



## The Dark Side of Internet Gaming Disorder

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**ABSTRACT:** -Internet gaming disorder (IGD) is classified as an addictive disorder by both the diagnostic and statistical manual of mental disorders, fifth edition, and the 11th revision of the international classification of diseases. According to an epidemiology survey, 3-5% of people globally have it. Like other addiction illnesses, IGD presents clinically as decreased game control leading to functional impairment in daily life, including social, professional, and academic domains. IGD has a significant degree of variety, making its neurobiological and psychosocial conditions unknown. Alternations in the following areas could be the underlying mechanisms: emotional regulation, cognitive control, response to rewards or dislike, and games. There are several possible correlations between impulsivity, hostility, depression, anxiety, stress, social support, and family dynamics. Attention-deficit hyperactivity disorder (ADHD), depressive disorders, social anxiety disorders, generalised anxiety disorder, and personality disorders are strongly associated with IGD. Clinically significant arises from the bidirectional relationship between diseases and IGD. To make a diagnosis and create a customised treatment plan, it is therefore essential to thoroughly evaluate all of the primary symptoms of IGD as well as any negative effects, functional impairment, complications, and environmental factors, especially stress and family dynamics. Patients with IGD should be administered psychological therapy as soon as possible due to possible due to the lack of effective somatic interventions.

**Keywords:** Problematic gaming, gaming addiction, online risk, psychological resilience, Chinese, adolescence, psychological well-being

### I. INTRODUCTION: -

Playing video games on an electronic device has progressively gained popularity as a kind of amusement. But playing these games too much might have negative effects on your physical and

mental well-being and perhaps cause gaming disorder (GD). It is according to a recent meta-analysis, 3.5% of girls and 8.5% of males worldwide are predicted to have GD. Asia has the highest prevalence (6.3%) of any region in the world, followed by North America (3.6%), Oceania (3.0%), and Europe (2.7%) [1]. The age group with the highest prevalence, children and adolescents, was 6.6%. Uncontrollable or persistent online or offline gaming behaviour is referred to as "gaming disorder." This type of addictive behaviour is often referred to as gaming addiction troublesome gamin and pathological gaming [2]. The term "gaming disorder" (GD) is used throughout this review.



Fig-1

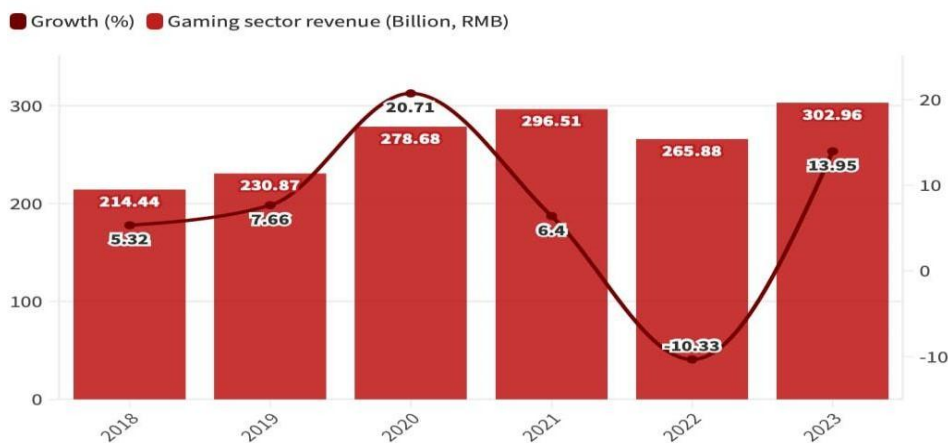
Roughly 175 million people under the age of 18, or 93.1% of the country's minor population, were routinely online in 2019, and the percentage of children under the age of 10 who use the internet is worryingly rising. During the global COVID-19 pandemic outbreak, screen time and online gaming surged unprecedentedly [3]. There is a drawback to this solution: since most kids and teenagers lack the knowledge and experience necessary to maintain a healthy online presence, they run the risk of developing severe dependency. Internet gaming disorder is a prevalent type of screen-based dependency.

- A. An intense obsession with video games.
- B. Unpleasant reactions when gaming is stopped.
- C. Increased gaming engagement.
- D. Loss of control.



- E. Abandoning other interests or hobbies in favour of gaming.
- F. Continuing excessive gaming despite knowledge of the detriment psychosocial effects. Lying to family and friends about how much time is spent gaming.
- G. Using gaming to escape unpleasant moods;
- H. Jeopardizing relationships, employment, and education in favour of excessive gaming.

**China's Gaming Market Growth, 2018-2023**



Source: 2023 China Gaming Industry Report

Fig-2

According to Oxford English Dictionary (2024), a game is "an activity which provides amusement or fun; an amusement, a diversion, a pastime." Video games are software designed for entertainment that can be played on computers, game consoles, handheld consoles, and mobile phones. An online video game is one that allows players in various physical places to play together over the Internet [4]. Furthermore, internet games are categorized based on whether they are cooperative or competitive. Gaming Disorder Predictors Twelve competitive video games among university students are split into amateur and professional divisions, much like in sports, and are also known as e-sports. Massively multiplayer online games, which enable numerous players to access an online gaming environment and communicate with one another at the same time, have become increasingly popular in the video game industry, especially in recent years. Over 50% of video game players in Turkey are under 35, with the bulk falling between the ages [5]. One could argue that the nation's youth, young adults, and children are among the populations that the e-Sports sector primarily targets.

## II. Methods: -

### Beck Anxiety Inventory (BAI): -

The Beck Anxiety Inventory (BAI original version ; Chinese version ; the Beck Depression

Inventory-II (BDI-II original version ; Chinese version ; the Satisfaction with Life Scale (SWSL original version ; Chinese version ; the Rosenberg Self-Esteem Scale (RSES original version ; Chinese version ; the Internet Gaming Disorder Test (IGD original version ; Chinese version ; the Strengths and Difficulties Questionnaire (SDQ original version ; Chinese version ; and a section on socio-demographic data (respondent's age, gender, residence, number of family members, and daily gaming time) were all completed by the research participants. To measure elevated anxiety symptoms, the 21-item BAI (Chinese version and original version is used. This test measures the physiological, emotional, and cognitive aspects of anxiety symptoms [6]. A four-point rating scale, with 0 representing "not at all" and 3 representing "severely—I could barely stand it," is given to each participant. They were questioned about how each statement had affected them throughout the previous week, including the day they finished the BAI.

### Beck Depression Inventory (BDI): -

BDI The 21-item Beck Depression Inventory (BDI) was created to screen for depression severity. It was later amended in 1996 to better align with the Diagnostic and Statistical Manual-IV (DMS-IV) criteria for depression severity. The four-point Likert scale (0 to 3) is used to gauge the degree of depression in the responses.



The BDI total score falls between 0 and 63. Approximately ten minutes are needed to finish this screening test. Excellent psychometric qualities can be found in the original BDI, which has strong test-retest reliability (0.93) and great internal consistency reliability (Cronbach's alpha = 0.92). The Chinese BDI's internal consistency dependability was also shown to be good (Cronbach's alpha = 0.94) The BDI exhibited good model fits in this investigation The five items in the SWSL. Chinese version is used to screen people's life satisfaction from a global cognitive judging perspective. Each item on the survey, such as "In most ways my life is close to my ideal," or "The conditions of my life are excellent," has seven Likert points, ranging from 1 (strongly disagree) to 7 (strongly agree), which respondents use to indicate how satisfied they are with the topic. The SWSL exhibited strong model fits in the current investigation. The highest overall score indicates a higher degree of online gaming addiction. The IGD-20 Test showed strong model fits in the current investigation The SDQ is a 25-item assessment tool used to evaluate youth behavioural issues (original version; Chinese version [7]).

#### Measures:

##### Psychological Resilience:

The self-report version of the Child and Youth Resilience Measure-28 was utilized to measure psychological resilience due to its prior validation among Chinese children. Three major constructs are measured by the 28 items: contextual elements that promote a sense of belonging (e.g., spirituality, culture, education), individual factors (e.g., personal skills, peer support, social skills), and relationship with the primary caregiver (e.g., physical and psychological caregiving). A 5-point Likert scale, with 1 denoting not a lot and 5 denoting a lot, was used by the participants to rate each item [8].

##### Neurobiological studies:

Treatments addressing deficiencies in executive and cognitive-affective domains may be necessary since these disparities may be the root cause of impairments in cognition (e.g., decision-making), emotion processing (e.g., emotion regulation, impulsivity), and executive functions (e.g., working memory, attention). In regions linked to emotional regulation, decision-making, and cognitive and motor control (e.g. ventromedial and dorsolateral prefrontal, anterior cingulate, and premotor cortices), a meta-analysis of adults with and without IGD revealed structural differences with reduced gray -matter volumes [9]. Additionally,

brain activations during "hot" and "cold" executive functioning tests were different between those with and without IGD, indicating that both domains might profit from focused interventions.

##### Clinical studies:

Reviews assessing the effectiveness of treatments. discuss methodological flaws that limit the amount of information that can be used to confirm the efficacy of various treatment approaches. These flaws include small sample sizes, the lack of randomization, blinding and control groups, insufficient information on effect sizes, recruitment and sample characteristics, and a lack of information on treatment adherence. There has been an increase in treatment-efficacy studies in the past few years, and the quality of treatment evidence has been steadily improving. However, there is still a lot that has to be done to improve [10]. Studies should include follow- up assessments that last for at least six months or more, assessments of clinical improvement conducted by certified specialists (such as psychiatrists), and more thorough evaluations of treatment outcomes and underlying processes, according to King and colleagues.

##### Depression Linked to IGD and Dangerous Online Conduct:

Research has indicated that depression may serve as a risk factor for behaviours associated to the Internet. According to certain research, depression may play a role in the development and maintenance of IGD in teenagers [ 11]. An additional finding from a longitudinal study suggested a potential reciprocal relationship between IGD and depressive symptoms that are associated with similar risk variables, including low academic achievement and poor self-regulation.



Fig-3



Furthermore, because IGD disrupts real-life social connections, it may evoke more depressed symptoms, which can lead to interpersonal issues and social isolation that spiral out of control. The neurocognitive model states that negative online gaming experiences change how the brain works and how players think. For example, they gain a sense of reward and have less executive function when it comes to handling big life responsibilities, which can make them feel like failures and increase their risk of developing depressive symptoms [12].

### Gender Moderate Mediation Effect:

#### Sex differences in study variables:

| Factors                      | Female  | Male    | t (p)   | Cohen's d |
|------------------------------|---------|---------|---------|-----------|
| Psychological Resilience     | 102.255 | 102.333 | -0.078  | 0.0005    |
| Internet Gaming Disorder     | 33.011  | 34.194  | -3.095  | 0.202     |
| Risky online Behaviour       | 8.866   | 9.863   | -6.580  | 0.421     |
| Share data                   | 1.396   | 1.517   | -3.317  | 0.201     |
| Meeting strangers            | 1.821   | 1.943   | -2.597  | 0.163     |
| violence                     | 1.667   | 2.297   | -13.751 | 0.842     |
| Bullying                     | 1.270   | 1.306   | -1.375  | 0.064     |
| Pornography                  | 1.311   | 1.418   | -3.082  | 0.185     |
| Being bullied                | 1.416   | 1.447   | -0.961  | 0.059     |
| Loneliness                   | 34.710  | 33.159  | -2.350  | 0.154     |
| Depression                   | 9.645   | 7.409   | 5.892   | 0.393     |
| Online hours                 | 3.553   | 3.197   | -0.928  | 0.057     |
| Internet Gaming hours        | 1.381   | 3.197   | -12.137 | 0.701     |
| Social networking site hours | 1.850   | 1.672   | 1.048   | 0.059     |

In conclusion, this study looked at psychological resilience as a mechanism that underlies the link between depressive symptoms and harmful online behaviours. Research on the interaction between risk and protective factors in both IGD and risky online behaviour in teenagers is still lacking in terms of negative psychological effects and social impact, despite the fact that some studies have looked at those who have an Internet addiction. As stated at the beginning, Internet addiction and IGD share conceptual similarities but are different, each having an own set of psychological correlates. Therefore, IGD, which

Because women are more likely than men to suffer from depression, and because women are more likely than men to seek social support to alleviate psychological discomfort, this study also looked at sex differences. Given that men are more likely than women to play online games and see cyberpornography, there is also a tendency for the strength of the correlation between risky online behaviour and depressive symptoms to differ by sex. Given these results, we suggest that the degree to which depressed symptoms are linked to both IGD and dangerous online behaviour varies by sex [13].

was just added to the ICD-11 as a mental disease, requires further empirical research. We also broadened the scope to look at a variety of dangerous online behaviours in addition to certain Internet-related diseases. This study aimed to bridge the information gaps by examining depressed symptoms as risk factors for risky online behaviour and IGD. More significantly, it looked at the potential mediating effect of psychological resilience on depressive symptoms and these new issues in the cyber age [14]. We administered a cross-sectional survey to a sample of secondary school pupils in order to evaluate these theories. To the best



of our knowledge, this study is the first to identify the psychological resilience mechanisms that underlie the correlation between depressive symptoms and risky online behaviour as well as IGD. The results have real-world ramifications for the planning of prevention and intervention initiatives meant to lessen these new issues in the digital age.

#### **Massive Multiplayer Online Role-Playing Games:**

Understanding the characteristics of massive multiplayer online role-playing games (MMORPG), the most popular type of online gaming with over 20 million players globally and predicted to grow in number, is crucial for providing context for IGD. MMORPGs were created to improve the gaming experience by allowing players to create their own virtual worlds of delight and fantasy [15]. They evolved from single-player games in the 1980s. Games become increasingly complex and interactive as the gaming business developed and expanded into new markets. In order to improve their characters' standings, players from a variety of racial backgrounds, age groups, and geographic locations can now connect with one another through custom-built characters in massively multiplayer online role-playing games (MMORPGs) like World of Warcraft and League of Legends. In contrast to console-based offline games, massively multiplayer online role-playing games (MMORPGs) are endless, accessible worldwide, encourage players to play nonstop, and are linked to a higher risk of developing compulsive behaviours.

#### **Identifying and Handling IGD:**

Internet Gaming Disorder (IGD) was added to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) fifth edition by the American Psychiatric Association (APA) in 2013. IGD was included to the DSM-5 appendix as a condition that needed additional clinical investigation before it could be categorized as a formal mental disorder. Internet gaming addiction, online gaming addiction, computer game addiction, and pathological gaming are some of the terms that have been used to characterize IGD in the literature [16]. The current article uses the term IGD in accordance with the APA category. As a recently proposed mental illness, IGD is still relatively unknown to primary care physicians (PCPs). However, IGD is unquestionably a significant emergent issue that is probably underreported and undervalued in clinical settings. PCPs from a variety of specialties, such as family physicians, mental health counsellors, and community nurses, provide frontline care to patients

and are essential in the early detection and prompt treatment of IGD [17]. Therefore, it is essential that PCPs learn about IGD.

#### **What signs of Internet gaming disorder are present?**

The following are some ways that IGD symptoms might appear:

Even when there should be time for school, family time, or relaxation, the person's thoughts are consumed by gaming. They get agitated, nervous, and restless when they are unable to play. They eventually have to play for longer periods of time in order to get the same amount of thrill and fulfilment, frequently at the expense of important activities like eating and sleeping. They struggle more and more to restrict their gaming time, even after making several vows to themselves or loved ones [18]. As gaming becomes more important to them, they become disinterested in things that used to bring them joy. They keep playing games in spite of the obvious drawbacks, which include poorer academic results, damaged relationships, and health problems brought on by malnutrition or sleep deprivation. Internet gaming turns into a major way to escape from stress, mental suffering, or real-life issues; it offers a short-term haven but no lasting remedy.

#### **Which factors contribute to Internet gaming disorder?**

Although the exact causes of IGD are not well understood, the following are some potential causes:

##### **Individual factors:**

Individual factors are important in the aetiology of GD, in addition to environmental and gaming-related factors. These include genetic susceptibility, neurobiological mechanisms, comorbid psychopathology, personality traits, motivational variables, and demographic risk factors. Whether playing video games continues to be a healthy passion or turns into a disorder ultimately depends on the players and their unique vulnerabilities.

##### **Environmental elements:**

Lastly, environmental factors are influences that come from outside the person's surroundings rather than from within them. The gamer's family, friends, workplace, school, and culture are a few examples of environmental variables. The aetiology of GD includes situational and contextual elements in addition to game-related



and individual characteristics.

#### **Psychological factors:**

According to Dr. Ghosh, excessive gaming can be motivated by a need for social connection, escapism, or a sense of accomplishment. They may find incentives, recognition, and a sense of belonging in the virtual world that are difficult to come by in the actual world.

#### **Motivating elements:**

The function of motives in GD has been extensively studied. Numerous studies found mild to high connections between GD and achievement-related incentives (e.g., competition, progress), as well as moderate to substantial associations between escapism (playing video games to ignore everyday issues) and GD. Additionally, a number of studies have documented a noteworthy and substantial mediation effect of escapism between GD and various mental symptoms (such as depression). Two recent meta-analyses showed similar results. In the first, escapism and accomplishment motivation showed the highest favourable correlation, whereas immersion and social motivation showed a weaker but still significant association.

#### **Social factors:**

People may gravitate into online gaming groups due to a lack of supportive relationships and a desire to fit in. Compared to interacting with people outside of the virtual world, they feel more appreciated and understood there.

#### **Biological factors:**

According to the expert, some people may be more prone to addictive behaviours due to a hereditary predisposition or changes in brain chemistry. Their reaction to gaming is influenced by this factor.

#### **Environmental factors:**

Certain individuals are raised in a setting where screen time is uncontrolled and gaming is frequently utilized as a way to pass the time. This may help lead to the development of compulsive gaming behaviours.

#### **Is IGD more common in those who are depressed?**

According to Dr Ghosh, people who have underlying mental health conditions like anxiety or depression are particularly susceptible to acquiring Internet gaming problem. Gaming frequently provides a momentary reprieve from intense emotions of loneliness and inadequacy for someone suffering from depression. Games' immersive qualities provide players a feeling of achievement

and purpose while offering an emotional escape from the difficulties of the real world. But this ostensibly secure environment can become a trap, escalating underlying problems and fostering a dependency cycle.

#### **How is IGD diagnosed?**

An extensive evaluation procedure is required to diagnose Internet gaming disorder:

#### **Individual thoughts:**

Finding out the extent of the gaming activity begins with in-depth conversations with a psychologist. They give patients a secure, accepting environment in which they may honestly consider their behaviours and how they affect different facets of their lives [19].

#### **Assessing the influence:**

According to the expert, standardized measures and questionnaires are used to gauge how severe a gaming addiction is. These frequently serve as a sobering wake-up call, assisting people in realizing the seriousness of their circumstances.

#### **Family members' voices:**

To provide a more complete picture of the person's gaming behaviours and their effects in real life, input from friends and family is obtained. It can be emotionally taxing to hear loved ones voice their worries.

#### **Holistic comprehension:**

A comprehensive picture of the person's mental health is ensured by evaluating co-occurring illnesses, such as anxiety and depression. This thorough analysis reveals more profound emotional issues that may be fuelling the addiction to gaming.

#### **How is IGD treated?**

IGD is often treated using the following techniques [20]:

#### **Cognitive behavioural therapy (CBT):**

It assists people in identifying and altering harmful thought and behaviour patterns. Instead of using gaming to deal with stress and emotions, people can acquire more healthy coping mechanisms through cognitive behavioural therapy.

#### **Family counselling:**

By establishing appropriate boundaries and encouraging communication and understanding, family members can help create a supportive environment. According to Dr. Ghosh, this team effort aids in restoring relationships and trust damaged by the addiction.

#### **Behavioural treatments:**



People can recover control over their gaming habits by putting in place time limitations and regular schedules. A more balanced lifestyle can be promoted by striking a balance between gaming and other pursuits.

**Drugs:**

Medication may be recommended to treat underlying disorders such as anxiety or depression in order to alleviate some of the emotional pressures. Appropriate medical care can assist stabilize mood and lessen the need for gaming as a coping strategy.

**Support networks:**

Making connections with those going through comparable struggles can foster a feeling of belonging and mutual understanding. People can feel less alone in their troubles by breaking the isolation and providing emotional support through this group effort. The diagnosis of internet gaming disorder is a very recent one. A person's life may suffer as a result of their increased preference for gaming. Therapy and family support are two methods of treating this illness. Get health news and the most recent information on wellness and health.

**Game types: online and offline:**

Since online games frequently (though not always) allow for multiplayer play, and offline games (mostly) do not, the goal of distinguishing between online and offline games is to group them according to their social components. Online gamers are more likely to have GD than offline gamers, according to numerous studies and nevertheless, GD has also been connected to offline games. Given that the risk of GD is linked to loneliness, social anxiety, low self-esteem, and lower social competence, the most likely explanation is that online multiplayer games offer safe spaces where players can satisfy their social needs while staying anonymous and invisible, thereby reducing their anxiety from in-person interactions. Because they feel more socially competent and effective in these virtual environments, players with psychosocial vulnerabilities tend to prefer online social interactions over traditional face-to-face social activities. As a result, they appear to be especially vulnerable to problematic engagement with multiplayer online games that involve social interaction.

**Game design components, structural traits, and genres:**

Although there are numerous distinct game genre classifications, videogames can be categorized into shooter, strategy, role-playing, multiplayer online battle arena (MOBA), and other categories.

Numerous genres exist, and they frequently overlap with one another. Furthermore, a lot of games fall under multiple genres at the same time, and as the videogame industry continues to progress technologically, new game genres are constantly emerging, frequently by fusing old ones [21]. Change and development happen quickly. Furthermore, popular and new genres can often appear so quickly that research finds it difficult to keep up. As a result, certain research findings about gaming genres can even be out of date when they are published. However, a number of game genres and stand-alone titles have remained popular, and the literature indicates that certain of these genres have a greater potential for addiction than others. Along with first-person/third-person shooter (FPS/TPS), real-time strategy (RTS), and multiplayer online battle arena (MOBA) games, massively multiplayer online role-playing games (MMORPGs) are by far the most studied game type genre and have been consistently linked to problematic gaming. MMORPGs are permanent, immersive 3D virtual environments (usually with a fantasy or science-fiction theme) that allow a large number of users to communicate with one another online. This implies that even when players are not playing the game, the world is still there and changing large armies with medieval, fantasy, or sci-fi themes must be commanded in RTS games, which frequently involve resource management and the construction of military bases or settlements. Finally,[22] MOBAs require a high level of cooperation and are match-based, with two teams competing against one another, much like shooter games. Players often fight each other using spells and talents, and they can buy unique gear to improve and customize their fighting style as the game progresses.

**Personality characteristics:**

Based on the Five-Factor Model, a sizable number of studies have looked at the relationship between GD symptoms and the so-called "Big Five personality traits". Two meta-analyses have been conducted to summarize the existing research on the relationship between GD and the Big Five personality traits, showing a positive correlation with neuroticism and a negative correlation with extraversion, conscientiousness, and agreeableness. Given that neurotic people are prone to anxiety, depression, and stress, it makes sense that they would use virtual game worlds as an escape because they believe these virtual spaces to be safer and easier to manage than their real-world surroundings. However, gaming may become troublesome if kids



continue to escape in games to avoid negative affective states. Because games contain clear rules and regular positive reinforcement, those with low conscientiousness scores may find them appealing because they struggle with self-discipline and dutifulness, are less structured, and are less persistent in their goals [23]. Last but not least, impulsivity is thought to be a shared explanatory component for both GD and attention-deficit hyperactivity disorder (ADHD), which has also been identified as a significant comorbid disorder. Numerous research has also looked at the relationship between GD and other personality factors. For instance, some studies have found a favourable correlation between sensation seeking and GD symptoms, whereas other studies found no significant correlation at all. It is conceivable that people may become addicted to video games in an attempt to find new stimuli through their difficulties and adventures.

#### **Upcoming Studies: New Targeted and All-Inclusive Therapy Program:**

Considering future study, there is a definite need for developing a new, complete treatment program that incorporates individual, family, and society components. Time spent playing video games, active attitudes, single-parent households, loneliness, impulsivity, behaviour issues, decreased levels of fitness and sports involvement, and more were among the risk factors that Mihara and Higuchi identified. Likewise, protective factors include improved social skills, self-worth, classroom social integration, school-related wellbeing, and perceived behavioural control, and support for teacher autonomy.] Future treatment programs could be an integrated specific program based on protective and risk factors; specifically, the treatment program could include counsellor-led traditional psychology sessions and sports check-ins to increase the amount of time spent exercising; additionally, the program could involve school staff (e.g., a teacher or a counsellor) to help them reintegrate or return to class; and finally, the family, as recommended by Bonnaire and Liddle. Following the development of a novel treatment program, researchers should carry out a feasibility study and randomized controlled trial to ascertain the effectiveness of the treatment.

### **III. Conclusion: -**

We discovered a moderately positive connection between AG and IGD in this investigation. In other words, individuals with

higher IGD levels might exhibit more AG. Furthermore, individuals who exhibit more aggressive behaviours might also have greater levels of IGD. Additionally, a number of factors, such as survey year, age, and geography, mitigate the association between IGD and AG. In Asia, there is a higher correlation between IGD and AG than in Europe. IGD and AG have a correlation coefficient that is comparable to that of middle school, college, and elementary school pupils [25]. Lastly, as the survey year increases, so does the correlation between IGD and AG. According to this meta-analysis, individuals with greater IGD may exhibit more aggression, and those with higher IGD may also exhibit more aggression. In Asia compared to Europe, the correlation coefficient between IGD and AG was substantially larger in primary school than in middle school and college, and it increased with each passing year.

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