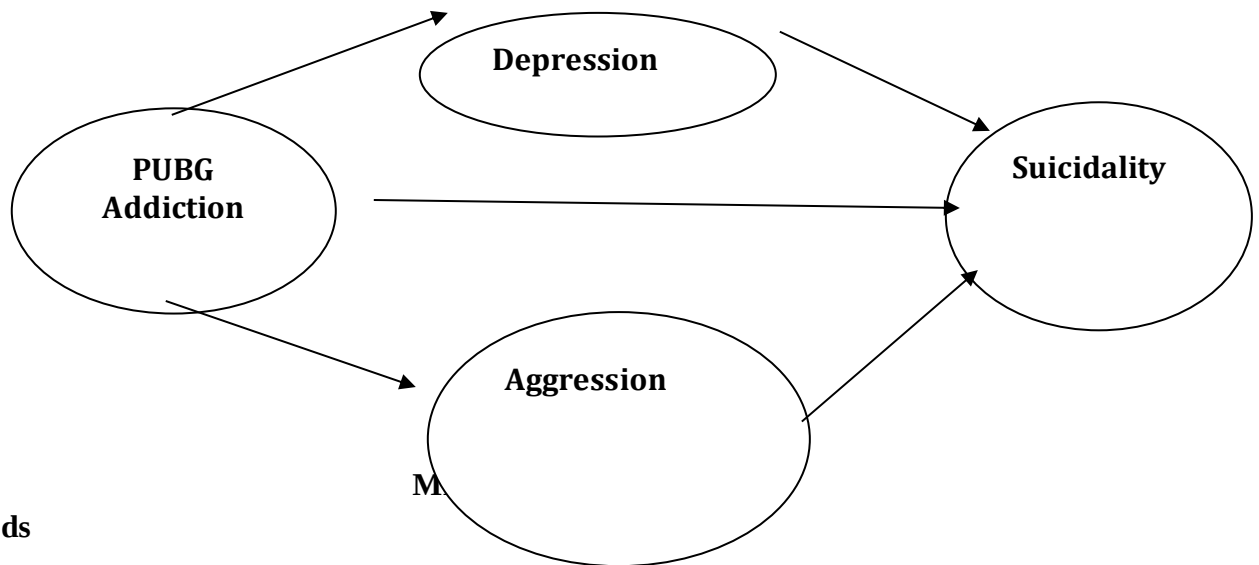
The General Aggression Model (Anderson & Bushman, 2002), the I-PACE Model (Brand et al., 2019), and Social Cognitive Theory (Bandura, 1986) serve as the foundation for this conceptual framework. It implies that PUBG addiction has two interrelated effects on suicidality.

It has been suggested that the aggressive pathway leads to increased aggression as a result of observational learning, reinforcement, and desensitisation to violent play, followed by increased suicidal behaviour (Anderson & Bushman, 2001; Tunc Turk et al., 2023).

The depressive pathway suggests that overuse of games can lead to depression via social isolation, maladaptive coping, sleep problems, and perceived failure, which can in turn heighten their risk of committing suicide (Kowert et al., 2015; Männikkö et al., 2020; Lovibond & Lovibond, 1995).

As such, it is thought that aggression and depression would be hypothesized to mediate separately between PUBG addictiveness and suicidality.

CONCEPTUAL FRAME WORK



Methods

Research Hypotheses

The following hypotheses were tested in this study:

1. There is a positive correlation between PUBG addiction and aggression, depression, and suicidality in adolescents.
2. Adolescents addicted to PUBG have significantly higher depressive symptoms than those who are not addicted to PUBG.
3. The more addicted a person is to PUBG the more he or she is likely to become aggressive.
4. Aggression and depression are mediators between PUBG addiction and suicidality.

Research Design and Participants

One hundred male students between the ages of fifteen and twenty-five from public, private, and university schools in Khyber Pakhtunkhwa, Pakistan, participated in a cross-sectional survey. Purposive sampling was used to choose participants, and those who played PUBG at least three times a week were included. Individuals with pre-existing mental health conditions were not included. According to Fritz and MacKinnon (2007), there were enough individuals to estimate a medium effect size with 80% statistical power. Because PUBG is more popular among men than women in Pakistan, the study was carried out with a group of male volunteers.

Demographic Questionnaire: Data on age, education, religion, marital status, family structure, birth order, and socioeconomic level were collected using a questionnaire created by the researcher. For individuals under the age of eighteen, informed permission and parental consent were acquired.

Game Addiction Scale (GAS): To evaluate the level of gaming addiction, the Game Addiction Scale (GAS) by Lemmens et al. (2009) was used to assess the addiction of 7 items. Items are scored on a 5 point likert scale from 1 to 5 with 1 being the least and 5 being the most addictive with respect to gaming. Cronbach's $\alpha = .90$ indicates the scale's high reliability.

Buss-Perry Aggression Questionnaire (BPAQ): Aggression was measured using the 29-item Buss-Perry Aggression Questionnaire (Buss & Perry, 1992) that includes items on physical aggression, verbal aggression, anger, and hostility. The higher scores are the more aggressive.

The Beck Depression Inventory (BDI): Depressive symptoms were assessed by using the 21 items version of Beck Depression Inventory (Beck, 1961), which was used to identify the severity of depression.

The Beck Scale for Suicidal Ideation (BSSI): Suicidality was evaluated with the 19-item Beck Scale for Suicidal Ideation (Beck et al., 1988), which is a reliable instrument to measure suicidal thoughts and intentions.

Procedure

Following institutional and ethical clearance, the data collection was carried out. The study goals, confidentiality, voluntary participation, and right to withdraw at any point were explained to the participants. Participants were given informed consent, and then completed the GAS, BPAQ, BDI and BSSI. Each participant spent roughly 30 to 45 minutes collecting data in a supervised setting between January and March of 2024. Participants who reported psychological discomfort were referred for appropriate help, and confidentiality was maintained throughout the study.

Statistical Analysis

SPSS version 26 was used to analyze the data. Prior to the inferential analyses, descriptive statistics, reliability analysis (Cronbach alpha), and assumption testing were carried out. Pearson correlation coefficients were used to test for correlations between PUBG addiction, aggression, depression, and suicidality. Independent-samples t-tests compared depression and suicidality scores between the high addiction and low addiction groups. To explore the indirect effect of aggression and depression on the relationship between PUBG addiction and suicidality, mediation analyses were performed with 5,000 bootstrap samples using the Hayes' PROCESS macro (Model 4); Hayes (2022). An indirect effect was deemed significant if the 95% bias-corrected confidence interval was not zero. Cohen's d (Cohen, 1988) was used when reporting effect size.

RESULTS

Data and Reliability Descriptive Statistics:

Table 1 gives descriptive statistics and reliability estimates of the study variables. Participants showed moderate levels of depression ($M = 18.30$, $SD = 6.10$), suicidality ($M = 8.70$, $SD = 3.20$), violence ($M = 22.40$, $SD = 5.60$), and PUBG addiction ($M = 3.50$, $SD = 1.20$). Mild to moderate depressive symptoms were indicated by the mean depression score. Every instrument had an acceptable to exceptional Cronbach's alpha coefficient (ranging from .78 to .91). The Buss-Perry Aggression Questionnaire ($\alpha = .79$), the Beck Depression Inventory ($\alpha = .78$), the Game Addiction

Scale ($\alpha = .80$), and the Beck Scale for Suicidal Ideation ($\alpha = .91$) had the highest reliability (Table 1).

Table 1 : *Descriptive Statistics and alpha reliability of study variables (200)*

Variable	M	SD	α	Range
Game Addiction Scale (GAS)	3.50	1.20	.80	1-5
Buss-Perry Aggression Questionnaire	22.40	5.60	.79	29-145
Physical Aggression	8.20	2.40	.72	9-45
Verbal Aggression	5.10	1.30	.58	5-25
Anger	5.80	1.80	.73	7-35
Hostility	3.30	1.10	.72	8-40
Beck Depression Inventory (BDI)	18.30	6.10	.78	0-63
Beck Scale for Suicidal Ideation (BSSI)	8.70	3.20	.91	0-38

Note. M = Mean; SD = Standard Deviation; α = Cronbach's alpha; Range = possible range of scores for each scale.

Correlation analysis between PUBG addiction and multiple assessment scales was done in order to evaluate Hypothesis 1. PUBG addiction was found to have a substantial and positive link with suicidality ($r = .32$, $p < .01$), depression ($r = .38$, $p < .01$), and violence ($r = .49$, $p < .01$), as shown in Table 2. Physical aggression ($r = .57$, $p < .01$) showed the highest correlation across aggressive characteristics, followed by hostility ($r = .50$, $p < .01$), verbal aggression ($r = .42$, $p < .01$), and rage ($r = .39$, $p < .01$). Suicidality and depression were strongly correlated ($r = .65$, $p < .01$), and overall aggression and suicidality were significantly correlated ($r = .52$, $p < .01$).

Table 2 : *Correlation Matrix between PUBG addiction , Aggression, Depression, and Suicidality (N=100)*

Variable	1	2	3	4	5	6	7
1. Game Addiction	—						
2. Physical Aggression	.57	—					
3. Verbal Aggression	.42	.45	—				
4. Anger	.39	.60	.50	—			
5. Hostility	.50	.35	.40	.55	—		
6. Total Aggression	.49	.65	.62	.71	.50	—	
7. Depression	.38	.57	.30	.39	.43	.55	—
8. Suicidality	.32	.50	.42	.39	.44	.52	.65

Note. $p < .05$. $p < .01$ (2-tailed).

Group Comparisons: The results are presented in the form of a comparison table of participants with high and low addiction to PUBG (Table 3). Compared to those with lower addiction ($M = 25.4$, $SD = 5.2$), adolescents with higher PUBG addiction reported substantially more depressive symptoms ($M = 31.2$, $SD = 5.9$), $t(198) = 6.45$, $p < .001$, Cohen's $d = 1.08$. Similarly, suicidality ratings were substantially higher in the high-addiction group ($M = 21.3$, $SD = 3.5$) than in the low-addiction group ($M = 16.1$, $SD = 2.8$), $t(198) = 8.14$, $p < .001$, Cohen's $d = 1.29$. Hypothesis 2 is supported by the huge effect sizes, which indicate that the two groups differ significantly.

Table 3 Comparative Analysis of Depressive Symptoms and Suicidality Based on PUBG addiction (N=200)

Variable	High PUBG Addiction SD) (n=110)	Low PUBG Addiction L, SD) (n=90)	t (df)	p	Cohen's d
Depression Score	31.2 (5.9)	25.4 (5.2)	6.45 (198)	.001	1.08
Suicidality Score	21.3 (3.5)	16.1 (2.8)	8.14 (198)	.001	1.29

Mediation Analysis:

The PROCESS Macro (Model 4) was utilized with 5,000 bootstrap samples to perform mediation analysis (Table 4). In the case of PUBG addiction and suicidality (indirect impact = .18, Boot SE = .04, 95% CI [.12,.25]) and aggression (indirect effect = .15, Boot SE = .04, 95% CI [.10,.21]), the indirect effects of depression and aggression were significant. The direct effects were also significant in both models which suggests the partial mediation. A moderate to large mediation effect size was found for depression ($\kappa^2 = .42$) and aggression ($\kappa^2 = .35$), supporting Hypothesis 4, which posited that both depression and aggression could mediate the relationship between PUBG addiction and suicidality.

Table 4: Mediation Analysis: Indirect Effects of PUBG Addiction on Suicidality Through Depression and Aggression (N = 100)

Model	Indirect Effect	Boot SE	Boot LLCI	Boot ULCI	Effect Size (κ^2)
Depression	.18	.04	.12	.25	.42
Aggression	.15	.04	.10	.21	.35

Note. N = 100. Unstandardized coefficients are reported. Boot SE = standard error based on 5,000 bootstrap samples; Boot LLCI = lower limit of 95% confidence interval; Boot ULCI = upper limit of 95% confidence interval. Indirect effects are significant if the 95% bootstrap confidence interval does not contain zero. κ^2 = effect size for mediation (Preacher & Kelley, 2011).

DISCUSSION:

In the present study, the association of PUBG addiction and psychological outcome was explored among Pakistani adolescents with the special focus on the mediating role of aggression as well as depression. Higher PUBG addiction was significantly associated with greater aggression, depression, and suicidality across all four hypotheses, in general.

PUBG Addiction and Psychological Outcomes:

As hypothesized in 1, PUBG addiction was positively correlated with aggression, depression and suicidality. The highest correlation was with aggression and then depression and suicidality, which may indicate that these violent and competitive aspects of PUBG have a more dominant effect on aggression, rather than on any wider psychological distress. The results are in accordance with the previous studies which showed that gaming addiction is associated with negative mental health outcomes (Männikkö et al., 2020; Ahmed et al., 2022) and with the theories of “Social Cognitive Theory” (Bandura, 1986) and the General Aggression Model (Anderson & Bushman, 2002). Exposure to violent game content can become a reinforcing experience and may be leading to learning of reinforcement of aggressive thoughts and behaviors by observing others and rehearsing behaviors repeatedly.

Despite being a highly competitive game, PUBG is also addictive, and that can sometimes lead to feelings of depression and aggression.

The results demonstrated that adolescents with high PUBG addiction had considerably greater depression and aggression scores than the less dependent group of adolescents, supporting Hypotheses 2 and 3. The findings are consistent with previous research that has demonstrated how problematic gaming might cause depression through emotional instability, sleep disruptions, social isolation, and maladaptive coping (Kowert et al., 2015; Männiký et al., 2020; Lin et al., 2023). The results are also consistent with the “I-PACE model”, (Brand et al., 2019), which indicates that emotional and cognitive dysregulation may play a role in the development and maintenance of gaming addiction.

The observed aggression corresponds with a wealth of literature detecting increases in aggressive thoughts, emotions, and behaviors following violent video games (Anderson et al., 2010; Burkhardt et al., 2022). The strong linkage to physical aggression suggests that repeated exposure to rewarded virtual violence may foster aggressive behavioral scripts and lessen sensitivity to violence as predicted by the “General Aggression Model” (Anderson & Bushman, 2002; Anderson & Dill, 2000).

Mediating Roles of Depression and Aggression:

The results of mediation analyses confirmed Hypothesis 4: depression and aggression partially mediated the relationship between PUBG addiction and suicidality. Excessive game playing seems to have a stronger effect via an increase in depressive symptoms and this is revealed in the prominence of depression as a stronger mediator. These results are similar to those found in previous studies that showed depression as a significant pathway between gaming addiction and suicidality (Lee et al., 2025; Farhin & Deka, 2026; Yu et al., 2020).

Aggression also greatly mediated this relationship, lending further credence to the idea of the General Aggression Model (Anderson & Bushman, 2002) that aggressive cognition and behavior lead to serious psychological consequences. Aggressive adolescents might be more impulsive, experience interpersonal conflict, and be socially isolated, which in turn may raise their vulnerability to suicidal ideation (Tuncturk et al., 2023; Teng et al., 2019). Given the continued existence of strong direct effects, there may be other mechanisms involved in adolescents' suicidality when they have gaming addiction.

Cultural Context:

The findings need to be understood in the context of Pakistan's sociocultural context. Academic stress, lack of recreational options, the stigma surrounding mental health and access to psychological services can make adolescents more susceptible to harmful gaming behaviors and their associated effects (Mun, 2023; Alvi et al., 2023; Baloch et al., 2021). In contrast, high family support and involvement in religious activities are protective factors that have a positive impact on social support and self-regulation (Hassan et al., 2023; Lee et al., 2025). The contexts make it clear that culturally responsive prevention and intervention approaches are important.

Implications of Study:

The results align with 'Social Cognitive Theory' (Bandura, 1986), 'General Aggression Model' (Anderson & Bushman, 2002) and 'I-PACE model' (Brand et al., 2019), which indicate that PUBG addiction can lead to suicidality by both aggressive and depressive means.

From a clinical standpoint, routine screening for gaming addiction should be considered when a young person complains of depression, aggression or suicidal ideation. Intervention should focus on gaming addiction, as well as emotion regulation, depression and anger management disorders, and include evidence-based interventions, including family-based interventions and cognitive-behavioral therapy (Esmaeli et al., 2023).

As a public health issue, schools need to encourage responsible gambling habits and conduct screening and awareness campaigns. Policymakers should intensify the efforts of adolescent mental health services, promote responsible gaming policies, and promote collaborative efforts between educators, healthcare providers, and families.

Limitations of Study:

There are a few caveats to be noted. Because of the cross-sectional design, no causal inferences can be drawn, and only self-report measures were used, which could have resulted in response bias. It was only adolescent males from Khyber Pakhtunkhwa who participated in the study that restricted the generalizability of the results. The results may have been influenced by the relatively small sample size, and by not considering some potentially confounding variables like personality traits, family environment, and socioeconomic factors. In addition, certain aspects of the game, including the measurements of daily play duration and addiction, were not assessed in a detailed manner.

Future Research:

Longitudinal studies in the future are required to determine cause-effect relationships between PUBG addiction and psychological effects. Female subjects should be included in research, larger and diversified samples should be taken from varied parts of Pakistan and objective measures of gaming behavior should be used. Additional studies using mixed-methods and intervention studies that assess cognitive-behavioral, family-based, and school-based programs would further strengthen the evidence-base. Comparative studies of the diverse online games could also then clarify whether these results are generalizable beyond the scope of PUBG or pertain only to gaming addiction.

Conclusion:

The outcomes of this study have shown that there is significant relation between PUBG addiction and its association with aggression, depression and suicidality in Pakistani adolescents. The link between PUBG addiction and suicidality was partially mediated by depression and aggression, among the psychological pathways that exert influence on the mental health of gamers addicted to PUBG. The results support the "Social Cognitive Theory" (Bandura, 1986), "General Aggression Model" (Anderson & Bushman, 2002), and "I-PACE model" (Brand et al., 2019) as appropriate theories to examine the psychological harm associated with playing, building on earlier research carried out outside of the Western context.

Given the high incidence of PlayerUnknown's Battlegrounds (PUBG) in Pakistan, it is critical to diagnose gaming addiction early on and provide culturally relevant therapies. Screening, mental health education, family involvement, and public awareness campaigns should be combined to lessen the psychological impacts of excessive gaming and promote healthy gaming practices in teenagers.

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