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PSYCHOLOGICAL EFFECTS OF ONLINE GAMING ON ADOLESCENTS: A QUANTITATIVE STUDY OF ADDICTION AND ACADEMIC PERFORMANCE

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Abstract
This paper examines the video game addiction in adolescents over the Internet. The growth of online gaming, especially mobile gaming platforms has made teens more vulnerable to the behavioural and psychological consequences of excessive gaming. In the study, a quantitative survey was conducted on 110 adolescent students, who were of different educational backgrounds, with the majority of them ranging between 13 and 18 to study aspects of gaming time, platform of choice, gaming motivation and parental supervision. Frequency distributions, correlation, and regression as examples of descriptive and inferential statistical analyses were used to evaluate the psychological, social and academic impacts of online gaming. The findings revealed that most teenagers played games on gaming mainly due to entertainment and relieving stress with mobile phones being the most common device. The regression analysis indicated that emotional reliance on gaming and engagement in peer-based gameplay were important predictors of problematic gaming behaviour. Additionally, it was revealed that excessive gaming is correlated with problems such as sleeping disturbances, lack of academic improvement and social complaints towards family members. These results indicate that the role of parents is strongly related to decreasing the level of addiction to online gaming through their awareness, supervision and discussion. It is instead about the need to have a strategic parental involvement and specific educational campaigns to develop healthy gaming habits in adolescents.
Keywords: Online video games, Adolescents, Gaming addiction, psychological impact, Academic performance.

1. INTRODUCTION

Gaming has evolved to become a humble form of recreation to a mainstream entertainment sector, which has an influence on millions of people across the world. The gaming industry has also been able to provide the gamers with very intense immersion, using the mobile, console, and personal computer platforms, due to technological innovations. The population of gamers around the world is growing to over 3.38 billion in 2024, a figure that is the foundation of an industry that is expected to earn over 187 billion dollars. Games are no longer just a simple form of entertainment they are now cultural phenomenon that inform the process of social interaction, narrative creation and education.

The main age group of the users spans between 12 and 35 years of age; however, their use is rising in younger children and the elderly. In the past, online gaming was dominated by men, but today, there has been a significant reduction in gender inequalities. Most online gamers are found in the Asia-Pacific region where they are estimated to constitute about 50 percent of total global population with China, India, Japan and South Korea in the lead. The markets of North America and Europe are also important; they represent about 20 3/4 of the global base of players. The most common platform of online gaming is the mobile devices which have more than 2billion mobile gamers around the world. Gaming has become a possibility anywhere and at any time due to the portability of smartphones and tablets. The PUBG Mobile, Free Fire, Candy Crush Saga, and Clash of Clans are considered notable mobile games. Extensive gaming can result in addiction, which negatively impacts both mental health and productivity and social life.

Online video gaming in the digital age has completely changed the nature of communication, competition, and leisure time of people. In comparison to the traditional offline games the online video games offer a social experience that cuts across the national boundaries because it allows the players to interact and communicate in real time with the millions in the world. Players can create teams, come up with strategies and play such popular games as League of Legends, Fortnite and Call of Duty Warzone, thus, creating a sense of community and belonging. These interactions are improved by communication modalities, such as voice chat, text messaging and streaming platforms, making gaming a social hub.

The growth of online gaming has been possible due to the advancement in cloud infrastructure and access to the internet. Gamers are having smooth online experiences on consoles, personal computers, and mobile devices due to fast broadband and low-cost data plans. Players do not require costly equipment to stream high-quality games over cloud-gaming platforms like Google Stadia, Xbox Cloud Gaming, or PlayStation Now. All these developments increase the playability of online games across the globe especially in areas that do not make it efficient to purchase the powerful hardware.

Online video games are of various types and they appeal to different interests and abilities of players. Whereas massively multiplayer online role-playing games (MMORPG) like World of Warcraft and Final Fantasy XIV can provide players with large virtual worlds in which they can complete missions and build characters over time, battle-royale games such as PUBG, Free Fire, and Apex Legends revolve around survival and strategy. Faster games that can be played in a few minutes attract a wider audience, i.e., Candy Crush Saga, Ludo King, and Among Us. All players will have an opportunity to find a game that they like regardless of their age and background, increasing diversity.

The introduction of the e-sports has seen online gaming become a professional industry that includes tournaments, sponsorship deals, and millions of fans. The League of Legends world championship, Fortnite world cup, and The International (Dota2) have world championships that draw huge crowds, and the prize pools are worth millions of dollars. The streaming platforms such as the Twitch or Yale Gaming also help to blur the line between gaming and mainstream entertainment as it allows fans to view live competitions and communicate with their favorite players.

There are many advantages to online gaming, but the downside to online gaming also exists. Examples that may affect the mental health and online gaming experience of players include cheating, toxic behavior and cyberbullying. Also, a number of jurisdictions have implemented laws, including restrictions on the time spent by the minors on the video games, in reaction to the fears of video-gaming addiction. Cybersecurity threats such as hacking and data breaches are also not new and will always be a challenge to the players and developers.

Although there are these fears, online video gaming is fast becoming a trend and form of entertainment. Besides being a recreational and competitive way of life, it is a bonding social factor in the world. As technology advances, online gaming will tend to be more creative, all-inclusive, and immersive, thus becoming the future of interactive entertainment.

2. REVIEW OF LITERATURE

2.1 Growth of Online Video Gaming Among Adolescents

The online gaming phenomenon has grown exponentially over the last twenty years particularly the young population. Anderson and Dill (2000) argue that the high interaction capability, instant feedback systems and competitiveness are some of the reasons why adolescents are highly involved in gaming. The rising levels of internet connectivity with devices especially smartphones have made gaming more easily accessible than ever. Mobile games, often presented as a free-to-play model with optional in-app purchases, have become the new form of consumption among teenagers as it offers immediate satisfaction and can be taken anywhere.

Kuss and Griffiths (2012) emphasize that online games have structural elements, including real-time feedback, social interaction patterns, and progress mechanisms, are critical in making the online game increasingly engaging and, in some cases, problematic.

2.2 Psychological Impact of Online Gaming

The psychological implications of internet video gaming form a major issue in modern studies on adolescents. Gameplay is used by many teenagers as a source of emotional regulation and they can use it to mitigate stress or boredom or avoid negative affect. The Cognitive-Behavioural Model of Internet Addiction developed by Davis (2001) assumes that those individuals who harbour latent emotional or cognitive susceptibilities have a very high probability of developing compulsive gaming habits.

In the current study, a significant range of adolescents confirmed that interaction with computer games caused a reduction in emotional distress, such as the instances of anger, sadness, or frustration. However, this dependency often gave birth to irritability, restlessness, or aggression in case of curtailing gaming access. Some of the participants stated that they felt the need to play every day, thus highlighting the compulsive and addictive nature of the digital gaming.

2.3 Academic and Lifestyle Consequences

The literature is steadfast that too much playing of video games has a negative impact on academic performance. Gentile et al. (2011) established that the students who devoted more time to gaming tended to have deteriorating grades, poor homework commitments and inconsistent sleep patterns. In line with this, the current study found that participants had reported sacrificing the time spent on studying and sleeping to engage in online gaming activities. In addition, the participants also reported such symptoms as headaches, eye strain, disturbed circadian rhythms, which have also been reported by Rehbein and Mossle (2013) with regards to the compulsive internet use.

The implication of lifestyle changes is also quite high, with a significant percentage of teenagers being prone to focusing on online communication over exercising or face-to-face socialization. An interesting percentage of the

sample reported that they would prefer to stay in the house and play video games rather than maintain social relationships and family time.

2.4 Social Aspects of Online Gaming

Social structures in online games are becoming increasingly more interactive, thereby allowing the interaction of more than one player, which subsequently promotes collaboration, competition, and communication between players. Yee (2006) describes virtual gaming environments as means of meeting social needs through the ability to form virtual friendships with other users, as well as to feel a sense of belonging. In the current research, the percentage of the participants who indicated that gaming with friends made them feel more connected and enjoyed the game more significantly increased. However, it is also possible that such a social gaming phenomenon can trigger an excessive dependency on peer approval and use identity formation as a result of seeking virtual success. There are some instances when excessive participation in online communities leads to social isolation in the real world. Teenagers can give privileged focus to online communication at the cost of the offline relationships that, in turn, can undermine the skills of interpersonal communication, as well as reduce emotional closeness with peers and family.

3. METHODOLOGY

The research design that was used in this study was a quantitative descriptive research design to explore the behavioral patterns, psychological, and lifestyle effects of using online video games among teenagers. The research aimed at obtaining empirical evidence connected to the frequency of gaming, the use of the platform, the goals of the gameplay, and the possible effects of playing on the physical, academic, and emotional health of participants.

The research focus was on a population of teenagers who are attending schools, most of them between 13 and 18 years of age, and few who exceeded 18, who were recruited in different academic institutions. The convenience sampling used to select 110 adolescents was conducted in urban, semi-urban and rural regions. A heterogeneous group of students at the government, aided, matriculation, and CBSE schools were sampled; the research was carried out in the whole Chengalpattu District in Tamil Nadu. The respondents were provided with the questionnaire in paper format and 130 individuals were used in accessing the data. The number of responses that were invalid was 20 and only 110 individuals were analysed, the data that had been gathered were inputted into and analysed using SPSS software.

4. ANALYSIS & DATA INTERPRETATION

The sample characteristics of the quantitative analysis of 110 samples included in the study are presented below.

4.1. Descriptive Analysis

Table 4.1.1

	N	Mini - mum Statistic	Maxi - mum Statistic	Mean Statistic	Std. Deviation
Age	110	2	5	3.36	0.751
Gender	110	1	2	1.33	0.471
Income	110	1	4	2.98	1.125
Educational level	110	2	4	3.27	0.589
Residency	110	1	3	1.80	0.538
Total	110				

Table 4.1.1 Descriptive statistics from 110 adolescents show a mean age category of 3.36 (SD = 0.75), indicating most were aged 15–16. The majority were male (M = 1.33, SD = 0.47). Most participants came from middle to upper-income families (M = 2.98, SD = 1.13) and were studying in higher secondary levels (M = 3.27, SD = 0.59). Residency data (M = 1.80, SD = 0.54) suggest a slight majority lived in semi-urban areas. These demographics help contextualize gaming behaviors in relation to age, gender, income, education and location.

4.2. Frequency Analysis

Table 4.2.1 Showing the Age of the respondents

		Frequency	Percent (In %)	Valid Percent (In %)	Cumulative Percent (In %)
Age of the Respondents	**13 – 14**	08	7.3	7.3	7.3
	15 - 16	64	58.2	58.3	65.5

	17 – 18	28	25.5	25.5	90.9
	Above 18	10	9.1	9.1	100.0
	Total	110	100.0	100.0	

Figure 4.1

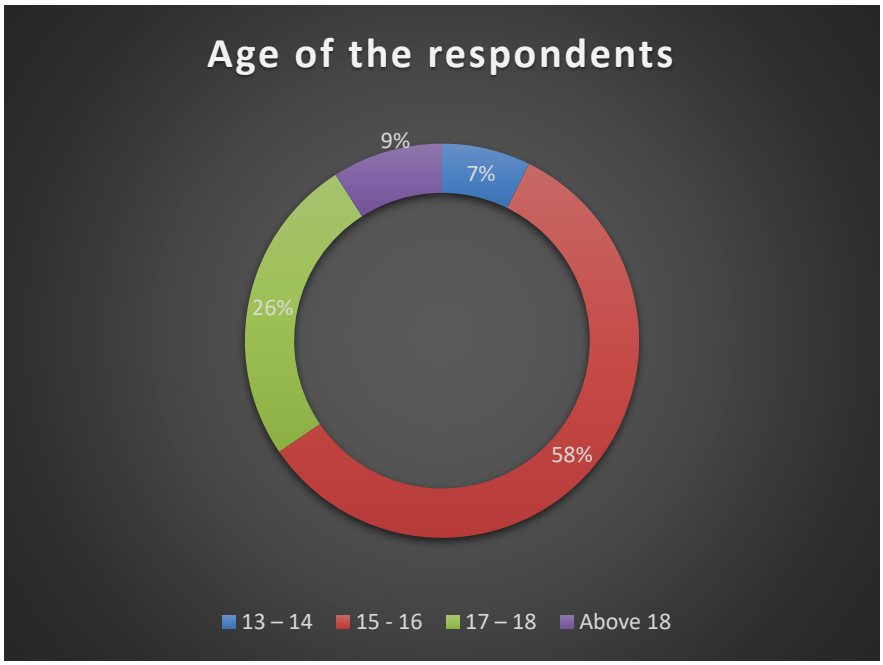

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Table 4.2.1 and Fig. 4.1 frequency analysis showed that the majority of adolescent respondents were aged 15–16 years (58.2%), followed by 17–18 years (25.5%) and above 18 years (9.1%). A smaller group fell in the 13–14 years category (7.3%). This distribution indicates that most participants were in mid to late adolescence, with a cumulative 90.9% aged between 15 and 18, suggesting this is the primary age group engaged in online gaming behavior in the study.

Table 4.2.2 Showing the Gender of the respondents

		Frequency	**Percent (In %)**	**Valid Percent (In %)**	**Cumulative Percent (In %)**
Gender of the Respondents	**Male**	74	67.3	67.3	67.3
	Female	36	32.7	32.7	100.0
	Total	110	100.0	100.0	

Table 4.2.2 Frequency analysis revealed that 67.3% of the respondents were male, while 32.7% were female. This indicates that a larger proportion of the adolescent participants in the study were male, reflecting a gender disparity in the sample, which may influence patterns of online gaming behavior observed in the research.

Table 4.2.3 Showing the Educational Level of the respondents

		Frequency	**Percent (In %)**	**Valid Percent (In %)**	**Cumulative Percent (In %)**
Educational level of the Respondents	**8^{th} – 9^{th}**	8	7.3	7.3	7.3
	10^{th} – 11^{th}	64	58.2	58.2	65.5
	12^{th} and above	38	34.5	34.5	100.0
	Total	110	100.0	100.0	

Figure 4.2

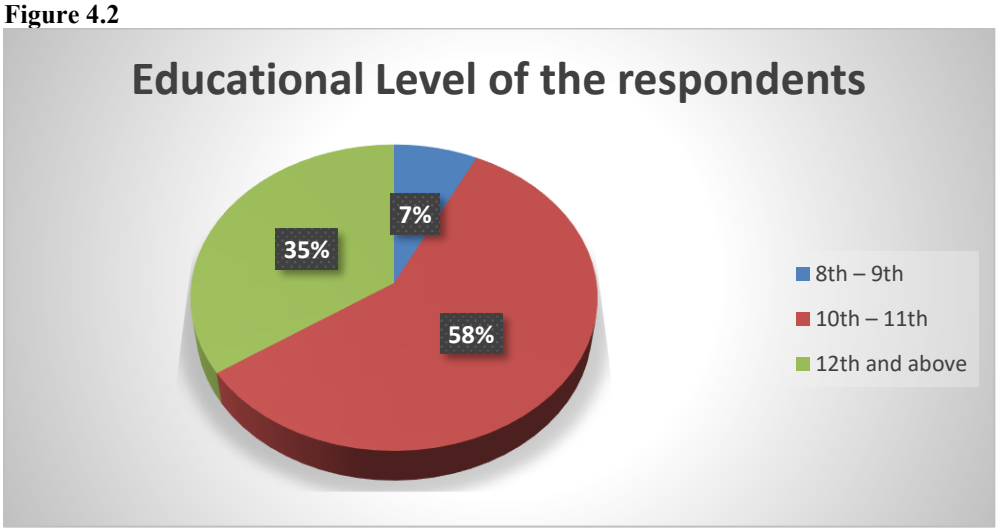


Table 4.2.3. and Fig. 4.2 shows that the frequency analysis revealed that the majority of respondents were in 10th–11th grade (58.2%), followed by those in 12th grade and above (34.5%) and a smaller group in 8th–9th grade (7.3%). This indicates that most participants were in higher secondary education, with a cumulative 92.7% studying in 10th grade or above, reflecting the views of older adolescents actively engaged in online gaming.

Table 4.2.4 Platform using for online gaming

		Frequency	Percent (In %)	Valid Percent (In %)	Cumulative Percent (In %)
Platform using for online gaming	**PC**	15	13.6	13.6	13.6
	Play Station	2	1.8	1.8	15.5
	Xbox	0	0.0	0.0	15.5
	Mobile Phone	93	84.5	84.5	100.0
	Total	110	100.0	100.0	

Figure 4.3

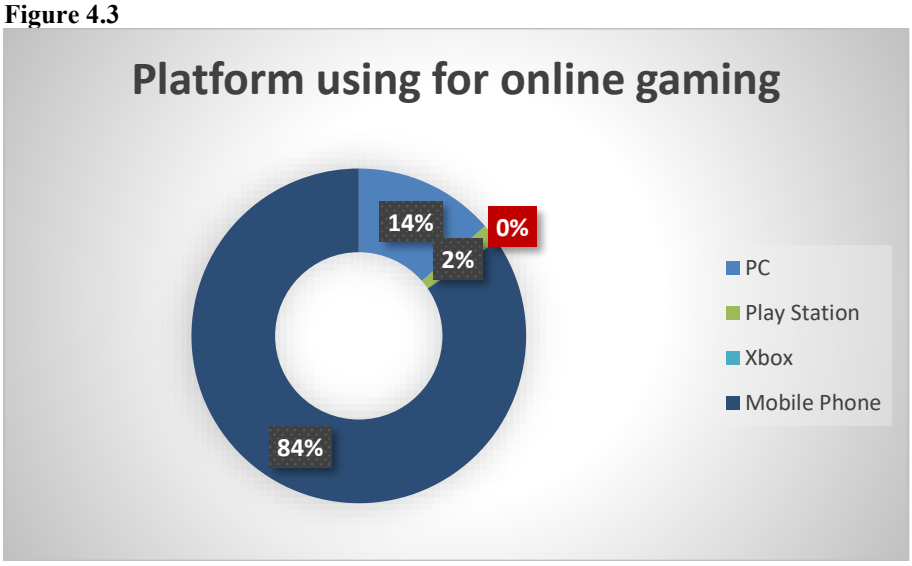


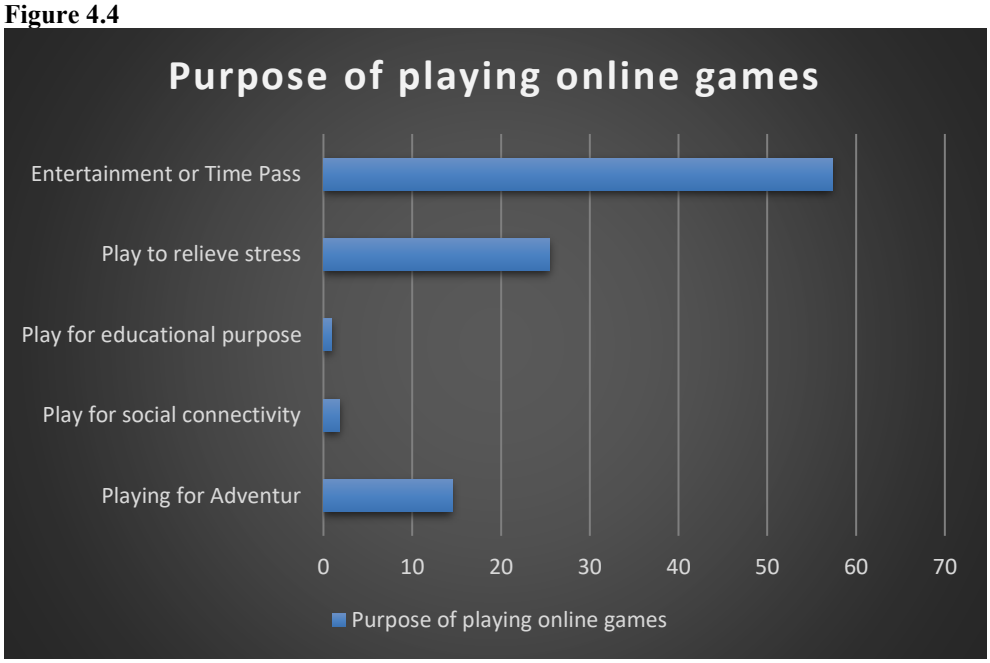
Table 4.2.4. and Fig. 4.3 shows that a survey Frequency analysis indicated that the majority of adolescents used mobile phones for online gaming (84.5%), while smaller proportions used PCs (13.6%) and PlayStation (1.8%). No respondents reported using an Xbox. This suggests that mobile gaming is the most accessible and preferred platform among adolescents in the study, reflecting the widespread use of smartphones for digital entertainment.

Table 4.2.5 Purpose of playing online games

Purpose of playing online		Frequency	Percent (In %)	Valid Percent (In %)	Cumulative Percent (In %)

games	**Playing for Adventur**	16	14.5	14.5	14.5
	Play for social connectivity	2	1.8	1.8	16.4
	Play for educational purpose	1	.9	.9	17.3
	Play to relieve stress	28	25.5	25.5	42.7
	Entertainment or Time Pass	63	57.3	57.3	100.0
	Total	110	100.0	100.0	

Figure 4.4



From the Table 4.2.5 and Fig. 4.4 shows that a Frequency analysis revealed that the majority of adolescents played online games for entertainment or time pass (57.3%), followed by playing to relieve stress (25.5%) and for adventure (14.5%). Very few reported playing for social connectivity (1.8%) or educational purposes (0.9%). This suggests that most adolescents engage in online gaming primarily for leisure and stress relief rather than for social or academic reasons.

4.3 Cross-tabulation:
Table 4.3.1

As seen from Table 4.3.1, Cross-tabulation analysis between age and annual family income revealed distinct patterns. Among adolescents aged 15–16, the majority (57.8%) came from families earning more than ₹3 lakhs

		Annual family income of the respondent					
		Less than 1 Lakhs	**1 - 2 Lakhs**	**2 - 3 Lakhs**	**More than 3 Lakhs**	**Total**	**Percent (In %)**
Age of the respondents	**13 – 14**	0	2	2	4	8	7.3
	15 - 16	0	8	19	37	64	58.2
	17 – 18	17	4	3	4	28	25.5
	Above 18	1	2	2	5	10	9.1
	Total	18	16	26	50	110	100.0
		16.4%	14.5%	23.6%	45.5%		

annually. In contrast, most respondents aged 17–18 were from lower income groups, with 60.7% earning less than ₹1 lakh. Younger adolescents (13–14) were more evenly distributed, though half reported incomes above ₹3 lakhs. Respondents aged above 18 showed a balanced distribution across income brackets. Overall, 45.5% of participants came from the highest income group, suggesting that family income tends to increase with the middle-adolescent group in this study.

Table 4.3.2

		Time spends per week					
Age of the respondents		**1 – 5 Hours**	**6 – 20 Hours**	**21 – 40 Hours**	**More than 40 hours**	**Total**	**Percent (In %)**
	17 - 21	3	2	2	1	8	7.3
	22- 26	18	20	18	8	54	49.1
	27 - 31	5	18	4	1	28	25.5
	More than 31	4	5	1	0	10	9.1
	Total	30	45	25	10	110	100.0
		27.3%	40.9	22.7	9.1		

Table 4.3.2, shows that the adolescents aged 22–26 accounted for the highest gaming duration overall, with 40 out of 54 (74.1%) spending more than 6 hours weekly and 8 respondents in this group spending over 40 hours. Among those aged 27–31, 18 individuals (64.3%) reported spending 6–20 hours per week. The 17–21 age group showed the least gaming activity, with only 1 respondent playing more than 40 hours. Those aged above 31 played more moderately, with no one exceeding 40 hours. Overall, 40.9% of all participants gamed 6–20 hours weekly, indicating moderate playtime was most common across age groups.

4.4. Factor analysis

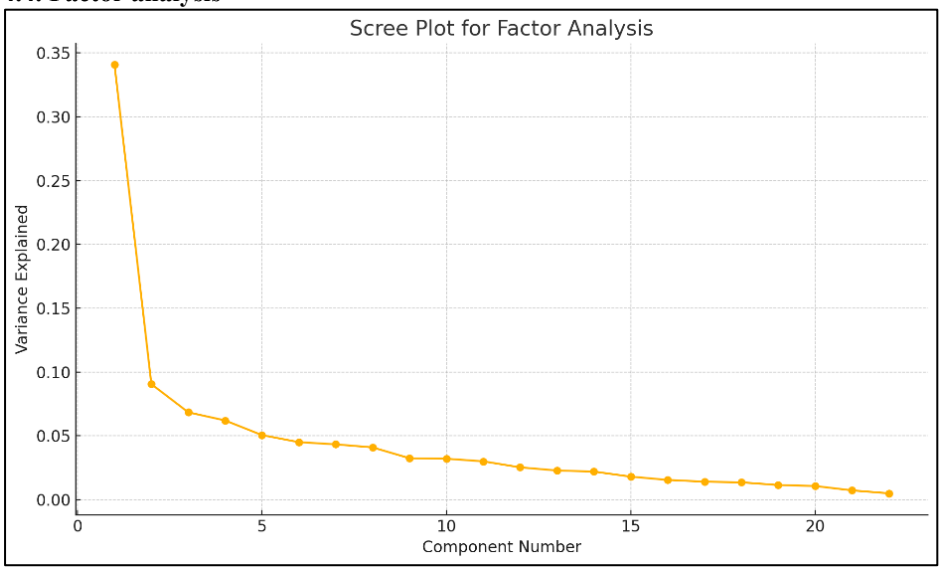


Fig 4.5 The scree plot from the factor analysis reveals a clear "elbow" after the second component, indicating that a two-factor solution effectively captures the core structure of the data. These two factors correspond to the psychological effects (e.g., stress relief, emotional dependence, aggression) and social connection (e.g., gaming with friends, social isolation, peer interaction) aspects of adolescent gaming behavior. The first factor explains the largest portion of variance, reflecting the dominance of emotional and behavioral patterns tied to psychological impacts. The second factor captures socially influenced gaming habits, supporting the study's focus on how gaming affects interpersonal relationships.

4.5. Result of Correlation and Regression:

4.5.1. Spearman Correlation Analysis

A Spearman correlation matrix was generated to examine monotonic relationships between variables. The results showed:

- Strong correlations among physical/lifestyle items such as sleep loss (PLS2) and academic impact (PLS6).
- Moderate correlations between psychological items like emotional relief through gaming (PE1) and playing when angry (PE3).
- Social complaints (SC4) were positively associated with social gaming habits (SC1) and lifestyle disruptions (PLS2).

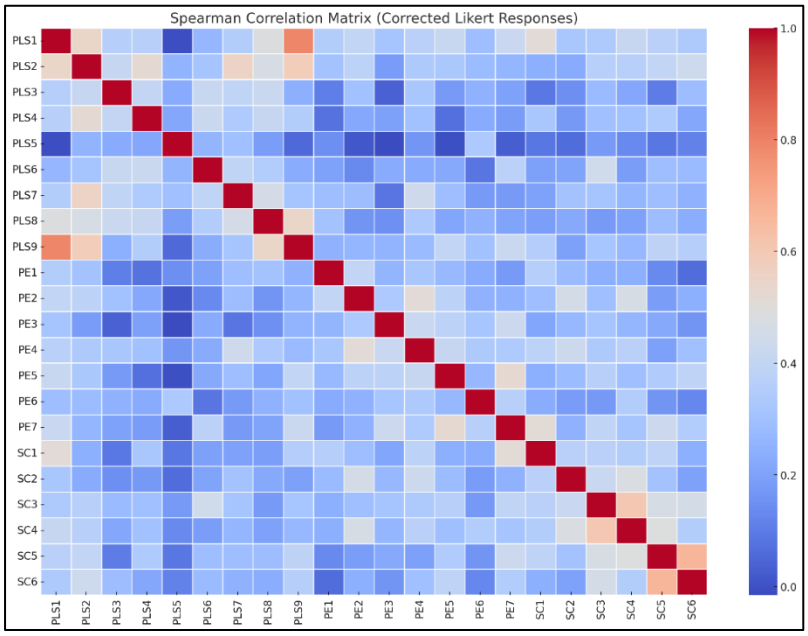


Fig 4.6 These results indicate that behavioural patterns are intertwined across lifestyle, emotional and social dimensions, supporting the multi-dimensional impact of online gaming.

4.5.2. Regression Analysis

1. Psychological Impact (PE3):

The model found social gaming closeness (SC1) to be a significant predictor ($p = 0.035$) of emotional gaming habits. Gaming for emotional relief (PE1) was marginally significant ($p = 0.056$). R^2 was 0.152, indicating a modest ability to explain variations in psychological impact.

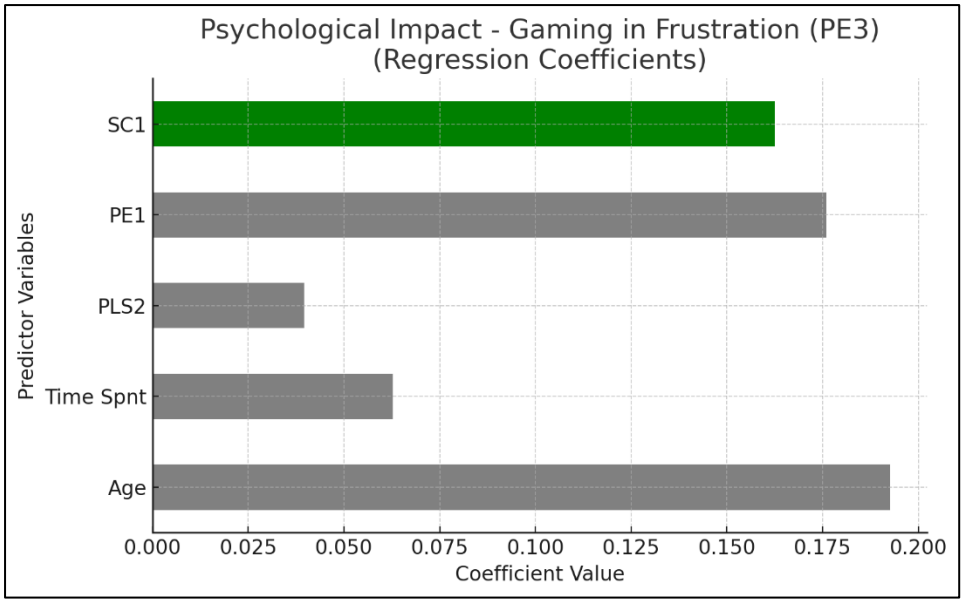


Fig 4.7 The second chart illustrates how SC1 (feeling close to friends in group gaming) and PE1 (gaming to relieve stress) influence the tendency to game during emotional distress. SC1 is a statistically significant predictor (green bar), while PE1 is marginally significant.

Interpretation:

The psychological model shows that adolescents who use gaming for social bonding or emotional relief are more likely to resort to gaming when feeling frustrated or angry. This highlights a coping mechanism where online gaming becomes an emotional escape. The model accounts for approximately 15.2% of the variation in emotional gaming behaviour.

2. Social Impact (SC4):

The strongest model ($R^2 = 0.257$) showed significant predictors including age ($p = 0.016$), PLS2 ($p = 0.001$) and SC1 ($p = 0.005$). This model demonstrated that older adolescents who experienced sleep disruption and preferred group gaming were more likely to receive complaints from family or friends.

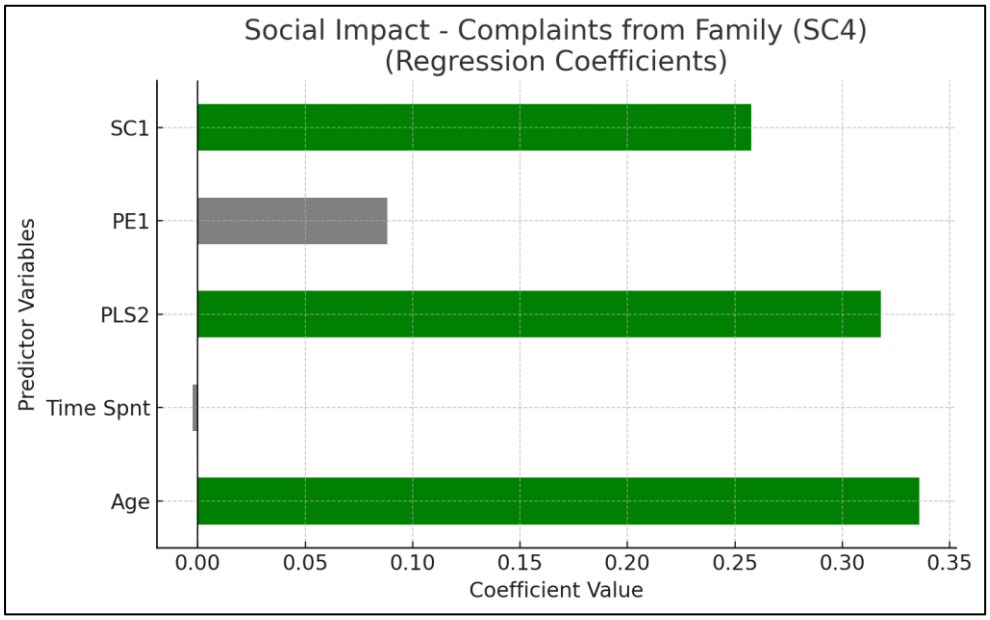


Fig 4.8 The third chart is the most insightful, with three green bars: Age, PLS2 (sleep issues) and SC1 (social gaming habits). These variables significantly predict complaints from others regarding excessive gaming.
Interpretation:
Older students who reported lifestyle disturbances and preferred group gaming were more likely to receive negative feedback from their family or social circle. This suggests that problematic gaming behaviour not only affects the individual's lifestyle but is also noticed and commented upon by others. This model has the highest explanatory power, explaining 25.7% of the variation in social complaints.
The pictorial depiction of the regression analysis (provided earlier) clearly highlights significant predictors using color-coded bars, reinforcing the quantitative findings.

5. FINDINGS & CONCLUSION

The present study provides an in-depth analysis of behavioural, psychological, and lifestyle effects of online video gaming in the youth group. The results indicate that most teenagers play online games majorly to relax and to relieve their stress, and mobile phones are the most widely used platforms. Although this kind of engagement provides a way of entertaining, having some rest and socializing, the analysis will simultaneously reveal the major negative outcomes of excessive use, including sleep patterns disruption, decreased academic achievements, emotional addiction, bodily discomfort, as well as the behavioural problems like irritability and aggression. The statistics also reveal that teenagers are habitually giving preference to the virtual communication, compared to the real-life duties and connections and triggering a drop in their overall health. These findings thus highlight the two-sided nature of online gaming as both an avenue of digital interaction and a possible behavioural threat when used improperly.
Following these results, a number of recommendations and future research directions are outlined. Teenagers need to be advised to develop a healthy gaming behaviour of limiting the amount of time on screens and engaging in other recreational activities like sporting activities, reading, and creative activities. Schools can play a central role in this by incorporating digital wellness education in their curriculums in order to promote responsible media usage. Education on the warning signs of excessive gaming and the associated effects among the youth, parents, and educators should be created through campaigns conducted in the community. In addition, the psychological counselling and supportive services are to be made available to students with evidence of gaming stress or addiction. Future studies ought to include longitudinal studies that seek to query the long-term impact of online gaming on mental and emotional development of adolescents. The generalizability of findings will be improved by expanding the demographic area to include the participants who represent heterogeneous areas and socio-economic statuses. Qualitative research, as a method, such as interviews and case studies, may provide more knowledge about the individual gaming experience. Other studies are also required to determine the effects of particular game genres, interaction between gaming and mental disorders, and integration of social media. The studies on the topic of digital literacy, self-regulation skills, and evidence-based educational and policy interventions will be invaluable to the discussion of the growing prevalence of online video game addiction in adolescents.

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