

**EMOTIONAL, BEHAVIOURAL DIFFICULTIES AND
PERSONALITY TRAITS OF YOUTH WITH PROBLEMATIC
ONLINE GAMING**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY**

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SCHOOL OF MEDICAL AND PARAMEDICAL SCIENCES
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**EMOTIONAL, BEHAVIOURAL DIFFICULTIES AND PERSONALITY
TRAITS OF YOUTH WITH PROBLEMATIC ONLINE GAMING**

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**In partial fulfillment of the requirement of the Degree of Doctor of Philosophy
in Clinical Psychology of Mizoram University, Aizawl**



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CERTIFICATE

This is to certify that the present research work titled, **“Emotional, Behavioural Difficulties and Personality Traits of youth with Problematic Online Gaming”** is the original research work carried out by **Ms. Abhipsa Satapathy** under my supervision. The work done is being submitted for the Award of the degree of Doctor of Philosophy in Clinical Psychology of Mizoram University.

This is to further certify that the research conducted by Ms. Abhipsa Satapathy has not been submitted in support of an application to this or any other University or an Institute of Learning.

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DECLARATION
MIZORAM UNIVERSITY
OCTOBER, 2025

I **Abhipsa Satapathy**, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to do the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any other University/Institute.

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(Abhipsa Satapathy)

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LIST OF ABBREVIATIONS

AAA- American Automobile Association

ACS- Action Shooter

ADHD- attention deficit hyperactivity disorder

APA – American Psychological Association

BFI- Big Five Factor Inventory

BRS- Brain and Skill

CI- Confidence Interval

COVID- Coronavirus Disease

CPU- Central Processing Unit

CSE – Core Self-Evaluation

DLPFC- Dorsolateral Prefrontal Cortex

DLPFC- dorsolateral prefrontal cortex

DSM-5- Diagnostic and Statistical Manual of Mental Disorders, 5th Edition

E-Games- Electronic Games

ESRB- Entertainment Software Rating Board

FIFA- Fédération International de Football Association

FPS- First Person Shooter

GA- Game Addiction

GADIA-A- Gaming Disorder Scale for Adolescents

GAS- Gaming Addiction Scale

GDT- Gaming Disorder Test

GHQ- General Health Questionnaire

GPU- Graphic Processing Unit

IAT- Internet Addiction Test

ICD- International Classification of Diseases

ICSD- International Classification of Sleep Disorders

IGD- Internet Gaming Disorder

IGDS- Internet Gaming Disorder Scale

I-PACE- the interaction of Person-Affect-Cognition-Execution

ISI- Insomnia Severity Index

MGC- Maladaptive Gaming Cognition

MMORPG- Multiplayer online Role-playing Games

MUD- Multi-user dungeon

PC- Personal Computer

PEGI- Pan-European Game Information

PS4- PlayStation

PSS- Perceived Stress Scale

RAM- Random Access Memory

RGB- Red, Green, Blue

RGU- Recreational Game Use Groups

RPG- Roleplay Games

RTS- Real Time Strategy

SDQ- Strength and Difficulty Questionnaire

SPSS 26- Statistical Package for Social Sciences

U & G- Uses and Gratification

UNICEF- United Nations International Children's Emergency Fund

WHO- World Health Organization

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CHAPTER I

INTRODUCTION

Overview

Technology is becoming one of the defining factors in the human psychological and social process in recent years, as the world becomes increasingly interconnected globally. Contemporary children are growing up in an environment where the internet and digital media are omnipresent, having never experienced a world devoid of such technologies. The concept of “being connected” now carries a vastly different meaning compared to that of earlier generations. The use has become irrefutable in our daily lives. Due to the evolving concepts of globalization and Westernization, India has witnessed drastic changes among its citizens in various spheres of life, including education, marketing, medical and health-related facilities, maps-related information, and industries, among others. The past decade has seen a tremendous surge in internet usage not only in India but also across the globe. In urban India, active internet users soared from about 5 million in 2000 to approximately 42 million in 2008. By 2011, India had emerged as the third-largest digital population globally, with approximately 120 million individuals accessing the internet (Baniya et al., 2016).

In the booming technology era, it isn't easy to imagine life without the internet. With the easy accessibility of smartphones and the minimal expenses for an internet data pack, it provides multifarious possibilities for everyday life requirements. Being from the comfort of a home enables frequent internet access in ways that school/college libraries and office-based internet access do not provide. Recently, many studies have suggested that content creation and social networking are getting plenty of attention from youth and older generations. Individuals continue to participate in a broad range of online activities, spanning informational pursuits, interpersonal communication, and various forms of creative expression. For a lot of people, computer gaming offers both enjoyment and mental stimulation (Paulus et al., 2018; Sharma et al., 2022).

The World Health Organization (WHO) identifies adolescents and young adults aged 10-19 as a significant global demographic, and they are among the most

frequent users of digital technologies, having been raised in an environment rich with online resources (Undavalli et al., 2020; Paulus et al., 2018). Empirical studies shed light on the relationship between social withdrawal and increased internet use. The Japanese phenomenon of “Hikikomori,” which involves individuals withdrawing from society and staying in their homes for at least six months, can lead to increased dependence on the internet. According to a study by Solanki et al. (2023), people with the severe syndrome of social withdrawal often avoid social activities like school, work, or interaction. Instead, they rely heavily on the internet to connect with others, which provides them a sense of connection while allowing them to avoid face-to-face interaction.

Internet gaming is currently a booming market worldwide. As social and internet connectivity continue to deepen globally, the integration and adoption of technology stand out as a pivotal force shaping this transformation. In the 20th century, online games became the most popular and one of the modes of enjoyment among adolescents as normal physical activities were replaced by technologies (Jayalakshmi et al., 2017). Online social networking has caused subsequent changes over the last decade, the way people connect and engage with each other. Based on different studies, numerous psychological frameworks have contributed to diverse conceptualizations of addiction, resulting in a multiplicity of definitions across empirical literature. During the 2000s, the rise of online gaming led to increased scholarly attention on gaming addiction, with research highlighting its harmful effects, prevalence rates, and contributing risk factors. In 2022, over one billion individuals engaged in computer gaming, reflecting an 8% expansion in the industry during that year (Kuss, 2013). Understanding the structural characteristics, context, and psychological correlates, gaming addiction can help comprehensively understand. According to the referenced studies, various individual-level factors are crucial in differentiating general gaming behavior from pathological gaming. Moreover, the contextual features of a game may hold distinct significance for gamers, shaped by their personal circumstances and gaming inclinations.

Online gaming has become a global phenomenon, from massively multiplayer online games to role-playing and combat genre-based games. The platform has a major benefit, allowing gamers to connect with a worldwide community. Online gaming activities enable playing games to turn into a social activity that encourages making friends to maintaining rivalry beyond geographical boundaries. Many people still prefer playing offline games for different reasons, like no tension of an unstable internet connection and extra money for the data pack. Offline games are different, where people play games without the internet, which offers a different immersive experience to enjoy themselves. Online games tend to be more fast-paced, whereas offline games are more relaxed and give a solitary experience; moreover, there is no real-time experience. Online games have gradually become a normal thing. However, many individuals worry about the negative impacts of video gaming; currently, there is limited evidence to validate these concerns or to inform policymakers on implementing gaming time regulations (Qu, 2023).

Although gaming disorder has been officially acknowledged as a public health concern, most gamers who are involved in online gaming behaviour do not show signs of a medical diagnosis. Estimating its exact prevalence. Previous studies have reported widely varying prevalence rates from 0.7% to 27.5% highlighting methodological inconsistencies and heterogeneities in sample characteristics (Mihira & Higuchi, 2017). A global survey suggests a more conservative estimate that gaming disorder might affect 3% and 1% of individuals from the general population (Przybylski et al., 2016). Notably, the “internet” in Internet Gaming Disorder (IGD) appears to reference the medium of gameplay- namely, digital or technical devices- without necessitating exclusive online engagement. This implies that the core diagnostic features apply equally to both online and offline gaming contexts. Such a conceptualization is far from trivial; rather, it reinforces the notion that gaming addiction is not contingent on the virtual nature of the activity but can emerge in both digital and non-digital settings.

Structural Characteristics of Online Gaming

Online games remain popular due to their constant upgrades and expansions that provide a dynamic gaming experience to the gamers. Unlike traditional video games, where people play games individually on a computer, online games are currently played against other gamers. Excessive online gaming behavior can be shaped by various influences, including the game design characteristics, and the research into structural characteristics of online games is in its infancy. Online games involve tons of gamers globally, and the lack of appropriate research tools to find out the features of games that promote excessive gameplay is concerning. It is important to understand the dynamic nature of online video games to identify “problematic” online gaming among gamers.

Lesser-known factors about the underlying mechanisms of online games although the diagnostic features of Game Disorder are already being established, currently, it is drawing the attention of researchers. Structural features of games refer to inherent elements responsible for the initiation of play behavior in the first place and contribute to ongoing development and persistence of online gaming behaviour. Some researchers have begun to examine the rewarding element of involvement in online gaming-related activities. Although different types of genres exist, like massive multiplayer games, role-playing, strategy, combat games, etc., those are not typically considered a structural aspect of a game per se, as structural characteristics comprise components and elements within the internet games. Massively Multiplayer Online Role-Playing Games (MMORPGs) such as World of Warcraft, EverQuest, etc. usually allow gamers to choose from a variety of professions, races, and genders, provided virtually really for gamers to explore. Gamers consider gameplay to be about gaining skills, completing quests, and defeating enemies, which is more motivation for gamers to continue playing the games.

Online games incorporate diverse reinforcement strategies depending on individual preferences. Success in playing games depends on multiple factors, and the reinforcement might be intrinsic (beating another player, scoring highest, or maybe a name on the ‘Hall of Fame’ or extrinsic (appreciation from friends) (Wood

et al., 2004). In terms of structure, different taxonomies have been proposed by researchers. Studies have suggested 12 structural features related to background setting, graphics, duration of play, price of the game, control options, sound, game dynamics, advanced level upgrade, winning and losing features, social features, character development, narrative features, and multiplayer features that are thought to influence playing behavior uniquely (Montag et al., 2021). Certain game features may exert psychological influences that foster problematic engagement with online gaming. Many researchers agree on the point that excessive levels of gaming activity have negative social and personal consequences if maintained over time (Qu, 2023). It is widely understood that different types of online games present different potential addictive features based on their structural characteristics (Montag et al., 2021). Based on operant conditioning theory, various authors have suggested that structural mechanisms of online games using the principles of variable ratio and fixed-interval schedules may be intentionally embedded to foster the ‘compulsive use’ of gaming (King et al., 2010).

Based on many studies, the user input features of online video games are attracting users towards indulging in playing video games, and the hands-on feel of the experience adds more fun to it. Playing games using a handheld device and dedicated gaming consoles, as the complete setup includes some assorted buttons, triggers, joysticks, motion control, etc., is more fascinating than playing using a keyboard and mouse. Similarly, Arcade machine games have some additional features for gamers to experience differently. A study suggested that to be ‘pro’ in video games, the player needs to have good eye-hand coordination and the use of “hot keys” (King et al., 2010). Study in cognitive psychology suggests that gamers develop an internal representation of game elements over time, which helps them to differentiate in terms of the different functional qualities of these elements. The video games are designed in such a way that if the gamer loses their game, they get plenty of chances to revive the game by acquiring more “lives” and “turns,” which makes it more challenging to attempt. In online video games, to minimize the cognitive regret that they feel after losing, they get another chance to replay the losing scenario, which features saving their progress in the game (King et al., 2010).

Gaming Genres

Various research has explored a range of contributing factors to the development of Internet Gaming Disorder. However, the key factor for influencing gaming behavior, the specific attraction and benefits of different genres that motivate gamers to indulge in gaming, has been overlooked. Gaming genres are developed in such a way as to attract the gamers to fulfill their psychological needs by playing certain games; therefore, some games by design feel compelling than others (Gurp, 2017). The game genres played and the symptoms of IGD may differ based on various age groups. In addition, standard reward systems that are fundamental to each category of games played by gamers impact the gamers depending on their age group. Previous studies have suggested that school students spend time playing video games, which is influenced by their preferred genres (Rathakrishnan et al., 2023). The time spent on gaming is dependent on the genre of the online games one is playing. Online games differ based on different genres; some commonly played genres are shown below in the diagram.

Figure 1

Diagram representing the various online game genres



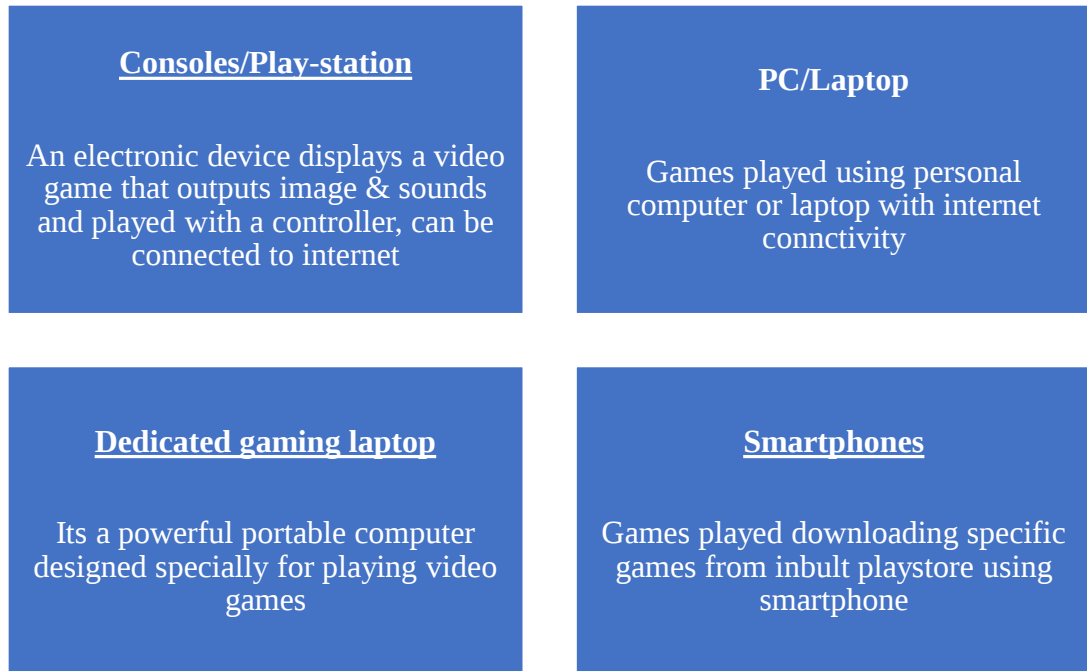
Action games require the player to perform based on motor-skill performance, including seamless coordination and reaction time, aiming to conquer an obstacle. The genre includes some varieties of sub-genres like fighters, platforms, shooters, and combat games. Some examples of action games are Tomb Raider, The Phantom Pain, Rise of the Tomb Raider, Samurai Showdown, etc. Research has suggested that combat games, where gamers primarily use firearms to engage enemies (Park et al., 2016), and competitive shooter games offer a unique social experience, consistently required in combat-based scenarios (Griffith & Sharpe, 2024). Likewise, role-playing games require the gamers to play in an avatar role or to become some fictional character to play along with the game narrative. The focus is to develop some characters that gamers have designed for themselves. For example, Dungeons & Dragons, Fallout, Final Fantasy, etc. Simulation games are designed to involve situations or objects that closely resemble the real world for gamers to have a real-time experience. For example, some simulation games are Jurassic Park, SimCity, Operation Genesis, etc. Strategy games require internal decisions for gamers to strategize by manipulating a situation or object to achieve the goal. It typically requires high situational awareness, StarCraft, Age of Empires, and Warcraft. Adventure games are based on fantasy worlds and stories involve narrative-based media or an interactive story in a virtual world for gamers to reach their goal.

Platforms for Playing Games

Online games can be played using various platforms due to their effect and innovations. These are popular platforms for playing online games, depending on the type of games someone is interested in, as shown in the diagram below.

Figure 2

Diagram representing different platforms for playing games



PC platforms like Steam and Epic Games Store are great for gamers who enjoy exploring different type of genres and cutting-edge graphics. One of the largest digital distribution platforms for PC games, Steam offers a massive library ranging from indie games to AAA titles. It is also a social platform where gamers can create profiles, join groups, chat, and trade items. Games like Battle.net, FIFA, The Sims, and Apex Legends can be played using a PC or a Laptop.

PlayStation consoles work as an integrated online platform, which offers online multiplayer capabilities, downloading, and media streaming features. Moreover, it gives access to services like PlayStation Plus, which offers free monthly games and discounts. PS4, PS5, and Xbox Live are some of the consoles people use. Mobile platforms offer thousands of mobile games across genres, and games can be downloaded using the Google Play Store/App Store. Some key features, like free-to-play and premium games, in-app purchases, microtransactions, and multiplayer

support games, are available. Consoles offer more curated experiences with exclusive titles, while mobile platforms focus on quick, accessible gaming and high-quality games on almost any device.

A dedicated Gaming laptop is a high-performance laptop specifically designed for gaming. Unlike standard laptops, gaming laptops are built with powerful components, advanced cooling systems, and gaming-centric features to handle the intensive demands of modern games, particularly in terms of graphics, processing power, and overall performance. Some key features of a dedicated Gaming Laptop are a powerful GPU, high-performance CPU, ample RAM, High Refresh Rate Display, storage, an advanced cooling system, customizable RGB lighting, enhanced audio, port selection, battery life, etc.

With the technological advancements, it became easier for young people to get their hands on smartphones. The popularity of internet-based games played on smartphones is rising day by day. Existing literature identifies problematic mobile video gaming as a phenomenon where users strongly rely on mobile games and tend to play games without control (Wang et al., 2019).

Defining Problematic Online Gaming

Electronic games are becoming the most demanding applications to run on computer hardware. Research suggests that problematic online gaming is multifaceted rather than a unitary phenomenon. Prolonged use of the internet, regardless of its form, can negatively affect mental health and has long been a concern as a problematic behavior of human interactions with information and communication technologies. With the increasing use of digital technologies, undoubtedly, we are becoming dependent on the virtual environment, sometimes it's even more than the real one. It has become a sad reality that individuals are becoming more active in social media rather than in social gatherings. These days, many of us keep our gadgets so close that they are a part of our daily routines, whether we are eating, sleeping, or relaxing, anticipating digital stimuli. It seems

very rewarding how online connection starts feeling more rewarding than real-life friendships.

Electronic games (E-games) are taking over the world currently, as they are more interactive and fun to play. As the predominant category of electronic games, video games provide physical feedback in response to user interaction through a graphical interface. People play video games using various platforms like personal computers, arcade machines, home consoles connected to televisions, dedicated gaming devices, and mobile phones. Additionally, electronic games encompass formats such as pinball machines, standalone gaming systems, and portable handheld consoles. The prevalence rate for online game addiction, based on different studies, shows 8.7% of Singaporean youth, 1.7% in Germany, and 9.9% among Spanish adolescents worldwide (Navaneetham & Chandran, 2018).

The notion of “internet addiction” remains under debate and has yet to be formally classified as a clinical disorder. Ongoing discussions highlight its evolving nature, with research indicating that compulsive and excessive internet use may lead to behavioral addiction. This phenomenon can manifest across various online activities, including shopping, gambling, social networking, and playing video games. The coexistence of excessive internet use and its psychological effects on individuals is well established. Young adults in India are associated with the excessive or addictive use of the Internet and are more psychologically distressed (Sharma et al., 2020). The classification of excessive online and video gaming as either a disorder or an addiction remained contentious, but that changed when the World Health Organization officially listed gaming disorder as a diagnosable mental health issue in its ICD-11 guidelines (Singh, 2019). The WHO’s diagnostic framework for gaming disorder differentiates between primarily online gaming and offline gaming behaviors, recognizing that the mode of engagement may influence the nature and severity of the disorder. Researchers have used different ways to describe behavior related to online gaming as “compulsive gaming,” “internet dependency,” “pathological gaming,” “problematic gaming,” etc.

Numerous scholars have proposed that video game addiction aligns with the classification of Internet Gaming Disorder (IGD), given its capacity to induce neurobiological changes akin to those observed in substance use and gambling addictions (Mohammad et al., 2023). Prior research indicates that persistent and habitual engagement in internet-based gaming occurs across diverse domains of daily functioning. Advances in technology and the ease of accessing gaming across various devices have contributed to the rising prevalence of IGD, elevating it to a significant public health issue. Past studies revealed that the world's first reported death due to gaming occurred in 2004. A South Korean boy suddenly died while gaming because he had minimal rest over four consecutive days (Saunders et al., 2017).

As a part of the proposed framework for IGD, the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) recommended nine specific criteria as follows:

- 1) *Preoccupation with gaming-related activities*- refers to a state in which gaming dominates an individual's thoughts, emotions, and daily behaviors. The person frequently reflects on past gaming experiences or persistently anticipates future gameplay, indicating a significant intrusion of gaming into everyday cognitive and emotional functioning.
- 2) *Increased tolerance to gaming*- it is a challenging concept for gamers. Due to strong feelings or desires, or cravings, they increase the time of gaming for them to feel satisfied.
- 3) *Withdrawal*: Withdrawal is considered an important feature of behavioral addiction. When gamers do not engage in playing, they constantly feel left out; to avoid the unpleasant symptoms related to withdrawal, they feel the need to play regularly.
- 4) *Persistent inability to cut down or quit gaming despite repeated efforts*
- 5) *Diminished engagement in previously enjoyed activities or hobbies, often replaced by excessive focus on gaming* – Due to withdrawal, they confined themselves to a room to finish the game or continue to play.
- 6) *Continued gaming despite its negative consequences*- as gamers advance through a game, they often develop a strong desire to excel. This drive to reach higher levels

and outperform others leads to increasingly frequent and prolonged gameplay, as staying competitive becomes a central focus.

- 7) *Hiding or deception about their gaming activities-* The amount of time a gamer spends on gaming activities slowly affects their daily activities. To avoid conflict at home, they try to hide it from others, making up reasons for not socializing or doing any other work.
- 8) *Gaming is used to escape or regulate negative emotional states-* parents or family members setting some limits to playing online games have reported negative moods, anger outbursts, lots of resentment, or children can be brutal in responding at times (Mohammad et al., 2023). Gamers play online games as an escape mechanism, where they stay away from real-life issues.
- 9) *Jeopardize or lose important relationships, career options, and jobs to be active in games-*

According to various research, adolescents and youth populations belonging to the 10-19 years of age group are the most active adopters of online gaming worldwide (Undavalli et al., 2020; Sharma et al., 2022). According to the DSM-5, Internet Gaming Disorder is characterized by recurrent and persistent gaming behavior that may result in negative outcomes or clinically significant impairment, provided that five or more of the nine diagnostic criteria are met within 12 months (Undavalli et al., 2020).

Likewise, the urge and compulsion to play digital games have been classified in ICD-11, suggesting the diagnostic criteria are slightly different from DSM-5. As outlined in the ICD-11, Gaming Disorder is diagnosed when all criteria are met, including: (a) a marked loss of control in gaming behaviour, (b) prioritizing gaming over essential daily functioning, and (c) continued engagement irrespective of negative consequences. The behavior patterns must be severe to cause substantial disruption in an individual's personal, social engagement, occupational functioning, or other day-to-day chores (Darvesh et al., 2020). Research indicates that the prevalence of Internet Gaming Disorder (IGD) among adolescents varies

significantly across regions, with estimates ranging from approximately 1.25 to 10% in Western countries and between 7.5% to 15% in Asian countries (Luo et al., 2022).

Theoretical framework

Several research studies have explored IGD, yet many lack a well-defined theoretical model. However, certain theories and models remain significant in providing a clearer understanding of the clinical factors contributing to IGD. Various theoretical perspectives from the domains of motivational dynamics, communication process, and media-related studies were employed to support the present research's objectives and construct its underlying conceptual framework.

Risk Behavior Theory

Adolescence is commonly recognized as a period of significant change and increased susceptibility. It is during this time that crucial developmental milestones are reached, accompanied by major neurological restructuring within the brain. During this phase, critical developmental processes occur alongside an essential reorganization of the brain. A commonly observed phenomenon during adolescence is the emergence of risk-taking behaviors; such risks are not merely individual choices but are shaped by the complex interplay between personal characteristics and environmental influences. These appear to be closely linked to this developmental phase and may increase susceptibility to various psychological conditions (Kaess et al., 2021; Jessor, 1992). Risk behavior theory posits that such behaviors emerge from dynamic interactions between individual characteristics and environmental contexts. These actions are typically viewed as detrimental to health, often undermining physical, psychological, or social well-being.

The theory proposes that risk behaviors rarely occur in isolation; rather, they are often positively correlated and manifest collectively as lifestyle patterns. These interconnected behaviors can pose significant threats to adolescents' overall well-being and daily functioning. The theory suggested that adolescent risk behavior emerges from the interaction of three explanatory systems: the behavior systems,

personality system, and perceived environment system (Jiang et al., 2017). These behaviors are often health-compromising and reflect deeper psychological dynamics that underscore the need to understand adolescence as a period of both opportunity and risk. Past literature reported an association of IGD with various other substance use. Engaging in non-disordered gaming can satisfy adolescents' need for reward and stimulation, potentially serving as a protective factor against involvement in health-risk behaviors like substance use (Sucha et al., 2024).

Uses and Gratification Theory (U & G)

User and Gratifications Theory, formulated by Elihu Katz and Jay G. Blumler in 1974, provides a fundamental framework for why individuals actively choose social media platforms to meet their gratification. In this study, the Uses and Gratification theory is used to explain problematic internet gaming in the context of school-going students. This motivational theory is centered on the premise that individuals possess distinct needs, such as the desire for entertainment, which they actively seek to satisfy through engagement with various media platforms. Recent research studies validate the uses and gratifications approach as one of the most relevant communication theories for explaining media usage within virtual environments. In this study, the theory can be applied to explain problematic online gaming by examining the motivations behind why individuals engage in excessive gaming and how this behavior may lead to unhealthy or compulsive use. Problematic online gaming often refers to excessive gaming that disrupts a person's daily life, relationships, work, or education, sometimes resulting in negative psychological, social, or physical outcomes.

Based on various research findings, it was suggested that problematic gaming has been linked to gamers' ongoing need for gratification, stemming from a psychological craving for the sense of pleasure that closely resembles the immersive experience of virtual reality (Yung et al., 2023). The engaging nature of online gaming, coupled with rewarding elements like the excitement of victory and social recognition, motivates individuals to invest increased time and effort in gameplay. As the desire for achievement is fulfilled in the virtual world, gamers may prioritize

these experiences over other aspects of psychological well-being, such as rest, sleep, social activities, etc. The current study emphasizes a significant association with insomnia. According to Pilcher et al. (2015), chronic sleep deprivation is strongly associated with an individual's level of self-control. The user gratification approaches a robust framework for examining individuals' motivations for engaging in video game play. It highlights various underlying drivers such as the pursuit of arousal, the desire for challenge and competition, the appeal of fantasy environments, and the need for social interaction (Chory & Goodboy, 2011).

Studies have suggested that gamers frequently feel free while playing video games, leading to stress relief and increased happiness. Furthermore, the encouragement and recognition they receive from other gamers for their impressive achievements contribute to their sense of fulfillment, particularly when they struggle to attain similar accomplishments in their daily lives. Previous studies reported that gamers view social aspects of a game to collaborate, negotiate, and build relationships. Their experience is crucial in shaping their ongoing motivation to engage with social networking games, as these experiences help satisfy their needs and interests (Sampat & Krishnamoorthy, 2016). These rewarding experiences may lead individuals to become more dependent on them, potentially resulting in the development of IGD.

Flow and Immersion Model of IGD

Introduced by Mihaly Csikszentmihalyi in the 1970s, the flow theory explains the psychological state of optimal engagement that occurs through immersion and focused attention on a task. This state is achieved when the difficulty of the task aligns with a person's ability, resulting in intense enjoyment and a sense of fulfillment. Immersion theory in gaming has been shaped by various researchers and scholars in fields like psychology, media studies, and game design, and it is heavily influenced by flow theory. However, no single individual is solely credited with its development. The Flow and Immersion model is particularly useful in understanding problematic online gaming, as it explains how gamers can become deeply engrossed in the gaming experience to the point where it leads to excessive and unhealthy

behaviors. Flow and immersion describe psychological states where individuals lose track of time and reality due to their deep engagement in an activity, such as online gaming. Immersion is closely related to flow but more specifically refers to being “mentally present” in an environment, such as the virtual world of video games.

Highly immersive games often have rich narratives, captivating visuals, and complex mechanics that pull the player into the game’s reality. Different levels of immersion are engagement, engrossment, and total immersion. While flow and immersion are positively experienced in many contexts, they can also lead to problematic gaming behaviors when gamers seek to remain in these states for prolonged periods, often at the cost of real-world responsibilities and well-being. Online games, particularly multiplayer games, MMORPGs, and battle royale games, are designed in ways that make flow and immersion easily achievable, thus contributing to the development of problematic gaming. Flow plays an important role as a driver of excessive gaming (Ajith et al., 2024). Game genres, game types, and game levels influence flow (Nah et al., 2014). The study suggests that the internet is indeed an environment that facilitates flow, particularly through activities such as retrieving information, emailing, online gaming, and online discourse.

Cognitive and behavioral model of IGD

The Cognitive and Behavioral model for online gaming addiction was given by Mark D. Griffiths in the 1990s and early 2000s. He uses these principles to understand the psychological mechanisms behind problematic internet and gaming behavior. The cognitive-behavioral model often explains addiction-related behaviors by focusing on the role of maladaptive thinking patterns and behaviors. In IGD, cognitive distortions such as the belief that gaming is the only source of achievement, preoccupation with gaming, escape from real-world problems, or that gaming is the primary source of social support can reinforce excessive gaming behavior. Cognitive dissonance theory can partly explain the relationship between video gaming cognitions and problematic behavior. When individuals invest significant time, money, or other resources into gaming and their habits begin to

interfere with daily life, they may experience regret and a sense of personal accountability for the negative consequences of their gaming activities.

Cognitions such as “I feel safe online” and “nobody loves me offline” were found to be analogous to Beck’s cognitive theory of depression. These thoughts suggest that individuals turn to the internet in search of validating social engagement and feedback from others due to their low self-esteem and negative self-perception. The central component of addiction involves reward-seeking behavior. Reward-centric models have emphasized the pleasurable aspects of drug use, proposing that substances can “hijack” the brain’s reward circuits (Dong & Potenza, 2014). Negative reinforcement models propose that relief from aversive states, such as stress, can drive individuals to engage in addictive behaviors.

Interaction of Person-Affect-Cognition-Execution (I-PACE) Model

The I-PACE model was given by Matthias Brand and his colleagues in 2016. The model is utilized because it seeks to describe the key mechanisms that contribute to the onset and persistence of problematic gaming behavior. It also serves as a theoretical framework for addressing addictive behaviors and informing clinical practice. This model explains IGD by considering individuals’ predispositions (e.g., personality traits, emotional regulation), affective responses (e.g., stress), cognitive biases (e.g., gaming-related thoughts), and executive functions (e.g., decision-making). The I-PACE model suggests that the individual’s personality characteristics and perceptual style shape their emotional and mental reactions to situations, strengthening their decision to participate in internet-based activities.

Theories suggest that perceived psychological stress, life situations, and individual interpretations lead to emotional and cognitive reactions, which might affect whether people choose to use the Internet to cope. In response, some argue that internet use is one of the primary methods for dealing with stressful life events. The theory suggests that engaging in internet gaming results from emotional and cognitive responses to the internet and external stimuli (Munyeti, 2022). In 2014, Brand introduced the I-PACE model, suggesting that addiction arises from individual

susceptibility (genetic and personality traits), psychological factors like negative emotions, and the interplay of cognitive and emotional aspects (Brand et al., 2016).

Online Gaming in India

In the modern era, the importance of technology is evident, and the use of online gaming behavior significantly influences the lifestyle of this generation. Game developers design their products to attract and engage audiences who may not have previously been involved in gaming. These games evoke a wide range of emotional experiences, ranging from enjoyment and thrill to irritation, excitement, and even disinterest. Modern electronic games demand sustained attention from gamers to achieve full immersion, shifting the experience from passive engagement to active, focused participation. Today's online games are particularly popular among children and adolescents due to their immediate reward mechanisms that encourage progression to higher levels, as well as their increasingly realistic graphics, immersive sound design, and dynamic visual effects. The nature of gaming has undergone a profound shift over the past 5000 years, from rudimentary forms involving pebbles, sand, and simple physical tools to today's sophisticated internet-enabled digital environments powered by connectivity and virtual platforms. The gaming environments reflect a marked progression, now featuring diverse storylines, intricate reward mechanisms, and distinctive gameplay attributes. Additionally, online platforms have transformed games into social spaces, enabling interaction among gamers. The advent of the internet has added a compelling layer of engagement, often reinforcing sustained player involvement.

There are several different methods available for connecting to the internet. The diffusion and engagement with advanced digital platforms, including online gaming, are linked to the broader internet infrastructure, usage environment within a given country due to the status of the internet ecosystem in India. The internet gaming market is likely to grow in India. India is ranked 5th globally in a market survey among other countries for downloading games (Bhaskar et al., 2021). Gaming activities have become widely popular among various age groups as a recreational activity. Games and sports are considered a diversion from routine work. Gaming has

an ancient history that is still a significant part of Indian culture. With time, the scenario changes. There has been a modern shift from board and outdoor games towards virtual reality. Different studies suggested that the concept of 'Online Gaming Disorder' refers to persistent and recurrent involvement in online games that leads to a decline in daily activities and affects educational activity for adolescents (Bhaskar et al., 2021). Playing video games is a medium for today's youth to make sense of and feel at home in the virtual world when parents are busy making their career choices.

The usage of the Internet in India is increasing day by day, though there is a dearth of knowledge regarding the prevalence of IGD in the country. In the 21st century, major and drastic life changes took place when COVID-19 hit India. The state-imposed lockdowns confined people to their homes, and a major shift from traditional pedagogy to online pedagogy occurred. The usage of computers, laptops, and mobile phones with internet technology has become an essential part of growth and development worldwide. Students were expected to follow their classes online; traditional schools shifted to advanced high-tech classrooms to avoid physical contact. Due to restricted movement, changes in socializing patterns added frustration, stress, boredom, and anxiety among young adults (Savarimuthu et al., 2023). Online gaming remained largely unaffected during the pandemic, with numerous studies indicating a substantial rise in user engagement. Lockdown measures and limited recreational options led to increased participation, especially among young adults (Tiwari et al., 2023). WinZo Games, an Indian-based gaming platform, reported a 30% rise in mobile gaming traffic during the pandemic period (Amin et al., 2020). Likewise, the Indian mobile gaming platform Paytm First Games experienced a 200% increase in its user base during the pandemic, with approximately 75,000 new users joining the platform each day (Amin et al., 2020).

The gaming industry in India is thriving today, and it is considered one of the booming technology markets. But it was a tough row to hoe. The prevalence of problematic gaming among medical students in Kerala was found to be 6.98%, indicating a notable concern (Bhaskar et al., 2021). The industry has faced issues

related to a lack of support, high taxes, and a lack of awareness in the past years; however, the gaming industry is currently being accepted and recognized. According to previous studies, the Indian mindset was a hurdle to accepting the gaming industry as a career option, where people who became doctors, engineers, scientists, and professors were praised by society. The gaming companies have upped their game in the market in the past couple of years. In 2021, the Ministry for Electronics and Information Technology amended new online gaming rules to the existing Information Technology and Digital Media Rules to expand online gaming innovation while safeguarding citizens from illegal betting and ‘wagering online’ across the country (Singh & Balhara, 2023). It intends to minimize the negative impact related to online gaming and, more importantly, the financial loss and psychological harm.

The new rule related to online gaming in India is more inclined towards maintaining uniformity in terms of regulation across the country. Unlike the previous one, some state governments have banned some online games, considering their possible role in causing problematic online gaming, gambling, and suicide among young adults (Singh & Balhara, 2023). The coexistence of psychological difficulties with the problematic use of online games has been well-established in Indian settings. According to previous studies, 6.8% of gamers belonging to the age group of 16-18 years reported that psychiatric symptoms related to stress, anxiety, and depression were involved in problematic online gaming in India (Sharma et al., 2020). A study conducted by Hellstrom et al. (2015) suggested that young males are more into playing excessive games and reported experiencing negative consequences due to their gaming habits.

Emotional, Behavioral problems, and online gaming

Emotion plays an important role in human life, which may affect how we perceive and react to a situation or event. Individuals make sense of the world out of reality through their subjective emotional world. Previous studies have suggested a significant association of emotional and behavioral problems with problematic gaming (Thakur et al., 2023). Excessive engagement in video games may reflect a

disproportionate allocation of time and attention, yet it does not inherently constitute problematic behavior. It is only when this engagement becomes maladaptive, marked by a persistent inability to regulate gaming habits despite negative social or emotional consequences, that it aligns with the criteria for pathological gaming (Patel et al., 2020). Gaming can help develop cognitive skills like problem-solving, reasoning, etc., as suggested by previous studies, and excessive gameplay may create difficulty in sleep cycles, concentration issues, and poor self-control among adolescents (Amin et al., 2020).

A higher level of correlation has been seen between Internet Gaming Disorder and emotional problems in adolescents in Singapore and Germany (Ahmed et al., 2022; Wong et al., 2020). Research has indicated that people who struggle to control their emotions are more likely to engage in addictive behaviors to avoid or reduce negative feelings (Farmer & Lloyd, 2024; Ansari et al., 2022). Gamers who use unhealthy coping strategies, like playing for long periods and ignoring social responsibilities, may rely on the positive effects of video games, such as fulfilling psychological needs, regulating mood, or escaping and managing the stress they experience in real life (Ajith et al., 2024). Studies have suggested that pathological gaming, when it's difficult to control, may lead to social and emotional problems (Patel et al., 2020).

Virtual reality can provide a different experience for current and future game gamers. It allows people to get 'lost' in the world of gaming. Sometimes, people find online games so engaging that they lose touch with their surroundings. Winning a game creates a sense of mastery and achievement, and it is rewarding for the gamers, as suggested by different research. However, it has a significant impact on human behavior because it creates dependency or addiction. Past studies have suggested that the good game experience called 'immersion' plays a major role in making gamers maintain gaming activity (Jennet et al., 2008). Immersion is described as a lack of awareness of time and environment. There is limited research conducted in this field. Playing excessive games can be seen as a compulsive habit, making it problematic. Research suggests that online gamers show complete control over gaming activity,

which requires emotional involvement and dissociation from the real world (Jennet et al., 2008).

Studies have suggested that individual with alexithymia manage their emotions through compulsive or impulsive acts, which is related to addiction (Ahmed et al., 2022). A study conducted by Zamani et al. (2009) suggested that students who prefer video games over other types of enjoyment are more prone to develop behavioral problems compared to others. Problematic use of video games may lead to behavior addiction, conduct problems, ADHD, and dependency among users (Rooij et al., 2014; Milani et al., 2017; Singh et al., 2020). Studies have indicated that adolescents exhibit a proclivity toward certain aspects of the Internet, which potentially leads to an increase in behavioral addiction. Adolescents these days are interested in creating virtual identities through various platforms such as chat rooms and online role-playing games, as suggested by various researchers (Fatima et al., 2023). Very little research has been conducted on the psychological problems associated with problematic online gaming; thus, the current study will play an essential role in adding to the literature.

Today's generation depends on the internet, and online gaming is considered a leisure activity for different age groups. Video games are played for several reasons: they can relieve stress, provide a challenge, competition, gambling, relaxation, social interaction, and escape from the real world. With the increased involvement of e-games among adolescents, it would be interesting to find out the characteristics and strategies involved in online video games that make them invest in spending time in in-game related activities. Adolescents with technology addiction are reported to have oppositional symptoms, impulsivity, psychiatric problems, sleep disorders, etc. (Amudhan et al., 2021; Singh et al., 2024). Like those addicted to drugs or alcohol, gamers become preoccupied with gaming-related activities, avoid going out or being involved in other types of activities, and withdraw from family and friends. Internet Gaming Disorder (IGD) has been considered an emerging concern among individuals that is worthy of future research.

Personality Traits and Problematic Online Gaming

Understanding typology and personality traits would give an idea about how individuals differ in cognition, emotion, motivation, and behavior. Since individual differences are nearly boundless, given the understanding of personality, it is a combination of characteristics and qualities distinctive from an individual's character. Temperamental characteristics and personality traits are considered important variables to understand in developing and maintaining gaming-related activities (Ajith et al., 2024). Trait theory suggests that an individual's personality differences strengthen based on certain basic traits they have. The trait approach is considered a major theoretical base for studying human personality. Traits consist of major personality characteristics that must be consistent, sustaining, and different from person to person. Therefore, it is considered that personality traits are important components in human life. Various researchers have suggested that personality traits and gaming genres play a key role in developing problematic online gaming (Seong et al., 2019; Akbari et al., 2021).

A connection has been identified between personality traits, preferred gaming genres, and the amount of time spent playing online games. According to Bartle's studies, it has been suggested that different personalities are associated with games that motivate them to play and provide reasons and satisfaction for doing so (Cruz et al., 2023). The insight has led to the creation of various frameworks that categorize gamers and link specific game types to distinct player profiles. Research indicates that Bartle was among the first to propose a player classification system, based on his analysis of user behaviors and attitudes within Multi-User Dungeon (MUD) environments. Following Bartle's foundation work, subsequent game researchers proposed new classification systems grounded in play patterns, neurobiological archetypes, emotional responses to games, and gamers' intrinsic motivational drives. Various types of research suggest gamers may differ in their motivation to play certain types of games; individual experiences of reinforcement from a game are different due to their personality variables (Hellstrom et al., 2015). There is very little research investigating personality traits; moreover, it is not very clear who play video games for what reason. Research by Chory and Goodboy (2011) suggested that

individuals who are more extroverted and open to experiences might be drawn to violent games. This could be their desire for stimulating and novel experiences, as well as their social nature.

Investigating the five factors of personality traits of online gamers and non-gamers has attracted many researchers' attention lately. Online gaming has shown a rise among the Indian population, suggesting approximately 6.92 hours spent playing online games (Ajith et al., 2024). There have been ideas floating around that gaming genres have greater potential for maintaining an addiction factor than others. However, very few research studies have been conducted about the gaming genres and the personality factors responsible for them. Different aspects like social, educational, personal, and seeking the experience of the flow of playing have major roles contributing to a disorder that needs further examination. Studies have suggested that gaming has been associated with emotional regulation, degree of isolation, and conflict related to family dynamics. Personality was found to have a greater association with gaming behavior; therefore, it has been found out competitive individual prefers games given opportunities to compete (Ajith et al., 2024). Studies have suggested that high neuroticism and low agreeableness are associated with online gaming disorder (Braun et al., 2016; Herrero et al., 2022). There has been evidence suggesting that low extraversion plays a role in addiction more than others. Moreover, anonymity and reduced face-to-face interaction for individuals with introverted traits are associated more with online-related activities (Braun et al., 2016).

Insomnia, Perceived Stress, and Online Gaming

Sleep occupies approximately one-third of a human's lifespan and plays a critical role in sustaining both physiological and psychological health. Prior empirical research indicates that disruption in sleep patterns can adversely affect daily performance and overall mental well-being. Sleep quality can be assessed by different factors, like how an individual can fall asleep, sleeping hours, maintaining sleep, and waking up fresh. Insomnia is one of the most common sleep problems people faces today. According to the International Classification of Sleep Disorders

(ICSD-3), it is characterized by challenges in initiating sleep, maintaining its duration, and experiencing excessive daytime fatigue, all of which significantly disrupt daily functioning (Karthikeyan et al., 2021; Lam, 2014). Studies have suggested that gaming addiction or increased time spent on online gaming has a considerable impact on the sleep-wake cycle, which may lead to insomnia and other sleep-related problems (Zaman et al., 2022; Solanki et al., 2023). Insomnia affects between 10% and 30% of the global population, with prevalence rates differing across regions (Karthikeyan et al., 2021).

Prior studies have shown that rigorous gaming involvement and time spent on gaming activities affect sleep (Bansal & Kranti, 2022). Research indicates that individuals engaged in online gaming often develop a strong attachment to the games they play and dedicate substantial time to gaming-related activities. According to the National Sleep Foundation, students are advised to obtain 7-9 hours of sleep per night; however, studies have shown that college students frequently fall short of this recommendation due to multiple contributing factors (Kharisma et al., 2020). The studies conducted in this area have suggested that family dynamics and socio-economic background play an important role in developing problematic gaming among school students. Disturbance in lifestyle, specifically sleeping habits and eating patterns, decreased socialization/interaction, and other offline activities might be factors for individuals spending time in online gaming or related activities (Archana et al., 2019; Ahmed et al., 2022).

The problematic use of online gaming highly depends on the frequency and duration of playing games. Studies have suggested that among adolescents, IGD has positively correlated with anxiety, stress, and sleep quality as sleep latency (Fazeli et al., 2020; Saquib et al., 2017). As advancements in the internet gaming field increased over the past few years, the level of sleep-related problems has risen (Kristensen et al., 2021). Furthermore, research has suggested that addiction-related sleep problems have contributed to psychological and neurological problems in today's scenario (D'Souza & Meenakshi, 2018). Exposure to electromagnetic fields while playing online games via wireless gaming devices may alter the sleep

architecture or circadian rhythm and inhibit the secretion of melatonin (Kristensen et al., 2021; Sosso et al., 2020). Considering the impact of light, visual stimulation affects the sleep mechanism, which results in disturbed sleep quality and may develop into psychological symptoms. Increased research is ongoing to establish a relationship with different factors associated with it. It may be possible for individuals playing online games to cope with sleeplessness, which might lead to increased screen time or vice versa (Ahmed et al., 2022; Kristensen et al., 2021).

Online game addiction represents a distinct form of behavioral dependency, separate from traditional gaming habits, and has generated significant scholarly interest due to its potential adverse effects on individuals' mental health. While the majority of individuals engage in gaming in a balanced and health-promoting manner, excessive gameplay has been linked to negative outcomes such as reduced academic performance, disrupted sleep patterns, diminished social interaction, decreased interest in other activities, heightened stress levels, and increased anxiety (Yarasani et al., 2018). Excessive online & offline gaming adversely affects sleep quality and other psychological distress (Fazeli et al., 2020; Romdhane et al., 2023). Based on various research, it has been suggested that video games stimulate the pleasure center of the brain and release dopamine, which helps to maintain wakefulness. The study will bring awareness to a better understanding of the gravity of problematic online gaming in today's digital world and the psychological problems related to it. Therefore, the current study holds substantial importance in examining the gaming behaviors of school-aged adolescents in the Delhi NCR region, along with their associated psychological factors such as stress.

Stress refers to the disruption of psychological and physiological balance, arising from an individual's perceived inability to manage the demand imposed by their environment at a given moment. Studies have suggested that perceived stress has a significant association with internet gaming disorder (Che et al., 2017). Individuals experiencing high levels of stress may engage in online gaming as a coping mechanism to alleviate current psychological strain or to manage underlying life stressors (Snodgrass et al., 2014). Studies suggested that environmental stressors

produce various psychological “strains” that motivate gamers to be involved in gaming as an escape mechanism, which may lead to problematic online gaming (Snodgrass et al., 2014; Yen et al., 2019). Perceived stress has been defined as a situation of human life appraised as stressful and which exceeds their ability to cope with the situation (Cohen et al., 1983). IGD is becoming a topic of discussion, and growing evidence suggests it has negative consequences on individual mental health (Canale et al., 2018; Rajab et al., 2020; Garg et al., 2023). According to different research, stress is a well-established factor for the onset and relapse of addiction (Snodgrass et al., 2014; Mustafa & Lokesh, 2022).

Research has indicated a bidirectional relationship between gaming and stress. Excessive engagement in gaming can adversely affect adolescents’ social and familial connections, diminish self-regulation, and hinder academic performance (Almigbal et al., 2022). Moreover, there has been evidence that excessive video gaming has an impact on the alteration of the brain’s emotional control system, and the changes happening to the areas of the brain may be connected to stress (Almigbal et al., 2022; Kumar et al., 2021). Due to the different stressful events in our surrounding environment, stress may appear as a nonspecific response related to bodily reactions. In other words, a ‘stressor’ is related to something that might make you feel tense and anxious in each situation. So, human perception and reaction to a stressful situation is more than just a stimulus or a response phenomenon. Various studies suggest that adolescents and young adults are particularly prone to encountering stressful experiences for the first time, often triggered by a range of contributing factors (Balhara et al., 2020). During the COVID-19 pandemic, the whole world went through a situation of uncertainty and stress, which made human beings confine themselves to a house arrest situation to avoid the spread of the disease. Due to this, students and adolescents have been found to develop problematic internet use or indulge more in online gaming-related behavior (Singh et al., 2020; Balhara et al., 2020; Mustafa & Lokesh, 2022). Stress has been defined in two ways. One is the human capacity to meet the demands of a situation and their perception or evaluation of the fulfillment of demands that were beyond their control.

Studies have suggested that some types of casual or violent games may relieve stress and improve mood (Mustafa & Lokesh, 2022).

According to Lazarus and Folkman (1984), perceived stress arises from a dynamic exchange between the individuals and their environment, in which the person evaluates the situation as overwhelming or exceeding their coping abilities, thus posing a threat to their overall well-being. Building on this framework, recent studies have identified casual video games as a potential tool for stress reduction. Their accessible design, intuitive interface, and widespread popularity- particularly among student populations- make them a promising medium for alleviating perceived stress (Desai et al., 2021). Neurobiologically, the brain functions as the central organ responsible for interpreting stress. It gives both behavioral and physiological responses, which can be either health-promoting or detrimental. Under conditions of acute or chronic stress, the brain undergoes structural and functional changes, influencing multiple bodily systems- including metabolic, cardiovascular, and immune pathways that collectively mediate the short- and long-term consequences of stress exposure (McEwen, 2006).

Understanding the multifaceted mechanisms underlying Internet Gaming Disorder (IGD) is crucial, particularly considering its increasing prevalence among adolescents. The literature has predominantly emphasized the adverse consequences of excessive gaming, such as impaired academic achievement, increased aggression, poor grades, and sleep problems. Recent research highlights potential benefits of video game play, including enhanced cognitive flexibility and reduced stress levels, as noted in the 2013 review titled “Video games Play May Provide Learning, Health, Social Benefits”. Still, a major concern is that online gaming can reduce face-to-face social interaction. Less time spent with others in person may affect how young people develop key social skills during an important stage of growing up. Empirical evidence suggests that greater involvement in internet gaming may elevate the risk of developing Internet Gaming Disorder (IGD), with higher engagement serving as a potential precursor to pathological use patterns (Sohrabi et al., 2024). Demographic trends further indicate that younger individuals and males are disproportionately

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affected by IGD (Almutairi et al., 2023). Consequences of gaming addiction have been linked to a range of psychosocial impairments, including sleep disturbances, reduced academic performance, and deterioration of interpersonal relationships. Such outcomes may increase adolescents' vulnerability to elevated stress levels- though the causal direction may be bidirectional, with stress itself also serving as a potential driver of excessive gaming (Rajab et al., 2020).

From the above-mentioned information, it can be interpreted that online gaming is becoming a growing concern in India, particularly among adolescents and young adults. Though some studies and reports acknowledge the rise, most are limited to anecdotal accounts, media articles, and isolated case reports. However, very few comprehensive studies exist, and those that do tend to focus narrowly on clinical diagnosis, such as "Gaming Addiction" or "Internet Gaming Addiction." These terms, while useful, may miss a broader range of harmful behaviors that do not meet diagnostic thresholds but still affect users' emotional health, behavior, and daily functioning. Smartphone distraction is increasingly recognized as a multifaceted phenomenon, encompassing a range of cognitive-emotional and behavioral components. These elements not only serve as precursors or predisposing factors that shape individuals' engagement with smartphone use, but also emerge as consequential outcomes of such usage patterns (Benedetto et al., 2024). This bidirectional influence highlights the dynamic interplay between psychological predispositions and technological behavior. The concept of problematic gaming provides a more inclusive framework to study these emerging patterns. It encompasses behaviors like excessive time spent in gaming, poor academic performance, increased irritability, and social withdrawal, even if they are not yet clinically diagnosable. Given India's socio-cultural context, including parental expectations, education pressures, and rapid digital adoption, it is crucial to understand how problematic gaming manifests locally.

Review of Literature

Previous research from the past 10 years was gathered from various databases and publications, utilizing study factors as keywords. Chapter one provides a comprehensive framework, whereas the literature reviews pertinent to the current study issue are examined in this chapter. The present chapter examines prior research in this domain at both national and international levels, highlighting the principal themes and deficiencies in the existing literature.

Problematic Online Gaming Prevalence and Online Gaming-Related Variables

Chow et al. (2025) employed a cross-lagged survey design to explore gender-specific patterns within the motivation-cognition-behavior framework, focusing on the interplay between academic-related stress, gaming flow, maladaptive gaming cognition (MGC), and symptoms of gaming disorder (GD) among 300 Chinese school students. The findings revealed notable gender differences, with MGC among female participants showing significant associations with academic stress, GD symptoms, and gaming flow.

Liao et al. (2023) investigated the demographic profiles, gaming behaviors, personality traits, and motivational factors of gamers across various game genres, aiming to identify attributes linked to genre-specific Internet Gaming Disorder (IGD). the study analyzed four game categories, including action shooter (ACS) and brain and skill (BRS) games, using anonymous survey data from 5593 Chinese gamers. Results indicated notable differences in demographic characteristics, gaming habits, and personality traits across genre-based groups. Moreover, the predictors of IGD showed slight variation among these groups, even after controlling for socio-demographic factors. Key contributors to IGD included prolonged daily gaming, high sensation-seeking tendencies, and escapist motivations.

In a recent investigation, Shrestha et al. (2023) employed a cross-sectional study among 446 students from the 8th, 9th, and 10th grades. The prevalence was reported at 18.9% among school-going adolescents, and male members were found to be involved in games. The associated factors found include playing games daily, spending money on buying games, and using personal devices.

A cross-sectional survey was conducted by Amudhan et al. (2020) in India among 1729 school-going adolescents. It was found that almost 99.59% of participants reported using technology in various forms. Out of these, 8.91% reported having a phone addiction, followed by 2.55% gaming addiction. Technology addiction has been found to correlate strongly with multiple risk factors spanning individual, familial, and school-related domains.

Ansari et al. (2022) shed light on to understand how common internet gaming is and how it impacts the adolescents who play online games versus those who do not. The sample included 119 non-gamers, 62 individuals engaged in violent games, and 58 participants involved in non-violent games. the study reported an IGD prevalence rate of 0.8%. Violent gaming was significantly linked to male participants, as well as increased frequency and duration of gameplay. Additionally, lower levels of psychological well-being were correlated with higher IGD severity.

Lee (2020) researched to comprehend the significance of game genres in ascertaining the success criteria of online games. The study identified perceived pleasure, convenience of use, and quality as possible determinants of success for online gaming services and created a research model to investigate their correlation with gamers' satisfaction and desire to continue use. The approach was used across three primary online gaming genres: role-playing games (RPG), real-time strategy (RTS), and first-person shooters (FPS). The results indicated that the impact of perceived quality differed across various game genres, highlighting the importance of genre-specific factors in determining the primary drivers of success for online gaming services.

A survey by Hirche et al. (2020) with 820 video gamers at the world's largest trade fair in 2018, to examine psychological factors linked to problematic gaming. The findings indicated that the individuals with problematic gaming behaviors scored significantly higher in neuroticism, depressive symptoms, and gaming duration. They also differed in traits like extraversion, conscientiousness, and openness compared to games without such issues. Gamers who favored genres such as MMORPGs and first-person shooter games (FPS) tended to spend more time gaming and exhibited

elevated levels of problematic use. Moreover, excessive gaming time, high-end neuroticism, and reduced conscientiousness emerged as strong predictors of problematic gaming behavior.

Salam et al. (2019) sought a study to examine the motives behind involvement in playing games using the IGDS-9 questionnaire among students aged 16-19 years. It has resulted that 59.6% of participants were males involved in games for social motives, female gamers were playing games as a coping mechanism, and 1.5% of students reported having IGD.

Archana et al. (2019) conducted a study among 60 adolescent online gamers aged between 16 and 18 years to assess elevated levels of depression, anxiety, and stress. The findings revealed the usage pattern ranging from 10 to 14 hours per day and a significant positive association between gaming duration among psychological variables.

Bicholkar et al. (2019) assessed how common problematic online gaming is among Indian medical students to evaluate how problematic online gaming intersects deeper aspects of psychological well-being. It was found that the prevalence was 8% for problematic online gaming. A significant association was found with the gender, frequency, and duration of gaming sessions.

A study conducted by Navaneetham & Chandran (2018) in Bengaluru among 200 school students belonging to classes 8th and 9th grades aim to explore the prevalence and mental health problems among pathological gamers. It has been shown that 20% of students play video games, 18% of them play under control, and 17.5% meet criteria for gaming addiction. Moreover, 19% of students reported gaming for over 3 hours a day.

Yarasani et al. (2018) cross-sectionally studied 575 medical undergraduates to understand the prevalence of online video game addiction. On average, the students played for 3 hours, and addicted gamers' playtime was 7 hours. 73.9% of students used mobile phones, and 12.2 % played games using a computer. The study found that males and females had different gaming habits and associated difficulties.

Dong et al. (2018) explore gender specific neural and behavioral responses to cue-induced cravings and deprivation in the context of IGD. the study involved 99 participants categorized into IGD and Recreational Gaming Use (RGU) groups, employing functional MRI and subjective assessments. Results revealed significant gender by group interactions in the left dorsolateral prefrontal cortex (DLPFC) across pre-gaming and post-gaming phases, with reduced DLPFC activation observed in IGD individuals, particularly females, during post-pre comparisons. Additionally, females with IGD exhibited heightened caudate activation at the post-gaming phase compared to their RGU counterparts. These findings suggest that females with RGU may possess stronger executive control and greater resistance to IGD than males. However, once IGD develops, it may compromise their executive functioning and intensify craving responses, making recovery more challenging.

Na et al. (2017) investigated the characteristics of players from different game genres and their association with IGD. The study classified internet games into four distinct genres: real-time strategy, MMORPGs, sports simulations, and first-person shooters (FPS). 2923 participants, each primarily engaged with one of these genres, took part in an anonymous online survey to provide sociodemographic, gaming behavior, and psychopathological data. The findings indicated that gamers of MMORPG and FPS games were more likely to meet IGD criteria than those who played other genres. Moreover, significant differences were noted among IGD-suspected gamers within each genre-specific group, highlighting the diversity of factors influencing IGD development across gaming genres.

Milani et al. (2017) investigated different patterns of gaming and internet use (sub-clinical and clinical level of problematic internet use, and IGD) among 612 Italian students aged 9 to 19 years. The research examined addiction-related variables in relation to gender, gaming frequency, coping style, adjustment issues, and interpersonal functioning. Results indicate that 15.2% showed signs of subclinical problematic internet gaming, whereas 2.1% had diagnosable levels of Internet Gaming Disorder (IGD). 16.3% had a problem with internet use, and nearly

6% reported addiction. IGD seems to be associated with numerous detrimental effects as psychological, social, and behavioural impairments.

A study carried out by Xu et al. (2011) to understand both risk and protective factors in online gaming addiction among 623 adolescents. The findings suggested several functional needs, such as escapism and social connection, that drive addiction, alongside preventive strategies like education and attention-shifting activities. The overall data showed that both types of influences affected addiction, often through actual game-play behavior.

Online gaming and emotional and behavioral problems

Hur (2025) conducted an online survey in South Korea to understand the peer influences and gene-environment interplay associated with game addiction. A total of 1462 twins aged between 15 and 29 years participated in the study. They found out that people who are more genetically susceptible to game addiction tend to have peer groups involved in playing games, showing a gene-environment link. People having peer influences on playing games can develop addiction without a high genetic risk.

Benedetto et al. (2024) conducted a study involving 676 Italian high school students to explore the psychological and behavioural dimensions of smartphone use. The result indicated that the scores on the strength and difficulty scale (SDS) were positively correlated with levels of internet addiction (IA). Furthermore, the students displaying high internalizing and externalizing symptoms, particularly those with traits of ADHD, were more likely to exhibit problematic smartphone use.

Thakur et al. (2023) examined gaming behaviors, gaming disorder, and associated psychopathological traits involving 707 Indian female adolescents. The study found that 0.8% of the sample population fulfilled the diagnostic criteria for gaming addiction. Significant correlations were observed between IGD scores and various psychological variables, like hyperactivity, emotional difficulties, conduct issues, and peer-related problems, which showed positive associations, while prosocial behavior was negatively correlated. Comparative analysis between

individuals diagnosed with gaming disorder and those without revealed notable disparities across emotional issues, conduct, and peer-related problems, and hyperactivity/impulsivity levels. Additionally, conduct and peer difficulties emerged as trend-level predictors of gaming disorder.

Almutairi et al. (2023) investigated the prevalence of IGD and linked psychiatric comorbidities involving 1332 adults from Arab countries. The sample comprised 48.9% males, 51.3% college graduates, and 91.8% urban residents, with 31.8% reporting engagement in online gaming. The findings revealed that individuals with a college degree exhibited a lower prevalence of IGD. Internet gamers showed significantly elevated ADHD scores compared to non-gamers, and those diagnosed with IGD reported heightened symptoms of anxiety and depression.

Ahmed et al. (2022) conducted a study among 564 adolescents and young adults to investigate time spent using online gaming apps and associated behavioral, emotional, and sleep problems. The result has been found that participants who were using online gaming applications for more than 6 hours reported higher scores on emotional and hyperactivity domains. Additionally, the participants reported problematic sleep patterns.

Mukherjee et al. (2021) explored the influence of multiplayer role-playing games on psychological and social correlates of Indian adolescents. The research included 150 gamers and 150 non-gamers. Information on gaming addiction and experiences was exclusively gathered from gamers. Studies have shown that a range of negative gaming experiences and compulsive gaming behaviors contribute to declining psychological well-being and disrupt interpersonal relationships with both parents and peers. Male gamers had a significant chance of experiencing detrimental psychological health and interpersonal connection problems.

Singh et al. (2020) studied 409 middle and high school students from Assam, aiming to determine how online gaming affects their emotions and behaviour. The result suggested an association of online gaming behavior with hyperactivity, emotional, conduct, peer problems, and difficulty score among adolescents.

Darvesh et al. (2020) reviewed research published since July 2018, evaluating 5,550 citations and identifying 160 studies that utilized 35 distinct diagnostic approaches for IGD. Reported prevalence rates varied widely, ranging from 0.21%-57.50% in general populations, 3.20%-91% in clinical cohorts, and 50.42%-79.25% among individuals undergoing interventions. Most studies originated from Korea, China, and the United States. The five most associated health conditions included depression, anxiety, internet addiction (IA), impulsivity, and attention-deficit/hyperactivity disorder (ADHD).

Rikkers et al. (2016) conducted a comprehensive survey assessing mental health and well-being among 6310 parents and carers of children aged 4-17, alongside self-report questionnaires from 2967 adolescents aged 11-17. The findings revealed that 98.9% of youth engaged in internet use, 85.3% reported electronic gaming, and 3.9% exhibited problematic behaviors and behavioral issues compared to males. Additionally, those experiencing emotional difficulties or elevated distress were more likely to spend substantial time engaged in gaming activities.

Online gaming characteristics and Personality traits

Ajith et al. (2024) carried out a cross-sectional study to investigate problematic gaming behaviour in relation to gaming motives, personality traits, and family dynamics among Indian youth. The sample comprised 179 youth (86 males, 93 females), aged 18-25, all of whom had engaged in online gaming for at least one year. The findings revealed that escapism and competition were primarily gaming motives. Additionally, low family cohesion and reduced levels of conscientiousness emerged as significant predictors of problematic gaming behavior.

Mohamed et al. (2023) implemented a cross-sectional design to assess IGD prevalence and its correlation with personality dimensions among university students. The sample comprised 170 participants aged 19 to 25 years, with 65.88% identifying as male and 34.12% as female. Furthermore, 10.58% of participants were reported to have IGD. significance correlations were determined between extraversion, conscientiousness, neuroticism, and IGD.

Rathakrishnan et al. (2023) administered an online survey to investigate the correlation between personality factors and gaming interests among students. The study aims to investigate gender disparities in gaming length and changes in video game playing behaviors according to age. The sample comprised 420 students aged 12 to 17 years, encompassing both avid and casual gamers. The results indicated a substantial correlation between online gaming genre preferences like role-playing, combat games, and big five personality dimensions, including extraversion, agreeableness, conscientiousness, neuroticism, and openness. Furthermore, the results suggested a variation in gaming frequency correlated with age.

Jain et al. (2022) implemented a cross-sectional observational design to assess the gaming addiction prevalence and its correlation with psychological and personality-based correlates among medical students. The sample comprised 341 participants aged over 18 years. The study reported a gaming addiction prevalence of 29.9%. Students identified with gaming addiction exhibited significantly elevated levels of stress, anxiety, depression, along with a lower score of agreeableness compared to their non addicted peers.

Kim et al. (2022) conducted a study involving 3,217 middle school students across various regions of Korea to examine how different game genres influence IGD and associated personality traits. The findings revealed significant genre-based disparities in gaming addiction and psychological profiles. People who played real-time strategy and first-person shooter games showed heightened tolerance and withdrawal symptoms in everyday life compared to those engaged in other genres, such as role-playing and casual shooting games.

The meta-analysis comprising data of 17 studies with a combined sample of 25634 individuals by Akbari et al. (2021) suggested a male predominance of 75%. The findings indicated that conscientiousness served as a protective personality trait against problematic online gaming.

Bhaskar et al. (2021) employed a cross-sectional design to examine the prevalence of problematic gaming among medical students of Kerala, India. It was

found that the prevalence among the students was 6.98% and they reported playing games for less than 3 hours. A significant association was found with many physical complaints, such as headache, neck pain, and wrist pain, among gamers.

Raja et al. (2020) implemented a cross-sectional observational design involving 225 intern doctors assigned to the Psychiatry Department over 12 months, to investigate the interplay between gaming-related characteristics and personality dimensions in the context of Gaming Addiction (GA). Findings indicated that the individuals who had been gaming for over five years and spent money on games were more likely to exhibit signs of gaming addiction. Among those identified as addicted, 70% used multiple devices for gaming, and 91.42% engaged in gaming beyond leisure purposes. These results indicate trait-specific dispositions in gaming-related psychopathology. A positive association was found between neuroticism and GA, while extraversion was inversely correlated.

In a cross-sectional analysis carried out by Liao et al. (2020) involving 6379 Chinese adolescents aged 15-25 years to assess the prevalence of IGD and its association with personality traits and psychological correlates. 17.0% met the criteria for IGD, suggesting a substantial rate of adolescent gamers met the diagnostic criteria for disordered gaming. Notably, IGD was significantly correlated with higher neuroticism and lower conscientiousness, alongside increased daily and monthly gaming duration.

Seong et al. (2019) conducted a study among 139 frequent gamers who reported excessive internet gaming for the study based on the hypothesis that an individual's preference for playing online games was associated with personality traits. It was concluded that temperamental characteristics were a potential factor related to preferred gameplay.

Throuvala et al. (2019) explored psychological pathways contributing to IGD, especially how feelings accepted and rejected by parents play a role. They also explored how someone's personality and self-image might influence or explain that connection. The study involved 225 young adult online gamers. Findings indicated

that parental rejection was significantly linked to IGD, with CSE serving as a mediating factor. However, no significant moderating effects were observed.

Laier et al. (2018) examined a sample of 103 male and female participants to examine to investigate how maladaptive personality traits and expectations about gaming online might work together to predict IGD. The findings revealed significant associations between IGD symptoms and several maladaptive traits. Additionally, both types of internet use expectancies, experience-based and gaming-related, were significantly linked to IGD symptomology. These findings suggested that both avoidance and positive expectancies contributed to IGD development; their roles in mediating the impact of maladaptive personality traits are distinct.

A cross-sectional observational study by Baniya et al. (2016) included 140 Indian medical students to investigate the association between personality dimensions and addictive behaviours related to Facebook and gaming. The results indicated that elevated neuroticism, increased agreeableness, and low extraversion were linked to exhibiting addictive tendencies toward both platforms. Notably, extraversion emerged as the strongest predictor of Facebook addiction, while neuroticism was most strongly associated with gaming addiction.

Perceived Stress, Insomnia, and Online Gaming

Tripathi et al. (2024) conducted a comparative cross-sectional study to investigate the association between IGD, perceived stress, and impulsivity among adolescent males in India. The study included 100 participants aged 10 to 19 years, evenly divided into IGD and non-IGD groups. The result demonstrated a significant difference in impulsivity between groups, showing a potential role in the development and maintenance of IGD. Perceived stress level, however, did not differ significantly. Furthermore, no difference was found between perceived stress and impulsivity among participants without IGD.

Savolainen et al. (2024) examined the influence of perceived stress on the correlation between in-game purchasing behavior and gaming issues, as well as the association between monetary expenditure and gambling difficulties. The research

comprised 1,530 participants, of whom 50.33% were male. The results indicated that felt stress strongly influenced the link between in-game purchasing behavior and gaming-related issues, as well as the connection between expenditure on gaming and gambling. Experiencing stress may affect expenditures on gaming activities, thereby exacerbating gaming-related issues.

Hur (2024) surveyed 1468 twins (Mean age 22.6) to evaluate two competing models of gene-by-environmental interaction- the diathesis-stress and bioecological frameworks to understand the underlying association. The findings suggested that gaming addiction is primarily driven by genetic predispositions, with minimal influence from shared influential factors and a moderate contribution from non-shared environments. Estimated for perceived stress, indicated moderated influences from genetic factors, shared environmental conditions, and non-shared environmental experiences. Further, it was suggested that the diathesis-stress model, revealing that genetic susceptibility to game addiction intensifies under higher levels of perceived stress, while environmental influences on game addiction remain consistent regardless of stress exposure.

Diego et al. (2024) studied 1209 young adult gamers to identify latent psychological subgroups based on issues like levels of depression, anxiety, and stress, and to examine the differences in co-occurring addictive behaviors such as tobacco, alcohol, cannabis, gaming, and gambling. The results revealed that individuals experiencing moderate to high emotional distress, predominantly female participants, demonstrated elevated gaming severity, increased prevalence of substance use, and more pronounced alcohol related consequences. The study suggested that the heightened emotional distress was associated with increased reliance on gaming and other addictive behaviors.

Abdallat et al. (2024) surveyed 2473 Jordanian University students aged 18-26, examining how gaming addiction affects their studies and sleep. The findings revealed that 15.2% of participants met criteria for IGD, with males showing a higher rate. Additionally, 64.4% of the students reported poor sleep quality, a condition

more frequently observed among females. The study further identified an association between IGD and poor sleep quality.

Farmer et al. (2024) invited 40 students in the UK to examine the role of problematic video gaming behaviour. The results indicated a significant decrease in stress after a short video game session. Hence, video gaming can act as a short-term buffer against the psychological impact of stress.

Sohrabi et al. (2024) conducted a descriptive study among 122 high school students in Tehran to examine the interrelation between IGD, perceived stress, and obsessive-compulsive disorder. The result showed that those under more stress were prone to IGD symptoms. Furthermore, IGD appears to be more characterized by impulsivity than compulsivity.

Shakya et al. (2023) investigated IGD and sleep quality among 112 individuals aged 18-28. The sample predominantly comprised Hindu participants (91.1%) of participants, from nuclear families (66.1%) and residing in cities (75.9%). The study found that 65.1% of participants reported mild to moderate sleep disturbances linked to internet gaming addiction. Furthermore, gaming disorder was significantly associated with specific sleep-related issues, including early awakenings, daytime fatigue, excessive sleepiness, and headaches.

Lin et al. (2023) conducted a comparative study involving 207 young adults (69 participants each divided into three groups: IGD group, a control group, gamer group without IGD) to examine the interplay among circadian typologies, insomnia, and IGD, while also evaluating the moderating effect of ADHD. The findings revealed that individuals diagnosed with IGD showed a pronounced tendency toward evening-oriented sleep patterns and experienced more severe symptoms of insomnia than those in other comparison groups. Critically, the presence of ADHD symptoms further intensifies both the circadian dysregulation and sleep disturbance among individuals with IGD.

Solanki et al. (2023) shed light on the prevalence of digital dependency and its psychological impact on 400 medical undergraduate students in India. The results

showed that 47.2% of participants reported internet addiction, 32% experienced gaming addiction, and 24.5% displayed hikikomori traits characterized by severe social withdrawal. A significant link between insomnia and these issues emphasizes how they are interconnected, potentially worsening stress and overall well-being.

Garg et al. (2023) carried out a cross-sectional study in Haryana involving 795 students to explore the role of sleep quality, health outcomes of perceived stress, and suicidal behavior with IGD. 348 participants (Mean age =21.03) were found to be gamers. The prevalence rate of IGD was 15.23 %. The factors associated with males, living in a single-parent family, and playing games for more than 3 hours a day were associated with IGD symptoms.

Romdhane et al. (2023) examined 851 Tunisian university students to see the moderating and mediating role of insomnia severity, cyber-victimization, and cyberbullying in IGD and psychotic symptoms. The findings indicated that 25% of participants were at risk for IGD, while 1.8% met the diagnostic criteria. Notably, insomnia severity fully mediated the IGD-paranoid ideation, with higher IGD scores linked to increased sleep difficulties.

Mustafa and Lokesh (2022) investigated the association between gaming experience and perceived stress among young adults aged 18-25, involving 227 participants (107 gamers and 120 non-gamers). Their study revealed a massive disparity in stress scores between IGD and non-IGD groups.

Bansal and Kranti (2022) carried out a cross-sectional study involving 347 college students aged 18-25 to assess the how common gaming disorder and its correlation with perceived stress, sleep quality, and self-esteem. The study reported a 4.6% prevalence rate of gaming disorder; higher IGD scores were positively correlated with elevated stress levels and poorer sleep quality.

During the isolation and COVID-19 pandemic, Verma et al. (2022) studied 372 individuals to understand how gaming addiction shaped and its association with loneliness and insomnia. The study reported an overall IGD prevalence of 0.8%, rising to 2.02% among those identified as gamers. Highlighting a potential link

between gaming behavior and psychosocial challenges during the health crisis. A regression study revealed that Internet Gaming Disorder (IGD) correlated with the average daily hours dedicated to online gaming, feelings of loneliness, and the severity of sleeplessness.

Kucukturan et al. (2021) conducted a qualitative study examining how age, gender, personality traits, general aptitude, and chronotype relate to sleep quality among high school students. The sample comprised 922 students, the majority of whom identified as girls rather than guys. The results demonstrated that specific personality traits, namely conscientiousness, neuroticism, and openness to experience, were significantly linked to individuals' chronotype preferences, particularly their inclination toward morningness and eveningness. Furthermore, gender and diurnal preference, whether evening or morning kinds, were found to be substantially correlated with gaming addiction. Sleep quality was anticipated by computer game addiction and morningness and eveningness.

Almighal et al. (2022) conducted a study with 370 medical students to understand how addiction affects stress. The findings revealed a low gaming addiction rate of 4.6%, contrasted by a high prevalence of perceived stress at 95.9%. Elevated stress levels were more commonly reported among younger students, females, and individuals from high-income backgrounds. Importantly, no significant correlation was identified between gaming disorder and perceived stress within this cohort.

Gandaputra et al. (2021) investigated the relationship between pre-sleep online gaming and insomnia from a gender-based perspective among 315 Indonesian middle school students in grades 8 and 9. The study found that 50.3% of male students and 21.7% of female students engaged in online gaming before bedtime. Among males, grade 9 students exhibited higher rates of moderate to severe insomnia compared to those in grade 8. In contrast, female students who frequently played games before sleep were most likely to experience moderate to severe insomnia.

A cross-sectional study by Kumar et al. (2021) among 922 undergraduate medical students to understand problematic gaming prevalence, gaming-specific engagement, and stress correlation. 8.71% of participants reported problematic gaming, with male students showing significantly longer durations in gaming and higher IGD scores. Participants who played more action and simulation genre-related games were reported to have higher scores on Gaming Disorder Scales. A positive correlation was found between perceived stress and IGD severity.

Desai et al. (2021) experimented with 80 undergraduate students (mean age = 19.46) to compare the stress-reducing effects of a simple video game, Flower, with those of a mindfulness meditation technique known as the body scan. The research aimed to evaluate whether interactive gaming could serve as an effective alternative to traditional stress-relief practices among adults. Half of the students played video games, and the other half did meditation. Each activity lasted 20 minutes. Before and after the session, they measured stress in two ways: how stressed the students felt (using a short stress questionnaire) and physical signs like blood pressure (using an electronic cuff) and heart rate. The result suggested that both activities helped reduce stress in a meaningful way. The results suggested that mindfulness meditation provides a slightly better result, but video games worked almost as well. The findings underscore the therapeutic potential of casual video games, emphasizing their accessibility, intuitive design, and widespread appeal among students as effective short-term tools for stress reduction.

Karthikeyan et al. (2021) surveyed 376 medical students in Tamil Nadu to examine the prevalence of IGD and insomnia. Among the participants, 68.51% were male ($n = 220$), and 41.49% were female ($n = 156$). The study reported an IGD prevalence of 4.25%, while 19.4% of students exhibited moderate levels of insomnia.

Lin et al. (2021) conducted a study in Taiwan among 69 gamers and 138 non-gamers to examine psychological constructs, including coping styles, resilience, stress perception, and depressive symptoms. The findings revealed that the IGD-diagnosed individuals were more likely to engage in games to deal with stressful situations or escape real-life problems. Moreover, these participants reported

perceived stress and depression, and lower levels of problem-solving skills and resilience. Further analysis revealed that gaming to cope was linked with unhelpful strategies like venting and distracting oneself. Interestingly, both gamers and non-gamers who used unhealthy coping strategies had more stress and depression. However, non-gamers, using problem-focused coping like actively dealing with issues, were connected to lower stress and depression.

Mehmood et al. (2021) examined the development of smartphone addiction among 600 international students in China, using the I-PACE model to analyze the interplay of personal, affective, cognitive, and executive factors. The result revealed that 20.3% of participants met the criteria for smartphone addiction, while the remaining 79.7% exhibited typical usage patterns. Notably, smartphone addiction was significantly associated with neuroticism, loneliness, depression, perceived stress, and maladaptive coping strategies, highlighting its complex and multifactorial underpinnings.

Kharisma et al. (2020) conducted a study involving 111 collegiate gamers from Surabaya's online gaming community to examine the relationship between online gaming addiction severity and sleep quality metrics. The results demonstrated that elevated levels of gaming addiction higher levels of gaming addiction were linked to poor sleep quality, suggesting that excessive gaming may exert psychological effects on college students, particularly in terms of disrupted sleep patterns. The sensory system associated with vision induces weariness, resulting in challenges in initiating sleep and attaining quality rest.

Pratiwi and Karneli (2020) conducted a quantitative study to examine the influence of online gaming and peer conformity on bullying behavior among students. The sample included 122 eighth-grade students, of whom 45 were selected through purposive sampling. The findings indicated that online gaming contributed to bullying behavior by 70.5%. Additionally, peer conformity showed a dual association; a 9-6% contribution in one context and a 73% contribution in another, suggesting varying influences depending on the measurement and model used.

Balhara et al. (2020) examined the changes in gaming behaviour during the COVID-19 pandemic among 393 college students. The findings revealed that the majority (50.8%) reported increased engagement, while 14.6% noted a decline. Importantly, the rise in gaming hours was attributed to its use as a coping strategy for managing exam-related stress during the pandemic period.

Canale et al. (2019) investigated the moderating role of psychological resilience, which might buffer the impact of perceived stress on IGD and gaming frequency, an area previously overlooked in scholarly research.

Yen et al. (2019) investigated the interplay between perceived stress, depression, resilience, and IGD severity in a sample of 174 individuals, half with gaming addiction and half without. Their findings revealed that those with IGD experienced notably higher perceived stress and reduced resilience. While resilience initially showed a significant link to IGD even after accounting for stress, this association disappeared once depression was also controlled for.

Sosso and Kuss (2018) examine the prevalence of IGD, psychological problems, and sleep disturbances among African gamers. They looked at how gaming changed over 1, 6, and 12 months. Most gamers preferred online game formats. Mean weekly gaming duration is significantly higher among male gamers (14 hours a week), compared to female participants, while women (around 3 hours). The more time people spent gaming, the less sleep they got. After one month, no one had serious sleep problems, but by six months, many started to show mild to moderate signs of insomnia.

Vyjayanthi et al. (2014) conducted a study to understand internet addiction among 810 engineering students in India (455 men and 349 women) to explore gender differences and how studying engineering might influence addiction patterns. They found that 8.8% showed signs of internet addictions, with a higher rate among males (10.33%) compared to females (6.84%). While females were active on social media platforms, males dominated in playing multiplayer online games. internet addiction was linked to real-life problems, such as trouble with social relationships

and poor academic performance. Users with physical signs of gaming addiction often experienced problems such as insomnia (26.8%), feeling sleepy during the day (20%), and eye strain (19%).

Earlier studies on Internet Gaming Disorder (IGD) have highlighted how too much time spent online gaming, gamers' reasons for gaming, and the types of games they choose can shape their psychological characteristics. The present study findings will shed light on the benefits and harms of excessive gaming and its psychological impact. Moreover, how personality plays a role in gaming behavior. The results suggested the role of genre-specific features, such as immersive environments or fast-paced reward systems, in shaping behavioral outcomes. Additionally, studies have identified key motivational factors driving gaming behavior, including achievement, social interaction, and escapism. These motives often serve as psychological reinforcers, increasing vulnerability to addictive patterns of play and other gaming-related characteristics worth studying.

CHAPTER III

STATEMENT OF THE PROBLEM

Statement of the problem

Research on video games and internet addiction is still in its early stages. However, growing academic interest has begun to focus on internet addiction, which is now seen as a major risk to the social and psychological health of people who depend heavily on online activities (Jiang et al., 2017). Previous studies have identified online game addiction as one of the most concerning and widespread forms of technology-related addiction (Huh & Bowman, 2008; Xu et al., 2011). Playing online games has become the most widely adopted leisure activity for people of all ages, with adolescents showing particularly high levels of engagement (Xu et al., 2011). Different aspects of gaming, such as the types of games played, the device used, how often someone plays, and for how long, significantly influence why people continue to play and what motivates their gaming behavior.

Empirical study finding shows that individuals are often driven to play online games to satisfy three main needs: the desire for achievements or progress, to be seen and recognized by others, and to deeply engage or escape into the gaming world (Wan & Chiou, 2006). The present study has focused on these research gaps to understand gaming characteristics. With the rapid advancement of technology, gaming has become more relevant as it continues to transfer various aspects of human life. This research aims to explore the underlying reasons why people are drawn to video games. Many individuals play games to relax and take a break from everyday stress.

Immersing themselves in virtual worlds helps them disconnect from real-life worries and feel more at ease. Overcoming in-game challenges offers a rewarding sense of achievement, while online platforms also provide opportunities to connect and socialize with others. The creative elements of game design, storytelling, and gameplay make these experiences both engaging and enjoyable. For many gamers, video and online games provide a way to disconnect from real-life pressures. These games often challenge users with critical thinking, problem solving, and improve eye-hand coordination, making the experience both mentally engaging and physically interactive.

Through gameplay, gamers often build skills like problem-solving, coordination, and strategic thinking, which can be useful in real life. However, online gaming also has a downside, including behavioral risks such as addiction and possible negative impacts on social relationships. As gaming continues to evolve, it may offer even more avenues for enjoyment and engagement. The way individuals interact within the games often influences their real-life behavior. Gamers may mimic aggressive or violent actions as they observe them on screen, leading to an adoption of similar behavior in their daily lives. This can lead to increased frustration and irritation over minor setbacks and failures. It has become a pressing concern for researchers to further understand these areas.

Online gaming has become increasingly common, especially among young people, and its rise has brought growing concerns about gaming addiction. As more youth engage in extended gaming sessions, it can start to affect their mental health and disrupt everyday routines like sleep, school, and social interactions. Problematic gaming has been associated with serious consequences like poor academic performance, social withdrawal, and mental health challenges. This makes it essential to explore the key factors that drive such behavior, so that effective strategies can be developed to prevent and manage its impact. Exploring emotional and behavioral difficulties, such as hyperactivity, conduct problems, peer issues, and emotional issues, can help identify the specific psychological impacts of excessive gaming. Studying gender differences in internet gaming disorder and internet addiction is very crucial for different reasons. To build a comprehensive socio- ecological framework for preventing technology addiction and guiding policy decisions, it's essential to understand how people use technology, what risk factors make them vulnerable, how their brain functions may differ, and the psychological effects of excessive use (Amudhan et al., 2020). These insights help create targeted strategies that address individual behaviors, social environments, and broader systemic influences.

Personality traits, temperament, stress levels, and surrounding environmental factors are seen as major contributors to how online gaming habits form and continue over time. These elements can shape why individuals start

gaming, how often they play, and whether their behavior becomes problematic. Additionally, understanding the personality traits that make certain youths more vulnerable to problematic gaming, such as higher neuroticism or lower conscientiousness, may provide valuable insights into prevention and intervention strategies. Prior studies have shown that perceived stress has been linked to internet addiction and IGD (Che et al., 2017; Rosenkranz et al., 2017). Gamers experiencing a high level of stress turn to games to cope with stress, but this can sometimes worsen their stress over time (Snodgrass et al., 2014). Additionally, studies have found that playing games excessively, whether online or offline, can harm sleep by delaying falling asleep and causing overall sleep deprivation (Peracchia & Curcio, 2018). Video games activate the brain's pleasure center, releasing significant amounts of dopamine, which has been shown to promote wakefulness by inhibiting melatonin production.

Problematic gaming can indeed pose several health risks that affect various aspects of well-being. Excessive gaming often leads to late-night sessions, physical strain, social difficulties, and isolation, resulting in poor sleep quality and irregular sleep patterns (Gandaputra et al., 2021; Solanki et al., 2023). Online game addiction, emerging as a distinct form of behavioral addiction beyond traditional desktop-based gaming, has increasingly drawn researchers' interest because of its possible harmful effects on mental health. This is crucial to examine the severity of online gaming, particularly among adolescents. Investigating these issues can help us understand how problematic gaming may impede youth's social and personal development while also offering valuable insights for mental health education practices. Findings will contribute to designing effective interventions for addressing problematic gaming. The study seeks to fill existing gaps by exploring how various factors interact to influence online gaming addiction in youth. Uncovering these relationships provides valuable insights to help design focused interventions, inform policy decisions, and build effective support systems for young individuals affected by problematic gaming.

Research Questions

- 1) What are the gender-based differences in online gaming behavior and its characteristics among youth?
- 2) How do emotional and behavioral problems differ among youth based on their preferred gaming genres, such as Action, Strategy, Roleplay, Simulation, Adventure, and Combat games?
- 3) What is the link between personality traits, emotional and behavioral problems, perceived stress, and insomnia with problematic online gaming among youth?
- 4) How do genders differ in terms of problematic online gaming, personality traits, perceived stress, and insomnia?
- 5) To what extent do personality traits, emotional and behavioral problems, perceived stress, and insomnia predict problematic online gaming among youth?

Research Objectives

In response to emerging evidence and gaps in research, the study was guided by the following objectives:

- 1) To analyze the gender specific patterns and characteristics related to internet gaming behaviour among youth
- 2) To compare preferred gaming genres (i.e., Action, strategy, role-play, simulation, adventure, and combat games) and analyze the differences in emotional and behavioral problems among youth
- 3) To examine how personality domains (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism), emotional and behavioral problems, perceived stress, and insomnia relate to problematic online gaming among youth
- 4) To explore gender disparities in problematic online gaming, various personality traits, emotional and behavioural problems, perceived stress, and insomnia among youth

- 5) To examine the role of personality traits, emotional and behavioral problems, perceived stress, and insomnia in predicting problematic online gaming

Research Hypotheses

H1: There would be a significant difference between male and female youth in their internet gaming behaviour patterns

H2: There would be significant differences in emotional and behavioral problems among youth based on preferred gaming genres

H3: There would be a significant relationship between differences in personality trait domains and problematic online gaming among youth

H4: There would be a significant relationship between problematic online gaming and emotional and behavioral problems

H5: There would be a significant association between problematic online gaming, perceived stress, and insomnia

H6: There would be significant gender disparities in problematic online gaming, personality traits, perceived stress, and insomnia among youth

H7: Personality traits, emotional and behavioral problems, perceived stress, and insomnia significantly predict problematic online gaming

Operational Definitions

The important variables and concepts that the investigator included in the present study are as follows:

Problematic Online Gaming/Internet Gaming Disorder (IGD)

In 2013, the American Psychiatric Association (APA) recognized Gaming Disorder in the DSM-5 as a condition needing further research. It is described as a pattern of ongoing and repeated internet game use that causes serious problems or distress for at least 12 months (APA PsycNet, n.d.). Problematic online gaming refers to a pattern of maladaptive video game use, primarily online, that involves

excessive time spent on gaming-related activities. This behavior is driven by beliefs such as overvaluing in-game rewards, adhering to rigid self-imposed rules, viewing gaming as a source of self-esteem, and using it for social validation. These behaviors continue despite significant negative impacts on daily life (Moreno et al., 2021).

Online Gaming Characteristics

Online gaming characteristics are defined by quantifiable behaviors and preferences related to digital gameplay. These include the frequency and duration of gaming sessions (e.g., hours per day), type of gaming device used (e.g., smartphones, PC, console), financial investment in games (e.g., in-game purchases), preferred game genres (e.g., RPG, FPS, MMORPG), and social engagement indicators such as participation in gaming communities or clubs.

According to Qu (2023), online gaming is defined by three key features: visually rich 3D graphics and immersive sound design, highly interactive gameplay, and the capacity to construct virtual reality environments. These elements create a digital space that enhances gamers' cognitive engagement, offering a realistic and intuitive experience that closely mirrors the real world and deepens their sense of presence within the game.

Gaming Genres

Gaming genres refer to the classification of video games based on their core gameplay mechanics, such as player interaction, objectives, and control systems, rather than narrative and visual elements. It is operationalized by identifying consistent patterns in game-play structure, including combat style, progression system, and player roles. Common types of games include first-person shooters (FPS), role-playing games (RPGs), combat games, action-adventure games, simulation games, and strategy games.

Youth

As outlined in the 2014 National Youth Policy by India's Ministry of Youth Affairs and Sports, youth refer to individuals aged 15 to 29 (*'Youth' in India: A*

Critical Assessment of Defining and Categorizing Youth, n.d.). This age range marks the transitional phase from childhood to adulthood.

Personality traits

Personality traits refer to consistent ways of thinking, feeling, and behaving that make each person unique. These traits shape how individuals respond to different situations and interact with others over time. They reflect consistent tendencies in how a person thinks, feels, and acts in different situations and over time.

In the present study, the Big Five model was used to describe the traits, which include:

- **Openness to experience**- the trait that reflects a person's level of creativity, curiosity, and willingness to explore new ideas, experiences, and perspectives.
- **Conscientiousness**- the trait describes how a person is organized, hardworking, and dependable.
- **Extraversion**- the trait reflects how sociable, assertive, and outgoing a person is.
- **Agreeableness**- the trait explains to what extent someone is compassionate, cooperative, and empathetic.
- **Neuroticism**- the trait reflects the tendency to experience negative emotions like Emotional instability, anxiety, and sadness.

Emotional and Behavioral Problems

Emotional and behavioral challenges are generally divided into two main categories: internalizing factors, which include emotional issues and difficulties with peer relationships, and externalizing factors, such as behavioral problems and hyperactivity (Sierra et al., 2015). In this study, these difficulties are measured using the Strengths and Difficulties Questionnaire (SDQ), which assesses five distinct subscales and generates both specific domain scores and a composite score reflecting overall psychological difficulty. The subscales include:

- **Emotional symptoms-** Assessing signs of anxiety, depression, psychosomatic pain, and other internal emotional difficulties
- **Conduct problems-** Evaluates behaviors related to rule-breaking, aggression, lying, or cheating
- **Hyperactivity/inattention-** Measures attention deficit and signs of hyperactive behavior
- **Peer problems-** Examines challenges in forming and maintaining peer relationships and navigating social situations
- **Prosocial behavior-** Measure the tendencies of positive social behavior, helpfulness, empathy, and cooperative behaviors. This subscale is not included in total difficulty scores but provides an insight into strengths.

Perceived Stress

Perceived stress is an individual's subjective evaluation of how stressful their life situations feel. It may include how unpredictable and out of control things seem to be, and whether the person can cope with the situation.

Insomnia

Insomnia is a sleep disorder marked by difficulty in falling asleep, maintaining sleep, or achieving restorative sleep, irrespective of having sufficient time and a conducive sleep environment. Individuals with insomnia may also struggle with waking up feeling refreshed, which can impair daytime functioning and overall well-being.

CHAPTER IV

METHODS AND PROCEDURE

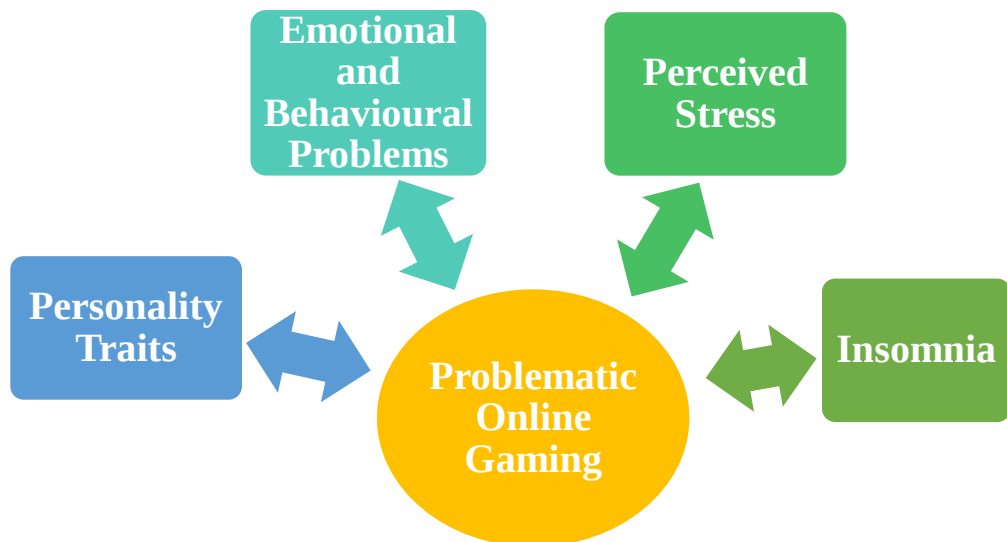
Methods and Procedure

This chapter presents the research design and provides information about the source of data used in the study. Moreover, it describes the research design, sample selection, tools employed, ethical protocols followed, methodological procedure adopted in both the pilot study and main study, and the statistical analyses used to examine the study's hypothesis and fulfill the study's objective.

Research Design

Figure 3

Diagram representing the research design of the present study



As shown in Figure 3, this study adopts a non-experimental research approach, specifically adopting a correlational and descriptive design; hence, it did not involve changing or controlling variables. The research used a descriptive and correlational design to prioritize the observation of naturally occurring phenomena and to examine the complex interplay between problematic online gaming and four

key psychological constructs: personality traits, emotional and behavioral problems, perceived stress, and insomnia. The primary aim was to characterize patterns associated with problematic online gaming among the gamers (students actively involved in online gaming for the past twelve months). Furthermore, the study aimed to explore associations between the variables (i.e., different personality traits, emotional and behavioral problems, perceived stress, and insomnia), without focusing on causal relationships.

Target Population

The research was carried out in various government and private schools throughout Delhi NCR. As a diverse and densely populated region, it provided an opportunity to study various demographic groups, offering a broad perspective on how online gaming affects different socio-economic classes and individuals belonging to young age groups. With high internet penetration and widespread digital access, Delhi NCR has many individuals, especially youth, actively engaging in online gaming.

The urban environment of the region, marked by academic and professional pressures, makes it an ideal setting to explore the role of stress, psychological problems, and personality traits in contributing to problematic internet gaming. Furthermore, Delhi NCR is home to a young, tech-savvy population who are especially at risk of developing gaming addiction. Despite the growing prevalence of gaming, there is limited research on the issue within India, especially in urban centers like Delhi NCR, creating an urgent need to study this phenomenon.

Sample

Five hundred participants were initially recruited in the study, out of which 452 met the inclusion and exclusion criteria and were selected for final analysis. The sample consisted of 452 high school students, both male and female (age group 15-19 years), belonging to 10th, 11th, and 12th classes across different schools in Delhi NCR, who were using various devices to access the internet for gaming. Given the non-experimental nature of the design, the study limits the causal interpretation

between the study's variables, the study offers a valuable starting point for a nuanced understanding of variable interactions in underexplored domains.

Figure 4

Diagram representing the sample distribution of the study

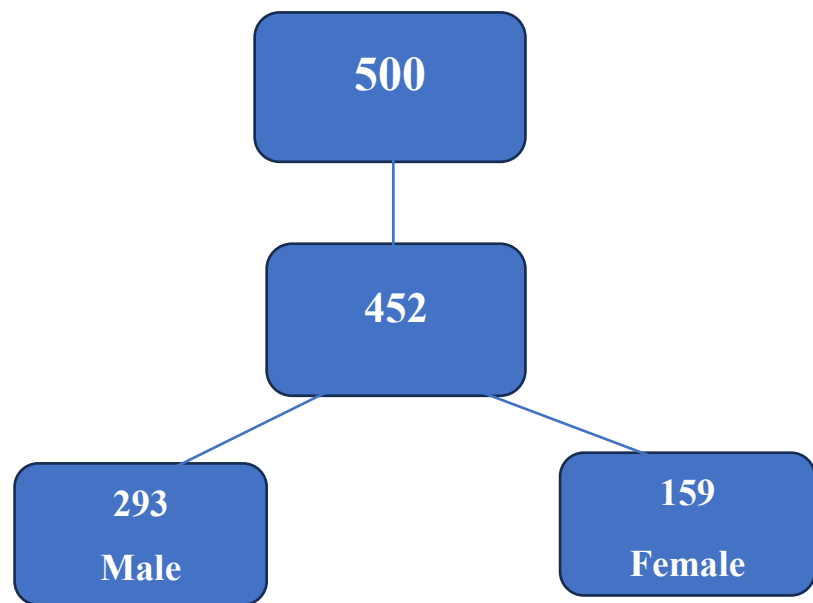


Figure 4 depicts a systematic procedure that was followed for collecting samples for the present study. A total of 500 youth took part in the study. Based on the predefined inclusion and exclusion criteria, the final sample comprised 452 youth participants. The study population consisted of boys' and girls' participants aged 15-19 years, representing the adolescent developmental age. In this present study, the adolescent participants or the high school students are referred to as youth. According to UNICEF and WHO, 'youth' belongs to the age group of 15-24 years (United Nations, n.d.).

Inclusion Criteria

- Participants aged between 15 and 19 years
- Participants who are currently playing (12 months) internet games/video games using different mediums

- Participants belonging to both government and private schools/colleges will be included
- Participants who can understand, read, and write the English language
- Participants who agreed to take part by giving their informed consent to participate in the study

Exclusion Criteria

- Participants less than 15 and more than 19 years old will be excluded
- Participants not played any mode of internet games/video games for the past 12 months will be excluded
- Participants having any major comorbid medical and psychiatric disorder will be excluded
- Participants with impairment in vision, hearing, and motor functions will be excluded

Study Variables

The present study explores demographic variables and online gaming related characteristics among gamers which includes game genres, platform used for gaming and daily playing session duration etc. the research further investigates psychological constructs such as various personality dimensions such as openness, extraversion, conscientiousness, agreeableness, and neuroticism alongside emotional and behavioral issues (emotional distress, conduct issues, hyperactivity, peer problems and prosocial tendencies), perceived stress and insomnia.

Description of the tools used in the study

Keeping the objectives in view, the following standardized tools were administered in the present study to assess the relevance of psychological constructs among youth:

Socio-demographic information and online gaming-related variable datasheet

- A self-constructed structured data sheet was utilized to gather both socio-demographic details (Age, Gender, Education, Family type, and living arrangement) and online-gaming related variables. Identifying information,

such as name and contact information, was deliberately avoided to maintain anonymity.

- The second part of the form focused on online gaming-related behaviors like mode of play, platform used, age of initiation, gaming genres, feelings, and emotions during gameplay

General Health Questionnaire short-version (GHQ-12) (Goldberg & Williams, 1988)

The General Health Questionnaire (GHQ-12) is a widely used screening instrument comprising 12 items, scored on a bimodal scale (0-0-1-1), assessing mental health issues people may have felt in the past few weeks. In addition to being a more general measure of psychiatric well-being. Total score ranges from 0 to 12, with a greater score reflecting psychological distress. A score above a special cut-off of 4 in the bimodal model indicates psychological distress and suggests further evaluation for potential mental health conditions (Comotti et al., 2023). The GHQ-12 was reliable with a Cronbach's $\alpha=0.72$. It includes 12 items categorized into three factors: Feeling anxious and depressed, struggling with everyday tasks, and losing confidence. The scale points are described as follows: “less than usual,” “no more than usual,” “rather more than usual,” and “much more than usual.”

Instructions provided for the GHQ-12 questionnaire were, “We would like to know if you have had any medical complaints, and how your health has been in general, over the past few weeks. Please answer all the questions by putting a tick simply by underlining the statements that you think most nearly apply to you. Remember that we want to know about the present and recent complaints, not those you had in the past.”

Internet Gaming Disorder Scale- short-form (IGDS9-sf) (Pontes and Griffiths, 2014)

The test developed by Pontes & Griffiths in 2015 was used to assess gaming behavior over the past 12 months. It is a comprehensive screening tool that comprises nine core criteria for Internet Gaming Disorder as outlined in DSM-5. It employs a 5-point Likert format, ranging from 1 (never) to 5 (very often), allowing respondent to rate the frequency of their experiences with gaming-related behavior.

Total score ranges from 9 to 45; a higher score reflects greater severity of the gaming-related problem. The scale presented an excellent internal consistency (Cronbach's α , i.e., 0.90) for the present study.

Instructions for the IGDS9-SF questionnaire were, "These questions are related to your gaming activity during the past year (i.e., 12 months). By gaming activity, we mean any gaming-related activity that was played either on a computer/laptop, smartphones, a gaming console, /or any other kind of device online exclusively. Please indicate on the scale from 1 to 5 the extent to which these statements apply to you. All the questions are mandatory."

Big Five Inventory (BFI) (Goldberg, 1993)

The BFI is a 44-item questionnaire that measures five personality traits: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Participants respond using a 5-point Likert scale. The tool suggests a good reliability and Cronbach's alpha value between 0.79 and 0.88.

Instructions for the BFI questionnaire were, "Here are several characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement on a scale of 1-5, where 1= disagree, 2= slightly disagree, 3= neutral, 4= slightly agree, and 5= agree to indicate the extent to which you agree or disagree with that statement. All the questions are mandatory."

Strength and Difficulty Questionnaire (SDQ) (Goodman, 1997)

The questionnaire is widely used as a screening tool for emotional and behavioral issues in young people. The scale was developed by Robert N. Goodman in 2001 and consists of 25 items. SDQ measures five core areas: emotional issues, conduct problems, hyperactivity, peer issues, and prosocial behavior. Items are rated on a three-point scale on how true each statement has been over the last six months. The total difficulty score ranges from 0 to 40, with each subscale (emotional problems, conduct problems, hyperactivity, and peer problems) ranging from 0 to 10.

A higher score suggests more psychological difficulties, and reliability was acceptable (Cronbach's alpha of 0.73).

The instructions provided for the questionnaire were, "Please read each statement and mark the box out of the options for Not True, Somewhat True, or Certainly True, which best suits you. It would help us if you answered all items as best you can, even if you were not certain. Please give your answers based on how things have been for you over the last six months. All the questions are mandatory."

Perceived Stress Scale-10 (PSS-10) (Cohen et al., 1983)

PSS is utilized for assessing the degree to which individuals perceive life events as stressful. The 10-item scale employs a 5-point Likert scale ranging from 0 (never) to 4 (very frequently), with four items reversely scored to control response bias. The total score ranges from 0 to 40, with a higher score indicating greater perceived stress. Stress level was classified as low (0-13), moderate stress (14-26), and 27-40 as high stress. PSS shows an adequate internal consistency with Cronbach's alpha (0.92) and reliability for this scale.

Instructions for PSS-10 were, "The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling how often you felt or thought a certain way. Please put a tick mark next to each statement to indicate the extent to which you agree or disagree with that statement. All the questions are mandatory."

Insomnia Severity Index (ISI) (Morin, 1993)

The scale consists of a 7-item self-report instrument designed to assess the severity of insomnia symptoms in the past two weeks. It consists of seven domains, assessing the sleep onset, maintenance of sleep, dissatisfaction with sleep quality, interference with daytime functioning, early morning awakening, perception of sleep problems by others, and distress associated with sleep disturbances. The ISI employs a 5-point rating system ranging from 0 (no problem) to 4 (very severe problem), yielding a total score between 0 and 28. A score of 0-7 means no sleep issues, 8-14 shows mild sleep trouble, 15-21 suggests moderate insomnia, and 22-28 indicates

severe sleep difficulties. The scale is highly reliable, with an internal consistency value (Cronbach's $\alpha = 0.90$ and 0.91).

Instructions for the ISI scale were, “Read all the statements carefully and for each question, please circle the number that best describes your answer. Please rate the current (i.e., Last 2 weeks) severity of your sleep difficulties. All questions are mandatory.”

Ethical Consideration

The study was ethically approved, non-invasive, and posed no physical or emotional harm to the participants. All procedures were followed by Ethical guidelines and officially approved by the Human Ethics Committee of Mizoram University (MZU/HEC/2024/025), India. The study has followed the APA 7th (American Psychological Association-7th edition) research ethics guidelines.

Informed consent/ Assent

Before participation, individuals were thoroughly briefed on the study's purpose and asked to sign the consent form before the assessment commenced. They were provided with the detailed information sheet and consent form (see Appendix II/III), ensuring transparency, voluntary participation, and confidentiality.

Participants under 18 years were thoroughly briefed about the purpose of the research. Verbal and written consent were collected from the participants and caretakers. The caretakers were gathered separately for a smooth process.

Procedure

The present study has two phases, namely the pilot study and the main study. The pilot phase was essential to ensure the usability, reliability, and cultural relevance of the research tools. It helps refine the procedures and ensure the ethical soundness, identification of challenges, and lays the foundation of the main study.

The main study applied the validated research instruments to test the hypothesis, to examine variable relationships, and generate relevant findings related to the adolescent problematic behaviour related to internet gaming.

Pilot Study

Before commencing the main research, a pilot investigation was carried out to assess to make sure that the tools and methods were suitable for the participants taking part. The pilot sample comprised 100 high school students, from 10th, 11th, and 12th grades, aged between 15 and 19 years. Based on insights gained from this preliminary phase, several adjustments were implemented to enhance the qualitative exploration of intensive gaming behaviors, with particular emphasis on internet gaming-related constructs. The pilot study results showed a good consistency (Cronbach's alpha), making them appropriate for use in the study (Table 1).

Table 1

Reliability test on the scales used in the study

Variables	Items	Cronbach's Alpha (α)
GHQ-12	12	.79
IGDS9-SF	9	.76
<i>Personality Traits (BFI Domains)</i>		
Openness to experience	10	.72
Conscientiousness	8	.76
Extraversion	9	.79
Agreeableness	9	.79
Neuroticism	8	.71
<i>Emotional and Behavioral Problems (SDQ Domains)</i>		
Conduct problems	5	.71
Emotional problems	5	.72
Hyperactivity	5	.71
Peer problems	5	.72
Prosocial behavior	5	.71
Total difficulty Score	25	.72
Perceived Stress (PSS)	10	.71
Insomnia (ISI)	7	.75

Note. GHQ 12- General Health Questionnaire, IGDS9-SF- Internet Gaming Disorder Scale-Short Form, BFI- Big Five Factor Inventory, SDQ- Strengths and Difficulties Questionnaire, PSS- Perceived Stress Scale, ISI- Insomnia Severity Index

Main Study

Sample collection process

- To recruit the study participants, the study used a non-random sampling method, combining purposive and convenience sampling in multiple stages to select participants. The stages are as follows.
- Purposive sampling techniques were followed for selecting participants from 10th, 11th, and 12th classes from Government and private schools throughout Delhi NCR.
- The convenience sampling method was employed while selecting schools, while keeping their regular lectures uninterrupted.
- The students were approached for data collection during their extracurricular or lunch periods.

Response rate

A total of thirteen school authorities, both government and private, across Delhi NCR were approached for data collection, using the current study proposals and a human ethics clearance letter. Out of these, 8 schools granted permission for data collection.

Around 500 school-going students belonging to 10th, 11th, and 12th standards were screened for the study, out of which 452 participants were selected for participation as they were actively using the internet for playing games and fulfilling the study inclusion criteria. A total of 48 participants were excluded from the study due to non-fulfillment of predefined inclusion criteria. The participants were screened for psychological distress based on the GHQ-12 questionnaire. The GHQ-12 was administered with other tools and gathered all the data in one sitting.

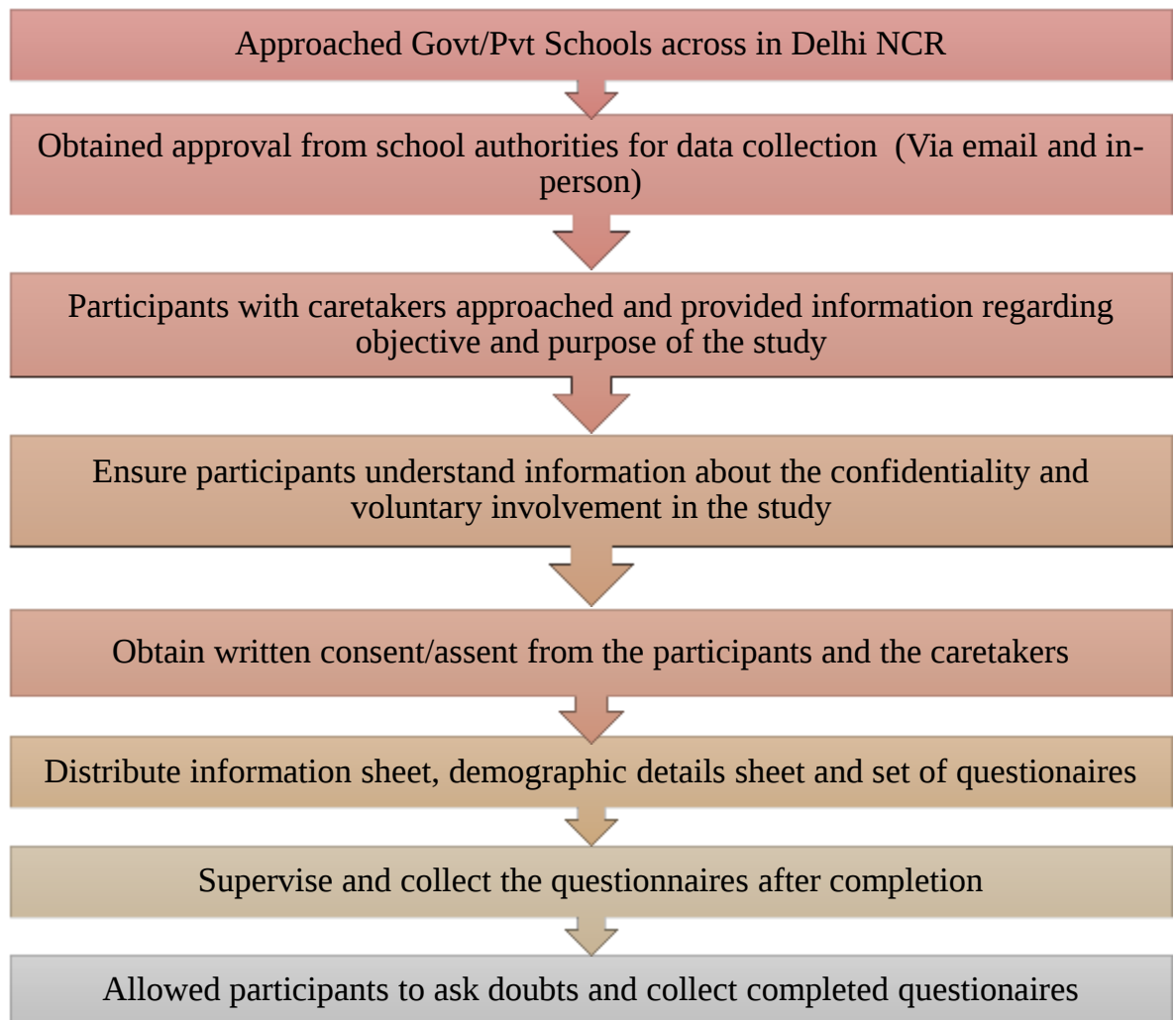
Duration of data collection

The sampling method included participants from different genders and school types to ensure balanced representation. The data collection process took place over a duration of around 12 months.

The following essential steps were followed for the study procedure as given in Figure 5.

Figure 5

Flowchart for the procedure of data collection



As shown in Figure 5, a systematic procedure was followed for the present study. The data collection process commenced only after obtaining Ethical clearance from the Human Ethics Committee, Mizoram University, followed by approval obtained from the respective schools' authorities across Delhi NCR. Approval to conduct research was obtained by the research supervisor and the Head of Department, ensuring institutional support and oversight. After getting permission

from the school authorities, participants and their caretakers were approached in their classrooms. Both were provided with comprehensive information regarding the research objective and purpose. Before data collection, written and verbal consent were obtained from each participant, ensuring the affirmation of their voluntary participation in the study. Informed consent was also obtained from their caregivers to ensure ethical compliance.

The researcher provided each participant with an information sheet, a consent form, and the questionnaire. The participants were instructed to carefully review the details provided in the information sheet and subsequently signed the consent form, which clearly explained that the answers would be kept confidential, their participation was entirely voluntary and they could refuse participation and withdraw at any given point without facing any consequences.

The questionnaire set was administered under the supervision of the researcher. Participants were given a break for lunch in between the overall assessment process. No rewards or payments were offered, ensuring ethical standards and the autonomy of the participants. Following the assessment, both school authorities and students were briefed on online game addiction/ problematic gaming and related psychological issues. Participants also had a chance to ask questions and clear their doubts after the assessment. Participants were assured that all the information provided would remain confidential and would be used exclusively for research purposes. It took about 30-35 minutes to complete the questionnaires.

Statistical Analyses

The data were analyzed using IBM SPSS software (version 26) with a significance threshold set at $p < 0.05$. Descriptive statistics helped to understand the patterns and prevalence of key variables among the youth. The study variables were tested by the Kolmogorov-Smirnov test for normality and to further evaluate the normality of the data, skewness and kurtosis values were examined. Descriptive statistics helped to understand the patterns and prevalence of key variables among the youth. For continuous data, the mean (M) and the standard deviation (SD) were calculated, while the categorical data were summarized using frequencies and

percentages (%). The Chi-square test was employed to assess the statistical relationship between various socio-demographic factors, including age group (≤ 15 years vs. > 15 years), gender, education level, family type, living arrangements, and a set of online gaming-related variables. These gaming variables encompassed the age of initiation playing games, money spent on in-game purchases, the degree of enjoyment experienced during gameplay, emotional reactions such as irritation and anger when games were disrupted or lost, feelings of guilt linked with gaming, the urge to play, the frequency of gaming sessions, and the perception of gaming as addictive. This analysis was conducted to help explain how demographic characteristics influence gaming experience. Normality was tested using the Kolmogorov-Smirnov test to assess whether the data followed a normal distribution. The independent and dependent variables were found not to be normally distributed; non-parametric tests were performed to maintain the analytical integrity. The Spearman correlation was employed to determine the links between personality traits, emotional and behavioral problems, perceived stress, and insomnia.

The Mann-Whitney U test was employed to explore how different types of games, like action, strategy, role-play, simulation, adventure, and combat games, might relate to various emotional and behavioral issues. Additionally, the same test was used to assess gender-based differences among study variables. To identify predictors of problematic gaming behavior, quintile regression analysis was conducted to understand the complexity of skewed data. Estimating the relationships at four distinct quintiles (0.25, 0.50, 0.75, and 0.90) will allow researchers to understand how various factors influence gaming behavior across different levels of severity.

CHAPTER V

RESULT AND DISCUSSION

RESULT AND DISCUSSION

The present study, entitled “Emotional, Behavioural Difficulties and Personality Traits of youth with Problematic Online Gaming,” investigates the impact of problematic online gaming on young individuals and its association with emotional and behavioural challenges. Furthermore, the study seeks to examine the personality traits that are linked to problematic gaming among youth. This chapter explains the statistical method used to explore the study hypothesis and fulfill the study objectives. The hypothesis formulated in Chapter 3 was tested through various statistical procedures. These includes: a) preliminary analysis such as data screening b) Descriptive summaries, Chi-square analysis to honor the diversity of participant’s background and gaming related variables, c) Correlation analysis to explore meaningful relationships among variables; d) the Mann-Whitney U Test to identify differences between preferred gaming genres and different emotional and behavioral problems and gender differences in personality traits among young population, e) to understand the predictive role of personality traits, emotional and behavioral problems, perceived stress and insomnia on problematic online gaming, Quantile Regression analysis was employed. Since the dataset did not conform to the assumptions of normality, non-parametric statistical tests were employed to analyze it.

Furthermore, the chapter discusses the key findings, which explored how problematic online gaming among youth relates to personality traits, emotional and behavioural issues, perceived stress, and insomnia. The chapter critically examines the prevalence of problematic online gaming, its related variables, gender differences, and interrelationships of other study variables. Furthermore, it elaborates on how the findings address the research questions and hypothesis, offering valuable insights into the study objectives.

Preliminary Analysis

Before diving into the main findings and hypothesis testing, the study begins with a careful check of the data. This included a pilot phase, followed by a data screening process and descriptive summaries of participants' background, and scores

from key questionnaires like General Health Questionnaire short-version (GHQ-12; Goldberg & Williams, 1988), Internet Gaming Disorder Scale- short-form (IGDS9-sf; Pontes and Griffiths, 2014), Big Five Inventory (BFI; Goldberg, 1993), Strength and Difficulty Questionnaire (SDQ; Goodman, 1997), Perceived Stress Scale-10 (PSS-10; Cohen et al., 1983), and Insomnia Severity Index (ISI; Morin, 1993).

Data screening process

Before hypothesis testing, it was essential to ensure the suitability and clarity of the collected data. Data were screened and considered for final analysis based on the inclusion and exclusion criteria. There were 452 individuals included in the final analysis. These steps are outlined below to demonstrate methodological rigor applied in validating the data for the current study.

Data coding and management

After data collection and screening, individual datasheets were assigned a serial number and systematically coded into an Excel spreadsheet. The entries were carefully checked to ensure they matched the original record and to eliminate discrepancies. The dataset was converted to a format compatible with SPSS 26th version, which was used for all statistical analyses done for the present study.

Normality Test

The study variables were tested by the Kolmogorov-Smirnov test for normality. First, a visual representation of the histograms and Q-Q plots indicated a noticeable deviation from the normal distribution. To further evaluate the normality, the skewness and kurtosis values were examined. According to established guidelines, the value should fall within ± 1.96 (Hair et al., 2013) and ± 2.00 (Field, 2000; Garson, 2012; George & Mallery, 2003; Gravetter et al., 2017). In the present study, all values were outside that range, confirming non-normality. Detailed values are presented in Table 2.

Table 2 highlights the mean scores, standard deviation (SD), Skewness, and Kurtosis of the study variables. The descriptive statistics of study variables indicated non-normality in the data, suggesting the need for nonparametric statistical analysis.

The mean score for problematic online gaming was 17.15 (SD = 0.475). For the Big Five Personality traits, the domains with the highest mean scores were as follows: openness to experience (M= 33.52, SD= 5.30), agreeableness (M= 30.38, SD= 5.29), and conscientiousness (M= 27.30, SD= 4.85). The domains with the lowest mean scores were: extraversion (M= 24.58, SD= 4.81), and neuroticism (M= 23.94, SD= 5.60).

In the Strength and Difficulty Questionnaire (SDQ) domains, the mean scores were as follows: total difficulty score (SDQ total) of 15.29 (SD = 5.29), prosocial behavior (M = 6.65, SD = 2.43), and hyperactivity (M = 4.26, SD = 2.14). The domains with the lowest mean scores were emotional problems (M = 3.94, SD = 2.28), peer problems (M = 3.78, SD = 1.69), and conduct problems (M = 3.12, SD = 1.70). Additionally, the mean scores for perceived stress and insomnia were 19.15 (SD = 6.05) and 9.99 (SD = 5.73), respectively.

Table 2

Descriptive statistics of study variables (N=452)

Variables	Mean	SD	Skewness	Std. Error	Kurtosis	Std. Error
Problematic online gaming (IGD)	17.15	.475	.475	.115	-.583	.229
<i>Personality Traits</i>						
Openness to experience	33.52	5.30	-.213	.115	-.357	.229
Conscientiousness	27.30	4.85	.158	.115	-.096	.229
Extraversion	24.58	4.81	.073	.115	-.022	.229
Agreeableness	30.38	5.29	-.069	.115	-.336	.229
Neuroticism	23.94	5.60	.271	.115	.131	.229
<i>Emotional and Behavioural Problems</i>						
Conduct problem	3.12	1.70	.306	.115	-.652	.229
Emotional Problem	3.94	2.28	.245	.115	-.544	.229
Hyperactivity	4.26	2.14	.165	.115	-.462	.229
Peer problem	3.78	1.69	.182	.115	-.330	.229
Prosocial Behavior	6.65	2.43	-.530	.115	-.437	.229

Total Difficulty Score	15.29	5.29	.245	.115	-.278	.229
Perceived Stress	19.15	6.05	.345	.115	-.120	.229
Insomnia	9.99	5.73	.342	.115	-.459	.229

Note. SD: Standard Deviation, SDQ- Strengths and Difficulties Questionnaire; Total difficulty scores from SDQ domains (includes emotional, conduct problems, hyperactivity, and peer problems)

Table 3 presents the distribution and detailed demographic characteristics of the participants. The chart below presents a summary of demographic characteristics to better understand the sample.

Table 3

Socio-demographic details of the gamers (N= 452)

Socio-demographic characteristics				
Distribution of gender among gamers in numbers and percentage				
Male	Female			
293 (65%)	159 (35%)			
Distribution of age among the gamers				
15 years	16 years	17 years	18 years	19 years
88 (20%)	40 (31%)	166 (37%)	49 (11%)	9 (2%)
Distribution of education qualifications among the gamers				
10 th Std.	11 th std.	12 th std.		
130 (29%)	172 (38%)	150 (33%)		
Distribution of family type among the gamers				
Joint	Nuclear			
185 (41%)	267 (59%)			
Distribution of living arrangements among the gamers				
Home	Hostel	Rented accommodations		
113 (25%)	231 (51%)	108 (24%)		

Note. Mean Age = 16.45 (SD= 0.98)

Figure 6 illustrates the gender distribution across the two groups of participants, revealing that 65% males and 35% females were reported to be engaging in gaming. These findings indicate that male participants were more actively involved in gaming compared to their female counterparts.

Figure 6

The Gender distribution diagram (N= 452)

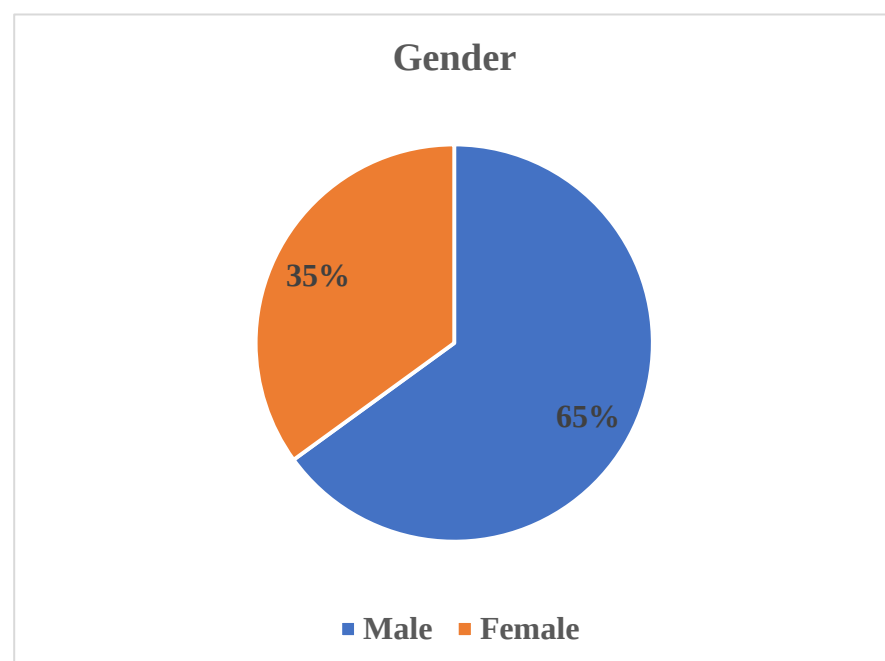
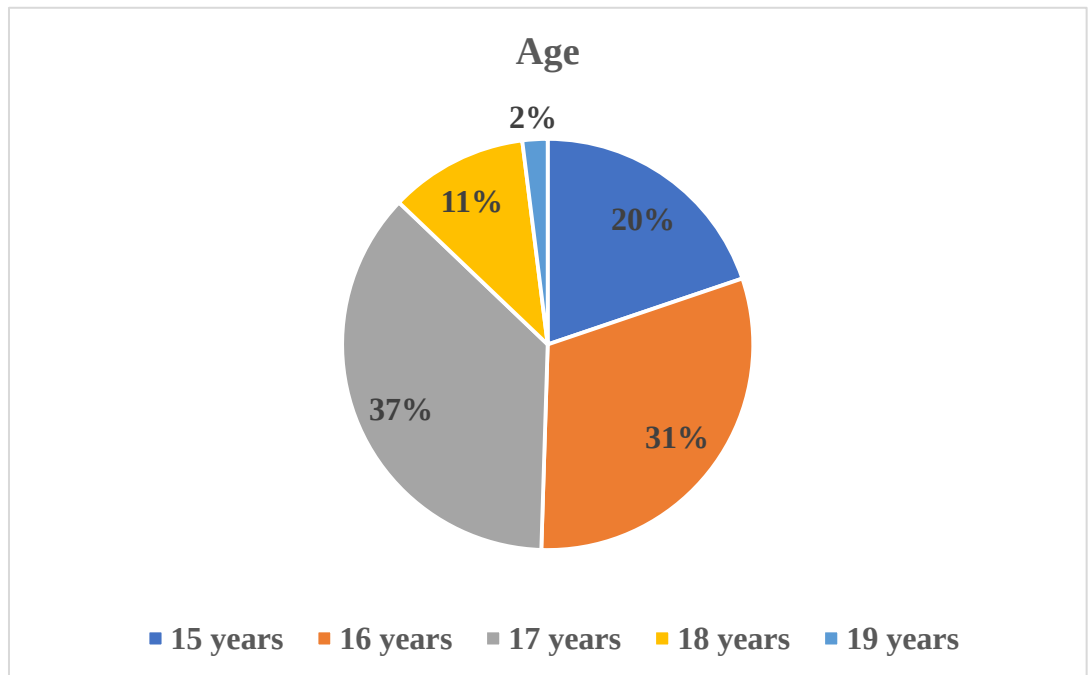


Figure 7 represents the distribution of age groups among the gamers, indicating that the largest group of gamers belongs to the 17-year age group, which is 37%. 16-year-olds, making up 31%, follow this. The 15-year-olds comprise 20% gamers, while the 18-year-olds account for 11% gamers. The smallest group is the 19-year-olds, with only 2% gamers. On average, the gamers were 16.45 years old, indicating a mid-adolescent cohort.

Figure 7

Showing the distribution of age from the overall sample (N=452)



Note. Mean age= 16.45

The distribution of education levels (Figure 8) among the gamers represents that 29% belong to the 10th std, 38% belong to the 11th std, and 33% belong to the 12th std. This indicates that most gamers involved in playing online games are from the 11th std.

Figure 8

Presenting the educational levels of gamers

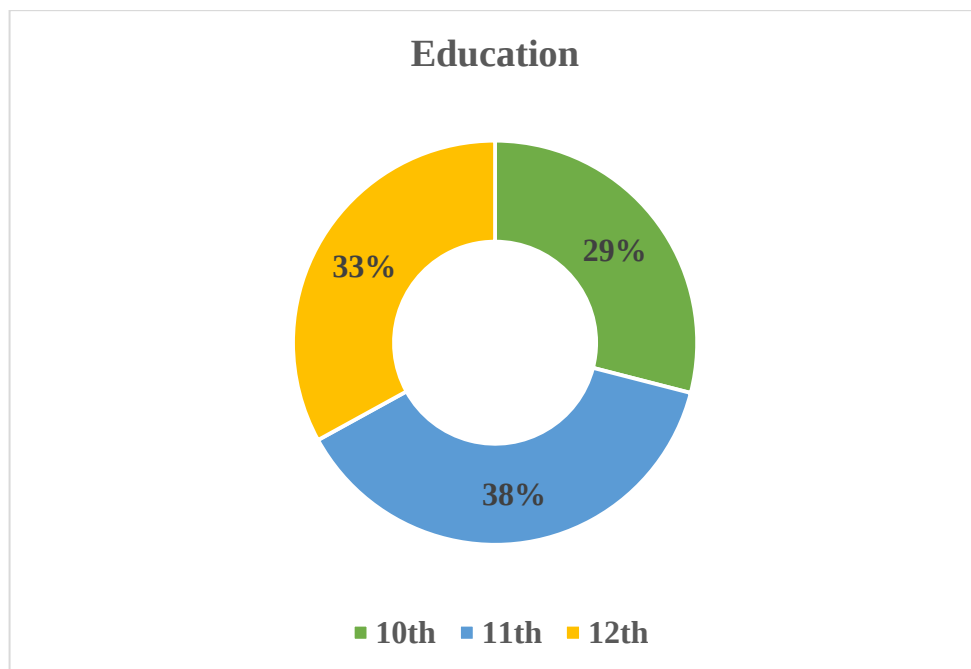
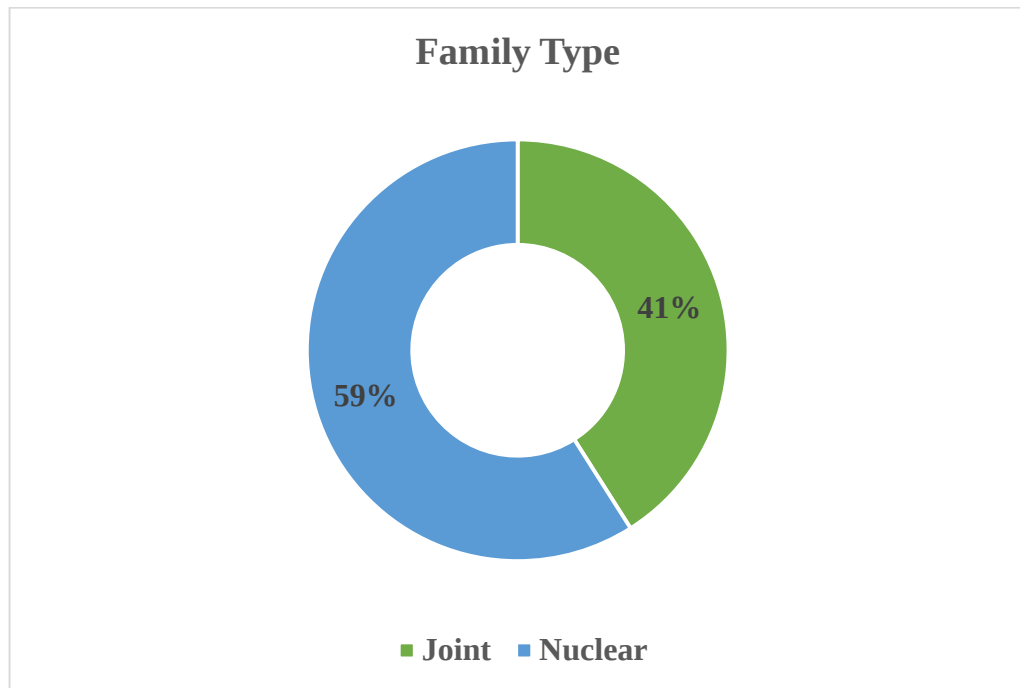


Figure 9 shows that 59% participants live in nuclear families, while 41% participants reside in joint families. This indicates that most of the participants come from nuclear family backgrounds.

Figure 9

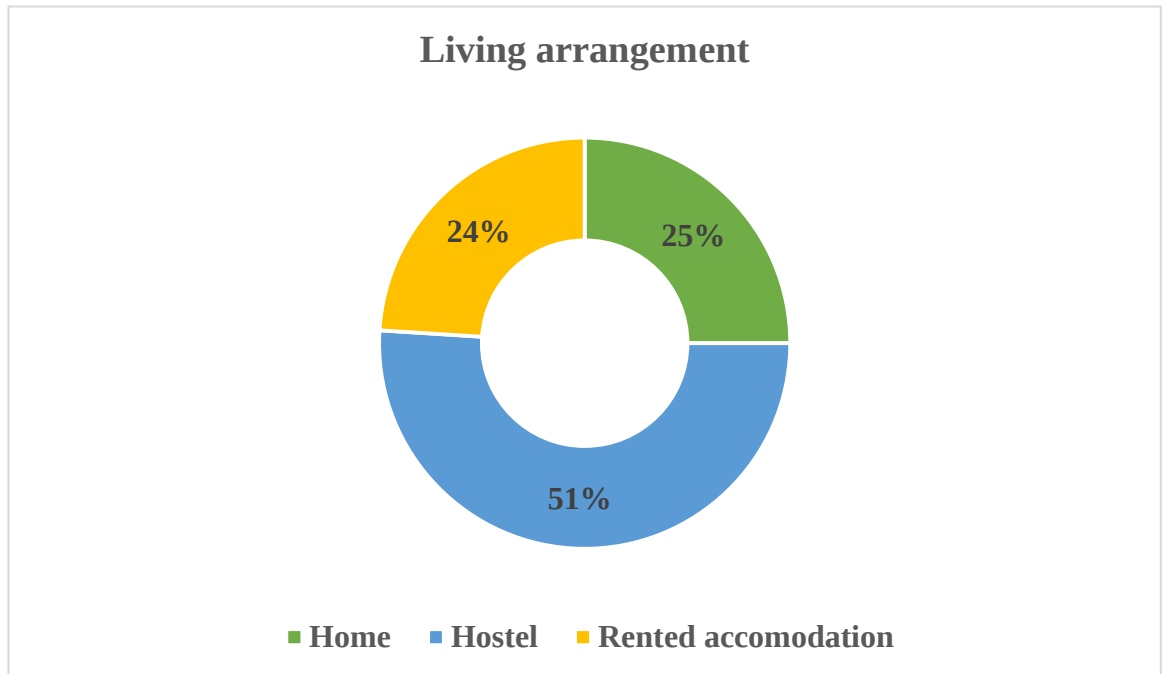
Shows classifications of family type



The diagram (Figure 10) shows the residential status of the participants, revealing that most of the participants live away from their homes. Most of them, 51% participants, stay in hostels, while 25% participants reside in their homes, and 24% stay in rented places like apartments or rooms.

Figure 10

Living arrangements of gamers



Characteristics of Online Gaming-Related Variables

As detailed in Table 4, one-quarter of participants (25%) reported making planned in-game purchases, while the remaining 75% did not engage in such spending. A significant majority (85%) expressed enjoyment in gaming, whereas 16% participants indicated they did not derive pleasure from it. Regarding the perceptions of addiction, 58% of respondents considered online games to be addictive, while 43% disagreed. When asked about compulsive gaming tendencies, 45% participants acknowledged experiencing a persistent urge to play, in contrast to 55% participants who did not report such urges. Emotional responses to game-play disruptions were also notable: 56% participants reported feeling irritated or angry after losing or encountering interruptions, whereas 44% participants did not experience such reactions.

Table 4*Descriptive statistics for online gaming-related variables*

	<i>No</i>	<i>Yes</i>
<i>Online Gaming Variables</i>	<i>N (%)</i>	<i>N (%)</i>
Money spent on buying Games	338 (75%)	114 (25%)
A feeling of enjoyment while playing games	70 (16%)	382 (85%)
Irritation & anger at the loss of Games or the disruption of games	198 (44%)	254 (56%)
Guilt for engaging in games	297 (66%)	115 (34%)
Urge to play games	247 (55%)	205 (45%)
Are games addictive?	192 (43%)	260 (58%)

Note. N=452

Table 5 demonstrates the age of initiation for playing online games and the daily time spent on gaming.

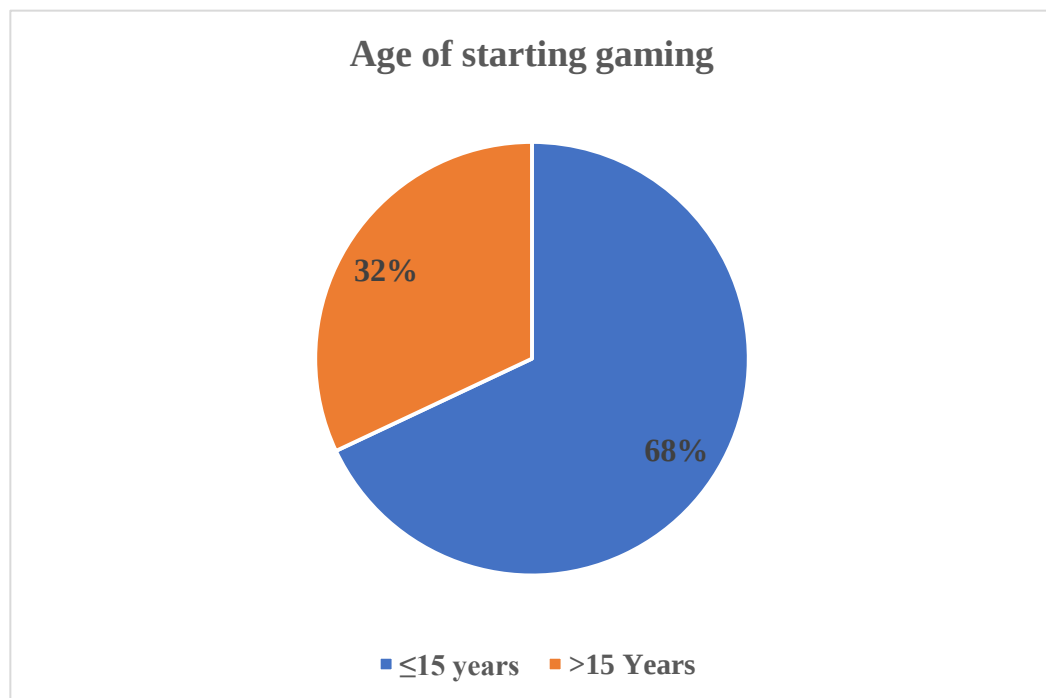
Table 5*Age at which they started playing online games and duration of daily gameplay*

	Category	Frequency (N)	Percentage (%)
Age Started Playing Gaming	≤15 years	307	68
	>15 years	146	32
Daily time spent on Gaming	1-2 hours	351	78
	3-4 hours	77	17
	5-6 hours	7	2
	>6 hours	17	4

Figure 11 illustrates that most participants (68%) reported initiating gameplay at or before the age of 15, whereas 32% participants began gaming after the age of 15.

Figure 11

Presents the age of onset for Gaming behavior (N=452)



The graph (Figure 12) represents gamers' daily engagement in online gaming. Regarding the duration of gaming sessions, most of them, 78%, played for 1-2 hours daily, 17% played for 3-4 hours, 2% played for 5-6 hours, and 4% were involved in gaming more than 6 hours a day.

Figure 12

Presents the frequency of daily online gaming over the 12 months

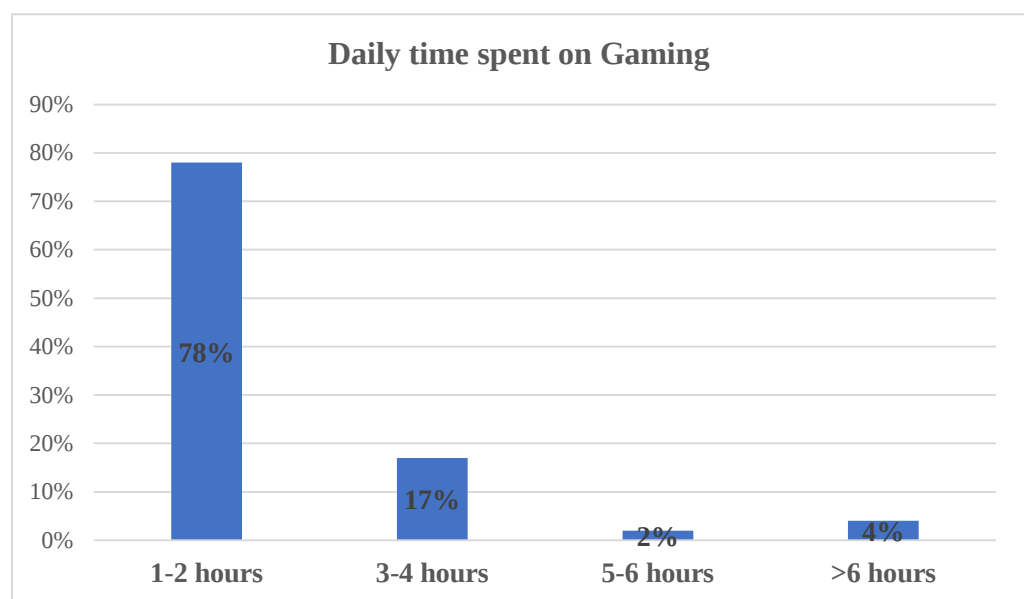


Table 6 demonstrates the frequency (N) and percentage (%) of platform usage and genre preferences among the gamers

Table 6*Platform used for playing games and Genre preference (N=452)*

Category		No	Yes
		<i>N (%)</i>	<i>N (%)</i>
Platform Usage	Dedicated gaming laptop	435 (96%)	17 (4%)
	Gaming console	429 (95%)	23 (5%)
	PC/Laptop	323 (72%)	129 (29%)
	Mobile/smartphones	66 (15%)	386 (85%)
Genre preference	Action	193 (43%)	259 (57%)
	Strategy	304 (67%)	148 (33%)
	Roleplay	384 (85%)	68 (15%)
	Simulation	370 (82%)	82 (18%)
	Adventure	270 (60%)	182 (40%)
	Combat	340 (75%)	112 (25%)

Note. No- Did not prefer; Yes- Prefer

The graph (Figure 13) presents the common platform used by gamers for playing online games. Most of them (85%) used smartphones for gaming, while 15% gamers did not. As for the other platforms, 29% gamers used a PC/laptop, 5% used gaming consoles, and 4% used a dedicated gaming laptop. However, the majority did not use the platforms, with 72% not using a PC/Laptop, 95% not using gaming consoles, and 96% not using dedicated gaming laptops.

Figure 13

Presents the platform used by gamers for online gaming

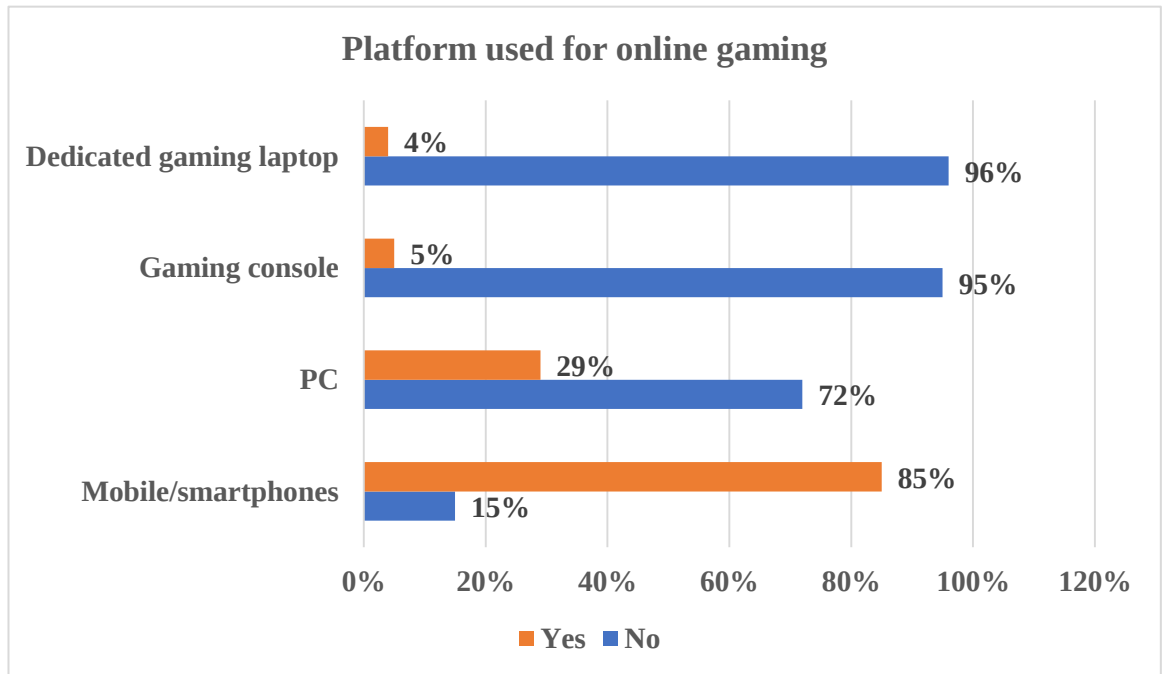


Figure 14 highlights the preferred gaming genres among online gamers. Out of 452, 57% of gamers preferred action-related games, while 43% did not. A smaller group of gamers (33%) engaged in strategy-related games, while 67% did not prefer this genre. Only 15% played role-play-related games, while 85% did not. Simulation games were played by 18% gamers, with the majority of them (82%) not engaging in this genre. Adventure games were preferred by 40%, while 60% did not play them. Combat games were played by 25% gamers, whereas 75% were not involved in this genre.

Figure 14

Shows the distribution of preferred gaming genres

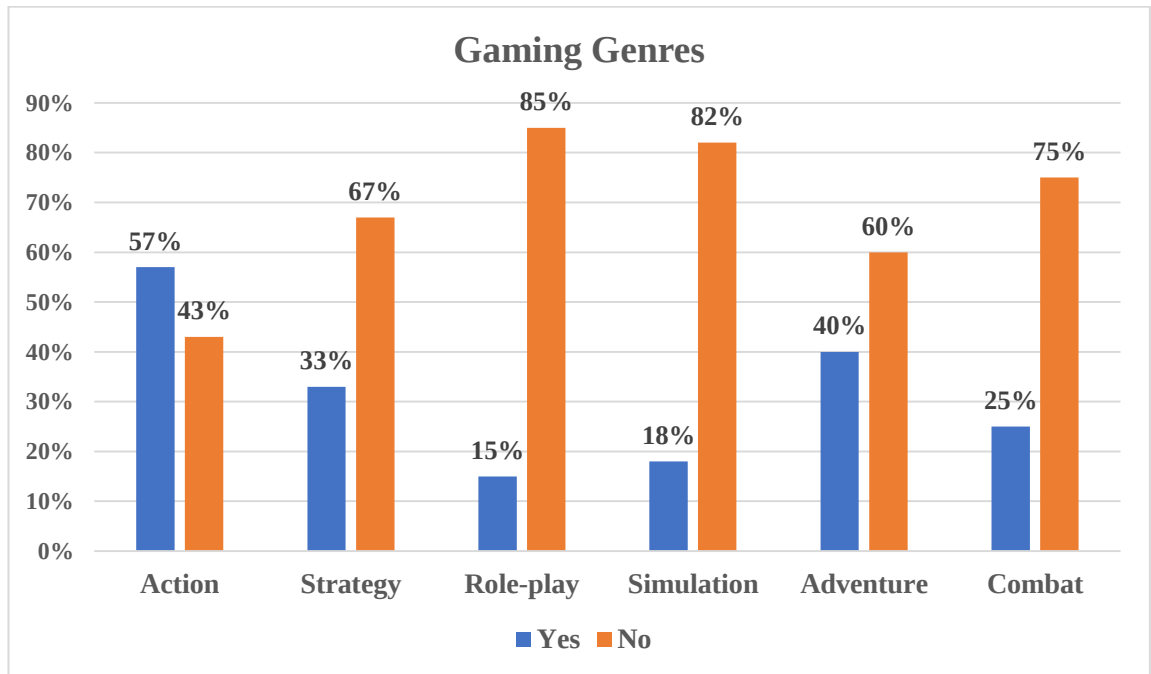


Table 7 offers a rich matrix of chi-square results exploring the associations between online-gaming related variables and six socio-demographic factors: gender, age group, education, family type, and living arrangement. The results offer critical insights into patterns of digital engagement among adolescents. The age variable was grouped into two cohorts: 15-16 years and 17-19 years, while the age of gaming initiation was dichotomized into ≤ 15 (N=182) years and > 15 years (N=46). The analysis identified a significant relation between the age of initiating gaming and age group, $\chi^2 = 30.93$ (df=1, $p < .001$); education level $\chi^2 = 9.72$ (df=2, $p = .008$); and living arrangement $\chi^2 = 10.15$ (df=2, $p = .006$), suggesting that developmental stage, academic exposure, may shape early gaming habits.

Gender emerged as a particularly salient factor, showing strong associations with monetary investment in games $\chi^2 = 40.62$ (df=1, $p < .001$) and enjoyment $\chi^2 = 30.77$ (df=1, $p < .001$), urge to play $\chi^2 = 22.76$ (df= 1, $p < .001$), frequency $\chi^2 = 59.78$ (df= 2, $p < .001$), and daily engagement $\chi^2 = 20.19$ (df= 3, $p < .001$), underscoring

potential gendered motivations and behavioural tendencies in gaming. Feeling of guilt were more prevalent among specific age groups, $\chi^2 = 4.91$ (df= 1, $p < .05$), pointing to the role of cultural and developmental norms in shaping affective experiences. The urge to play also varied significantly by education, $\chi^2 = 9.43$ (df= 2, $p < .01$) and family type $\chi^2 = 4.54$ (df= 1, $p < .05$), indicating that structural and cognitive factors may influence compulsive tendencies. Frequency of gaming was significantly associated with age groups $\chi^2 = 6.81$ (df=2, $p < .05$). Collectively, these results emphasize the complex interplay of adolescent gaming behavior and underscore the importance of tailoring interventions to demographic profiles and psychosocial contexts.

Table 7

Chi-square test for examining the associations between online-gaming-related behaviors and socio-demographic factors

	Gender	Age Groups	Education	Family Type	Living arrangement
Age of starting gaming	$\chi^2 = .082$ df = 1 p -value = .77	$\chi^2 = 30.93$ df = 1 p -value = 0.000***	$\chi^2 = 9.72$ df = 2 p -value = .008*	$\chi^2 = 1.63$ df = 1 p -value = .20	$\chi^2 = 10.15$ df = 2 p -value = 0.006*
Money spent on buying Games	$\chi^2 = 40.62$ df = 1 p -value = 0.000***	$\chi^2 = .576$ df = 1 p -value = .44	$\chi^2 = .990$ df = 2 p -value = .61	$\chi^2 = .650$ df = 1 p -value = .42	$\chi^2 = .142$ df = 2 p -value = .93
A feeling of enjoyment while playing games	$\chi^2 = 30.77$ df = 1 p -value = 0.000***	$\chi^2 = .193$ df = 1 p -value = .66	$\chi^2 = 1.02$ df = 2 p -value = .60	$\chi^2 = 3.09$ df = 1 p -value = .07	$\chi^2 = 2.68$ df = 2 p -value = .26
Irritation & anger at the loss of Games or the disruption of games	$\chi^2 = 2.12$ df = 1 p -value = .14	$\chi^2 = .001$ df = 1 p -value = .98	$\chi^2 = 2.38$ df = 2 p -value = .30	$\chi^2 = .000$ df = 1 p -value = .99	$\chi^2 = .858$ df = 2 p -value = .65
Guilt for engaging in games	$\chi^2 = .26$ df = 1 p -value = .60	$\chi^2 = 4.91$ df = 1 p -value = 0.02*	$\chi^2 = .705$ df = 2 p -value = .70	$\chi^2 = 1.68$ df = 1 p -value = .19	$\chi^2 = .21$ df = 2 p -value = .89
Urge to play games	$\chi^2 = 22.76$ df = 1 p -value = 0.000***	$\chi^2 = .09$ df = 1 p -value = .76	$\chi^2 = 9.43$ df = 2 p -value = 0.009*	$\chi^2 = 4.54$ df = 1 p -value = 0.03*	$\chi^2 = 5.06$ df = 2 p -value = .06
Frequency of Gaming	$\chi^2 = 59.78$ df = 2 p -value = 0.000***	$\chi^2 = 6.81$ df = 2 p -value = 0.03*	$\chi^2 = 3.19$ df = 4 p -value = .52	$\chi^2 = 1.35$ df = 2 p -value = .50	$\chi^2 = .893$ df = 4 p -value = .92

Are games addictive?	$\chi^2 = .012$ df = 1 p -value = .91	$\chi^2 = .961$ df = 1 p -value = .32	$\chi^2 = .995$ df = 2 p -value = .60	$\chi^2 = .07$ df = 1 p -value = .78	$\chi^2 = 2.06$ df = 2 p -value = .35
Daily Time spent on gaming	$\chi^2 = 20.19$ df = 3 p -value = 0.000***	$\chi^2 = 1.59$ df = 3 p -value = .66	$\chi^2 = .3.96$ df = 6 p -value = .68	$\chi^2 = .92$ df = 3 p -value = .82	$\chi^2 = 5.61$ df = 6 p -value = .46

Note. $p < 0.001$ ***; $p < 0.01$ **; $p < 0.05$ *

The rapid expansion of online gaming in India, driven by fast internet and advanced technology, has become a double-edged sword for young people in India. While online gaming can provide entertainment, it has also brought significant worries about its harmful risk on both physical and psychological health. Many young individuals find themselves increasingly addicted to online games, which can lead to neglecting essential activities such as academics, work, and social interactions. A key factor contributing to the popularity of video games among students is their sophisticated design; moreover, these games are made to captivate gamers' curiosity with attractive gameplay, realistic images, and sounds. Previous studies have highlighted that understanding the global epidemiological impact of gaming disorder is essential (Satapathy et al., 2024). Adolescents represent a critical demographic in the study of gaming disorder due to their heightened vulnerability during a phase of rapid psychological, emotional, and social development.

The adolescent years represent a pivotal phase of development defined by profound psychological and behavioural changes, during which the urge to explore intensifies. Adolescents are frequently shaped by societal perceptions and stereotypes related to deviant behaviors, many of which increasingly emerge within digital spaces (Novrialdy et al., 2019). Studies have highlighted that excessive time spent gaming among adolescents with problematic usage patterns aligns with the concept of tolerance in Internet Gaming Disorder (IGD). This means that over time, disordered/problematic gamers need to extend their gaming duration to attain the same level of satisfaction (Macur & Pontes, 2021). Even though gaming is not inherently harmful, adolescents can start experiencing and navigating consequences due to their inability to resist playing, a lack of control over their gaming behavior,

peer pressure, negative emotions, and withdrawal symptoms when they cannot play (Eskasasnanda, 2017).

Given this background present study aimed to identify personality traits, emotional and behavioural difficulties, perceived stress, as well as insomnia among youth with problematic gaming. The initial phase of the study focused on examining how common problematic gaming is and exploring related characteristics. Secondly, it compared the genres of games played and examined differences in emotional and behavioural difficulties among gamers. Additionally, the study assessed the gender differences in the study variables. Furthermore, the study aimed to determine the personality dimensions, emotional and behavioural problems, perceived stress, and insomnia associated with problematic online gaming. Finally, the study sought to understand how these factors predict problematic online gaming.

Objective 1: To analyze the gender specific patterns and characteristics related to internet gaming behaviour among youth

Based on the study results, the present study reveals significant gender disparities in online gaming behavior, with male participants (65%) being more actively involved than their counterparts (35%). As expected, the study findings support the hypothesis of significant gender disparities among online gamers (see **Hypothesis 1**). The findings support previous studies, which indicate that problematic gaming is more common among Indian adolescent males than females (Singh et al., 2020; Sharma et al., 2023; Ahmed et al., 2022). The present findings identify that male gender is a significant predictor of problematic online gaming. Paulus et al. (2018) found that IGD rates were over five times higher in males than in females.

From the socio-demographic data (see Figure 6-10), it was found that most of the participants belonged to the 11th grade (38%), nuclear families (59%), and living in hostel accommodation (51%) settings were involved in online gaming. The findings suggested by previous studies are that an individual who belongs to a nuclear family reports more problematic gaming (Shrestha et al., 2023). These findings are further corroborated by neuroimaging data, revealing gender-based

differences in mesocorticolimbic activation during gaming, with males exhibiting significantly greater neural involvement. Elevated brain activity in reward circuit responses suggests that males may experience a stronger neurological response to gaming stimuli, potentially making them more prone to developing addictive gaming behaviors (Mentzoni et al., 2011).

The present data showed that males not only participated but also scored higher on the problematic online gaming behaviour. Developers also target female gamers in developing games, including social, story-based, and casual games. These games are less demanding and safer (Dong et al., 2018). Females may exhibit better executive control than men when faced with gaming cues, which may provide resilience against the development of IGD (Dong et al., 2018). As presented in Table 5, 68% of participants reported initiating online gaming at the age of 15 or before. Furthermore, 58% reported that games are addictive, and 45% urged to play games (see Table 4). Past studies have suggested that beginning gaming activity at an early age, before the development of early basic reasoning skills, may heighten the susceptibility to Internet Gaming Disorder (Singh et al., 2021). 56% of participants reported yes to feeling irritation or anger on disruption or loss of games (See Table 4).

In the present study, 85% reported a feeling of enjoyment while playing games (see Table 4). Given that participation in challenging and competitive scenarios significantly contributes to the enjoyment of computer games, it is plausible that individual differences in the preference for such engagement may modulate the degree of enjoyment experienced (Vorderer et al., 2003). Specifically, individuals with a higher predisposition toward competitive behavior may derive greater satisfaction from gaming activities that emphasize competition. Most participants indicated that they did not spend money on purchasing games or leveling up. Past studies have suggested a link between spending money on online gaming-related activities and IGD (Kochuchakkalackal & Reyes, 2020). The risk of addiction increases by 3.15 times when adolescents prefer spending time on games (Shrestha et al., 2023).

According to many researchers, investment in gaming-related purchases is a significant characteristic (Liao et al., 2020). However, 25% in the current study reported spending money on these activities.

Moreover, several structural characteristics of games can make gamers more likely to develop gaming addiction (Kuss, 2013). Most of the participants reported the addictive nature of online games. Features such as reward systems, in-game achievements, social-interaction elements, and immersive graphics and sound contribute to making these games highly engaging and difficult to resist. These elements can create compelling and often addictive experiences, particularly for individuals who are vulnerable to gaming addiction. In the present study (see Figure 14), most of the participants reported using smartphones (85%) and PC (29%) for playing online games. Recent advances in smartphone game platforms, faster processors, and improved internet connectivity have significantly increased accessibility to a wide variety of games, including real-time strategy, role-play, action, adventure, etc. (Paik et al., 2017). These developments have made it easier for gamers to engage with their preferred types of games anytime and anywhere, contributing to the growing popularity and reach of mobile gaming.

There is still limited research on how gaming-related behavior affects mental and psychological health. Though time investment and gaming genres are important factors, no study has pinpointed which genres most contribute to IGD (Na et al., 2017). The present study aims to fill the gap in the literature by understanding the role that game genres contribute to the development of IGD and related psychological concerns. By looking at gaming genres, games were classified into six primary genres- action, adventure, role-play, simulation, and combat games (See Figure 15). Among these, action games (57%) were more frequently played than adventure games (40%). These findings were aligned with the earlier studies that action and adventure games substantially impacted IGD (Singh et al., 2021; Salam et al., 2020; Heiden et al., 2019; Gulp, 2017).

Objective 2: To compare preferred gaming genres (i.e., Action, strategy, role-play, simulation, adventure, and combat games) and analyze the differences in emotional and behavioral problems among youth.

Table 8 provides a comprehensive comparison of genre groups across the independent variables (e.g., emotional issues, conduct problems, hyperactivity, peer-related problems, prosocial behavior, and problematic online gaming). The comparison groups reveal significant differences across a range of variables like hyperactivity, emotional difficulties, peer issues, and Internet Gaming Disorder. However, there were no significant differences observed for the total difficulty score and conduct problems. Gamers were grouped by preferred gaming genres. The Mann-Whitney U test revealed a significant difference in psychological outcomes based on gaming preferences. Gamers who played action ($U = 22233.5$, $z = -2.01$, $p = 0.04$) and adventure games ($U = 21297$, $z = -2.40$, $p = 0.01$) were found to have more signs of problematic online gaming. Those who played role-play related games reported more hyperactivity ($U = 10593$, $z = -2.50$, $p = 0.01$). Gamers who played simulation-related games showed more peer-related problems ($U = 12828$, $z = -2.22$, $p = 0.02$), while emotional problems were prominent among gamers involved in combat games ($U = 16391$, $z = -2.22$, $p = 0.02$).

Table 8

Showing the Mann-Whitney U Test for the comparison groups of genres played and differences in emotional and behavioural problems, and problematic online gaming

Comparison Of Genres	Problematic online gaming	Conduct Problems	Emotional Problems	Hyperactivity	Peer-problems	Prosocial Behavior	Total difficulty (SDQ Total)
Action vs. non-action	U= 22233 z = -2.01 p= 0.04* MR (Y/N) = 237/212	U=24317 z = -0.49 p= 0.61 MR (Y/N) =229/223	U=23154 z = -1.35 p= 0.17 MR (Y/N) = 219/236	U= 22753 z= -1.64 p= 0.09 MR (Y/N) = 235/215	U=24744.5 z = -0.18 p= 0.85 MR (Y/N) = 226/228	U=24434 z = -0.41 p= 0.68 MR (Y/N) = 224/229	U=24936 z = -0.04 p= 0.96 MR (Y/N) =226/227
Strategy vs. non-strategy	U = 20861 z = -1.25 p= 0.20 MR (Y/N) = 215/232	U = 20689 z = -1.40 p= 0.15 MR (Y/N) = 214/232	U = 21920 z = -0.44 p= 0.65 MR (Y/N) = 230/225	U = 21576 z = -0.71 p= 0.47 MR (Y/N) = 233/223	U = 22043 z = -0.35 p= 0.72 MR (Y/N) = 223/228	U = 20284 z = -1.71 p= 0.08 MR (Y/N) = 241/219	U=22033 z = -0.35 p= 0.72 MR (Y/N) = 223/228
Roleplay vs. non-role-play	U = 11537 z = -1.53 p= 0.12 MR (Y/N) = 249/223	U = 12723 z = -0.34 p= 0.73 MR (Y/N) = 231/226	U = 13019 z = 15365 p= 0.97 MR (Y/N) = 226/227	U = 10593 z = -2.50 p= 0.01* MR (Y/N) = 263/220	U = 12058 z = -1.02 p= 0.30 MR (Y/N) = 212/229	U = 11596 z = -1.48 p= 0.13 MR (Y/N) = 205/230	U=12328 z = -0.73 p= 0.46 MR (Y/N) = 237/225
Simulation vs. non-simulation	U = 14671 z = -0.46 p= 0.64 MR (Y/N) = 233/225	U = 14423 z = -0.70 p= 0.47 MR (Y/N) = 217/229	U = 14441 z = -0.687 p= 0.49 MR (Y/N) = 218/228	U = 13333.5 z = -1.73 p= 0.08 MR (Y/N) = 249/221	U = 12828 z = -2.22 p= 0.02* MR (Y/N) = 198/233	U = 15159 z = -0.01 p= 0.99 MR (Y/N) = 226/227	U = 14202.5 z = -0.90 p= 0.36 MR (Y/N) = 215/229
Adventure vs. non-adventure	U = 21297 z = -2.40 p= 0.01* MR (Y/N) = 244/214	U = 23028 z = -1.14 p= 0.25 MR (Y/N) = 235/221	U = 23862.5 z = -0.52 p= 0.60 MR (Y/N) = 230/224	U = 23663 z = -0.67 p= 0.50 MR (Y/N) = 231/223	U = 23715 z = 40368 p= 0.52 MR (Y/N) = 222/230	U = 22086 z = -1.83 p= 0.06 MR (Y/N) = 213/236	U = 24475.5 z = -0.06 p= 0.94 MR (Y/N) = 227/226
Combat vs. non-combat	U = 17332 z = -1.42 p= 0.15 MR (Y/N) = 242/221	U = 19038 z = -0.0 p= 0.99 MR (Y/N) = 227/226	U = 16391 z = -2.22 p= 0.02* MR (Y/N) = 203/234	U = 18456 z = -0.49 p= 0.62 MR (Y/N) = 232/225	U = 18771 z = -0.22 p= 0.82 MR (Y/N) = 224/227	U = 18665 z = -0.31 p= 0.75 MR (Y/N) = 223/228	U = 17957 z = -0.90 p= 0.36 MR (Y/N) = 217/230

Note. ** $p < 0.01$; * $p < 0.05$; Total difficulty scores from SDQ domains (includes emotional, conduct problems, hyperactivity, and peer problems)

As predicted (see **Hypothesis 2**), a significant difference was found in emotional and behavioural problems based on the participants' preferred game genres. Thus, the study findings support the proposed hypothesis. According to the present study, action and adventure gamers exhibited higher levels of problematic online gaming (see Table 8). A significant difference was found between individuals who played action games and those who did not ($U = 22233, p < 0.05$). Likewise, a statistically significant difference was observed between gamers who played adventure games and those who did not ($U = 21297, p < 0.01$), which aligns with previous findings. The action-adventure related games tend to keep gamers hooked longer, probably due to their fast-paced and adrenaline-driven nature (Gurp, 2017; Strojny et al., 2023). Today, it is not just about playing games; gamers also engage in various activities related to gaming. Consequently, as per Figure 13, this study found that most participants spend 1-2 hours daily (78%) playing games, and 17% reported playing games for 3-4 hours daily. Past research has suggested that the amount of time spent daily is linked to IGD (Ismail et al., 2021; Gurp, 2017).

Narrative and identity features allow gamers to assume different identities, either as a made-up character or a personalized avatar, which immerses gamers in the video game experience (King et al., 2010). In some simulation games like SimCity, gamers manage simultaneously multiple roles and objects, which helps build strategic thinking and multitasking skills. Many games also allow gamers to accommodate their customized preferences. For instance, in role-playing genre-based games (RPGs), users select traits such as race, gender, appearance, and ability. This kind of identity play is more than just entertainment, but also psychologically makes gamers engage in gaming-related activities. Research on gender swapping in Massive-Multiplayer Online Role-Playing Games (MMORPGs) highlights that being able to explore different identities can be a factor in why people play online games (King et al., 2010). In the present study, very few reported being involved in role-play-related games (15%), and 33% of gamers reported playing strategy-related games (see Figure 15). This was inferred to be the least preferred genre

by the current study participants. This may be a result of the age range in our sample. Empirical studies have found that genres such as MMORPGs and RPGs are predominantly favored by older adolescents (Elliott et al., 2012; Gorp, 2017).

The Mann-Whitney U test indicated a significant difference between participants more involved in role-play games and those who were not. Hyperactivity was associated with individuals who were more engaged in role-play-related games ($U = 10593$, $p < 0.01$) (see Table 8). Previous literature found that various genres of specific games, particularly strategy and role-playing games, are associated with vulnerability to IGD (Singh et al., 2021). This supports the current study findings. Previous study findings have suggested that ADHD severity is linked to video game addiction, and this connection may be influenced by the type of game played and its reinforcement intensity. Games like MMORPGs, with evolving reward systems and immersive mechanics, are especially potent in reinforcing excessive play and increasing addiction risk (Masi et al., 2021).

The gamers who participated in a strategy genre-related gamers group did not exhibit any statistically significant variation in scores related to psychological variables. A significant difference was inferred between participants who played simulation games and non-simulation gamers. Simulation gamers reported having peer problems ($U = 12828$, $p < 0.05$) in the present study (See Table 8). Gorp (2017) conducted a study suggesting that adolescents engaged in simulation genre-based games are prone to spending more time gaming because these games often lack a fixed endpoint, causing gamers to continue gaming and lose track of time. Studies have suggested that simulation gamers play games more to relieve stress and exhibit a higher degree of smartphone addiction than non-IGD individuals (Paik et al., 2017).

The present study found that participants who played combat games differed significantly from those who did not play. The present study reported that gamers who engaged in combat genre-related games

reported experiencing higher levels of emotional problems compared to non-gamers ($U = 16391$, $p < 0.05$). Previous studies have suggested that combat games or similar games where opponents defeat one another can impact emotions and behavior, heightening the risk of hostility and aggression (Quwaider et al., 2019). Thakur et al. (2021) studied 100 Indian students aged between 18 and 21 years to understand how gaming addiction among MMOGs affects their overall quality of life. The findings suggested no meaningful correlation between MMOG-related gaming addiction and quality of life.

Different types of games have different structural norms, including game length, level structure, and depth of character development, like an FPS game lasts 10-15 hours. In contrast, role-playing games (RPGs) generally demand longer engagement given the narrative complexity. In the present study, the majority of the participants spent minimal time playing online games, suggesting a low level of daily gaming activity. However, this trend might be attributed to various factors related to their age group, such as academic responsibilities, parental supervision, social activities, physical activities, etc. Strategy (33%), simulation (18%), and combat-related games (25%) were reported to be played by fewer gamers in the present study (See Figure 15). These findings could be attributed to the inherent characteristics of games. Mastering game skills often requires significant effort, especially in the case of simulation, role-play, and shooting/action games (Lee et al., 2007). However, the time and dedication needed to excel in these games might be different for some gamers, leading them to spend less time gaming overall. Moreover, the complexity and immersive nature of these games can be overwhelming, particularly for younger gamers or those with limited gaming experience.

Objective 3: To examine how personality domains (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism), emotional and behavioral problems, perceived stress, and insomnia relate to problematic online gaming among youth.

The present study explored how various personality traits relate to

problematic online gaming. While earlier studies have rarely explored how personality traits are linked to IGD (Liao et al., 2020), the present study found that gamers scored highest on openness to experience ($M = 33.52$), agreeableness ($M = 30.38$), and conscientiousness ($M = 27.30$), followed by extraversion ($M = 24.5$) (See Table 2). Gamers have different motives for engaging in online gaming. Even when they are participating in the same activities, their experience of enjoyment and psychological rewards can vary significantly based on their unique personality traits (Hellstrom et al., 2015). The study confirmed that certain personality traits are linked to problematic gaming behaviour, which supports **Hypothesis 3** (See Table 9). The proposed hypothesis was accepted. Jiang et al. (2018) conducted a study to understand factors influencing internet addiction and risk behavior among adolescents, excessive internet use in China. The findings revealed a statistically significant association of personality traits with internet addiction.

Table 9 illustrates the result of Spearman's correlation analysis between the five personality traits, emotional and behavioural problems (SDQ domains), total SDQ score, perceived stress, insomnia, and problematic online gaming. The analysis revealed significant negative correlations between problematic gaming and several personality traits: openness to experience ($r_s = -.105, p < 0.05$), conscientiousness ($r_s = -.141, p < 0.01$), extraversion ($r_s = -.097, p < 0.05$), and agreeableness ($r_s = -.149, p < 0.01$). These findings suggest that individuals who score higher on these traits are less likely to exhibit problematic online gaming. No significant correlation was found between neuroticism and problematic gaming.

From the SDQ domains, it has been further resulted that conduct problems ($r_s = .248, p < 0.01$), emotional issues ($r_s = .099, p < 0.05$), hyperactivity ($r_s = .128, p < 0.01$), peer problems ($r_s = .148, p < 0.01$), and total difficulty score ($r_s = .238, p < 0.01$) were found to have significant positive correlations with problematic online gaming. This implies that greater difficulties were associated with more severe problematic online gaming. However, Prosocial behavior was negatively correlated with problematic gaming ($r_s = -.0241, p < 0.01$), indicating that individuals with higher

prosocial tendencies were less likely to experience problematic gaming or gaming disorder.

Additionally, the analysis revealed a statistically significant positive correlation between problematic online gaming and insomnia ($r_s = .221, p < 0.01$), suggesting that those with problematic gaming might also struggle with sleep issues. However, perceived stress did not have a significant correlation with problematic gaming, indicating that stress levels might not directly influence gaming behavior.

Table 9*Spearman's Correlation results of the study variables*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Problematic gaming	-													
2 Openness to Experience	-.105*	-												
3 Conscientiousness	-.141**	.160**	-											
4 Extraversion	-.097*	.204**	.128**	-										
5 Agreeableness	-.149**	.288**	.156**	.093*	-									
6 Neuroticism	.055	.129**	-.234**	-.175**	.026	-								
7 Conduct Problem	.248**	-.014	-.174**	.080	-.211**	.100*	-							
8 Emotional problem	.099*	.083	-.159**	-.093*	-.029	.401**	.250**	-						
9 Hyperactivity	.128**	.015	-.301**	-.038	-.137**	.286**	.310**	.322**	-					
10 Peer problem	.148**	-.069	.016	-.182**	-.099*	.032	.166**	.155**	.070	-				
11 Prosocial Behavior	-.241**	.205**	.162**	.124**	.325**	.038	-.217**	.124**	-.131**	-.137**	-			
12 Total difficulty score	.238**	.002	-.258**	-.070	-.178**	.350**	.613**	.709**	.680**	.469**	-.103*	-		
13 Perceived stress	.083	.165**	-.114*	-.060	.061	.413**	.138**	.397**	.275**	.070	.093*	.341**	-	
14 Insomnia	.221**	.126**	-.153**	-.012	-.014	.287**	.142**	.350**	.240**	.118*	.069	.356**	.393**	-

Note. ** $p < 0.01$; * $p < 0.05$; Total difficulty scores from SDQ domains (includes emotional, conduct problems, hyperactivity, and peer problems)

Globally, various studies, including Raja et al. (2020), have consistently highlighted a strong association between personality traits and Gaming Addiction. While multiple factors contribute to online gaming vulnerability, personality characteristics remain central to predicting who may be at greater risk (Ranga et al., 2023; Seong et al., 2019). The Big Five personality model is the most widely used framework for understanding personality traits, and many studies have investigated how this model relates to online gaming. Sharma et al. (2021) found that individuals with elevated neurotic traits are more likely to use online gaming as a coping mechanism. Consistent with these findings, the current study has found that among the total gamers, some exhibited neuroticism traits ($M = 23.94$). However, no correlation was found between neuroticism and online gaming in this study.

Prior research has consistently indicated that conscientiousness serves as a protective factor against online gaming regardless of population, while neuroticism serves as a risk factor, but its impact varies across individuals (Akbari et al., 2021; Jain et al., 2021). The association between neuroticism and IGD has been more consistently reported as either positive or non-existent (Salvarli & Griffiths, 2019). Studies on IGD and neuroticism yielded mixed results; some studies report a significant link, while others found no association. The relationship may be influenced by several moderating factors, which need further evaluation. However, the current study findings align with the previous findings.

According to the diathesis-stress model of behavior, proposed that addiction can be a result of certain personality traits and how they perceive a situation (Mohamed et al., 2024). The current study identifies a statistically significant negative association between openness to experience ($r_s = -.105, p < 0.05$), extraversion ($r_s = -.097, p < 0.05$), and agreeableness ($r_s = -.149, p < 0.01$) and problematic online gaming (See Table 9). Previous research has found similar results (Dieris-Hirche et al., 2020; Mohamed et al., 2024; Jiang et al., 2018). There was a negative correlation found between conscientiousness ($r_s = -$

.141, $p < 0.01$) and online gaming. These findings may reflect some trait-based patterns: high conscientiousness is linked to better self-regulation and time-management, while low conscientiousness is associated with disorganization and poor goal-related commitments (Liao et al., 2020).

Previous studies have also found that low agreeableness plays a key role in IGD (Muhametjanova et al., 2021). Less agreeable people tend to prefer competition over teamwork; however, many digital games reward competitive behavior, which can lead to excessive game play (Muhametjanova et al., 2021). Braun et al. (2016) suggested that regular gamers, particularly those regularly involved in violent and role-playing genres, tend to exhibit elevated levels of openness to experience. These genres typically involve imaginative scenarios and exploratory gameplay.

Internet gaming can be highly addictive; adolescents are notably the most affected demographic. During adolescence, individuals undergo complex changes physically, emotionally, psychologically, and in their social lives. Driven by dynamic hormonal shifts and neural developments, their cognitive, intellectual, psychosocial, and emotional capacities grow rapidly. Due to these reasons, this population is particularly prone to developing addictive behaviour (Kochuchakkalackal & Reyes, 2020). Supporting **Hypothesis 4**, the present study revealed significant associations between various emotional and behavioural issues (SDQ domains) and problematic online gaming. Hence, the hypothesis is accepted.

The current study found a significant positive relationship with several SDQ domains: conduct problems ($r_s = .248$, $p < 0.01$), emotional problems ($r_s = .099$, $p < 0.05$), hyperactivity ($r_s = .128$, $p < 0.01$), peer problems ($r_s = .148$, $p < 0.01$), and total difficulty score. However, prosocial behavior ($r_s = -.241$, $p < 0.01$) was found to have a negative correlation with problematic gaming (See Table 9). Past studies have shown that behaviors such as emotional issues, conduct problems, hyperactivity, peer-related issues, and prosocial behavior are linked to online gaming addiction (Thakur et al., 2023; Singh et al., 2020).

Additionally, individuals with gaming addiction often experience symptoms like frequent headaches, excessive worrying, persistent unhappiness, and nervousness in new situations (Singh et al., 2020).

Many studies reported that psychological issues and associated risk factors related to gaming addiction are frequently observed in non-clinical populations, especially in school settings and online gamer groups (Rodriguez et al., 2018). Italian research has found that school-aged children with ADHD who also display symptoms of Internet Gaming Disorder (IGD) tend to have more severe ADHD symptoms (Ahmed et al., 2022; Seong et al., 2019). According to Heiden et al. (2019), prolonged daily engagement in gaming is linked to reduced social skills and an increase in peer-related problems. A regression analysis revealed that IGD is correlated with the degree of inattention; this correlation might be due to the overlapping characteristics of IGD and ADHD, such as the impulsive need for quick gratification and a propensity for sensation-seeking activities or risky behavior (Ahmed et al., 2022; Liao et al., 2020; Jiang et al., 2018).

On the other hand, neurobiological studies show that video games trigger striatal dopamine release, activating the brain's reward system and enhancing focus during gameplay, especially in individuals with ADHD. A dopamine surge can create a sense of comfort and temporary cognitive clarity (Koepp et al., 1988; Lorenz et al., 2015). However, the same traits that make video games appealing- impulsivity, emotional dysregulation, and low prosocial behavior are also core features of ADHD and known risk factors for developing gaming addiction. Therefore, while games may help with concentration in the moment, they can also reinforce compulsive use patterns over time (Masi et al., 2021).

Research indicates that IGD may be influenced by other mental health issues, acting as a maladaptive mechanism for prolonged psychiatric conditions, such as depression and ADHD (Hellstrom et al., 2015; Rikkers et al., 2016). Excessive gaming could be linked to various stressors, including social problems within the family, at school, or within peer groups.

As a result, gaming might become an escape strategy for individuals dealing with real-life issues (Hellstrom et al., 2015; Kiraly et al., 2015). Prior studies have indicated that youth experiencing elevated psychological distress and emotional difficulties are more likely to engage in playing online games (Rikkers et al., 2016).

The present study investigates how perceived stress and gaming behaviour are linked to one another (**Hypothesis 5**), considering whether stress impacts online gaming behaviour or vice versa. It was found in previous research that individuals with higher levels of stress are more prone to developing Internet Gaming Disorder (IGD) than those with lower stress (Canale et al., 2019; Snodgrass et al., 2014; Lin et al., 2021). Interestingly, the study did not find any link between how stressed gamers felt and whether they had difficulties with gaming. Hence, in contrast to prior literature, which suggests that gamers who felt more stressed did not necessarily mean they were more likely to game excessively. One possible reason for the discrepancy could be that most individuals report only 1-2 hours of daily gameplay, indicating relatively limited exposure. A similar observation was made in the study by Almigbal et al. (2022), conducted among medical students, which suggested that online gaming did not contribute to stress or vice versa. Instead, they proposed spending less amount of time on non-academic related activities such as video games/online games.

Moreover, previous findings suggested that psychological resilience, identified as a personality trait, can act as a buffer against stress and adverse situations, which helps individuals stay focused and not get easily lured by potentially distracting activities like online gaming (Canale et al., 2019; Kumar et al., 2021; McEwen, 2006; Lin et al., 2021). The 'General Theory of Addictions' (Jacobs, 1986) presents a compelling framework where addiction is viewed as a dependent state acquired over time, primarily as a maladaptive response to chronic stress (Canale et al., 2018). Central to this framework is the role of personality variables, which moderate the impact of stress on

behavioural outcomes. Traits such as impulsivity, sensation-seeking, and neuroticism may amplify vulnerability to addiction by impairing decision-making under ambiguity and increasing reliance on maladaptive coping mechanisms. Conversely, traits like conscientiousness or emotional stability may buffer individuals against stress-induced compulsive behaviors. This interaction, based on the present study findings, underscores the importance of considering personality profiles when examining pathways to addiction, particularly in contexts where stress is pervasive and coping resources are limited.

Furthermore, this study aimed to understand the relationship between sleep levels and problematic online gaming (**Hypothesis 5**). Ample evidence suggests a correlation between sleep disturbance and online gaming (Ahmed et al., 2022; Wong et al., 2020). A significant positive association (See Table 9) was found between insomnia and problematic online gaming ($r_s = .221$, $p < 0.01$), which supports previous findings indicating that problematic online gaming can cause psychological problems and disturbance in sleep patterns among Indian students (Verma et al., 2022; Yarasani et al., 2018; Alshammari et al., 2024). Achab et al. (2011) found that gamers who spent fewer hours sleeping at night experienced sleep deprivation and daytime sleepiness. Excessive internet use or gaming can lead to irregular sleep patterns or poor sleep quality and disturbed circadian rhythms due to altered bedtime schedules (Gammal et al., 2019; Karthikeyan et al., 2021). Gamers from various time zones often participate in multiplayer games, which can lead to irregular sleep-wake patterns. To stay connected with their teammates or continue playing, some gamers may avoid logging off or waking up in the middle of the night (Wong et al., 2020). Consequently, it can lead to sleep deprivation as individuals prioritize virtual activities and oversleep. The hypothesis was accepted by the study findings.

The present work indicates gender differences in different study variables, i.e., personality traits, emotional and behavioural problems,

perceived stress, and insomnia. A significant gender difference was predicted among all these variables (**Hypothesis 6**). It is intriguing how factors like personality traits and gender can influence gaming behavior. Previous studies have suggested that gender differences exist in behavioural patterns and related factors in addictive behavior (Ko et al., 2005). According to the person-environment transactional process, the impact of frequent gaming may vary among individuals based on their personality characteristics. Higher gaming frequency could negatively affect certain gamers more than others due to their distinct personality traits (Fernandez et al., 2020).

Objective 4: To explore gender disparities in problematic online gaming, various personality traits, emotional and behavioural problems, perceived stress, and insomnia among youth.

Table 10 shows the Mann-Whitney U test results to examine the gender difference in problematic online gaming and other independent variables (i.e., domains of personality traits, emotional and behavioural problems, perceived stress, and insomnia). The result reveals significant gender differences in various aspects of problematic online gaming, personality traits, emotional and behavioural issues, perceived stress, and insomnia.

A significant gender difference was found in problematic online gaming ($U = 14914$, $z = -6.33$, $p < 0.001$), with male participants reporting higher levels of problematic gaming compared to females. Within the personality traits domain, openness to experience ($U = 17744$, $z = -4.19$, $p < 0.001$) was reported to be higher for female participants. Agreeableness ($U = 16507.50$, $z = -5.12$, $p < 0.001$) and neuroticism ($U = 14864$, $z = -6.367$, $p < 0.001$) also showed significant gender differences, indicating higher levels among female gamers. The analysis indicated that no gender based significant differences were observed in extraversion and conscientiousness.

The study further reports significant differences between males and females in emotional problems, peer problems, prosocial behavior, and total difficulty scores. Emotional problems ($U = 16820$, $z = -4.92$, $p < 0.001$) and total difficulty scores ($U =$

20305, $z = -2.25$, $p < 0.05$) were found to be high among female gamers. However, peer problems are reported to be high among male gamers ($U = 20647$, $z = -2.02$, $p < 0.05$). Furthermore, Prosocial behavior ($U = 15473$, $z = -5.94$, $p < 0.001$) was found to be high among female gamers. No significant gender differences were found in conduct problems and hyperactivity. Female gamers exhibited significantly higher perceived stress ($U=15517$, $z = -5.87$, $p < 0.001$) and insomnia ($U=16601$, $z = -5.05$, $p < 0.001$) than males.

Table 10

Gender Differences in Problematic Online Gaming, Personality Traits, Perceived Stress, and Insomnia

Comparison	Variables	Mean Rank (M/F)	U-Value	z-Value	p-value
Male Female	Problematic online gaming (IGD)	255/174	14914	-6.33	.000***
Male Female	<i>Personality Traits</i>				
	Openness to experience	208/261	17744	-4.19	.000***
	Conscientiousness	227/225	23047	-.186	.852
	Extraversion	218/243	20726	-1.94	.052*
	Agreeableness	203/269	16507	-5.12	.000**
	Neuroticism	198/280	14864	-6.36	.000**
Male Female	<i>Emotional & Behavioural problems</i>				
	Conduct Problems	228/224	22966	-.250	.802
	Emotional Problems	204/267	16820	-4.92	.000**
	Hyperactivity	218/241	20942	-1.79	.073
	Peer Problems	236/210	20647	-2.02	.043*
	Prosocial Behavior	200/276	15473	-5.94	.000**
	Total difficulty (SDQ scores)	216/245	20305	-2.25	.024*
Male Female	Perceived stress	200/275	15517	-5.87	.000***
Male Female	Insomnia	204/269	16601	-5.05	.000***

Note. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; Male (N=293), Female (N=159); IGD= Internet Gaming Disorder; SDQ= Strengths and Difficulties Questionnaire; Total difficulty scores

from SDQ domains (includes emotional, conduct problems, hyperactivity, and peer problems)

The current study results indicate a significant gender difference in personality traits and online gaming (See Table 10). Traits, such as agreeableness ($U = 16507$; $p < 0.01$), openness to experience ($U = 17744$; $p < 0.01$), and neuroticism ($U = 14864$; $p < 0.01$), were more commonly reported by female gamers. Interestingly, the past studies have linked problematic gaming primarily to male gender and specific traits (Wartberg et al., 2023; Collins et al., 2012). However, the current results suggest a divergent pattern.

Different researchers argued that clinical correlates of gender may differ by gender. Males often exhibit higher levels of competitiveness in various contexts, including group interaction and negotiations. Conversely, females are generally perceived as more interpersonally oriented. Additionally, females are more likely to experience negative emotions and internalize problems, leading to a higher prevalence of emotional problems or problematic behavior as well as greater escapism tendencies (Kiraly et al., 2015; Rikkers et al., 2016). These findings align with observed gender differences in competitiveness and social-emotional inclination. In the current study (See Table 10), it has resulted in a significant gender difference in emotional problems ($U = 16820$; $p < 0.01$), peer problems ($U = 20647$; $p < 0.05$), prosocial behavior ($U = 15473$; $p < 0.01$), and total difficulty scores ($U = 20305$; $p < 0.05$).

Emotional problems and overall difficulty were significantly higher among female gamers than among males. However, peer problems were found to be more common among males. Past research suggested that gamers with IGD symptoms spend too much time gaming, which provokes more emotional difficulties that affect different areas of functioning (Garg et al., 2023). Gaming disorder in females may indicate both the cause and consequences of severe psychological problems. These difficulties manifest as behavioural and emotional symptoms, including various social factors, such as cultural role expectations, media portrayals of gaming, the growing gaming industry

focused on monetary gains, peer norms, and the general social isolation many people feel today (Thakur et al., 2023).

Despite the studies indicating trends in the effects of gaming on addiction and psychological issues, the specific impact of negative emotions experienced during online gaming has not been extensively researched. The competitive nature of gaming is also associated with the presence of a high level of stress (Sharma et al., 2022). The current study found a significant gender difference (See Table 10) in perceived stress ($U = 15517, p < 0.01$), with female participants reporting higher levels of stress compared to male participants. The present research shows that gender affects gaming habits among students. Males tend to play more online/ video games than females; the study supports previous findings in terms of problematic online gaming. However, the study results did not align in terms of gender differences in other variables like personality traits, emotional and behavioral problems, perceived stress, and insomnia. Typically, these games are seen as hobbies for young males and might help them boost their self-esteem and feel better about themselves, which can lead to addiction. However, there has been an increase in female gamers recently, probably because more games are available and accessible to them via smartphones and other portable devices (Almigbal et al., 2022; Thakur et al., 2023).

The present study aimed to understand the gender perspective on insomnia levels among school-going students. A significant gender difference (See Table 10) was found, with females reporting higher levels of insomnia compared to males ($U = 16601, p < 0.01$). These findings align with previous research suggesting that the behavior of playing games before sleep can lead to shorter sleep duration and delayed sleep timings, thus contributing to insomnia (Gandaputra et al., 2021; Li et al., 2021). Most studies indicate that males are more likely to use their devices for gaming and experience less sleep, whereas females are more involved in multimedia applications and social media (Gandaputra et al., 2021). According to a past study, adolescent girls and

women more often report sleep characteristics consistent with more nighttime wakefulness (Li et al., 2021). Based on the results, the current study accepts the hypothesis.

Objective 5: To examine the role of personality traits, emotional and behavioral problems, perceived stress, and insomnia in predicting problematic online gaming

A quantile regression analysis was performed to explore the relationship between various psychological measures and problematic online gaming across different quantiles (0.25, 0.50, 0.75, and 0.9). By analyzing the relationship across the 25th, 50th, 75th, and 90th percentiles, the researcher gains an understanding how can identify a more comprehensive understanding of how different factors affect the variables differently in low, medium, and high levels of the outcome. The model included multiple predictors, including personality traits (BFI dimensions), emotional and behavioural problems (SDQ dimensions), insomnia, and perceived stress. The model demonstrated varying explanatory power across quantiles, with pseudo-R-squared values of 0.081, 0.078, .144, and .167 for the 25th, 50th, 75th, and 90th percentiles, respectively, indicating stronger prediction at higher levels of problematic online gaming.

At the 25th quantile, conduct problems, peer-related issues, and insomnia emerged as significant predictors of problematic online gaming, pointing influential role (See Table 11). Other traits, emotional problems, hyperactivity, prosocial behavior, and total difficulty and perceived stress did not show any significant effects in this model. Conduct problems ($\beta = 1.05$, $p = .001$, 95% CI [0.407, 1.703]) demonstrated as a strong and positive predictor, the higher the conduct-related issues show a substantial increase in problematic online gaming. Peer problems ($\beta = 0.764$, $p = .022$, 95% CI [0.108, 1.41]) were found to significantly predict problematic online gaming behavior, suggesting that trouble in peer relationships (e.g., social isolation, bullying, and conflict) contributes to a higher level of problematic gaming. Insomnia ($\beta = 0.126$, $p = .032$, 95% CI [0.011, 0.24]) resulted as a significant predictor of problematic online gaming, suggesting sleep issues like difficulty falling asleep, waking up, and maintaining sleep may result in higher levels of problematic

gaming. These relationships suggest that even at lower levels of problematic online gaming, conduct problems and peer problems play substantial roles.

Table 11

Parameter estimates for Quantile 0.25

Parameter	Coefficient	<i>t</i>	df	Sig.	LB	UB
(Intercept)	16.67	4.49	438	.000	9.38	23.96
<i>Personality Traits</i>						
Openness to experience	-.083	-1.30	438	.192	-.208	.042
Conscientiousness	-.018	-.255	438	.799	-.157	.121
Extraversion	-.050	-.714	438	.475	-.187	.087
Agreeableness	-.043	-.661	438	.509	-.169	.084
Neuroticism	-.071	-1.03	438	.301	-.207	.064
<i>Emotional and Behavioural Problems</i>						
Conduct Problems	1.09	3.19	438	.002**	.421	1.77
Emotional Problems	.469	1.42	438	.154	-.176	1.11
Hyperactivity	.384	1.11	438	.267	-.295	1.06
Peer problem	.834	2.40	438	.017*	.152	1.51
Prosocial Behavior	-.178	-1.26	438	.206	-.455	.098
Total difficulty (SDQ Domains)	-.447	-1.56	438	.118	-1.008	.114
Perceived stress	.024	.389	438	.697	-.099	.147
Insomnia	.127	2.08	438	.038**	.007	.246

Note. $p < 0.001^{***}$; $p < 0.01^{**}$; $p < 0.05^{*}$; LB: Lower bound; UB: Upper bound (At 95% Confidence Interval)

Table 12 shows the median (50th quantile) analysis, resulted that conduct problems ($\beta = .770$, $p = .055$, 95% CI [-0.017, 1.55], peer problems ($\beta = 0.820$, $p = .042$, 95% CI [0.031, 1.608]), and insomnia ($\beta = 0.183$, $p = .010$, 95% CI [0.044, 0.321]) showed significant positive predictors of problematic online gaming. However, prosocial behaviour ($\beta = -0.478$, $p = .004$, 95% CI [-0.798, -0.158]) is found to be a significant negative predictor, which indicates that greater prosocial tendencies are associated with lower scores, suggesting a protective effect. The

analysis identified insomnia and prosocial behaviour as significant predictors of problematic gaming, pointing to the importance of physiological regulation and adaptive social behaviours. Marginal effects of conduct and peer problems suggest the influence of externalizing and interpersonal difficulties. In contrast, personality traits, several emotional and behavioural subdomains, and perceived stress did not have any significant impact on problematic gaming.

Table 12

Parameter estimates for Quantile 0.5

Parameter	Coefficient	<i>t</i>	df	Sig.	LB	UB
(Intercept)	24.04	5.55	438	.000	15.54	32.54
<i>Personality Traits</i>						
Openness to experience	-.095	-1.28	438	.199	-.241	.050
Conscientiousness	-.076	-.918	438	.359	-.238	.086
Extraversion	-.083	-1.02	438	.304	-.243	.076
Agreeableness	-.003	-.043	438	.966	-.151	.145
Neuroticism	-.125	-1.55	438	.122	-.283	.033
<i>Emotional and Behavioural Problems</i>						
Conduct Problems	.770	1.92	438	.055*	-.017	1.55
Emotional problems	.423	1.10	438	.270	-.330	1.17
Hyperactivity	.265	.659	438	.510	-.526	1.05
Peer Problems	.770	1.90	438	.050*	-.025	1.56
Prosocial behavior	-.481	-2.93	438	.004**	-.083	-.158
Total difficulty (SDQ Domains)	-.328	-.987	438	.324	-.982	.326
Perceived stress	.059	.807	438	.420	-.084	.202
Insomnia	.202	2.84	438	.005	.063	.341

Note. $p < 0.001$ ***; $p < 0.01$ **; $p < 0.05$ *; LB: Lower bound; UB: Upper bound (At 95% Confidence Interval)

At the 75th quantile, the analysis identified three significant predictors of problematic online gaming (See Table 13). Conscientiousness ($\beta = -0.157$, $p = .050$,

95% CI [-0.315, 0.000]) showed a negative predictor of problematic gaming, indicating individuals scoring higher in conscientiousness are less likely to exhibit problematic patterns. Conscientiousness serves as a control and a human regulatory capacity. Prosocial behaviour ($\beta = -0.587$, $p = .000$, 95% CI [-0.899, -0.275]), maintained its negative association with increased magnitude, acts as a protective buffer against the adverse outcome of gaming-related difficulties. Insomnia ($\beta = 0.315$, $p = .000$, 95% CI [0.180, 0.450]) showed as a key predictor, suggesting that physiological regulation plays a central role. The overall findings suggest that at the third quantile, insomnia resulted in a significant risk factor, while conscientiousness and prosocial behaviour were reported as protective factors. The analysis indicated that other personality traits, including Openness to Experience, extraversion, agreeableness, and neuroticism, as well as emotional and behavioural difficulties and perceived stress, showed non-significant effects here.

Table 13

Parameter estimates for Quantile 0.75

Parameter	Coefficient	<i>t</i>	df	Sig.	LB	UB
(Intercept)	28.69	6.92	438	.000	20.55	36.83
<i>Personality Traits</i>						
Openness to experience	-.048	-.679	438	.498	-.187	.091
Conscientiousness	-.210	-2.65	438	.008**	-.365	-.055
Extraversion	.039	.506	438	.613	-.113	.192
Agreeableness	-.106	-1.47	438	.142	-.248	.036
Neuroticism	-.077	-.994	438	.321	-.228	.075
<i>Emotional and Behavioural Problems</i>						
Conduct Problems	.258	.674	438	.501	-.495	1.01
Emotional problems	-.329	-.897	438	.370	-1.05	.392
Hyperactivity	-.350	-.907	438	.365	-1.10	.408
Peer Problems	.093	.241	438	.809	-.668	.855
Prosocial behavior	-.598	-3.80	438	.000***	-.906	-.289
Total difficulty (SDQ Domains)	.263	.825	438	.410	-.363	.889

Perceived stress	.073	1.04	438	.298	-.064	.210
Insomnia	.383	5.63	438	.000***	.249	.516

Note. $p < 0.001$ ***; $p < 0.01$ **; $p < 0.05$ *; LB: Lower bound; UB: Upper bound (At 95% Confidence Interval)

At the 90th percentile, the regression analysis identified prosocial behaviour ($\beta = -.699$, $p = .000$, 95% CI [-.906, -.289]) and insomnia ($\beta = .366$, $p = .000$, 95% CI [.215, .516]) as significant predictors of problematic online gaming (See Table 14). As prosocial behaviour reports a significantly negative strong protective factor, it suggests that individuals with higher pro-social tendencies show lower scores in problematic online gaming, which reflects the buffering effect of empathy and cooperation. The findings revealed that insomnia significantly increased the risk of problematic gaming, interpreting sleep disturbance as a key factor. Other traits as conscientiousness, show a trend toward being protective; this may reflect better regulation and goal-directed behaviour. However, neuroticism reported a weak positive association with problematic gaming. Other personality traits, emotional and behavioural problems, and perceived stress did not show any meaningful effects in this model.

Table 14*Parameter estimates for Quantile 0.9*

Parameter	Coefficient	t	df	Sig.	LB	UB
(Intercept)	22.42	4.78	438	.000	13.21	31.62
<i>Personality Traits</i>						
Openness to experience	-.028	-.34	438	.731	-.185	.130
Conscientiousness	-.154	-1.72	438	.084	-.330	.021
Extraversion	.047	.536	438	.593	-.126	.220
Agreeableness	-.005	-.066	438	.948	-.165	.155
Neuroticism	.148	1.70	438	.089	-.023	.319
<i>Emotional and Behavioural Problems</i>						
Conduct Problems	.648	1.49	438	.136	-.205	1.50
Emotional problems	.044	.106	438	.916	-.771	.859
Hyperactivity	-.114	-.260	438	.795	-.970	.743
Peer Problems	.200	.456	438	.649	-.661	1.06
Prosocial Behaviour	-.699	-3.93	438	.000***	-1.04	-.350
Total difficulty (SDQ Domains)	.040	.112	438	.911	-.668	.748
Perceived stress	.029	.368	438	.713	-.126	.184
Insomnia	.366	4.76	438	.000***	.215	.516

Note. $p < 0.001$ ***; $p < 0.01$ **; $p < 0.05$ *; LB: Lower bound; UB: Upper bound (At 95% Confidence Interval)

The overall graphs below (See Figure 15A to 24) collectively demonstrate that the predictions of study variables for problematic online gaming vary across quantiles, underscoring that risk factors exert differential influence depending on the severity of gaming involvement. These graphical interpretations complement the statistical findings and provide visual evidence for the complex, non-linear relationships between personality traits, emotional and behavioural problems, perceived stress, insomnia, and problematic online gaming.

The overall graphs from the quantile regression analysis for the personality traits domain revealed that the impact of openness to experience (See Figure 15B and Figure 19) remains marginal and non-significant across the distribution of problematic online gaming, suggesting limited predictive utility irrespective of symptom severity. The quantile prediction analysis revealed a consistent inverse predictive relationship between conscientiousness (see Figure 15C and Figure 20) and IGDS scores across all symptom levels. Notably, the steeper decline in the higher quantile (0.9) and became significant difference at the 75th quantile suggest that conscientiousness exerts a more substantial protective influence among gamers exhibiting elevated online gaming-related concerns.

Some factors, like insomnia (See Figure 18 and Figure 24) and prosocial behaviour (See Figures 16E & Figure 23), show consistent patterns with increasing magnitude, while conduct problems (See Figure 16A and Figure 21) demonstrate varying patterns of significance across quantiles. The prediction lines demonstrate a clear upward trend in the effect of insomnia severity across quantiles in predicting problematic online gaming. The relationship becomes progressively stronger and more significant at higher quantiles of problematic online gaming (See Figure 24). The confidence intervals (shown by the shaded area) narrow at higher quantiles, indicating more precise estimates (See Figure 18).

Prosocial behaviour maintained a significant negative relationship at both the 50th, 75th, and 90th quantiles, with a stronger protective effect at higher quantiles (See Figure 23). The downward slope becomes steeper after the median (50th quantile), suggesting that prosocial behaviour (See Figure 16E) has a stronger protective effect against severe gaming disorder or problematic patterns of online gaming. The confidence intervals remain relatively consistent across quantiles, indicating stable reliability of the estimates.

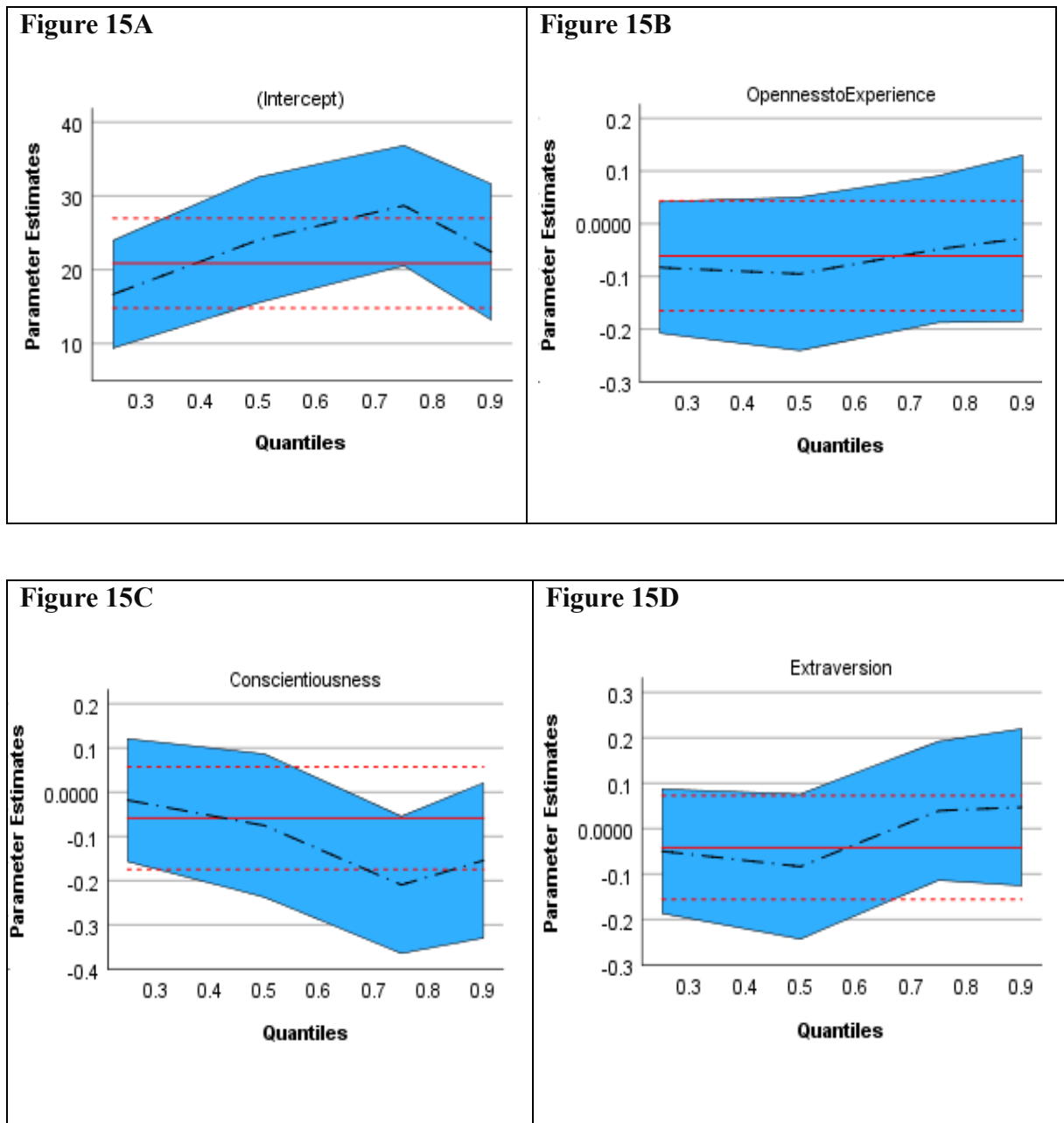
The plot for conduct problems (see Figure 16A and Figure 21) reveals a rising predictive relationship with problematic online gaming across the quantiles, with stronger effects observed as the severity of problematic gaming increases. The effect is most pronounced at the 25th quantile and becomes non-significant at higher

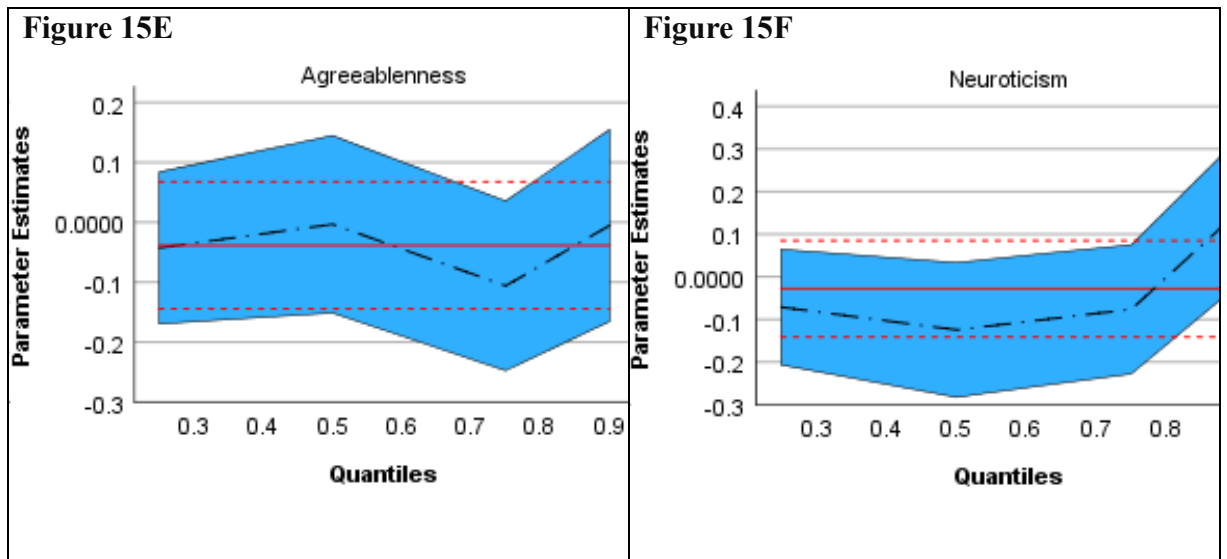
levels. Although the confidence intervals remain broad, the upward trend suggests that behavioural problems may exert increasing influence as vulnerability intensifies, consistent with models of cumulative risk and behavioural escalation.

Peer problems showed similar positive effects across quantiles, with minimal impact at lower levels but steep escalation in the 50th quantile, and became non-significant at the highest quantile (See Figure 16D and Figure 22). The effect size remains relatively stable between the 25th and 50th quantiles before declining. The confidence intervals widen considerably at higher quantiles, indicating increased uncertainty or variations; however, the trends show that when peer problems get more intense, they have a stronger link to online gaming-related issues.

The influence of domains of personality traits such as extraversion, agreeableness, and neuroticism on problematic internet gaming appears to be negligible. Similarly, from overall SDQ domains (Strengths and Difficulties Questionnaire), emotional problems and hyperactivity do not have any significant impact on problematic online gaming. Furthermore, perceived stress does not have any significant predictive role on problematic gaming.

- 1) The diagrams present the parameter estimates plots (15A to 15F) of personality traits (BFI Domains: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism) from quantile regression (95% confidence intervals).





2) The diagrams present the parameter estimates plots (16A to 16F) of emotional and behavioural problems (SDQ Domains: Emotional Problems, Conduct Problems, hyperactivity, peer problems, prosocial behaviour, and total difficulty) from quantile regression (95% confidence intervals).

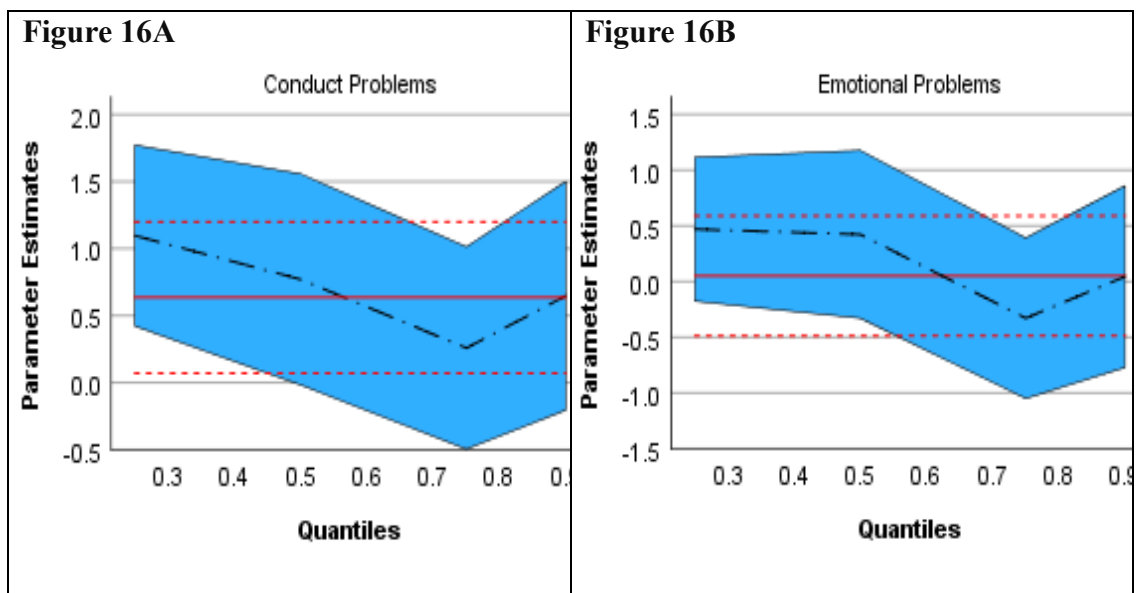


Figure 16C

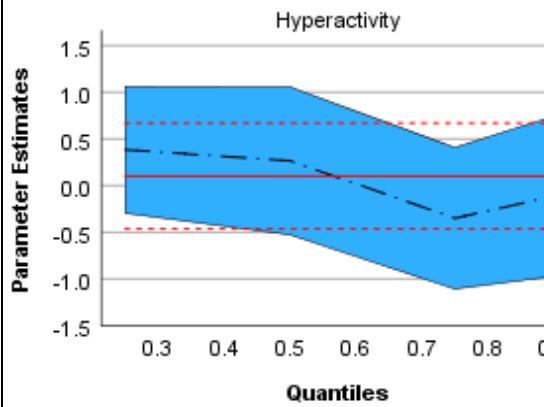


Figure 16D

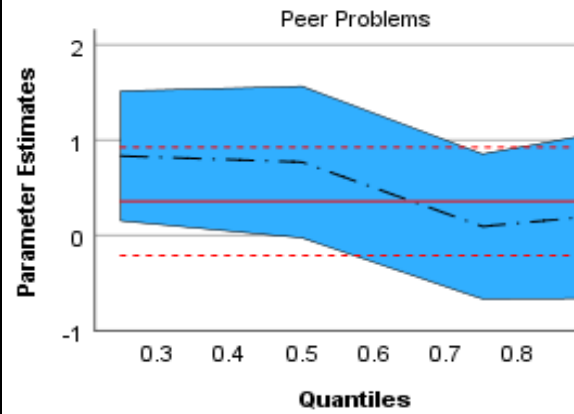


Figure 16E

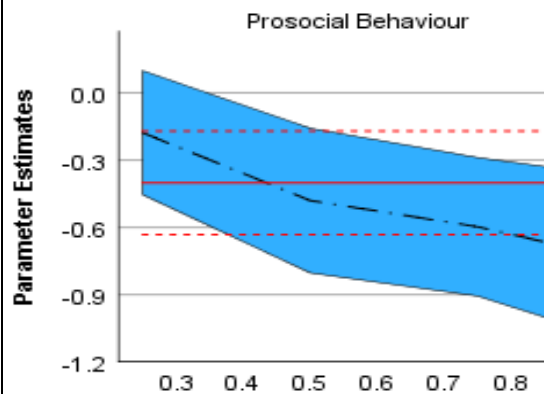
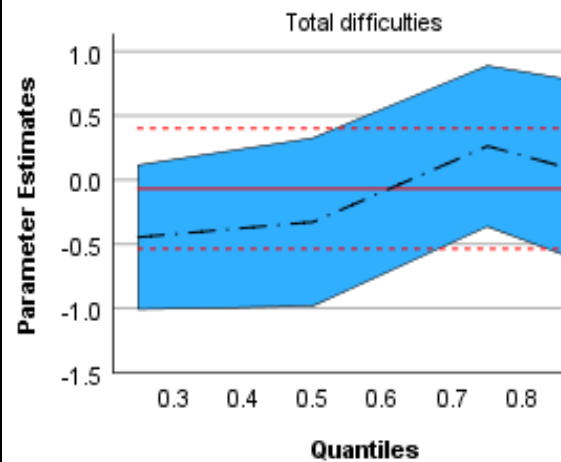
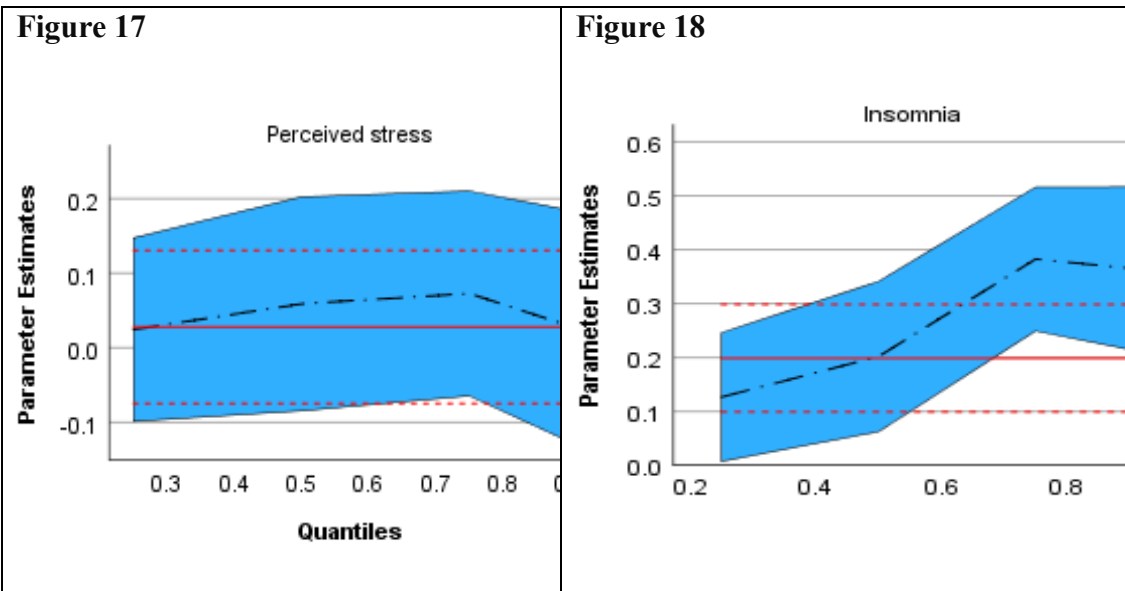


Figure 16F



- 3) The diagram presents the parameter estimates plots for Perceived Stress (Figure 17) and Insomnia (Figure 18) from quantile regression (95% confidence intervals).

- Confidence intervals of the parameter estimates
- · Parameter estimates at the different regression quantiles
- Parameter estimates for the ordinary linear regression with the same predictors
- - - Confidence interval bounds for the ordinary linear regression with the same predictors



- 4) The prediction lines from the regression analysis results provide insights into how openness to experience (Figure 19), conscientiousness (Figure 20), conduct problems (Figure 21), peer problems (Figure 22), Prosocial behavior (Figure 23), and insomnia (Figure 24) predict problematic online gaming

Figure 19

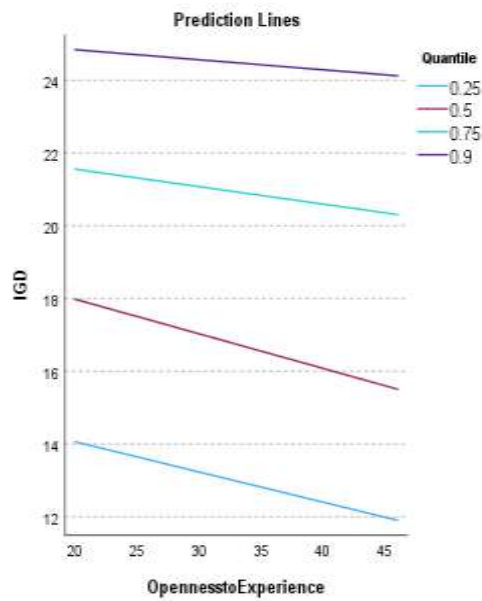


Figure 20

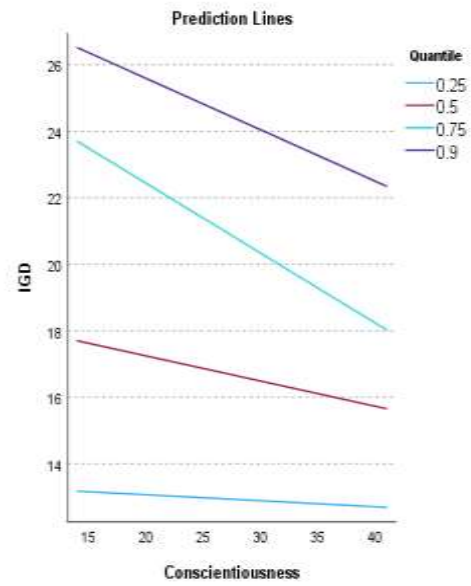


Figure 21

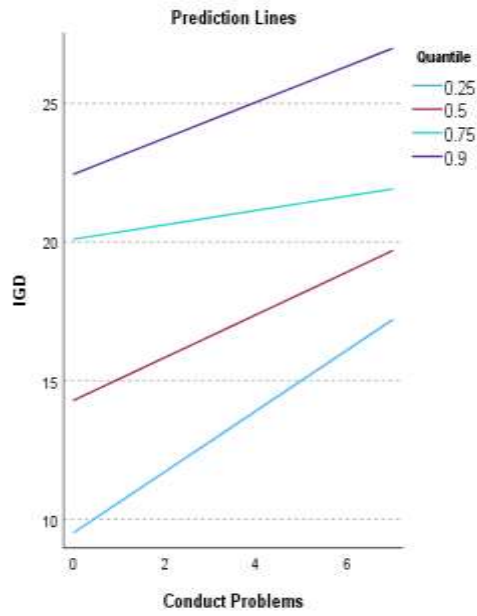


Figure 22

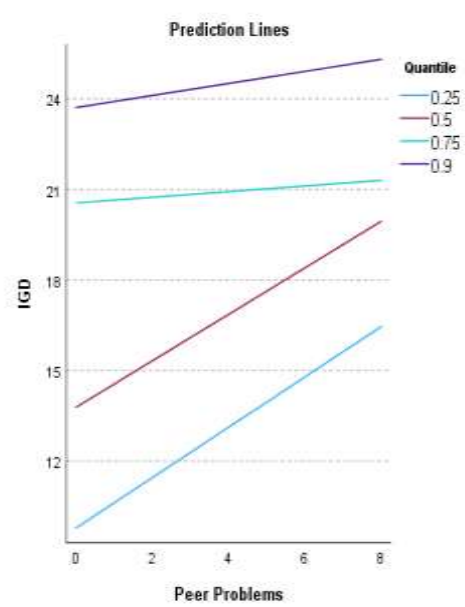


Figure 23

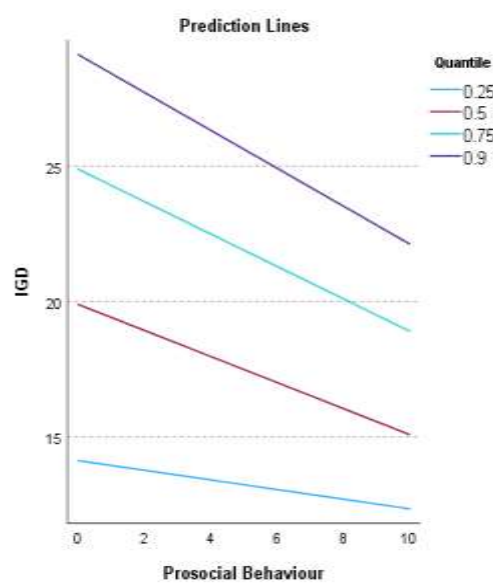
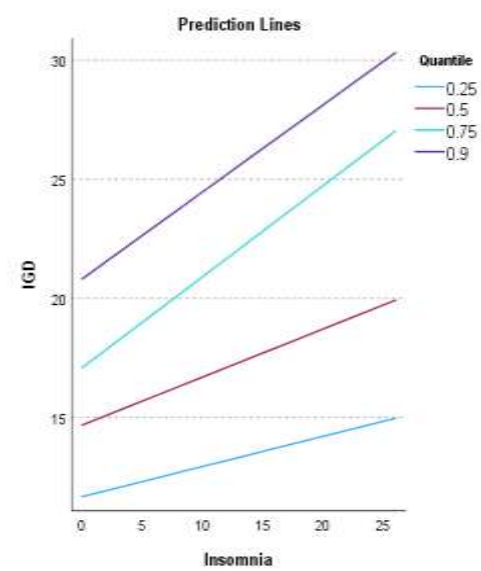


Figure 24



The present study used logistic regression analysis to find significant predictors among the variables. It was hypothesized that the study variables, i.e., personality traits, emotional and behavioural problems, perceived stress, and insomnia, would play a role in predicting problematic online gaming (**Hypothesis 7**). The result inferred that from the personality domain, at the 75th quantile, conscientiousness resulted in a significant predictor of problematic gaming (See Table 13), which supports the past study findings. Low conscientiousness appeared as the most powerful predictor of IGD (Akbari et al., 2021; Braun et al., 2016; Muller et al., 2013). The current study results suggested adolescents with low conscientiousness might have higher levels of problematic gaming or vice versa. According to the diathesis-stress model, specific personality traits predispose to IGD (Baniya et al., 2016).

Individuals who display low levels of conscientiousness are often seen as more prone to addiction, which is due to their struggle with social settings (Murcia et al., 2014). Agreeableness, extraversion, and neuroticism were not found to have any predictive role in problematic gaming. Previous studies have found that adolescents exhibiting higher levels of neuroticism in online gaming may function as a compensatory coping mechanism, and may turn to gaming as a way to escape when other coping skills are not working (Dieris-Hirche et al., 2020).

From the domain of emotional and behavioural problems, it was suggested that conduct problems ($\beta = 1.09$, $p < 0.001$ at 25th percentile; $\beta = .770$, $p < .05$ at 50th percentile) and peer problems ($\beta = .834$, $p < .01$ at 25th percentile; $\beta = .770$; $p < 0.05$ at 50th percentile) showed a positive impact, whereas, prosocial behavior ($\beta = -.481$, $p < .001$ at 50th percentile; $\beta = -.598$; $p < 0.001$ at 75th percentile, $\beta = -.699$, $p < .001$ at 90th percentile) contributed negatively and significantly to the prediction of problematic online gaming among adolescents in the present study (See Table 11 to 14). Similar findings were reported in previous studies (Singh et al., 2020; Milani et al., 2017). A study by Mukherjee et al. (2021) suggested that problematic male gamers

reported having experienced poor interpersonal relationships with parents and peers; the previous findings were aligned with the current study results. Previous study results indicated that psychiatric problems were directly or indirectly associated with problematic online gaming (Archana et al., 2019).

Past research on gamers at risk in clinical settings found that addicted adolescent gamers often faced issues like conduct problems and emotional, behavioural, and peer-related problems (Masi et al., 2021). The prosocial behavior was found to have a negative predictive role in problematic online gaming reported by the current findings. Previous research consistently indicates that excessive gaming is associated with a withdrawal from natural reinforcers, such as socializing with peers, participating in leisure or physical activities, and with psychological distress, particularly symptoms of anxiety and depression. Moreover, emerging evidence identifies preexisting psychological conditions as significant risk factors contributing to the development of gaming disorder (Diego et al., 2024).

Previous findings have suggested the role of stress because of maladaptive coping by problematic gaming or disordered gaming (Lin et al., 2021). The present study did not find any predictive role of perceived stress on problematic gaming. However, insomnia ($\beta=.126$, $p< 0.05$; $\beta=.183$, $p< 0.01$; $\beta=.315$, $p< 0.01$) was found to have a significant predictive role across all the quantiles (See Table 11, Table 12, Table 13, and Table 14) in problematic online gaming inferred in the current study. Lack of sleep and high stress can harm a person's physical and mental health, making them more likely to develop a gaming disorder (Bansal & Kranti, 2022). Prior research findings suggested a significant association between problematic gaming with insomnia and circadian dysregulation (Gandaputra et al., 2021; Saquib et al., 2017; Zaman et al., 2022; Lin et al., 2023). One reason could be that problematic online gaming negatively impacts sleep habits because it makes people too excited, which interferes with the body's calming process needed for sleep (Zaman et al., 2022). Hence, the hypothesis has been accepted.

CHAPTER VI

SUMMARY AND CONCLUSION

Summary and Conclusion

The present study, entitled “*Emotional, Behavioural Difficulties and Personality Traits of youth with Problematic Online Gaming,*” investigates the psychological and behavioural dimensions associated with excessive engagement with online gaming among youth. Furthermore, the study assesses the differences in emotional and behavioural problems related to specific genre-related online games. Specifically, the study aims to identify and compare gender-based patterns in problematic gaming behavior, exploring how these disparities manifest in emotional and behavioural problems and personality traits. It also investigates the role of perceived stress and sleep-related problems, particularly insomnia, as critical correlates that may intensify vulnerability to problematic gaming. Finally, the study explores the predictive role of all the study variables on problematic gaming.

The study hypothesized a significant gender difference between male and female participants concerning problematic online gaming. It was anticipated that individuals engaging with genre-specific games would exhibit distinct emotional and behavioural changes. Moreover, the study expected significant associations between problematic online gaming and psychological variables, namely emotional and behavioural difficulties, personality traits, perceived stress, and insomnia. Additionally, gender disparities were predicted across all measured constructs. The study also aimed to determine the predictive influence of these psychological factors on problematic online gaming.

To achieve the research objectives, 452 high school students comprising 293 males and 159 females (aged 15-19 years), who were studying in different government and private schools in classes 10th, 11th, and 12th, were considered for the study using a purposive and convenient sampling technique. GHQ-12 was used for screening any mental health condition. Five psychological scales were used to measure the variables of interest: i) Internet Gaming Disorder Scale- short form (IGDS9-SF), (ii) Strength and Difficulty Questionnaires (SDQ), (iii) Big Five

Inventory (BFI), (iv) Perceived Stress Scale (PSS), and (v) Insomnia Severity Index (ISI).

Before approaching the main study, a pilot study consisting of 100 samples was carried out to check the psychometric adequacy for measurement purposes across the samples. Firstly, to check the psychometric adequacy of each scale used in the target population included (i) Reliability coefficients (Cronbach's Alpha), (ii) Descriptive statistics consisting of Mean, SD, Skewness, and Kurtosis were included. As a part of the preliminary study analysis, a normality test was conducted to check the normality of the overall sample. The data did not fulfil the criteria for normal sample distribution; therefore, different non-parametric statistics were applied to test the study hypothesis.

From the results and discussion, several conclusions can be inferred. The findings revealed that online gaming is a widespread activity among school-going adolescents. The literature on problematic online gaming has suggested positive and negative influences. Most gamers were from the 17-year-old age group and belonged to nuclear families and were residing in hostel accommodations. Smartphones emerged as the most preferred platform for gaming, highlighting the convenience and accessibility of mobile gaming. Interestingly, while numerous studies have investigated online gaming, there is a notable gap in understanding various gaming characteristics. This study aims to fill that gap by examining aspects like gaming genres, money spent online, daily time spent on gaming, the platform used, and emotional responses such as anger, irritation, frustration, and urges.

From the participants' gaming habits, it is evident that most have been actively gaming over the past year, which was one of the major study inclusion criteria. The findings revealed that many started gaming in their mid-teens, while a smaller group began in their late teens. Some participants reported making in-game purchases and expressed enjoyment in gaming. However, a significant portion of participants also found online gaming to be addictive. Additionally, many participants experienced irritation or anger when their gameplay was interrupted or

lost, and some felt guilt associated with their gaming habits. Regular gaming urges were also reported. When it came to daily game duration, most participants played for one or two hours each day, with fewer individuals gaming for longer periods.

Moreover, the study reveals that adolescent gaming behavior is shaped by a constellation of socio-demographic factors, with significant associations observed across age, gender, education, family structure, and living arrangements. The result highlights the importance of context-sensitive interventions that account for developmental, cultural, and structural influences, thereby promoting healthier digital engagement among youth.

The study analysis revealed significant associations between online gaming behaviors and several socio-demographic factors. Age of Gaming initiation was significantly linked to age group, education level, and living arrangement, suggesting that the development stage and household context influence when adolescents begin gaming. Gender emerged as a key factor, showing associations with money spent, enjoyment, urge to play, frequency, and daily gaming time, indicating gendered patterns in gaming intensity and motivation. Age group was linked to feelings of guilt. Urge to play also varied significantly by education and family type, pointing to structural and cognitive factors in compulsive gaming tendencies. Frequency of gaming was significantly related to both gender and age group, reinforcing demographic influences on engagement levels. Notably, perceptions of gaming as addictive did not show significant associations with any socio-demographic variable.

One of the most fascinating findings was related to gaming genres, which have not been extensively studied in Indian research. There is a diverse array of gaming genres that participants engaged with, but the action-adventure genre stood out due to its association with IGD. Various psychological and behavioural outcomes were linked to different gaming genres, underscoring the need for genre-specific influences rather than only assessing the effects of gaming. For instance, adolescents who played specific genres or did not play those genres showed

significant differences in variables such as hyperactivity, emotional problems, peer problems, and IGD. Notably, IGD scores varied significantly between those who played action genres and those who did not, as well as between adventure and non-adventure genres. Hyperactivity levels differed between role-playing and non-role-playing genres, heightened peer issues among simulation game gamers, and combat gamers to more emotional problems. Interestingly, none of these gamers were directly linked to IGD. A lack of specific genre preferences indicates greater flexibility in choices of games potentially influences the behaviour outcomes.

The current study reveals intriguing insights into the differences in online gaming habits between genders. The findings revealed that boys were more susceptible to problematic online gaming behaviors compared to their female counterparts. Whereas female participants displayed higher levels of emotional problems, stress, and insomnia. Moreover, the female gamers scored significantly high in openness to experience, agreeableness, and neuroticism, though there were no significant differences in extraversion and conscientiousness. In summary, significant gender differences were observed in areas including IGD, certain personality traits, emotional problems, peer problems, prosocial behavior, total strength and difficulty score, perceived stress, and insomnia. However, no significant differences were noted in conscientiousness, conduct problems, and hyperactivity.

Correlational analysis revealed that elevated levels of certain personality traits, such as conscientiousness, agreeableness, openness to experience, and extraversion, were linked to reduced problematic gaming behaviour. Neuroticism, however, showed no association. On the other hand, conduct issues, emotional problems, hyperactivity, and peer-related difficulties were positively correlated with problematic gaming, while prosocial behavior was negatively correlated. Insomnia was positively related to problematic gaming, while perceived stress did not show a significant correlation. In the regression analysis, it was identified that openness to experience and conscientiousness emerged as significant predictors of problematic online gaming. Further identified that conduct problems, peer problems, prosocial

behavior, and insomnia were also significantly influenced by gaming behaviour across different quantiles. Perceived stress and other personality traits did not have any impact on problematic gaming. Moreover, emotional problems and hyperactivity did not show any significant impact on problematic gaming. These relationships were not uniform, with certain factors exhibiting varying significance levels across different gaming disorder severities.

In conclusion, personality traits and emotional and behavioural problems play crucial roles in influencing gaming behavior. Some traits offer protective effects, while others contribute to increased gaming severity. By understanding these distinctions, strategies can be developed to foster healthier gaming habits and mitigate the negative outcomes associated with problematic online gaming. Understanding these variables highlighted in the study is crucial for several reasons. Knowing the age group and family backgrounds most engaged in online gaming helps tailor interventions and educational programs to target the right audience. Understanding that smartphones are the preferred gaming platform can inform the design of apps and tools aimed at promoting healthier gaming habits. Recognizing the range of emotional and behavioural responses to gaming helps in developing a support system for those who experience negative emotions such as addiction, irritation, anger, or guilt. Identifying the genre-specific impacts on psychological health underscores the need for personalized approaches when addressing gaming disorders.

Acknowledging gender differences in gaming behaviors and psychological outcomes is vital for creating gender-sensitive support and intervention programs. This ensures that the unique needs of both male and female gamers are addressed appropriately. Understanding the role of personality traits in problematic gaming can help identify individuals who are at higher risk and provide them with targeted support. Recognizing the correlation between problematic gaming and psychological problems such as conduct problems, hyperactivity, and peer-related difficulties highlights the need for a holistic approach to addressing gaming disorders. This involves not only focusing on the gaming behavior itself but also

addressing underlying emotional and behavioural issues.

Limitations of the study

This study was a correlational and descriptive study; a purposive and convenient sampling method was applied for collecting data, so the causal relationship remains unclear. The study had a smaller group of participants, which may constrain the generalizability of its findings. To analyze these relationships to a deeper extent, future research should include more survey techniques (observations, interviews, etc. of the representative samples), as well as qualitative techniques, e.g., narratives of typical cases, participative action research strategies. The study contains self-reported data, which could be biased in the case of both over-reporting and under-reporting.

Implications of the study

The study reveals several key insights into the diverse characteristics of online gaming within the Indian sociocultural context. The findings offer more meaningful implications for professional working with youth, as well as academic researchers. The interpretation of results regarding psychological concerns associated with problematic online gaming among school-aged adolescents underscores the urgency of designing strategies for early detection and targeted interventions. Nationwide awareness campaigns promoting digital well-being and responsible gaming behavior should be co-developed by government bodies, tech companies, and NGOs. These campaigns can encourage age-appropriate usage, self-regulation, and peer accountability.

Further investigation is warranted to examine the patterns of engagement across gaming genres and to explore how specific gameplay variables influence psychological outcomes. As the video game industry continues to expand, there is a pressing need to address the societal implications of excessive gaming particularly for individuals who substitute virtual engagement to real world interaction. The study findings prompt policymakers to consider the importance of targeted intervention for sleep related interventions both preventive and therapeutic as a part of broader

mental health strategies for adolescent population. School level awareness is vital for identifying gaming-related problems and associated psychological risks.

Measures to create awareness among school-going students are necessary for early identification and hence prevent further consequences.

Recommendations

To Parents

For parents, social media, internet learning, and game playing offer valuable tools to enhance their children's academic outcomes and enhance their learning experiences. By staying actively engaged in their children's learning, monitoring their online activities, encouraging learning opportunities may promotes a balanced approach to their screen time. Parents can help their children make the most of these digital tools while minimizing potential risks and challenges. Effective parental involvement is key to supporting children's academic success in the digital age.

To reduce the risk linked to problematic gaming among children and adolescents, a set of practical recommendations can be jointly implemented by both teachers and parents. First, establishing a clear boundary around internet usage, including age-appropriate rules for websites, apps, and games, as well as regulating screen time, can help to foster equilibrium between digital and real-world activities. Active monitoring and guidance are essential; adults should supervise digital activities, utilize parental controls, and ensure exposure to safe, educational content. Fostering open communication is equally important, as it enables youth to discuss their online experience and understand the consequences of behaviors such as cyberbullying and data sharing. Promoting alternative activities, such as outdoor sports, hobbies, and family-based screen-free interactions, can reduce digital dependency and enhance social-emotional development.

Furthermore, educating children and adolescents about online safety, including the protection of personal information and the risks of interacting with

strangers, builds digital literacy and resilience. Adults must also lead by example, modeling healthy screen habits and avoiding excessive device use in front of children. Refrain from using online access or device time as a reward or punishment. This can lead to unhealthy associations with problematic internet use. Finally, recognizing early warning signs of distress or addiction, such as behavior changes or withdrawal, and seeking professional support, when necessary, ensures timely intervention and promotes overall well-being.

To Teachers

For teachers, social media, internet learning, and game playing offer opportunities to enhance instruction, engage students, and promote academic achievement. By seeking professional development, collaborating with colleagues, differentiating instruction, and integrating educational games effectively, teachers can leverage these digital tools to support student learning outcomes and create dynamic and engaging learning environments. However, they must also be mindful of the challenges associated with technology integration and strive to maintain a balance between digital and traditional instructional methods to maximize their impact on academic achievement.

To foster healthy gaming habits and mitigate the adverse effects of unhealthy patterns of online game related involvement among young population, educators play a pivotal role in early identification, guidance, and collaboration with parents. Teachers should actively observe students for behavioural or academic disruptions potentially linked to excessive or inappropriate gaming and promptly communicate these concerns to caregivers, enabling timely intervention. Equipping educators with knowledge about the psychological and behavioural consequences of violent or age- inappropriate games is essential; they must convey these risks to students and parents in a manner that is both engaging and developmentally appropriate. Promoting the use of age-appropriate games guided by standardized rating systems such as ESRB OR PEGI can help ensure safer content exposure, while encouraging parental oversight of gaming habits. Additionally, educators should address the gender portrayals within video games, fostering critical thinking among students to

resist internalizing harmful stereotypes. To support balanced digital engagement, teachers can share practical strategies for integrating screen time with enriching the potential educational and skill-building benefits of video games when used judiciously. Educators can help families maximize positive outcomes while minimizing the risks through structured moderation and informed supervision.

To Health Care Professionals

Health care professionals- including mental health specialists, Pediatricians, and Nurses should actively engage in educating both parents and children about the health risk linked to internet-based and violent video games. Physicians and nurses are particularly encouraged to participate in media literacy initiatives by familiarizing themselves with the potential health risks of excessive media exposure and routinely assessing children's digital consumption. Preventive healthcare services could be strengthened by incorporating targeted advisories on the adverse effects of gaming-related behaviors.

Furthermore, families and educational institutions need to be informed about the risks linked to excessive gaming. Structured workshops and outreach programs can serve as effective platforms for disseminating this knowledge and promoting healthier digital habits. Psychoeducational interventions aimed at children and adolescents should be prioritized to foster awareness of the detrimental consequences of prolonged and unregulated video game use.

To Law makers

The policymakers, including the Government and the Ministry of Electronics and Information Technology, should prioritize the development and implementation of age-appropriate guidelines and restrictions to mitigate the overuse of gaming platforms. The primary objective should be to minimize the adverse outcomes associated with online gaming, particularly financial loss and psychological distress.

In parallel, the gaming industry must reinforce existing regulatory frameworks through the active engagement of stakeholders. Their involvement is crucial for stabilizing comprehensive oversight mechanisms that ensure responsible game development and distribution. At a community level, regulation of retail outlets such as video game parlors warrants particular attention. A robust licensing system should be instituted to monitor operational standards and ensure accountability. Additionally, all video games should undergo cultural reevaluation and re-rating, regardless of the manufacturer, to align with local norms and sensibilities.

To Media Education Programs

Media education serves as a vital tool in mitigating the negative influence of media while amplifying its potential benefits. When children and adolescents are equipped with media literacy, they become more discerning consumers, enabling them to navigate the complex media landscape more effectively. Media literacy has potential to diminish negative influence of it while improving its educational and developmental benefits. Moreover, pediatricians can help minimize the detrimental effects of media exposure can serve as a key advocate in protecting children's media related harms.

Pediatricians play a pivotal role in this effort. By actively supporting and promoting media education, they can help safeguard young minds against harmful content, misinformation, and unrealistic portrayals often found in digital media. Their advocacy can foster healthier media habits and empower families to make informed choices.

Suggestions for future research

Building on the present findings, future research may extend this work across diverse age groups and varied cultural or educational contexts to enhance generalizability. Research focusing on specific game genres can help us better understand the traits linked to different types of gaming. Since this study highlights important trends and concerns, more research is needed to uncover how gaming habits develop and how IGD affects young people. Longitudinal studies can help understand the impact of playing online games too much. Researchers can also assess children's behavior and emotions how they change after and before playing violent games. Data from parents can be collected to compare and verify the findings.

APPENDICES

APPENDIX-I

Information Sheet for the study

This is the Questionnaire Set. It contains questions exploring your interest and thoughts about the online gaming experience. Please read all the instructions carefully and make sure that you have answered all the questions. If you have any questions while completing this Questionnaire Set, please let me know, and I will be happy to assist you. Please complete this Questionnaire and hand it over to me when you have answered all the questions. Confidentiality will be maintained, and your participation will be anonymous. The data will only be used for research purposes. Many thanks for your participation in this study!

This research project has been reviewed and approved by the Human Ethics Committee of Mizoram University for Ph.D. research. You can contact them with any queries regarding your rights as a research subject.

Purpose of the study

The purpose of the study is to assess the Emotional, behavioral difficulties, and personality traits of youth with problematic online gaming. Completion of the research instruments will take approximately 30-35 minutes.

Contact details:

Abhipsa Satapathy (PhD Scholar)

Email: abhipsa.satpathy92@gmail.com

APPENDIX-II

Consent/ Assent Form for participation in the study

You are being asked to become a subject in the research “Emotional, Behavioural Difficulties and Personality Traits of Youth with Problematic Online Gaming,” conducted by Ms. Abhipsa Satapathy, Ph.D. Scholar (Clinical Psychology) in the Department of Clinical Psychology, Mizoram University, Aizawl.

Your participation in the study is voluntary, and you can withdraw at any point in time if you are not interested in participating. Anonymity will be maintained throughout the research. There will be no physical or psychological risk involved in your participation. During the research, you will be informed if there are any changes, risks, or benefits involved in your participation.

Members of the research team will be aware of your participation, and the information provided by you will not be disclosed to others.

Declaration by the participants (Write only initials)

I,, the undersigned, give my consent to be a participant in this study. I have been informed about the purpose of the study. My participation in this study is purely voluntary.

Declaration by the Parents/ Guardian

I _____ M/F/G of _____ have no
objection and provide written consent of my child's/ ward's participation in the above-mentioned
study.

Signature of the Participant

(Date: _____)

Signature of Parents/ Guardian

(Date: _____)

APPENDIX-III

SOCIO-DEMOGRAPHIC DETAILS

SECTION: A

1. Name (Optional):

2. Gender: Male Female

3. Age: **4. DOB:**..... **5. Education/Class:**..... **6. Stream:**.....

7. School:.....

8. Family type: Joint Nuclear

9. Annual Family Income: Rs 0.0 to 2.5 lakh..... Rs 2.5 lakh to 3.00 lakh.....Rs 3.00 lakh to

5.00 lakh..... Rs 5.00 lakh to 7.5 lakh..... > more than Rs 7.5 lakh.....

10. Contact Number (optional):

11. E-mail ID:

SECTION: B

15. Online Gaming Variables

- i) **Online game played last month:** Yes..... No.....
- ii) **Mode of gaming:** Online... Offline.... both....
- iii) **Reasons for playing online games:**
- iv) **Online gaming frequency:** Daily..... Weekly Monthly
- v) **Gaming Genres:** Action.... Strategy.... Roleplay.... Simulation..... Adventure.....
Combat Games..... Any other (Please mention)
- vi) **Per-day time spent on gaming:** 1-2 hours..... 3-4 hours..... 5-6 hours..... >6 hours....
- vii) **Favorite Online game (Specify one game):**
- viii) **Age when you started playing online games:** 15 y..... 16y 17y.....
18 y.... 19y...
- ix) **Platform used for online gaming:** Mobile... Laptop/PC.... gaming console
Dedicated gaming laptop..... gaming parlor.....
- x) **Sleep time (h/day):**
xi) **Sleep time (h/night):**
- xii) **Compromise sleep for playing games:** Yes..... No.....
- xiii) **Money spent on buying online games and in-game purchases (Except gadgets and Internet data pack)**
- xiv) **Feeling of enjoyment/excitement playing online games:** Yes No
- xv) **Irritation and anger when the game is interrupted or lost:** Yes..... No

xvi) Urge to play online games: Yes..... No

xvii) Feeling of guilt while engaging in online games: Yes..... No

xviii) Are online games addictive? Yes..... No....

APPENDIX-IV

General Health Questionnaire Short-version (GHQ-12); (Goldberg & Williams,1988)

Instruction: We would like to know if you have had any medical complaints, and how your health has been in general, over the past few weeks. Please answer ALL the questions by putting a tick simply by underlining the statements which you think most nearly apply to you. Remember that we want to know about the present and recent complaints, not those you had in the past.

0= Not at all, 1= No more than usual, 2= Rather more than usual, 3= Much More than usual

S No.	ITEMS	Not at all	No more than usual	Rather more than usual	Much more than usual
1	Loss of sleep because of worry				
2	Felt constantly under strain				
3	Could not overcome difficulties				
4	Feeling unhappy and depressed				
5	Able to concentrate				
6	Playing a useful part in things				
7	Capable of making decisions				
8	Able to enjoy day-to-day activities				
9	Able to face problems				
10	Feeling reasonably happy				
11	Losing confidence				
12	Thinking of oneself as worthless				

APPENDIX-V

Internet Gaming Disorder Scale- Short-Version (IGDS9-SF); (Pontes and Griffiths, 2014)

Instructions: These questions relate to your gaming activity during the past year (i.e., 12 months). By gaming activity, we mean any gaming-related activity played on a computer/laptop, gaming console, /or any other kind of device online and/or offline. Please put a tick next to each statement to indicate the extent to which you agree or disagree with that statement.

	Items	Never	Rarely	Some times	Often	Very Often
1	Do you feel preoccupied with your gaming behavior? (Some examples: Do you think about previous gaming activity or anticipate the next gaming session? Do you think gaming has become the dominant activity in your daily life?)					
2	Do you feel more irritability, anxiety, or even sadness when you try to either reduce or stop your gaming activity?					
3	Do you feel the need to spend an increasing amount of time engaged in gaming in order to achieve satisfaction or pleasure?					
4	Do you systematically fail when trying to control or cease your gaming activity?					
5	Have you lost interest in previous hobbies and other entertainment activities as a result of your engagement with the game?					
6	Have you continued your gaming activity despite knowing it was causing problems between you and other people?					
7	Have you deceived or cheat any of your family members, therapists, or others because of the amount of your gaming activity?					
8	Do you play in order to temporarily escape or relieve a negative mood (e.g., helplessness, guilt, anxiety)?					
9	Have you jeopardized or lost an important relationship, job, or educational or career opportunity because of your gaming activity?					

APPENDIX-VI

Big Five Inventory (BFI); (Goldberg, 1993)

1= Never, 2= Rarely, 3= Sometimes, 4= Often, 5= Very often

Instruction: Here are several characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? **Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.**

Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree Strongly
1	2	3	4	5

I see myself as Someone Who...

- | | |
|---|---|
| _____ 1. Is talkative | _____ 23. Tends to be lazy |
| _____ 2. Tends to find fault with others | _____ 24. Is emotionally stable, not easily upset |
| _____ 3. Does a thorough job | _____ 25. Is inventive |
| _____ 4. Is depressed, blue | _____ 26. Has an assertive personality |
| _____ 5. Is original, comes up with new ideas | _____ 27. Can be cold and aloof |
| _____ 6. Is reserved | _____ 28. Perseveres until the task is finished |
| _____ 7. Is helpful and unselfish with others | _____ 29. Can be moody |
| _____ 8. Can be somewhat careless | _____ 30. Values artistic, aesthetic experiences |
| _____ 9. Is relaxed and handles stress well | _____ 31. Is sometimes shy, inhibited |
| _____ 10. Is curious about many different things everyone | _____ 32. Is considerate and kind to almost |
| _____ 11. Is full of energy | _____ 33. Does things efficiently |
| _____ 12. Starts quarrels with others | _____ 34. Remains calm in tense situations |
| _____ 13. Is a reliable worker | _____ 35. Prefers routine work |
| _____ 14. Can be tense | _____ 36. Is outgoing, sociable |
| _____ 15. Is ingenious (Clever/original), a deep thinker | _____ 37. Is sometimes rude to others |
| _____ 16. Generates a lot of enthusiasm | _____ 38. Makes plans and follows through with them |

____17. Has a forgiving nature

____18. Has a forgiving nature

____19. Worries a lot

____20. Has an active imagination

____21. Tends to be quiet

____22. Is generally trusting

____39. Gets nervous easily

____40. Likes to reflect, play with ideas

____41. Has few artistic interests

____42. Likes to cooperate with others

____43. Is easily distracted

____44. Is sophisticated in art, music, or literature

APPENDIX-VII

Strengths and Difficulties Questionnaire (SDQ); (Goodman, 1997)

Instruction: The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling how often you felt or thought a certain way. Please put a tick mark next to each statement to indicate the extent to which you agree or disagree with that statement.

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

Sl. No	ITEMS	Never	Rarely	Sometimes	Fairly Often	Very Often
1	In the last month, how often have you been upset because of something that happened unexpectedly?					
2	In the last month, how often have you felt that you were unable to control the important things in your life?					
3	In the last month, how often have you felt nervous and stressed?					
4	In the last month, how often have you felt confident about your ability to handle your personal problems?					
5	In the last month, how often have you felt that things were going your way?					
6	In the last month, how often have you found that you could not cope with all the things that you had to do?					
7	In the last month, how often have you been able to control irritations in your Life?					
8	In the last month, how often have you felt that you were on top of things?					
9	In the last month, how often have you been angered because of things that					

	What happened that was outside of your control?					
10	In the last month, how often have you felt difficulties piling up so high that you couldn't overcome them?					

APPENDIX-VIII

Perceived Stress Scale-10 (PSS-10); (Cohen et al., 1983)

For each item, please mark the box for Not True, Somewhat True, or Certainly True. It would help

us if you answered all items as best you can, even if you were not certain. Please give your answers based on how things have been for you over the last six months.

0= Not true, 1= somewhat true, 2= certainly true

S. No.	Items	Not True	Somewhat true	Certainly true
1	I try to be nice to other people. I care about their feelings			
2	I am restless, I cannot stay still for long			
3	I get a lot of headaches, stomach aches, or sickness			
4	I usually share with others (food, games, pens etc.)			
5	I get very angry and often lose my temper			
6	I am usually on my own. I generally play alone or keep to myself			
7	I usually do as I am told			
8	I worry a lot			
9	I am helpful if someone is hurt, upset, or feeling ill			
10	I am constantly fidgeting or squirming			
11	I have one good friend or more			
12	I fight a lot. I can make other people do what I want			
13	I am often unhappy, downhearted, or tearful			
14	Other people my age generally like me			
15	I am easily distracted; I find it difficult to concentrate			
16	I am nervous about new situations. I easily lose confidence			
17	I am kind to younger children			

18	I am often accused of lying or cheating			
19	Other children or young people pick on me or bully me			
20	I often volunteer to help others (parents, teachers, children)			
21	I think before I do things			
22	I take things that are not mine from home, school, or elsewhere			
23	I get on better with adults than with people my own age			
24	I have many fears, and I am easily scared			
25	I finish the work I'm doing. My attention is good			

APPENDIX-IX

Insomnia Severity Index (ISI); (Morin, 1993)

Instructions: For each question, please circle the number that best describes your answer. Please rate the *current (i.e., Last 2 weeks)* severity of your sleep difficulties.

SI No.	Sleep Problem	None	Mild	Moderate	Severe	Very severe
1.	Difficulty falling asleep	0	1	2	3	4
2.	Difficulty staying asleep	0	1	2	3	4
3.	Problems waking up too early	0	1	2	3	4

1. How satisfied/dissatisfied are you with your current sleep pattern?

Very satisfied	satisfied	Moderately satisfied	Dissatisfied	Very Dissatisfied
0	1	2	3	4

2. How noticeable to others do you think your sleep problem is in terms of impairing the quality of your life?

Not at all noticeable	A little	Somewhat	Much	Very much noticeable
0	1	2	3	4

3. How worried/distressed are you about your current sleep problem?

Not at all worried	A little	Somewhat	Much	Very much worried
0	1	2	3	4

4. To what extent do you consider your sleep problem to interfere with your daily functioning (e.g. daytime fatigue, mood, ability to function at work/daily chores, concentration, memory, mood, etc.) currently?

Not at all interfering	A little	Somewhat	Much	Very much interfering
0	1	2	3	4

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RESEARCH PAPER PRESENTED (INTERNATIONAL/NATIONAL)

Paper presented titled “Exploring the gender difference in Online Gaming disorder: Its association with Insomnia and perceived stress among School students” at the 8th International Conference of the Indian Academy of Health Psychology (ICIAHP 2023) held in Goa from 30th November to 2nd December, 2023. (RCI Approved)

Paper presented titled “Internet Gaming Disorder: A study of Gaming Characteristics and Personality Traits among School students in Delhi NCR” at the 6th International Conference of Mental Healthcare in India: Basics & Beyond on 5th and 6th October 2024. (RCI Approved)

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DEPARTMENT	: Clinical Psychology
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ABSTRACT

EMOTIONAL, BEHAVIOURAL DIFFICULTIES AND PERSONALITY TRAITS OF YOUTH WITH PROBLEMATIC ONLINE GAMING

**AN ABSTRACT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
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**DEPARTMENT OF CLINICAL PSYCHOLOGY
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**EMOTIONAL, BEHAVIOURAL DIFFICULTIES AND PERSONALITY
TRAITS OF YOUTH WITH PROBLEMATIC ONLINE GAMING**

By

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**In partial fulfillment of the requirement of the Degree of Doctor of
Philosophy in Clinical Psychology of Mizoram University, Aizawl**

Abstract

Youth today are deeply immersed in online and video gaming, making it a central aspect of modern leisure activities. While gaming can serve as a source of enjoyment and relaxation, excessive engagement has been linked to negative outcomes such as addiction, dependency, and maladaptive use. Before the release of the DSM-5, the lack of a standardized definition of gaming addiction posed challenges for systematic research and clinical diagnosis. To address this issue, the World Health Organization (WHO) formally recognized the harmful impact of excessive gaming by including Gaming Disorder (GD) in the ICD-11 classification of mental health conditions. GD is characterized by a recurrent pattern of gaming often involving online interactions that significantly disrupts daily functioning. This may manifest as poor academic performance, strained interpersonal relationships, and emotional distress. Although the term “Internet Gaming Disorder” implies an online context, problematic behaviors can also arise from offline gaming. Nonetheless, most empirical, and clinical studies concentrate on online genres, particularly Massively Multiplayer Online Role-playing Games (MMORPGs) and competitive First-Person Shooters, due to their immersive environment and psychologically rewarding features. A formal diagnosis requires that gaming behaviour leads to substantial impairments in an individual's overall health and psychosocial functioning (Gentile et al., 2017).

Personality traits and gender norms significantly influence how individuals interact with video games. Empirical research constantly shows that males, particularly boys, are more likely to engage with and derive enjoyment from gaming compared to their female counterparts. One contributing factor is the societal framing of gaming as a predominantly “male” activity. This perception may lead some girls to fear social exclusion or judgment from their peers if they play video games, potentially resulting in diminished emotional support and a sense of disconnection (Rathakrishnan et al., 2023). Psychological variables also play a critical role in the onset and progression of Internet Gaming Disorder

(IGD). For certain individuals, gaming functions as a coping mechanism providing temporary relief from stress, negative affect, or unresolved emotional challenges. Those with limited social competencies may gravitate toward gaming environments, which offer a more predictable and less intimidating alternative to real-world interactions (Thakur et al., 2023). Moreover, social isolation and loneliness are recognized as key contextual factors that heighten vulnerability to problematic gaming. In such cases, excessive gameplay may serve as a substitute for unmet emotional needs. As digital technologies become increasingly embedded in everyday life, research has documented a correlation between heavy gaming and elevated stress levels, as well as disrupted sleep patterns. Despite these findings, the underlying mechanisms through which gaming influences neurobiological and psychological functioning remain insufficiently understood.

The adverse impact of online gaming on adolescents' physical and mental health has been widely acknowledged. This study sought to investigate the prevalence of online gaming among adolescents and explore the influence of gaming-related variables. It further examined the associations between gaming behaviour and psychological constructs, including emotional and behavioural difficulties, personality traits, perceived stress, and insomnia. Employing a correlational and descriptive design, the study utilized a non-experimental approach. A total of 452 high school students, aged 15 to 19 years, enrolled in various government and private schools across the Delhi NCR region, were recruited through purposive and convenience sampling techniques. Data were collected using a socio-demographic and gaming-related behaviours questionnaire, alongside standardized psychometric instruments: the Internet Gaming Disorder Scale-Short Form (IGDS9-SF), the Strengths and Difficulties Questionnaire (SDQ), the Big Five Inventory (BFI), the Perceived Stress Scale (PSS), and the Insomnia Severity Index (ISI). The General Health Questionnaire (GHQ-12) was administered to screen for common mental health conditions. Participation was entirely voluntary and anonymous.

To evaluate the study's hypothesis, multiple statistical procedures were conducted. Descriptive statistics and data screening were used to summarize

demographic and gaming-related variables. The Chi-square test was employed to assess the statistical relationship between various socio-demographic factors and a set of online gaming-related variables. Spearman's correlation coefficients assessed relationships among key psychological and behavioural indicators. The Mann-Whitney U test was employed to detect differences in emotional and behavioural problems across gaming genres, as well as gender-based variations in the study variables. Quantile regression analysis was performed to identify predictors of problematic online gaming behaviour.

The physical and psychological consequences of online gaming have been widely documented across age groups, with particular concern for adolescents. Considering its increasing prevalence, the present study aimed to assess the extent of online gaming among high school students and investigate how specific gaming-related variables may be associated with their psychological well-being. Specifically, the investigation focused on the relationship between problematic online gaming behaviour and emotional and behavioural difficulties, personality traits, perceived stress, and sleep disturbances such as insomnia. A quantitative, correlational descriptive design was employed to address these objectives. Descriptive analysis indicated that the dataset did not follow a normal distribution, necessitating the use of non-parametric statistical techniques for subsequent analysis. The mean score for problematic online gaming was 17.15, suggesting a considerable level of concern within the sample. Regarding personality traits, the highest mean score was recorded for openness to experience ($M = 33.52$), followed by agreeableness ($M = 30.38$), conscientiousness ($M = 27.30$), and extraversion ($M = 24.58$). neuroticism yielded the lowest mean score ($M = 23.94$), potentially indicating lower levels of emotional stability among participants.

Chi-square analysis revealed significant associations between the age of starting gaming and participants' age group ($\chi^2 = 30.93, p < .001$), education level ($\chi^2 = 9.72, p = .008$), and living arrangement ($\chi^2 = 10.15, p = .006$). Spending on games ($\chi^2 = 40.62, p < .001$) and enjoyment derived from gaming were notably linked to gender ($\chi^2 = 30.77, p < .001$). Feelings of guilt about gaming were tied to age group ($\chi^2 = 4.91, p = .02$). The compulsion to play was significantly related to

gender ($\chi^2 = 22.76, p < .001$), education ($\chi^2 = 9.43, p = .009$), and family type ($\chi^2 = 4.54, p = .03$). Moreover, both the frequency of gaming ($\chi^2 = 59.78, p < .001$) and daily gaming habits showed strong correlations with gender ($\chi^2 = 20.19, p < .001$) and age group ($\chi^2 = 6.81, p = .03$).

The overall Strengths and Difficulties Questionnaire (SDQ) score averaged 15.29, indicating a moderate level of emotional and behavioural challenges among participants. Within the SDQ subscales, the highest mean score was observed for prosocial behaviour ($M = 6.65$), followed by hyperactivity ($M = 4.26$). Lower scores were recorded for emotional problems ($M = 3.94$), peer relationship difficulties ($M = 3.78$), and conduct issues ($M = 3.12$), suggesting relatively fewer concerns in these domains. Participants reported elevated levels of perceived stress, with a mean score of 19.15, and moderate sleep-related difficulties, as reflected by an average insomnia score of 9.99. These findings point to a notable presence of psychological distress and sleep disruption within the sample. A pronounced gender disparity was evident in the prevalence of problematic online gaming, with 65% of male participants exhibiting gaming-related concerns.

Demographic analysis revealed that most respondents were 17 years old (37%), enrolled in the 11th standard (38%), and resided in nuclear family households (59%). Additionally, over half of the participants (51%) reported living in hostel accommodations. To gain deeper insight into gaming behaviour, participants responded to structured survey items addressing various online gaming characteristics. A substantial proportion (68%) reported engaging in online gaming within the past 12 months, indicating sustained exposure. Notably, 68% of respondents began gaming at the age of 15, and a significant majority (85%) described gaming as enjoyable, underscoring its strong emotional appeal among adolescents.

Only a quarter of the sample (25%) reported involvement in in-game purchases, suggesting relatively low monetary engagement despite frequent gameplay. Emotional responses to gaming revealed notable patterns: 56% of participants experienced irritation or anger when games were disrupted or lost,

and 34% admitted feeling guilty about their gaming behaviour. Additionally, 45% reported a persistent urge to play, highlighting tendencies toward compulsive engagement, while 58% acknowledged that gaming felt addictive. In terms of daily habits, most participants (78%) spent 1-2 hours playing games each day, predominantly using smartphones and mobile devices (85%). These findings underscore the central role of mobile technology in facilitating gaming access and raise concerns about its potential impact on mental health, emotional regulation, and behavioural outcomes among adolescents.

The study examined the participants' engagement with various internet gaming genres, including action, strategy, role-play, simulation, adventure, and combat games. Action games were found to be the most popular, with 57% of participants actively playing them, followed by 40% preferring adventure games, 33% opting for strategy games, and a smaller proportion engaging in combat games (25%), simulation (18%), and role-play games (15%). Statistical analysis revealed significant differences in emotional and behavioural outcomes across genre preferences. For instance, problematic online gaming differed notably between action and non-action games ($U = 22233.5$, $p = 0.04$) and between adventure and non-adventure genres ($U = 21297$, $p = 0.01$). Hyperactivity was significantly higher among players of role-play games ($U = 10593$, $p = 0.01$), peer problems varied between simulation and non-simulation genres ($U = 12828$, $p = 0.02$), and emotional issues were more pronounced among those who played combat games compared to others ($U = 16391$, $p = 0.02$).

These results suggest that genre-specific engagement may be linked to unique psychological and behavioural patterns. To further explore gaming behaviour, the study examined gender-based differences in key variables. It was found that male participants exhibited significantly higher levels of problematic online gaming ($U = 14914$, $p < 0.001$). Interestingly, female gamers scored higher on personality traits such as openness to experiences ($U = 17744$, $p < 0.001$), agreeableness ($U = 16507.50$, $p < 0.001$), and neuroticism ($U = 14864$, $p < 0.001$), while no gender differences were observed for extraversion and conscientiousness. In terms of emotional and behavioural issues, female gamers reported higher emotional

problems ($U = 16820, p < 0.001$) and overall difficulty scores ($U = 20305, p < 0.05$), while peer problems were more prevalent among male gamers ($U = 20647, p < 0.05$). Female participants also demonstrated higher levels of prosocial behaviour ($U = 15473, p < 0.001$). There were no significant gender differences in conduct problems and hyperactivity. Additionally, female gamers exhibited greater perceived stress ($U=15517, p < 0.001$) and insomnia ($U=16601, p < 0.001$), highlighting important psychological health concerns about gendered gaming patterns.

The study findings revealed notable associations between problematic online gaming and severe psychological and behavioural variables. A significant negative correlation was observed between problematic gaming and four personality traits: openness to experience ($r_s = -.105, p < 0.05$), conscientiousness ($r_s = -.141, p < 0.01$), extraversion ($r_s = -.097, p < 0.05$), and agreeableness ($r_s = -.149, p < 0.01$). These results suggest that individuals exhibiting lower levels of these personality traits may be more prone to problematic gaming behaviours. Interestingly, no significant relationship was found between neuroticism and problematic online gaming, indicating that emotional instability may not directly influence excessive gaming patterns in this sample.

When examining emotional and behavioural difficulties using the SDQ domains, several positive correlations emerged. Conduct problems ($r_s = .248, p < 0.01$), emotional problems ($r_s = .099, p < 0.05$), hyperactivity ($r_s = .128, p < 0.01$), peer problems ($r_s = .148, p < 0.01$), and the total difficulty score ($r_s = .238, p < 0.01$) were all significantly associated with higher levels of problematic gaming. These findings suggest that adolescents facing greater psychological challenges are more likely to engage in problematic gaming behaviours. Conversely, prosocial behaviour demonstrated a significant negative correlation ($r_s = -.241, p < 0.01$), implying that individuals with stronger interpersonal skills and helping tendencies were less likely to report gaming-related difficulties. Further analysis revealed a significant positive relationship between problematic gaming and insomnia ($r_s = .221, p < 0.01$), indicating that excessive gaming may interfere with sleep quality or contribute to sleep-related problems. However, perceived

stress did not show a statistically significant association with problematic gaming, suggesting that within this sample, stress levels may not serve as a direct predictor of maladaptive gaming habits.

The quantile regression analysis revealed that certain psychological and behavioural variables played significant predictive roles in problematic online gaming, with effects varying across different levels of the distribution. At the 25th quantile, conduct problems demonstrated the strongest positive association ($\beta = 1.05, p < 0.001$), followed by peer problems ($\beta = 0.764, p < 0.05$) and insomnia severity ($\beta = 0.126, p < 0.05$). These results suggest that even among individuals with lower levels of problematic gaming, behavioural difficulties, and sleep disturbances are meaningful risk factors. Moving to the 50th quantile, peer problems remained a significant positive predictor ($\beta = 0.820, p < 0.05$). Reflecting the continued influence of interpersonal difficulties across moderate levels of gaming behaviour. Notably, prosocial behaviour emerged as a significant negative predictor at this level ($\beta = -0.478, p < 0.05$), suggesting that stronger social engagement and empathy serve as protective factors. Additionally, insomnia continued to show a positive association ($\beta = 0.183, p < 0.01$), with a slightly stronger impact than observed at the lower quantile.

At the 75th quantile representing individuals with the most severe gaming issues, the analysis identified four significant predictors. Conscientiousness showed a negative relationship with problematic gaming ($\beta = -0.157, p < 0.05$), indicating that individuals who exhibit greater self-control and discipline are less likely to experience serious gaming-related difficulties. Prosocial behaviour maintained its protective role, with an increased effect size ($\beta = -0.587, p < 0.001$), reinforcing its importance as a buffer against problematic engagement. Meanwhile, insomnia exhibited its strongest positive association at this level ($\beta = 0.315, p < 0.001$), highlighting the close link between gaming addiction and sleep disruption in more severe cases.

Overall, these findings suggest that insomnia becomes an increasingly prominent risk factor as problematic gaming intensifies, while conscientiousness

and prosocial behaviour consistently serve as protective traits across the spectrum. In contrast, other personality domains such as openness, extraversion, agreeableness, and neuroticism did not significantly contribute to the prediction model. Likewise, SDQ domains including emotional problems and hyperactivity, along with perceived stress, failed to show significant predictive value, suggesting a more limited role in explaining gaming-related maladaptation within the sampled population.

To summarize the overall findings, the study revealed that problematic online gaming behaviour is more prevalent among males. Most participants were actively engaged in online gaming, particularly action, adventure, strategy, and combat games. Gaming tended to begin in mid-adolescence and was often associated with enjoyment, although some participants reported irritation, guilt, or a strong urge to play, pointing to addictive tendencies. Mobile phones were the most used gaming platform, and gameplay generally occurred daily over moderate durations. In terms of psychological associations, problematic gaming was linked to lower scores in personality traits such as openness, conscientiousness, extraversion, and agreeableness, while pro-social behaviour emerged as a protective factor. Emotional and behavioural issues, including conduct problems, hyperactivity, and peer difficulties, showed significant positive relationships with problematic gaming, whereas stress levels did not appear to be directly linked. Sleep disturbances, particularly insomnia, consistently surfaced as a significant correlate of excessive gaming, especially among those with more severe gaming issues.

Genre-specific analysis highlighted differences in emotional and behavioural patterns, with certain game types being more associated with issues like hyperactivity, emotional problems, and peer difficulties. Gender comparison showed that while males engaged more heavily in gaming, females exhibited higher levels of perceived stress, emotional challenges, insomnia, and prosocial behaviour. Quantile regression confirmed that insomnia and peer issues are strong risk factors for problematic gaming, particularly at higher severity levels, while conscientiousness and prosocial behaviour appear to mitigate gaming-related

difficulties. Other personality traits and dimensions have limited predictive influences.

In conclusion, this study shows that personality traits and emotional issues play a big role in how teenagers experience online gaming. Some traits help protect against unhealthy habits, while others can make a gaming problem worse. Knowing who is most likely to be affected, like certain age groups or family types, can help design better support systems and awareness programs. Since most youth play games on their phones, tools to promote healthier gaming should focus on mobile platforms. The different emotional reactions to gaming, like frustration or guilt, show that it is not just about how much someone plays but also how gaming affects their feelings. Game genre matters too- some types of games can lead to more emotional and social struggles, so personalized help is important. Boys and girls experience gaming differently, which means support programs should be sensitive to gender-related needs. By understanding the personalities of those who are more vulnerable, like those who struggle with self-control or social interaction, we can offer more targeted support. And because gaming problems often go together with behavioural issues like hyperactivity or peer conflict, the broader picture needs to be investigated, not only gaming.

The study, while insightful, had certain limitations that affected its scope. It was a cross-sectional design and relied on purposive and convenience sampling, meaning the results cannot establish a cause-and-effect relationship. The sample size was modest and collected from one city. The study relied on self-reported responses, which could have led to over- or under-reporting. Despite these limitations, the findings provide valuable insights into how online gaming affects adolescents in India. The results highlight important psychological patterns linked to problematic gaming, such as sleep disturbances and emotional and behavioural challenges. These insights can guide early prevention efforts and help educators, parents, and policymakers better understand the impact of game genres, gender differences, and preferred devices, like smartphones, on students' mental health and well-being.

The study recommends that parents and teachers set clear boundaries for screen time, monitor children's digital habits, promote offline activities, encourage open communication, and lead by example. Teachers are urged to notice early warning signs, educate students and parents about gaming risks, and promote age-appropriate and healthy gaming habits. Media education programs should also be strengthened, helping children critically process violent and unrealistic portrayals in games. For further research, a deeper and broader approach is suggested. This includes expanding the age range of participants, incorporating qualitative tools like interviews and case studies, conducting longitudinal studies to explore long-term effects, measuring changes before and after exposure to violent games, and including parents' perspectives to validate findings. Building on the current findings, future studies should adopt longitudinal designs to explore the long-term psychological and behavioural effects of excessive online gaming, particularly during developmental transitions such as adolescence to early adulthood.

Tracking changes over time would help clarify causal relationships and trajectories of Internet Gaming Disorder. Researchers can broaden the scope by studying diverse age groups- including younger children, college students, and emerging adults- to understand how gaming behaviour evolves across life stages. Studies that involve participants from varied geographical, linguistic, and cultural backgrounds across India, it would enrich the understanding of regional differences in gaming patterns and challenges. In addition to self-report measures, mixed-method approaches should be employed. Incorporating qualitative methods such as in-depth interviews, focus groups, and digital ethnography would allow for richer narratives and contextual insights. Eye-tracking, behavioural observation, and physiological monitoring (e.g., heart rate variability, sleep trackers) could offer objective data to supplement psychological assessments.

Further research may also examine the neural and cognitive mechanisms underlying problematic gaming using neuropsychological assessments or brain imaging techniques. Investigating executive functioning, impulse control, and reward sensitivity may help identify cognitive vulnerabilities. Since the current

study emphasizes genre-specific impacts, future work should delve deeper into psychological mechanisms tied to specific game genres and analyze how immersive design features influence emotional engagement, dependency, and aggression. Expanding into parental and peer perspectives could offer a more holistic understanding of the social ecosystem around gaming. Studies might also include teachers and school counselors as informants to assess academic and behavioural correlates. Exploring intervention development is another important direction. Researchers could pilot and evaluate school-based programs that teach emotional regulation, digital literacy, and healthy coping strategies using games as a tool for positive behaviour rather than risk. Finally, with the rapid advancement of technology, including virtual reality, AI-driven game dynamics, and augmented reality, future studies must anticipate and address evolving risks. This includes assessing IGD risk within metaverse platforms and examining how emerging modalities may reinforce behavioural addiction.

Furthermore, future studies could investigate how specific design elements in games, such as reward schedules, multiplayer social features, avatar customization, and narrative depth, affect psychological engagement and risk of problematic use. Understanding how gamification strategies interact with individual vulnerabilities may help guide ethical game development and regulation. Exploring gaming behaviours within different cultural groups, linguistic communities, or rural versus urban settings across India could shed light on how social norms, values, and access influence gaming-related distress. Research could examine how parenting approaches, households, and parental attitudes towards gaming shape adolescent behaviour. Studies could assess family-level interventions that encourage healthy digital engagement while reducing conflict and isolation linked to gaming.