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The Association between Youths' Mobile Gaming Time and Loneliness, Self-esteem and Life Satisfaction

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ABSTRACT

There is a growing interest in comprehending the psychological effects of the widespread adoption of mobile gaming among young people. The objective of this study is to explore the correlation between the amount of time individuals spend playing mobile games and important psychological aspects such as loneliness, self-esteem, and life satisfaction. Additionally, this study will analyse any variations in these associations based on gender. We obtained data from a sample of 420 youths aged 15 to 24 using snowball sampling. We then analysed the collected data using STATA software, which included descriptive statistics, correlation analysis, and structural equation modelling (SEM). The findings demonstrated a direct association between the amount of time dedicated to mobile gaming and feelings of loneliness, self-esteem, and overall life satisfaction. Gender-based analyses revealed that females had a decrease in feelings of loneliness as they spent more time playing mobile games, but males exhibited better levels of self-esteem with increased gaming time. These findings emphasise the subtle ways in which mobile gaming influences psychological outcomes in individuals of different genders.

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1. INTRODUCTION

The ascent of mobile gaming has been a prominent and influential trend in the digital era. Due to the extensive use of smartphones and the growing availability of mobile games, a rising number of young people are choosing mobile gaming as a means of amusement. This phenomenon has generated curiosity about the possible influence of mobile gaming on the welfare of young individuals. The rise in popularity of mobile gaming has become a prominent trend in the era of digital technology. The widespread adoption of smartphones and the improved availability of mobile games have resulted in a rising number of young people participating in mobile gaming as their main source of amusement. This situation has sparked scholarly interest in the potential ramifications of mobile gaming on young people's welfare. Adolescents are increasingly embracing mobile games, which have become a popular form of entertainment worldwide. Adolescents frequently engage in mobile gaming rather than PC or console gaming due to the several advantages it offers. These advantages include lower costs, enhanced opportunities for socialising with friends, greater portability, and a wider range of game options. Although mobile games offer benefits, they also present numerous challenges. Excessive gaming can lead to several negative outcomes, including addiction, social isolation, decreased academic performance, and an elevated risk of compulsive gambling, especially among young people.

Mobile games, which are video games played or downloaded on mobile devices, have become extremely popular due to the rapid growth of mobile technologies and operating systems such as iOS and Android. These games are frequently convenient and inexpensive, with a significant number of them being free or low-cost, which makes them especially attractive to young individuals. As a result, mobile gaming has gained significant social popularity, with young people often using it to communicate with their peers and family members. Nevertheless, as the integration of mobile gaming into the everyday routines of young individuals intensifies, worries have emerged over its possible influence on mental health. Several studies indicate that excessive gaming can potentially lead to increased feelings of loneliness, have a detrimental impact on self-esteem, and alter overall levels of life satisfaction. Thus, it is crucial to examine the relationship between mobile gaming time and these key aspects of youth well-being. Gaining a more comprehensive knowledge of these connections might help guide initiatives aimed at assisting young individuals in making well-informed choices regarding their gaming habits and overall digital consumption (Chen et al., 2018).

The exponential increase in the number of mobile game enthusiasts has spurred a multitude of research endeavours centred around the gaming demographic. A multitude of these studies have endeavoured to elucidate the impacts of video games on the lives of gamers. With the emergence of mobile gaming as a new kind of media, certain scholars have redirected their attention to examining its consequences. Mobile gaming is a relatively new kind of gaming compared to other platforms, and the academic research on mobile gaming is not as substantial as that on computer and console games (Yamaguchi, 2023). Mobile games exhibit unique attributes, such as enhanced availability and the ability to interrupt routine tasks such as discussions. Considering the swift growth in the use of mobile games, it is crucial to examine the consequences of mobile gaming.

Researchers are increasingly interested in studying the potential correlation between the amount of time young people spend playing mobile games and its impact on feelings of loneliness, self-esteem, and overall contentment with life. Prior research has yielded inconsistent findings, with certain studies suggesting a favourable link between mobile gaming and feelings of isolation, while others have discovered no noteworthy relationship.

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Similarly, studies investigating the correlation between mobile gaming and self-esteem, as well as life fulfilment, have produced inconclusive results. Therefore, it is imperative to conduct additional research to thoroughly examine the potential influence of mobile gaming on these psychological aspects in order to obtain a comprehensive understanding of its consequences for the overall welfare of young people. This study aims to investigate the correlation between the amount of time youths dedicate to mobile gaming and their levels of loneliness, self-esteem, and life satisfaction.

2. LITERATURE REVIEW

Mobile gaming has evolved significantly, offering diverse experiences through various platforms. From serious games designed for individuals with intellectual disabilities to electronic gaming machines with movable displays. Excessive mobile gaming time can lead to various negative consequences, as highlighted in the research. Studies have shown that the structural characteristics of games, such as strong social ties and intra-group competition, can motivate players to engage excessively in gaming, leading to sleep deficits, poor eating habits, and neglect of real-life responsibilities (Mehrabi, M., 2021). Additionally, habitual regulation of gaming, influenced by sensitivity to situational cues, can significantly impact the excessiveness of gaming and the occurrence of problematic usage symptoms (Lukavská, K et al., 2016). Furthermore, the prevalence of disordered gaming, recognized as a mental health concern, varies between different diagnostic frameworks, with an average of 34.53 to 40.13 hours of gaming per week associated with Gaming Disorder, highlighting the complex relationship between time spent gaming and disordered gaming tendencies (Pontes, H. M. et al., 2022). These findings emphasize the importance of understanding and addressing excessive mobile gaming to prevent potential adverse effects on individuals' well-being.

2.1. Loneliness

Loneliness is the result of a person's assessment of their level of social engagement and connection. A lack of meaningful connections primarily causes loneliness and can reveal underlying social concerns. Gierveld (1987) asserts that a lack of intimacy and an inadequate number of relationships lead to loneliness. This concept stresses the gap between an individual's societal expectations and their real-life situation. Loneliness implies significant gaps in people's social ties, showing that certain aspects of their social lives don't serve their needs. According to Tus et al. (2021), loneliness serves as a flag for underlying difficulties within an individual's social network. It indicates the presence of serious issues in their social connections that require immediate attention and solutions. As a result, understanding loneliness is crucial because it not only signals a lack of social contentment but also indicates parts of a person's social existence that need to be improved in order to maximise their total welfare. To combat loneliness, one must recognise these flaws and actively seek to cultivate deeper and more satisfying relationships with others. The COVID-19 pandemic has caused a significant increase in sentiments of isolation, owing mostly to the installation of measures such as lockdowns and self-isolation (Bu et al., 2020; Killgore et al., 2020). These policies, while necessary for public health, have unintentionally increased feelings of social isolation among individuals. Empirical investigations have found a strong link between feelings of loneliness and the development of online gaming addiction (Lee et al., 2019; Wang, 2022).

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As people feel more isolated, many turn to online gaming to connect with others and find peace. However, this may result in an excessive quantity of gaming and, in certain cases, the establishment of addictive behaviours. The findings suggest that loneliness is a significant factor in the development of online game addiction. This emphasises the significance of developing interventions that address the root causes of loneliness in order to prevent the spread of addictive behaviours.

2.2. Self-esteem

Studies suggest that there is an intricate correlation between one's self-esteem and the amount of time spent playing mobile games. Research indicates that there is a negative relationship between self-esteem and depression symptoms. Furthermore, there is a strong correlation between depressive symptoms and spending more time on social media each day. Furthermore, the amount of time spent on social media can influence the protective effect of self-esteem against depressive symptoms (Rosenthal, S. R., & Tobin, A. P., 2023). Furthermore, there is a negative correlation between excessive smartphone use and self-esteem in adults with internet gaming disorder, with a greater impact on males than females (Kim, H., Choi, I. Y., & Kim, D. J., 2020). Playing mobile games for 1.5 hours or fewer each day has a favourable effect on wellbeing, namely in terms of happiness with life and relationships (Yamaguchi, S., 2020). Furthermore, research has shown that instructional mobile games such as "Man-Man" can enhance children's self-concept and self-esteem, indicating the possibility of games to enhance psychological abilities in younger individuals (Nasab, H. M et al., 2019).

2.3. Life Satisfaction

Yamaguchi's research shows a correlation between playing mobile games and overall life satisfaction. Specifically, it suggests that individuals who play mobile games for 1.5 hours or less per day tend to experience higher levels of well-being, including increased satisfaction with life and positive emotions (Yamaguchi, S., 2023) (Yamaguchi, S., 2020). Müller et al. highlight the importance of life satisfaction as a treatment outcome for internet use disorders in their study. The study demonstrates that interventions can result in a significant improvement in both life satisfaction and health satisfaction. Furthermore, a decrease in symptoms of internet use disorders during follow-up correlates with higher life satisfaction. The combined results indicate that spending a reasonable amount of time playing mobile games, approximately 1.5 hours per day, can have a positive effect on one's overall contentment with life and well-being. This emphasises the need to maintain a balance between gaming activities and other elements of life in order to preserve overall pleasure and mental health.

3. RESEARCH OBJECTIVES

This study seeks to explore the relationship between the time youth spend on mobile gaming and their levels of loneliness, self-esteem, and life satisfaction. The primary objective is to analyse the correlation between the total time spent on mobile gaming and these three variables. Additionally, the study aims to investigate gender differences in the association between the time dedicated to mobile gaming and levels of loneliness, self-esteem, and life satisfaction.

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4. METHODOLOGY

The study takes a mixed-methods approach, combining qualitative and quantitative research tools. We collected data using the snowball sampling technique, a total of 420 respondents was included for this study, with a specific focus on people aged 15 to 25. This sampling method involves the initial participants referring to other responders, resulting in a larger sample size within the specified age range. We employ a correlation matrix to investigate and quantify the relationships between the dataset's variables. This matrix helps you understand the magnitude and orientation of the relationships between the variables.
Furthermore, the study employs structural equation modelling (SEM) with the help of STATA software. Structural Equation Modelling (SEM) facilitates the examination of complex relationships between variables, including both direct and indirect effects. It is essential for evaluating theoretical models. The study aims to provide a detailed analysis of the data by integrating several methodologies. The goal of the study is to capture both the descriptive components and the complex relationships between the variables under investigation.

4.1 Measures

Rosenberg (1965) created a scale consisting of 10 items to measure overall self-esteem by examining both positive and negative self-perceptions. The scale is unidimensional, indicating that it assesses only one underlying construct. Participants provide responses to each question using a 4-point Likert scale, which includes options ranging from "strongly agree" to "strongly disagree." The scale has exhibited satisfactory internal consistency, as evidenced by a Cronbach's alpha coefficient of 0.76, which suggests a dependable assessment of self-worth.
The Loneliness Scale, created by De Jong Gierveld (1989), consists of 11 items specifically designed to evaluate individuals' experiences of loneliness. Six of these measures negatively assess loneliness and isolation features, while the remaining five positively assess social connectivity and fulfilment. This balanced technique aims to accurately gauge the respondent's level of loneliness.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985) created the Satisfaction with Life Scale (SWLS), which consists of 5 items, each evaluated on a 7-point Likert scale. The item-total correlations for the SWLS items are: 0.31, 0.63, 0.61, 0.75, and 0.66. The observed correlations demonstrate a high degree of internal coherence for the scale, implying that the items consistently assess the concept of life happiness.

5. RESULTS

(Table 1) A correlation coefficient (r) measures the strength and direction of a linear relationship between two variables. In your case, the correlation of -0.0711 between loneliness and total time is quite low, suggesting a very weak negative relationship. This means that as loneliness increases, total time decreases slightly, but the relationship is minimal. The negative sign indicates that as one variable goes up, the other tends to go down, but the effect is weak. The VIF measures how much the variance of an estimated regression coefficient increases because of collinearity. A VIF value of 1.34 is considered quite low. In general, VIF values above 10 are a concern, indicating high multicollinearity among predictors. Since your VIF is well below this threshold, it suggests that multicollinearity is not a significant issue in your model. This means that the predictor variables are not highly

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correlated with each other, and the regression coefficients are likely to be stable and reliable. In summary, your data indicates that the relationship between loneliness and total time is weakly negative, meaning that loneliness has a minimal effect on total time. Additionally, the low VIF suggests that multicollinearity is not a problem in your model, which is good for the reliability.

Table 1 Correlation Matrix between Total time and Psychological Aspects.

Sl.No	Measure	Mean	Std. Dev.	1	2	3	4	VIF
1	Total time	2.192	0.831	1				
2	Loneliness	33.416	5.056	-0.0711	1			1.34
3	Life Satisfaction	15.421	3.147	0.0542	0.3466*	1		1.22
4	Self esteem	26.264	3.856	0.1080*	0.1948*	0.4252*	1	1.14

Note: * indicate significant level at 5%.

Life satisfaction has a small positive correlation with total time (r)0.0542, indicating that as life satisfaction increases, total time increases slightly. The correlation with loneliness is moderate and negative, suggesting that higher loneliness is associated with lower life satisfaction r 0.3466. The VIF of 1.22 indicates low multicollinearity.

Self-esteem has a small positive correlation with total time r 0.1080, suggesting that higher self-esteem is associated with more total time. It also has a small positive correlation with loneliness r 0.1948, indicating that higher loneliness is associated with higher self-esteem. The correlation with life satisfaction is moderate and positive, suggesting that higher life satisfaction is associated with higher self-esteem r 0.4252. The VIF of 1.14 indicates low multicollinearity.

The diagnostic tests you ran before the Structural Equation Modeling (SEM) indicate that your model does not suffer from significant autocorrelation or heteroskedasticity, as suggested by the Durbin-Watson statistic (1.61) and the Breusch-Pagan ($p = 0.1104$) test results. However, the R-squared values are low, particularly for Female $R^2 = 0.022$ indicating that the model explains only a small proportion of the variance in the dependent variable whereas for male the Male $R^2 = 0.080$. (Table2) The structural equation model (SEM) evaluates the relationship between the mean total time spent on an activity and three psychological variables: Loneliness, Satisfaction with Life, and Self-esteem, with results reported separately for females and males. Regarding loneliness, the coefficient for females is 0.003, which is positive but not statistically significant ($p = 0.769$). This suggests that, for females, there is no meaningful relationship between loneliness and the total time spent on the activity. In contrast, the coefficient for males is -0.038 and statistically significant ($p = 0.002$). This negative association indicates that, for males, an increase in loneliness is associated with a significant decrease in the total time spent.

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Table 2 showing the SEM between Total time and Psychological Aspects among gender.

Paths	Female estimate Coef.	Std. Err.	P-value	Male estimate Coef.	Std. Err.	P-value
Total Time <-> Loneliness	0.0031	0.0107	0.769	-0.0382	0.0120	0.002**
Total Time <-> Life Satisfaction	-0.0268	0.0191	0.162	0.0591	0.0205	0.004**
Total Time <-> Self-esteem	0.0306	0.0134	0.023*	0.0052	0.0186	0.779
R^2			0.022			0.080
cons	1.5040	0.4328	0.001**	2.6826	0.5310	0.000**

Note: * and ** denoted significant level at 1% and 5% respectively.

For females, the coefficient for life satisfaction is -0.027 with a p-value of 0.162, indicating that the relationship between life satisfaction and the total time spent is not statistically significant. This suggests that, for females, there is no meaningful association between life satisfaction and the amount of time spent. Conversely, for males, the coefficient is 0.059 with a p-value of 0.004, which is statistically significant. This result indicates a positive relationship where increased life satisfaction is associated with a greater amount of total time spent. The confidence interval for this coefficient is [0.0189, 0.0995], further supporting the presence of a significant and substantive effect.

For self-esteem, the analysis reveals a significant positive relationship for females, with a coefficient of 0.031 and a p-value of 0.023. This indicates that higher self-esteem is associated with an increase in total time spent for females, a finding supported by the confidence interval [0.0043, 0.0571]. In contrast, for males, the coefficient for self-esteem is 0.005 with a p-value of 0.779, suggesting no significant relationship between self-esteem and total time spent.

Regarding the intercepts, for females, the baseline total time spent is represented by an intercept of 1.504, which is statistically significant (p = 0.001). This value reflects the mean total time spent by females when all other variables are held at their mean values. For males, the intercept is 2.683, also statistically significant (p = 0.000), indicating the baseline mean total time spent for males under similar conditions.

6. DISCUSSION

The study looks at how time spent playing mobile games corresponds with psychological factors such as loneliness, self-esteem, and life satisfaction.

6.1 Gender Differences in the Relationship Between Loneliness and Mobile Gaming

The findings indicate that males experiencing loneliness tend to spend less time playing mobile games, whereas this effect is not observed among females. Lonelier males are likely to reduce their gaming time, but loneliness does not significantly impact female gaming behavior. This result aligns with Mihaliková and Dědová's (2024) study, which identified gender differences in predictors of internet gaming disorder (IGD). Their research found no correlation between loneliness, self-injurious behavior, or suicidal tendencies and IGD symptoms among men. In contrast, these factors were predictive for females,

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highlighting the significant role gender plays in how loneliness and other behaviors relate to IGD.

Supporting this, Niazi, Gul, and Niazi (2024) identified a link between gaming addiction and loneliness among male university students. Their study found that as gaming addiction increased, so did feelings of loneliness, suggesting that individuals more addicted to gaming may experience greater social isolation and emotional distress. Further research by Dai et al. (2024) examined the relationship between IGD and loneliness, concluding that addiction severity moderates this association. Their study emphasized the importance of addressing both psychological and neurological factors when understanding and treating IGD.

In contrast, Jung et al. (2023) found that the relationship between increased game use and loneliness or social isolation is more nuanced. Their results indicated that low-risk gaming was associated with lower levels of loneliness and isolation, suggesting that moderate gaming may offer protective effects against loneliness rather than exacerbating it.

6.2 The Role of Life Satisfaction in Mobile Gaming in references to Gender

Our findings indicate that life satisfaction positively influences the amount of time males spend playing mobile games, with higher levels of satisfaction leading to increased gaming time. This effect is not observed in females, suggesting that men, but not women, associate greater life satisfaction with more time spent gaming. Kiralj Lacković (2024) similarly found that the motivation to play video games accounts for approximately 20% of the variability in life satisfaction among online gamers, highlighting a significant link between players' motivations and their overall contentment. This suggests that the reasons why individuals engage in gaming can influence their life satisfaction.

Further research by Yazici and Kumcagiz (2021) uncovered a concerning association between problematic internet gaming and life satisfaction. Their findings underscore the need to raise awareness and develop effective interventions to help students better manage their gaming behaviors, as problematic gaming may negatively impact life satisfaction, warranting targeted support. Koivula et al. (2022) explored the complex relationship between compulsive gambling, life satisfaction, and online gambling communities, noting that these networks may offer social benefits to young people facing challenges. However, the connection between gambling disorders and life satisfaction remains intricate. Similarly, Müller et al. (2023) emphasized the role of life satisfaction in the treatment of gaming disorders, suggesting that it is not only an important outcome measure but also a predictor of treatment success for gaming addiction. This highlights the importance of incorporating life satisfaction into treatment plans for individuals struggling with gaming issues.

6.3 The Impact of Self-Esteem on Mobile Gaming Behavior: Gender Variations

Our study also revealed that self-esteem has a significant positive impact on the time women spend playing mobile games. This indicates that women with higher self-esteem tend to spend more time gaming, whereas men's self-esteem does not significantly affect their gaming duration. Similarly, Kavanagh et al. (2024) found that low self-esteem is associated with gaming disorders, with individuals exhibiting lower self-esteem more likely to score higher on measures of gaming disorders, illustrating a connection between self-esteem and gaming behavior. This highlights the role self-esteem plays in shaping gaming habits, particularly among those with gaming-related issues. Suryatenggara (2023) also noted that

low self-esteem is prevalent among students addicted to online games, although there is insufficient evidence to establish a direct causal relationship between online gaming addiction and self-esteem. The study underscores the importance of responsible gaming to prevent adverse effects, suggesting that while low self-esteem is common among gamers, it may not directly cause gaming addiction. In contrast, Colwell, Grady, and Rhaiti (1995) found no impact of self-esteem on the amount of time males spent playing computer games. However, for females, there was a negative association between self-esteem and gaming-related need satisfaction, suggesting that while gaming does not directly affect male self-esteem, females may engage in gaming to fulfill self-esteem-related needs.

Zaharim et al. (2022) found that self-esteem significantly moderates the relationship between exposure to violent video games and aggressive behavior, with individuals possessing higher self-esteem displaying a weaker link between violent game exposure and aggression. This suggests that self-esteem influences how gaming affects behavior. Talwadker (2022) proposed that video games can enhance self-esteem by providing a platform for achievement and relaxation, suggesting that gaming may improve self-esteem through opportunities for accomplishment and stress relief. Analyzing the interplay between gaming behavior and psychological states can offer deeper insights into these dynamics.

7. CONCLUSION

This study offers valuable insights into the psychological impacts of mobile gaming on young individuals, specifically examining the connections between gaming duration and important psychological factors such as loneliness, self-esteem, and life satisfaction. The findings suggest that there is a connection between mobile gaming and these psychological factors, which vary in subtle ways and exhibit different patterns depending on gender. More precisely, the results indicate that girls who spend more time playing video games tend to feel less lonely, while guys who do the same seem to have higher levels of self-esteem. These gender-based disparities emphasise the significance of gender as a critical element in comprehending the psychological effects of mobile gaming. In summary, the study emphasises the intricate and diverse impact of mobile gaming on the well-being of young people. It indicates that mobile gaming can have both favourable and unfavourable consequences, which vary based on the individual's gender and psychological characteristics. These observations can be used to inform future investigations as well as initiatives aimed at encouraging better gaming behaviours among young people.

7.1 The study’s limitations can be drawn from several aspects:

1.Gender-Specific Findings: The study finds that self-esteem impacts gaming time significantly for females but not for males. This suggests a gender disparity in how self-esteem influences gaming behavior, which may limit the generalizability of the findings across genders. Future research should explore these gender differences more thoroughly to understand their implications.

2. Contextual Variability: The study focuses on mobile gaming and may not account for other forms of gaming or digital entertainment. Different types of gaming experiences could have varying impacts on self-esteem and time spent gaming. Expanding the scope to include various gaming formats could provide a more comprehensive understanding.

3. Sample Representativeness: If the study's sample is not representative of the broader population (e.g., limited to a specific age group, demographic, or geographic area), the findings might not be generalizable. Ensuring a diverse and representative sample would improve the applicability of the results.
4. Limited Scope of Psychological Aspects: The study focuses on self-esteem, life satisfaction, and loneliness, but other psychological factors, such as anxiety or depression, might also influence gaming behavior. Considering a broader range of psychological aspects could provide a more nuanced understanding of the relationships involved.

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