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**Research Paper**

# The Effect of Internet Gaming on Levels of Aggression and Procrastination among Adolescents and Young Adults

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## ABSTRACT

Our current world has been classified as an information society. The invention of technology and its evolution has impacted our lives on multiple levels and affected our lifestyles immensely. Internet gaming has become an exceedingly popular phenomenon among people of all walks of life. Once considered vogue, internet games have traversed demographic and cultural boundaries to now become a significant part of not only children's lives but lives of people of all ages. The aim of the current research is to study the effect that internet gaming has on aggression and procrastination among adolescents and young adults. Convenience sampling and snowball sampling techniques were used to gather data from participants. The sample consisted of 106 adolescents and 177 young adults between the ages of thirteen to twenty-five years. Three questionnaires were administered i.e., Internet Gaming Disorder Scale–Short-Form (IGDS9-SF), Buss and Perry Aggression Questionnaire, and Irrational Procrastination Scale. T-tests and Pearson's correlation methods were employed for analysis of the collected data. The results indicated that age does not have any significant effect on levels of internet gaming, aggression, or procrastination. However, the variables were found to be moderately correlated among one another.

***Keywords:*** *Internet Gaming, Aggression, Procrastination, Young Adults, Adolescents*

Our current world has been classified as an information society. The invention of technology and its evolution has impacted our lives on multiple levels and affected our lifestyles immensely. The use of technology is inevitable and it is intertwined with our lives. Due to the extent of the presence of various forms of technology in our lives, there is a constant debate as to whether technology has affected us negatively or positively.

### *Internet gaming*

Internet gaming has become an exceedingly popular phenomenon among people of all walks of life. Once considered vogue, internet games have traversed demographic and cultural boundaries to now become a significant part of not only children's lives but lives of people of all ages. All game types (both gambling related and non-gambling related, including the wagering of real money, virtual money, or no money wagering), which are played online (including through a social network/media platform played solo or multiplayer) via a

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computer, a laptop, a game console, a tablet, a mobile phone, or any other digital device that has internet access and game play capabilities fall under the category of internet gaming.

Based on the ancient mathematical game "Nim", the first known game machine was given by Dr. Edward Uhler Condon at the New York World's Fair in 1940. It was reported that it was played by approximately 50,000 people during the six months it was on display, with the computer reportedly winning more than 90 per cent of the games played. Since then, gaming has come a far way blossoming into the ubiquitous industry we know today.

Internet gaming dates back to as early as the 1970s with games such as MUD that were initially confined to internal networks. With the expansion in technology and availability of the internet, video games started introducing social networking features in popular games like counterstrike, starcraft, etc. Soon after, in the 2000s, massively multiplayer online games (MMOs) created a new trend. Today, technology has flourished to the point that even our favourite childhood games like ludo and solitaire are also available on our devices a click of a button away. Improvement in the caliber and variety of games has ensured that there is something for everyone.

It is an exponentially growing billion-dollar industry with an estimated usership of around one billion gamers worldwide mainly residing in Asian countries like China, Japan, South Korea, and India. In India, the gaming industry has flourished in the past few years. This boom is majorly attributable to the increased acceptance and usage of smartphones, decreased internet data costs, and changes in the perception of gaming as entertainment. The growth was further accelerated by the COVID-19 lockdowns. Internet gaming is becoming increasingly prominent and penetrating the lives and minds of almost all age groups but especially our ingenious youth.

Internet gaming has various benefits including- Source of learning and development of skills for children, Enhancement of concentration, brain speed, and memory, Refinement of multi-tasking abilities, Multiplayer games promote teamwork and various other social skills while instilling a sense of responsibility and belongingness, A way of experiencing alternate realities while providing entertainment and enjoyment, encourages healthy competition, and it May be used as positive reinforcement.

Although internet gaming has diverse constructive applications, it also has numerous detrimental impacts if an individual is subjected to prolonged and compulsive gaming. These include, but are not limited to- Ill-management of social interactions and hidden identities of some strangers pose a threat to privacy of individuals and may lead to cyber bullying, Potential physiological impact due to continuous uncontrolled gaming like increased blood pressure, bodily pains, etc., May incur financial costs, Influence on personality traits and other aspects such as aggression, hostility, prosocial behaviour, anxiety, stress, impulsivity, etc. Instigates anger and violence, Time crunch due to excessive time spent on gaming leading to lag in work, Withdrawal from social life and neglecting personal relationships, Changes in eating and sleeping patterns.

Internet gaming as an addictive behaviour- An addictive behaviour may be defined as action or a stimulus leading to an action which is rewarding as well as reinforcing. A reward is something our brain intrinsically identifies as positive and desirable, whereas, a reinforcement is a stimuli that increases the probability of the phenomena occurring which is

paired with it. Together, these may lead to the development of an addiction. Addiction is a biopsychosocial phenomenon characterized by continuation of the addictive behaviour despite adverse consequences and considerable harm. They lead to manifestations like saliency, compulsivity, mood alterations including the alleviation of negative emotions such as stress, and tolerance and withdrawal. Addictive behaviours activate certain parts of the brain known as 'reward centres' or 'pleasure pathways' which are associated with feelings of pleasure. When these areas are activated, the body releases dopamine alongside opiates and other neurochemicals. High levels of internet gaming, which acts as a stimulus, leads to an increase in the amount of dopamine being produced in the brain. Though the role of dopamine in the development and persistence of addictive behaviours is still ambiguous, most researches agree that it is involved in the reward and motivation processes of the brain. Dopamine stimulates receptors in the amygdala and the ventral tegmental area which lead to the generation of an impulse to repeat the behaviour i.e., internet gaming. The more frequently the behaviour is repeated, the more easily dopamine is released. However, after some time, the brain develops a tolerance to the high levels of dopamine being produced which leads to the individual feeling the compulsion to engage in internet gaming in excessive amounts to attain the same level of pleasure and satisfaction that they previously experienced. Internet gaming may also lead to dopamine being released in the nucleus accumbens, which is a prominent identified reward structure in other addictions. Once a tolerance is developed, the individual may experience withdrawal symptoms in the form of unpleasant sensations. Through passage of time, the brain chemistry may return to its original levels, curbing the addiction, though craving to indulge in the addictive behaviour may still occur over a long period of time.

Due to such high engagement of people with internet games, the World Health Organization deemed it even appropriate to consider severe cases as addictions and added it as a disorder in the International Classification of Diseases (ICD-11) published in 2018. It is becoming a ubiquitous disorder affecting not only individuals but also the people they are surrounded by.

### *Aggression*

A widely observable concomitant effect of internet gaming is aggression. Aggression can be defined as a range of physiological and psychological behaviours which may result in harm to the individual, others, or the environment. Commonly, the words 'anger' and 'aggression' are used interchangeably, but anger is a feeling whereas aggression is a consequential behaviour of the feeling.

Baron and Richardson (1994) define aggression as "any act that harms another individual who is motivated to avoid such harm." Due to the existence of perception of intent, it is essential to understand and differentiate aggression. An action which may be considered aggressive from one's perspective may not be considered aggressive from another's.

A number of factors influence the expression of aggression i.e., biological, environmental, and physical. Environmental factors suggest that people who witness aggression and hostility around them are more likely to display such behaviour. An apt demonstration of this phenomenon is Albert Bandura's Bobo Doll Experiment based on Social Learning Theory. The aim of this experiment was to illustrate that aggression is learnt through observational learning. Among the two groups in the experiment, the children from the experimental group displayed more aggressive behaviour towards the doll similar to what they had seen in the videos, as compared to the children from the controlled group. According to Bandura, the

violent behaviour of the adult models towards the dolls led the children to believe that such behaviours were acceptable. He suggested that, as a result, the children may have developed a penchant for responding to frustration with aggression in the future. This confirms that the environment of an individual plays a significant role in the acquisition and display of their aggression. To relate, violent games could be a significant contributor to the aggressive tendencies of an individual which may have been acquired through game play.

***Procrastination***

Another aspect of an individual's life affected owing to the increasing amounts of time engaged in gaming is procrastination. Procrastination can be defined as the act of deferring tasks until the last minute or even past their deadlines. It is a form of self-regulation failure that is characterized by the needless delay of things one intends to do despite the expectation of negative consequences (Steel, 2007; cf. Klingsieck, 2013). It has a significant influence on productivity, although for some it may benefit their efficiency.

Procrastination becomes a pressing problem if it becomes a chronic practice in one's life. It has a negative impact on the quality of one's work and is linked to a variety of negative physical and psychological outcomes. It may impact a number of aspects of one's life including mental health, social, financial, and professional well-being. It may result in increased stress levels, strain in personal as well as professional relationships, etc.

## METHODOLOGY

***Aim***

To study the effect that internet gaming has on aggression and procrastination among adolescents and young adults.

***Objectives***

i. To measure the age-based difference on the levels of internet gaming among adolescents and young adults
ii. To measure the age-based difference on the levels of aggression among adolescents and young adults
iii. To measure the age-based difference on the levels of procrastination among adolescents and young adults
iv. To study the relationship between internet gaming and aggression
v. To study the relationship between internet gaming and procrastination among young adults
vi. To study the relationship between aggression and procrastination

***Sample***

Convenience sampling and snowball sampling techniques were used to gather data from participants. Sample size consisted of 106 adolescents and 177 young adults between the ages of thirteen to twenty-five years.

***Locale of the study***

Due to the current situation created due to the COVID-19 pandemic, it was not possible to collect data one-on-one in person; therefore, the data was conducted online using Google forms. The forms were filled by participants all over India. The target population was adolescents between the ages of thirteen to eighteen years and young adults between the ages of nineteen to twenty-five years.

***Instruments***

Three measures were used in this study,

1. **Internet Gaming Disorder Scale–Short-Form (IGDS9-SF):** This nine-item brief tool was given by Pontes and Griffith in 2015. It is based on the core diagnostic criteria given by the American Psychiatric Association in the Diagnostic and Statistical Manual – 5 (DSM-5). It assesses both the symptoms as well as prevalence of gaming activity present within the last 12-month period of time. The scale has been found to be reliable through various construct validity criteria including construct, criterion-related, concurrent, and cross-cultural validity with Cronbach's alpha value as .87. Empirical validity of the scale was established through positive correlations between weekly game play, IGDS9-SF, and IGD-20. Exploratory Factor Analysis and Confirmatory Factor Analysis also supported cross-cultural validity of the tool which has since been translated and administered on populations throughout the globe.
2. **Buss and Perry Aggression Questionnaire:** BPAQ is one of the most commonly used tools to measure aggression. It was originally given by Buss and Perry in 1992 and later revised in 2011. It consists of 29 items which are divided into four factors i.e. physical aggression, verbal aggression, anger, and hostility. Physical and verbal aggression represent the instrumental components of anger and hostility represents the cognitive component, whereas, anger acts as a psychological bridge between the two. Using Exploratory and Confirmatory Factor Analysis methods, the tool showed adequate reliability and validity to be used by professionals as well as researchers with high internal consistency and appropriate stability. The test-retest reliability was found to be r=.78 (Cronbach's alpha).
3. **Irrational Procrastination Scale:** This tool was given by Steel in 2010. It consists of nine-items which measure implemental attributes of procrastination with special regard to an "irrational" component of delay where "irrational" refers to a voluntary delay despite expecting it to be disadvantageous. The compact one-dimensional scale has been found to be reliable and valid including content validity, structural validity, and substantive validity, and no DIF effects for gender with r=.87.

***Procedure***

Owing to the COVID-19 pandemic, data was collected online using Google forms. A Google form with four sections i.e. demographic details, Internet Gaming Disorder Scale – Short Form, Buss and Perry Aggression Questionnaire, and Irrational Procrastination Scale along with individual instructions for each scale was constructed. The Google form was circulated using social media applications such as WhatsApp, Instagram, Facebook, and LinkedIn. Data was collected from a total of 283 participants out of which 106 were adolescents i.e. between the ages of 13 to 18 years and 177 were young adults i.e. between the ages of 19 to 25 years. The number of males and females were almost equal in the sample population. After the completion of collection of data, the responses for each individual were calculated for all three scales separately along with the scores for the four factors of Buss and Perry Aggression Scale. Then, in accordance with the objectives and hypotheses of the study, statistical analysis was conducted using SPSS.

## RESULTS

***Table 1. Independent sample t-test of Age on levels of Internet Gaming***

| **Internet Gaming** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | *N* | *M* | *SD* | *t* | d.f. | *P* |
| Age | <19 | 106 | 18.56 | 8.074 | -.779 | 281 | .437 |
| | >=19 | 177 | 17.83 | 7.290 | | | |

*Note: p<.01.*

The independent sample t-test result has shown that there was no significant difference between adolescents and young adults on internet gaming, t (281) = -.779, p = .437, despite adolescents (M = 18.56, SD = 8.07) attaining higher scores than young adults (M = 17.83, SD = 7.3). Therefore, the results are not statistically significant at p < .01.

***Table 2. Independent sample t-test of Age on levels of Aggression***

| **Aggression** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | *N* | *M* | *SD* | *t* | d.f. | *P* |
| Age | <19 | 106 | 82.68 | 19.011 | .159 | 281 | .874 |
| | >=19 | 177 | 83.02 | 16.728 | | | |

*Note: p<.01.*

The independent sample t-test result has shown that there was no significant difference between adolescents and young adults on aggression, t (281) = .159, p = .874, despite young adults (M = 83, SD = 16.73) attaining higher scores than adolescents (M = 82.68, SD = 19.01). Therefore, the results are not statistically significant at p < .01.

***Table 3. Independent sample t-test of Age on levels of Procrastination***

| **Procrastination** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | *N* | *M* | *SD* | *t* | d.f. | *P* |
| Age | <19 | 106 | 26.99 | 7.088 | -1.567 | 281 | .118 |
| | >=19 | 177 | 25.80 | 5.562 | | | |

*Note: p<.01*

The independent sample t-test result has shown that there was no significant difference between adolescents and young adults on procrastination, t (281) = -1.567, p = .118, despite adolescents (M = 26.99, SD = 7.09) attaining higher scores than young adults (M = 25.80, SD = 5.56). Therefore, the results are not statistically significant at p < .01.

***Table 4. Pearson's correlation for levels of Internet Gaming and Aggression***

| | **Internet Gaming** | | |
|---|---|---|---|
| | r | P | d.f. |
| Aggression | .346** | .000 | 281 |

*Note: **Correlation is significant at the 0.01 level (2-tailed)*

Levels of Internet Gaming and Aggression were found to be moderately positively correlated through Pearson's correlation with r (281) = .346, p < .01.

***Table 5. Pearson's correlation for levels of Internet Gaming and Procrastination***

| | **Internet Gaming** | | |
|---|---|---|---|
| | r | P | d.f. |
| Procrastination | .450** | .000 | 281 |

*Note: **Correlation is significant at the 0.01 level (2-tailed)*

Levels of Internet Gaming and Procrastination were found to be moderately positively correlated through Pearson's correlation with r (281) = .449, p < .01.

***Table 6. Pearson's correlation for levels of Aggression and Procrastination***

| | **Aggression** | | |
|---|---|---|---|
| | r | P | d.f. |
| Procrastination | .443** | .000 | 281 |

*Note: **Correlation is significant at the 0.01 level (2-tailed)*

Levels of Aggression and Procrastination were found to be moderately positively correlated through Pearson's correlation with r (281) = .443, p < .01.

## DISCUSSION & CONCLUSION

Through a thorough analysis of data, it can be said that technology can play both positive and negative roles depending uniquely on the case at hand. Though it plays an important role in most cases, it needs to be curbed so that its negative effects on mental health can be decreased. Also, technology involved in the treatment and management of mental health disorders must be explored further to provide better treatment regimes.

It is clear that internet gaming has significant effect on the levels of aggression and procrastination though there is no significant difference between the adolescent and young adult population.

With an expanse of technology, the lives of people are getting more and more intertwined with technology. Gadgets have been integrated into almost all aspects of life. Screen based sedentary behaviours have become ubiquitous partly because of increasing need and partly because of increasing availability. These screen-based behaviours are indicators of mental health problems like increased anxiety, depression, prosocial behaviour, etc. Findings suggest that one way of reducing levels of aggression and procrastination is by limiting game play.

Further research is warranted on the topic. Behaviours associated with internet gaming are strong indicators of problems such as aggression and procrastination. However, they are modifiable. It is important to understand the determinants, correlates and consequences of high gaming time as it can act as a preventive as well as curative measure. Gaining a more thorough understanding of this complex relationship will lead to the development of more effective intervention strategies for improving emotional and physical well-being of individuals.

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***Conflict of Interest***

The author declared no conflict of interests.

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