

Mobile Games And Their Adverse Effect On Adolescents' Thought Process.

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Abstract: *Technology had advanced to such an extent that it is true that everyone is dependent on technological advancement for their daily routines. The emergence of Artificial intelligence, Virtual reality, augmented reality and many more are leveraged in many areas of human lives. Gaming is not the one that it is not benefitted from technological advancements. Games are preferred by many as a leisure activity. But in recent years the computer games have evolved to such a level that a majority of the population play games by making use of the Internet facility. This is particularly predominant among adolescents. Adolescents are engaged in Internet gaming to such an extent that they are found to be addicted to Internet games. This is detrimental to the physical and mental health of adolescents. By mobile gaming, we mean games that are played on smartphones and other portable gadgets (Ipads, tablets, etc). The emergence of massively multiplayer online games has proven to cause various health hazards in adolescents. Many studies report that mobile games are preferred by many adolescents next to social media. Many adolescents are found to have been addicted to Internet gaming practice to such great levels as to affect their academic performance as well as their general pleasant behaviour. Data from the Entertainment Software Associations shows that the average age of the persons addicted to Internet games is 30 years and 32 percent of the players are adolescents who are less than 18 years old. The video game addiction statistics confirm that nearly 12 percent of boys and 7 percent of girls of the global population are found to show mobile game addiction. In this article, we present the negative effects of Internet game addiction on adolescents. In this article, the terms Internet gaming and mobile gaming are used interchangeably.*

Keywords- *Internet gaming, mobile gaming, addiction, obesity, anxiety, aggression.*

1. INTRODUCTION

Games are an integral part of human activities. Games are preferred by many for different reasons namely for fun, for leisure, to overcome stress, to gain status, and many more. Sometimes individuals involve in games to escape from the problems faced in real life. In the recent years, the advancements in technology are at such an incredible level that it is utilized in all areas of human life including usage in daily routines [1]

Currently, the Internet is viewed as a means to aid in communication. It is also used as a source of entertainment and to establish connections with society. The Internet has also enabled students in getting global access to information. Adolescence is a period in one's life that is considered to be problematic due to biological changes. It is during this period that a majority of adolescents resort to unscrupulous activities. Internet gaming addiction is one such activity that is identified as a new addiction in the category of process addiction [2].

The usage of the Internet is found to have inclined between 2000 and 2020. The following table is an illustration of the same.

Region	Rate of increase in Internet usage(%)
Africa	31.2
Asia	46.7
Europe	80.2
Latin America	62.4
Middle East	58.7
North America	88.1
Australia	69.6
Entire World	51.7

Table 1: The increase in the Internet Usage.

Table 1 gives an idea of the percentage of people who use the Internet for many activities. This in turn is possible to reflect on the number of persons across the globe preferring to involve in Internet Games and become addicted to the same in due course. During the previous twenty years, innovations in computer technology have expanded drastically in all areas and the gaming industry also leveraged the technological advancements. Computer games have grown to such an extent that mobile gaming is the current buzzword. Earlier one has to use the desktop or the laptop to play the computer games. But the availability of the Internet made innovations in gaming patterns to make use of the Internet and play games. In recent years the massively multiplayer Internet Games [3] in which many players make use of the Internet and play in groups are popular among gamers. These advancements have resulted in many adolescents involving in these gaming exercises and over a period of time, they get addicted to gaming and spend more hours in gaming. This in turn acts as a source for a plethora of psychological, behavioural, and physical health problems. This habit of spending many hours in Internet gaming is considered a new type of addiction and the specialists say that this addiction is comparable to alcohol consumption or drug abuse. It is found from a majority of studies that males are more addicted to Internet games than females. A recent study reveals that adolescents spend more than 11 hours per day in Internet Gaming.

These Internet games do not mandate the need for a computer or a laptop and they can be played on any portable electronic gadgets namely smartphones, pads, tablets, etc. The availability of Internet connectivity in shopping malls, restaurants, and via their mobile data plans makes it easier for everyone to indulge in Internet games irrespective of the place they are present. This is also one of the main factors that act as a source for adolescents to get addicted to mobile gaming practices.

Figure 1 is a representation of Internet/Mobile Gaming in relation to gender and age [4].

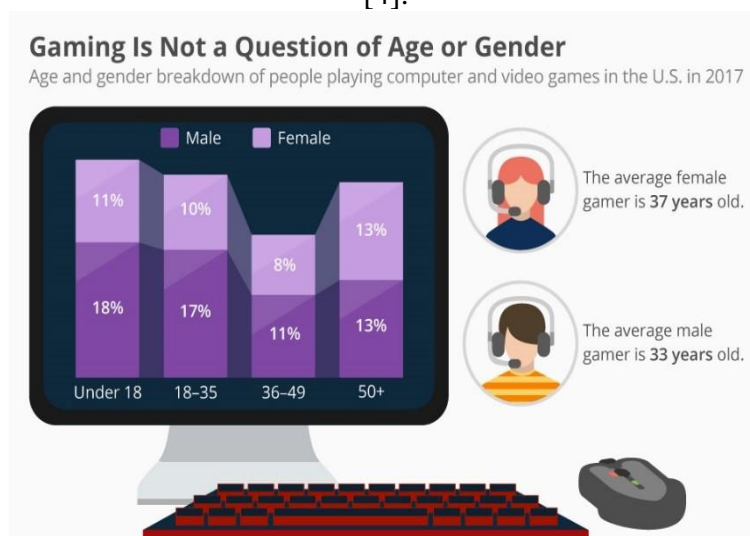


Figure 1: Internet Gaming [4]

This mobile game addiction is profoundly prevalent among adolescents and it is proven to be detrimental to the overall health of adolescents. Besides their health, the family members are also subjected to a variety of mental disturbances like stress, anxiety, etc. Many factors can be attributed to this new type of addiction. The most important factor is the lack of support from their parents. Adolescents who do not get the needed love and care from their parents are found to be more addicted to mobile gaming as they feel these games as sources to overcome stress. Another area that is to be concerned is the unemployment rate. It is found that many youths do not prefer to work as they are addicted to mobile gaming. This is reported by a study involving youth between the ages of 21 and 30 in the USA. This is not the situation that is prevalent only in the U.S but in other countries also these gamers do not perform their duties perfectly as their level of craving to get involved in the game is on the increase. This is particularly evident in male workers.

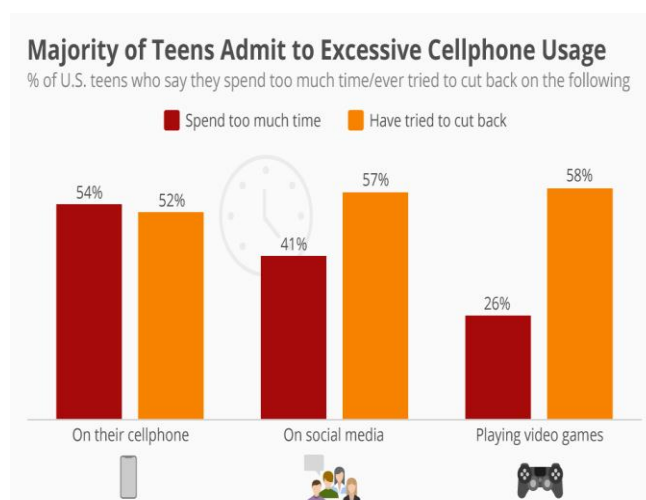


Figure 2: Sketch of excessive cell phone usage [5].

Figure 2 is a representation of mobile phone usage by people of all ages. This is an indication of the fact that in-person communication has witnessed a significant decrease.

This segment gives an overview of the evolution of mobile games. Initially, video games that were played on the television screens were available. Then computer games that were played on the computer made their entry into the market. Specific software and hardware were necessary to play computer games. By hardware we mean the graphics card, sound card, and processor. Then the era of Internet games using the PC and Internet attracted a huge population to involve in Internet gaming. By making use of the Internet facility many players were able to involve in the game. The advent of portable devices and the Internet on the go proved to be the reason for many to get involved in mobile gaming [6]. The figure below is an illustration of the history of Computer games.



Figure 3: Video Game Addiction [7]

The emergence of games that kindle to end their lives like Pokeman, PUBG is a perfect example of the interest shown by the Gaming providers to make huge profits. This intention of the Game developers to earn huge profits makes many adolescents involve in games that are highly adventurous and this results in a number of health hazards in the adolescents. Apart from the psychological disturbances the concentration level of the students in their academics declines and this puts the parents in agony. Figure 4 gives an idea of the revenue earned by the gaming industry.



Figure 4: Gaming Industry Growth

The adolescents who are identified to be addicted to mobile games suffer from a variety of problems like not concentrating in work, not attending schools and many more. Figure 5 is a pictorial representation of the different signs of a video game or Internet Game addiction that is discussed in the other sections of this article [8].

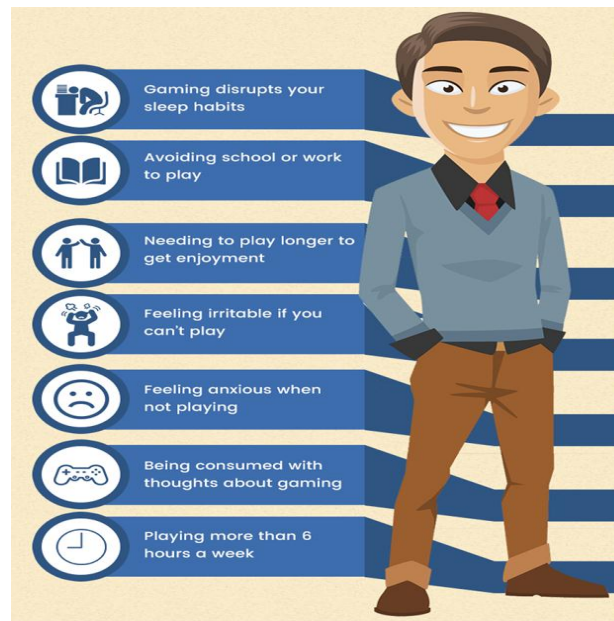


Figure 5: Symptoms of Internet Game addiction [7]

This article is structured in the following pattern. A segment that discusses the existing literature about Internet Game addiction and adolescents is present. Another segment which discusses the consequences of mobile game addiction is present in this article. A segment on the case studies of Internet Game addiction in the Indian states of Kerala and Pondicherry is present. Finally a section that discusses the ways that can be useful to prevent to this new addiction is present.

2. LITERATURE REVIEW

In this segment, let us examine the perspectives given by different specialists and survey scholars concerning the negative effects of the mobile game addiction of adolescents.

F W Paulus et.al, 2018 [1] elaborated on the harmful aspects of spending more hours on mobile gaming which they describe as Internet Gaming Disorder (IGD). The authors point out that addiction to Internet gaming may become a reason for adolescents to avoid talking to their friends and family and they may neglect their work. The adolescents will not attend schools properly which in turn affects their future. The authors elaborated on the adverse effect of the adolescents involved in online multiplayer games. In this context, adolescents compete with persons across the world and they spend more hours in the games. The study was conducted with the data that is collected from online databases namely ERIC, PSYINDEX, PsycINFO.PubMed.The symptoms of IGD are more screen time. Other symptoms are that the adolescents are preoccupied with the game and they experience

imbalances of mood. They involve in conflicts with their parents and this is a downside to the normal family ambiance.

Ibrahim [2] made a study of the relationship in existence between mobile game addiction and school attendance. The study was carried out in a model consisting of 365 students. Out of the 365 chosen students, 140 male adolescents and 225 female adolescents were considered for the study. The adolescents belonged to the Anatolian high school in Gaziantep province of Turkey. The data collected from the students were subjected to correlation and multiple regression analysis. The study concluded that Internet/Mobile gaming addiction is found to affect the school engagement of adolescents by a reasonable margin.

J L Wang et al., 2019 [9] made a description of the adverse effects of the present-day adolescents' obsession with mobile phone games. Although efficient means to measure the intensity of this negative behavior to the mental health of the adolescents is inadequate the reviewers put forth the fact that this addiction is expected to cause disturbance to the sound mood of the adolescents. In this research, the authors attempted to inspect the connection between portable game expansion and social uneasiness, sadness, and forlornness among youths. The researchers also tried to figure out if there is the existence of difference in gender in this new addiction pattern. The authors reported that male adolescents are found to be more involved in this hazardous new tradition than their female counterparts.

Eshrat et al., 2009 [10] have spoken about the physical health problems of adolescents as a result of their addiction to computer games or mobile games. The results of the study conducted in 9 Japanese cities are presented. The study puts forth the fact that the adolescent who spend more time in playing video games and other online games do not involve in any physical activity. This results in these adolescents gaining weight to such abnormal levels that vary widely from the normal body mass index values to be maintained. Obesity has a direct consequence to a plethora of health disorders namely diabetes, hypertension, and many more. It is also revealed that the heartbeat levels of these gamers are found to be higher than normal and this is a symptom that should be paid much attention to.

Anderson & Bushman [11] have discussed the prevalence of aggressive behavior among adolescents. The authors conclude that such behavior is the result of the involvement of adolescents in violent online games. This study was conducted in a study involving both males and female adolescents. It is found that involvement in violent games is directly related to the decrease in their prosocial behavioral patterns. A general Aggression model was chosen in which the inputs are taken to be the recent exposure to violent media. The authors say that exposure to violent media is supposed to increase the aggressive behavior of adolescents. We can define adolescence as the period in one's life where a majority of the population in this age category prefers to fulfill their desires and do what they want to do. It is a period in which they think that they are the heroes and try to act in the same manner as their role models, say certain personalities of the entertainment world. In such a period exposure to platforms that are sources of aggressive patterns contributes greatly to developing aggressive behavior and this is a subject of concern.

Deelip & Abhijeet [12] conducted a study to assess the connection between mobile game addiction and time the adolescents spend on mobile games. They also attempted to study the connection between Internet game addiction and personality. An examination of the Internet game habituation in relation to the disturbance of the sleeping pattern in adolescents is also conducted by the authors. The study was conducted in a model with 741 adolescents from Turkey. The chosen 740 students were asked to respond to several questions regarding

Internet Game addiction. The study concludes that a higher percentage of male adolescents were involved in mobile gaming particularly in the evening times and the female adolescents' involvement in gaming was found to be less. Also, the adolescents who were identified to be extroverts showed signs of less mobile game addiction

3. PRESENT DAY SCENARIO

- **Objectives of This Study**

Games are an integral part of human life. Gaming is one of the leisure activities humans prefer to do. It throws in a plethora of benefits for the psychological wellbeing of humans. But the present-day video games and the Internet gaming activities that are preferred by an increasing number of people pose a variety of health hazards. It is evident from many reports that a higher percentage of people are involved in Internet gaming and this number is very high among adolescents. The number is found to be high among male adolescents than female adolescents.

The advent of massive multiplayer Internet games is proven to be detrimental to both the physical and mental health of adolescents. The teenage population, the male adolescents in particular are reported to be addicted to Internet gaming or mobile gaming practices and this is directly related to affecting their thought process in many ways. This Internet Gaming addiction is reported to have increased to greater levels in the Covid-19-era as a majority of the global population were confined to their homes due to the lockdown measures taken by the governments across the globe in their effort to control the spread of the fatal infection. This is an area that needs much attention. In this article, we present the adverse effects of mobile game addiction on adolescents in their education, family life, and their health.

- **Mobile Game Addiction-An outline**

Internet game addiction or mobile game addiction may be viewed as a new entrant to process addictions. By process addiction, we mean an attitude to yearn for something like shopping or doing workouts. This may be compared to using drugs or alcohol consumption. Technological advancement made the functioning of all sectors of life easier. There is no wonder that the gaming industry is the one that is highly benefitted.

The advancement in technology resulted in the discovery of multiplayer games wherein many persons connect virtually by using the Internet facility and involve in group games. In this scenario, the adolescents connect to players around the world with differences in time zone and this affects the regular sleep routine of the adolescents which in turn causes many psychological and physical disorders. Also in today's world majority of the households has access to mobile phones or smartphones in specific and this Internet gaming can be carried out in mobiles and this is the reason for the increase in the number of adolescents involving in Internet gaming. In some scenarios, the adolescents who are habituated to Internet gaming are found to use drugs to win their competitors particularly in the Massive Multiplayer scenarios and this is a subject of concern [13].

- **Major sources responsible for the present-day youth getting addicted to mobile gaming.**

It is a known fact that it is essential for everyone to be rewarded for their excellence in performance in any field be it in academics or sports or their job. Our human brain

functions in that perspective. Everyone needs appreciation even for the simple task of preparing a tea or coffee. This nature of the human brain applies to the concept of mobile games also. As the teen is curious to win a game it results in him playing the game repeatedly until he becomes a master and wins in lesser time. Studies reveal that this game addiction of adolescents is comparable to that of consuming alcohol or drug abuse. In scenarios of many players playing a game online, the adolescents feel as if they are in the real world and they spend more time in their efforts to unearth new territories and newer levels of the game. The adolescents assume themselves as if they are globally competing and this attitude is a major cause for them getting addicted to the games.

The availability of social media platforms has proven to be one of the reasons for adolescents to spend more time playing mobile games. The presence of a number of gamers with huge followers on the various social media platforms like YouTube, Twitter, Instagram also contributes in many ways for the adolescents to indulge in Internet gaming. The adolescents take such personalities as inspirations and they assume that they can also become popular one day and show interest in gaming. The family ambiance is also one of the factors for the mobile gaming addiction by adolescents. Adolescents who are living in an insecure family where their attachment to their parents is comparatively low are found to be addicted to Internet gaming. Also in families where the parents do not spend much time with their teenage children the level of mobile game addiction is high. This may be due to the demands of the profession of the parents [13].

4. MOBILE PHONE ADDICTION AND IT'S EFFECTS

- **Impact on physical health**

In this segment of our article let us present some of the facts that address the impact of mobile game addiction on the physical health of adolescents. Spending many hours viewing the screens either on a laptop or desktop or mobile phone is expected to alter the vision of the person. One should adhere to the number of hours he/she should watch the screen to avoid many disorders related to vision. If one spends more hours playing online games or video games the minimum physical activity that is to be done by a person is not achieved and this results in inappropriate weight gain. Also, the gamers are found to intake more snacks during their games than usual [14]. This is done by them to get relieved from stress and this is another reason for weight gain. Obesity is proven to be the cause of many health disorders namely diabetes, hypertension, heart ailments, joint pains, and many more. The figure below is a representation of the snacking pattern of online gamers.

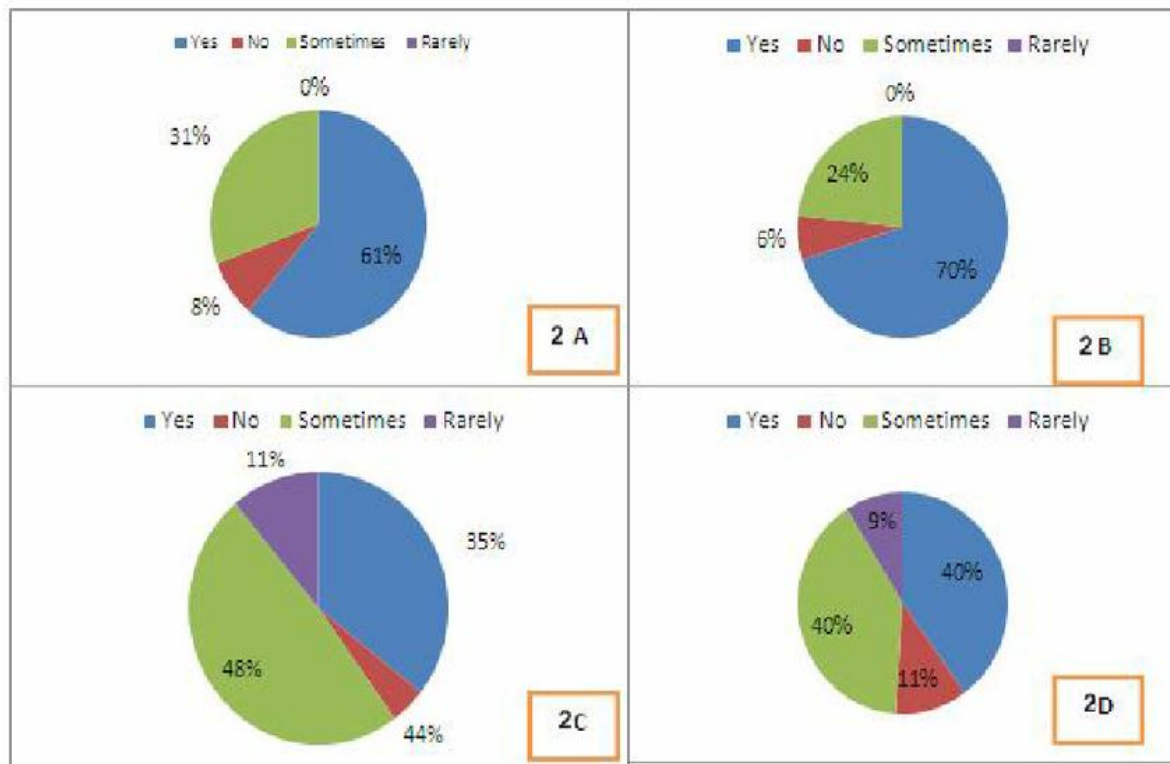


Figure 6: Snacking pattern of online gamers [14].

Once addicted to the Internet gaming practice the attitude to consider it as a leisure activity is faded and the adolescents assume themselves unfit when they lose and are on an urge to win desperately. This kindles them to involve in the activity repeatedly and this results in a higher heartbeat and rise in blood pressure. These disorders are due to the stress they experience in mobile gaming [10].

Reports prove that the physical stimuli that one experiences while involving in such gaming practices can in due course make the nervous system react more than the normal. There is a higher probability of the ones addicted to suffering from some nervous disorders. Adolescents who are involved in mobile gaming pay less attention to their personal hygiene and they spend minimum time with others and they spend more time alone playing games alone. Learning disabilities are found to be present in many cases of adolescents who are habituated to Internet games. The intense gamers fail to take nutritious food as they snack quite often. This causes a deficiency of certain essential nutrients. Sleeping disorders can cause various health issues which are diagnosed with many intense online gamers [7].

- **Impact on mental health of adolescents.**

Adolescents who spend more time in Internet Gaming are found to have various disturbances in their mental health. Stress and anxiety are the common mental health symptoms that are prevalent in most Internet Gamers. Many times especially in the multiplayer context if an adolescent loses the game he assumes himself to be less competitive and this leads to depression. Anxiety and depression which are the major mental health symptoms can cause several other health disorders. Mobile game addiction can be compared to that of gambling. Loneliness is one other psychological disturbance that is a result of Internet Gaming. As reports ascertain the fact that the percentage of male adolescents addicted to Gaming is higher

than the female exposure to violent games will cause a change in their behavior. They will be very aggressive and this is a concern for the family. Figure 7 is an illustration of the mental health disturbances due to mobile game addiction.

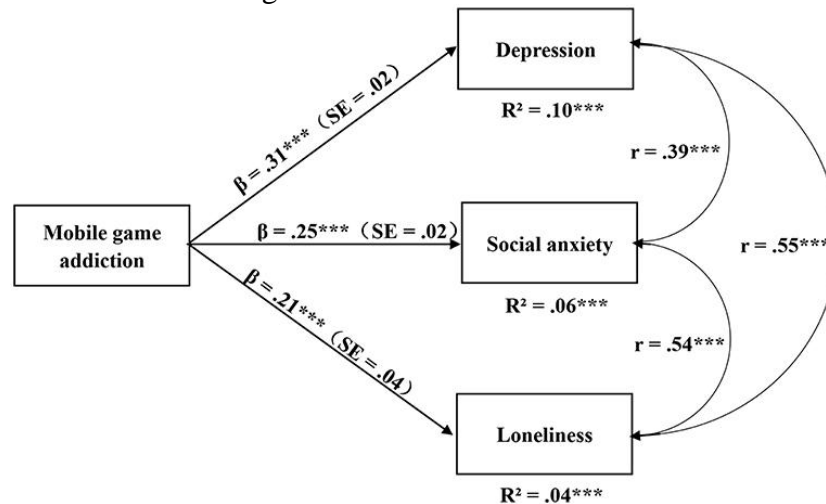


Figure 7. Mobile game addiction and psychological disturbances [9]

In multiplayer contexts reports of adolescents resorting to drug abuse in their path to win by any means is not a pleasant lifestyle. This will in turn cause a variety of mental disorders. The preoccupation of the games, inability to control themselves when are denied access to games, frequent conflicts with the parents are some of the other problems that arise as a consequence of intense gaming [9].

- **Impact of Mobile phone usage for fun**

In recent years many mobile applications that are available to showcase the talents of people have emerged. One such application is Tik Tok which gained huge popularity. This application served as a platform to showcase the talents viz dancing, acting, etc. to their social groups. This served as entertainment and many adolescents adopted to use applications of this sort to showcase their talents and particularly for fun activities. This helped the adolescents to get relief from the academic stress and other stress factors to a certain level. But many adolescents were found to be addicted to creating videos through the applications like Tik Tok and it posed several threats to the wellbeing of the adolescents. The adolescents spent hours in applications of this sort and failed to concentrate on their routine work. Many adolescents used such apps to bully others and this is a negative aspect to be concerned about. Apps of this kind had fewer restrictions on aspects such as who can be part of the app and this aspect enabled any stranger to message the adolescents or children and this resulted in many problems in the society and the family [15].

- **Impact on education.**

The present-day world is dependent on technology. The arrival of high definition television, the availability of several social media platforms, the video-sharing platforms like YouTube, Internet Radio are a few among the many technological advances mankind has witnessed in recent days. The gaming industry is not the one that failed to leverage technological advancement. In fact, it has gained huge advancement. The gaming industry

evolved from video games that are played in the television sets to the present-day Internet Gaming that involves multiple players situated in different parts of the world.

The adolescents are found to be addicted to Internet Gaming and mobile gaming practices to such an extent that their academic performance saw an alarming decline. In the USA nearly 90% of the households have access to the Internet and nearly 66% of the adolescents were found to be involved in Internet gaming. These adolescents in the colleges spend more time in mobile games as a result of the absence of supervision by parents and their concentration level in the academic classes declined as they were preoccupied with the game even during the class hours[16]. The result is that the GPA scores of the adolescents declined and this is detrimental to the future of the adolescents.

The mobile game addiction is shown to have created a behavioral disturbance in the adolescents like developing aggression and this increased level of aggression in the adolescents is one of the reasons to affect the academic performance of the adolescents [17]

Procrastination and distraction are the commonly identified features in adolescents and as a result of this the adolescents fail to complete their academic assignments and this affects the education of the adolescents. Proper Education is considered to be vital for a prosperous life and if it is hindered then the future of the adolescents is a worry [18].

The figure below is a representation of the use of technology for leisure activities by mankind in different age groups. It is found that nearly 95.1% of adolescents make use of technology. Technology encompasses the gaming activity and a larger percentage of students involving in gaming activities is an indirect indication of the decline in their academic performance.

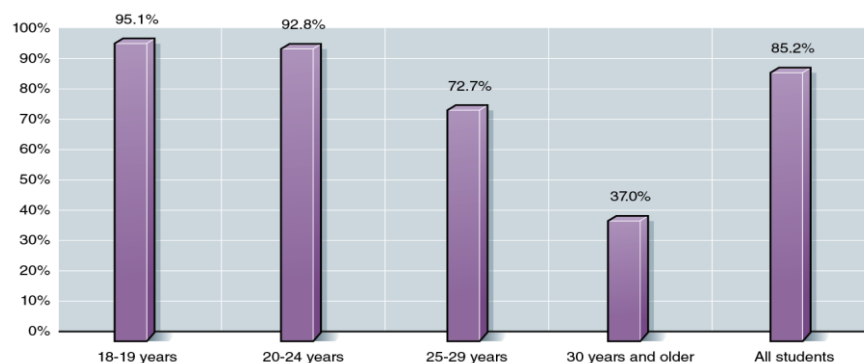


Figure8:Technology for leisure [19].

- **Impact on family life.**

Many adolescents who are addicted to mobile gaming spend less time interacting with the family members. It is the inherent behaviour of the adolescents to confront their parents and other family members to involve in conflicts when they are questioned. This is more severe in families where adolescent children are addicted to Mobile games. These addicted teens stay alone and engage themselves in Internet games which is a sign of a decrease in psychosocial presence. Their behaviour is severe if they develop symptoms of aggression when they are involved in games that promote violence. Studies show that many of the adolescents who are identified as intense gamers are socially inactive. This is more prevalent in male adolescents than the females [20].

There are reports of violence to an extent of killing the parents if they are denied access to Internet gaming. This is not a healthy sign in which a child should be brought up. It is not the failure on the part of the family members but it is the influence of the technological

advancements that impacted the young generations of the present. This is really a sign of worry for the adolescents of developing nations like India where family values are given importance.

5. CASE STUDIES

In this section let us conduct case studies of the impact of mobile game addiction of the adolescents in two Indian states namely Kerala and the Union Territory of Pondicherry.

- **Mobile Game addiction in Kerala**

Aswathy and Girish [21] conducted a study of the negative impact of online gaming addiction on adolescents belong to the Indian State of Kerala. The researchers aimed at estimating the number of hours a youth spends on online gaming. This is considered as a measure of the addiction level. If this data is made available then the government and other agencies can come out with strategies to lessen the addiction level. The data for the study was collected through questionnaires and from the databases that are available online. The number of participants for the model to conduct this study was chosen to be 200.

Among the chosen sample size males were 115 in number and females were 85. The 200 persons were chosen from 13 districts of Kerala. From the collected data it was inferred that nearly 83 participants spent 1-5 hours a week on online games and 95 people reported spending 6 to 8 hours per week which is the highest at 47.5 % and 3 responded with spending more than 80 hours in gaming. The study also revealed that many gave responses as the number of hours they sleep is reduced as they are involved in online gaming. This is not a healthy sign as one needs to have a sleep time of 7 to 8 hours for higher productivity.

The study revealed that nearly 8.5 percent of the participants prefer online games as a means to overcome stress. Different health issues like headache, vision disorders, back pain, neck pain are reported by the participants. In short, an adolescent from Kerala spends 6 to 20 hours a week on Internet gaming and many reported several problems. This research acts as a source to provide data to the Government and parents to figure out strategies to involve the adolescents in physical games. This will enable the adolescents to concentrate on their academics before they get addicted to these Internet games. Academic excellence will result in creating think tanks of the nation which is an asset for every nation.

- **Mobile Game addiction in Pondicherry**

Ranganathan et al., [22] conducted a study of the adverse effects of Internet Game addiction on the health of adolescents. The study was carried out in a model consisting of 600 adolescents belonging to the Union Territory of Pondicherry in India. The adolescents chosen were both schools going and college students. The average age of the participants is set to 16 years. Data collection was carried out by adopting the questionnaire pattern.

Among the chosen 600 participants 584 responded to the questions. If the score obtained by the participant is 8 for 14 then the authors concluded that the person is addicted to Internet games. The researchers concluded that 29 % of the adolescents are found to be addicted to Internet games and this is a subject of concern. Sleeping disorders, depression are some of the symptoms reported by the participants. It is high time that parents and teachers should work in cooperation to prevent adolescents to become more addicted to Internet Gaming. As the future of the nation is rested in the hands of the young generation the

Government should also give priority to this addiction and create awareness and provide training programs for the teachers, parents, and others to handle the adolescents.

6. SOLUTIONS TO STAY AWAY FROM MOBILE PHONE ADDICTION.

Although a majority of adolescents are found to be addicted to mobile games the availability of therapies to combat this addiction is a blessing in disguise for many. Counseling can to a greater extent help one to stay from mobile games. Evidence report that in a majority of the cases the addiction to mobile games is to overcome the level of stress one experiences either in their family or work. Video games are good if they are played for a few hours a week.

Parental support plays a major role in treating adolescents addicted to Internet games. Periodical supervision by the parents can to a greater extent prevent the adolescents to get addicted to this new type of addiction. The greater the love and care the parents show to their adolescent children the more is the possibility that the adolescents do not get distracted by Internet games [23].

7. CONCLUSION

In this article, we have carried out a thorough investigation of the adverse effects of adolescents getting addicted to mobile games and Internet games in particular. The study revealed that although Internet game addiction is prevalent among the population catering to all ages adolescents in high school and colleges are identified to be intense gamers. This new form of addiction which can be compared to alcohol addiction or drug abuse poses many health disorders. The physical health, as well as the mental health of adolescents, is adversely affected. This addiction also causes personality and behavioral changes to an extent that it sometimes ends in harming others. These activities which are a result of Internet game addiction are a threat to society and the legislators. It hampers the academic performance of adolescents and this is a subject of major concern for the parents. It is evident from the study that the unemployment rate is also increased as a result of mobile game addiction. This is a threat to the chiefs of the nations who aim at creating capable human resources. This can be avoided if parents show the needed love and care needed by their adolescent children. Proper therapies and counseling can to some extent help rescue the intense gamers from this addiction.

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