DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING,
SHARDA SCHOOL OF ENGINEERING AND TECHNOLOGY,
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Analysis of Effects of E-Games on Human Cognitive and Physical Behavior

A project submitted
in partial fulfillment of the requirements for the degree of
Bachelor of Technology in Computer Science and Engineering

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CERTIFICATE

This is to certify that the project report entitled "Analysis of Effects of E-Games on Human Cognitive and Physical Behavior" submitted by "Ujjawal Tiwari (2019620347) and Gautam Suri (2019628143)" to Sharda University, towards the fulfillment of requirements of the degree of Bachelor of Technology is record of bonafide final year Project work carried out by them in the Department of Computer Science and Engineering, School of Engineering and Technology, Sharda University. The results/findings contained in this Project have not been submitted in part or full to any other University/Institute for award of any other Degree/Diploma.

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ACKNOWLEDGEMENT

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ABSTRACT

Online gaming has rapidly become a popular activity for people of all ages and backgrounds, offering a wide variety of games and genres to suit different preferences. However, with the growing popularity of online games, there has also been an increase in the number of individuals who have become addicted to these games. This addiction can have serious consequences, including negative impacts on mental health, social relationships, and overall well-being.

Additionally, cyber bullying is a growing concern within the online gaming community. Individuals may be subjected to harassment, threats, and abuse from other players, leading to feelings of isolation, anxiety, and even depression. The lack of regulation and safety measures within online gaming platforms can exacerbate these issues, making it difficult for individuals to seek help or escape from toxic environments.

On the other hand, physical games such as sports and outdoor activities may also pose health risks, such as bruises, cuts, and even respiratory issues when exposed to dirt and dust. Despite the benefits of physical activity and the social interactions that come with playing sports, there is a need for proper safety measures and regulations to minimize the risks of injury.

Overall, it is important for individuals to be aware of the potential risks associated with both online and physical games, and to take necessary precautions to protect themselves. This study includes setting healthy boundaries and limiting screen time for online games, as well as wearing protective gear and following safety guidelines for physical games. Additionally, there is a need for greater regulation and safety measures within both the online and physical gaming industries to ensure the well-being of all individuals involved.

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Chapter 1: Introduction

1.1 Problem Statement

The research conducted in this study is valuable as it addresses the potential harms and benefits of both e-games and physical games. By comparing the two, the study can provide insights into which activities may be more beneficial or harmful for individuals. This information can then be used to develop suggestions and preventative measures to minimize the negative impacts of both types of games.

Furthermore, the study's focus on the development of individuals involved in these industries is crucial. It highlights the impact that these games can have on an individual's physical and mental well-being, as well as their social and professional development. With the increasing popularity of both e-games and physical games, it is important to understand the potential consequences of participating in these activities.

The research's attention to the comparative analysis between the two types of games is also significant. By examining the similarities and differences between e-games and physical games, the study can provide a comprehensive understanding of the potential benefits and harms of each. This analysis can help individuals make informed decisions about which activities to participate in and how to do so safely.

As it is important to be having a completely sorted comparison between two types of any workings, this research has also led us to come up with points completely implying to the pros and cons of both the types of games in a distinctive manner.
This study can help things form conversant determinations about which actions to take part in and in what manner commotion so cautiously.

Overall, this research has the potential to provide valuable insights into the impact of e-games and physical games on individuals. By developing suggestions and preventative

measures, the study can help to minimize the negative consequences of participating in these activities and promote the development of healthy, well-rounded individuals.

1.2 Project Overview

Pros of E-gaming:

Regarding the matter of the benefits of E-gaming, weather is never a concern. As long as it is based indoor, users are safe from rain and thunderstorms of all kinds. When things aren't going well, there's a hurricane or the power goes out, disrupting the iron line's presence. According to Israel, O. N [1], electronic games are becoming faster and more fun, regardless of gender and age. It is not a long-term proposition to claim that electronic games take less time than physical games. In addition, one can choose their characters, locations, modes, and appearance, giving they almost complete control over their game. The freedom to choose and play a favorite and selectable game factors makes the entire game an exclusive timeslot. While these free realms can give all the pleasure an individual crave, they also help enhance the brain cells. One of the greatest advantages of online gambling is its ability to heighten senses. This does not mean that those who do not play electronic games are less intelligent. It is a fact because many researchers have shown that those who are addicted to online gaming have a deep mind knowledge their brain cells and neurons are significantly more active than those who are little interested in electronic games or not involved at all. Awareness of reality by showing the hard work of many scientists is an informational claim, that is, those who participate in the conspiracy on the Internet have insightful information about thinking, and their intellectual cells and neurons are much more that a movement have that distinguishes them from those who have little interest in the fix hint that works in electronic games.

Besides, when an individual is alone, gaming is the perfect way to be engaged/indulged Electronic games typically require at least one player and offer a variety of options. Gaming can also promote a sense of calmness, as players can temporarily forget the stresses and anxieties that may be affecting them. While this relief may be fleeting, it can provide a brief period of respite. In addition to the benefits mentioned above, E-gaming can also become a source of increased linking because E-gaming can also be a great way to connect with

people from all over the world. This can truly happen because there are many online games that have multiplayer modes, allowing players to team up with others or compete against them.

This can help to develop communication and teamwork skills by playing such games which immensely need co-ordination, unity and co-operation. By portraying as a person who has such decent manners often provides opportunities to make new friends and socialize with like-minded individuals as well.

Another advantage of E-gaming is that it provides a safe environment for players to experiment with and take risks. In a virtual world, players can try out different strategies, approaches, and behaviors without fear of real-world consequences. As it is a safe environment, it makes it a welcoming environment. Henceforth, this can be particularly beneficial for children, who may be able to develop problem-solving skills and build confidence in a safe and controlled environment. E-gaming is also run as a business on numerous platforms bringing this thing also finally as a fact, E-gaming can also be a source of income for some people. Professional gamers can earn substantial amounts of money through sponsorships, advertising, and prize money. In addition, many gamers have turned to platforms like Twitch and YouTube to live stream their game-play and build a following, which can lead to additional income through donations and advertising revenue. Many advertisers of the gaming companies are found claiming that the gamers are earning decent amount of money via being extremely involved in it. Not just this, also there are people who are now using it as a second source of revenue generation.

Overall, E-gaming avails a lot. E-gaming provides numerous benefits to players of all ages and backgrounds, including improved cognitive function, socialization opportunities, and potential income. It is rewarding and at times an aid too with merit benefits mentioned above. While it is important to be mindful of the potential health risks associated with excessive gaming, when played in moderation, E-gaming can be a fun and rewarding activity for individuals and communities alike.

Cons of E-gaming:

Thorns also appear with all flowers. Just like almost everything has its drawbacks, electronic games as compared to outdoor activities have their drawbacks. There are some dangers and menace here also. Obesity is the greatest health threat of today. Research [2] has shown that those who play electronic games frequently are overweight and eat unhealthy foods because they become so obsessed with gaming that they begin to distance themselves from voluntary self-assessments of their health. In addition, many suffer from eye diseases and body aches. Many people have had cataracts and blurred vision with vision problems. It is known that an obese person, a poor diet, and lack of exercise are very prone to hypertension. Due to a sedentary lifestyle, these people are also prone to various heart diseases, making the "never obsessed with electronic games" extreme.

However, on a psychological note, most children who are interested in being involved just like being in love with the moments spending time playing and loving, Individuals who frequently engage in e-gaming were discovered to have deficient social skills, and adult gamers were frequently observed to suffer from depression and a restricted social life. and sometimes even not a handful of people to be in caress. Addiction to E-gaming [3] is another major disadvantage as many gamers start to carry a vibe or feelings wherein they crave to be playing E-games as they get the freedom to be selective in all forms. People, especially teenagers and young adults, tend to spend hours on end playing video games and being juvenile, neglecting other important aspects of their lives such as education, work, and relationships. Just like every addiction leads to a plethora of problems, this addiction can also have serious consequences, such as poor academic performance, job loss, and strained relationships with friends and family because of being involved in it mostly.

Moreover, E-gaming can also be a source of cyber bullying [4] and online harassment. Being around people does not only happen physically but also over the internet by E-gaming and as we know Since most E-games are played online, players often get the chances to interact with each other, and unfortunately, this can lead to negative interactions. Many players have reported instances of

bullying, harassment, and even threats while playing online games. This can have serious effects on one's mental health and overall well-being.

Another disadvantage of E-gaming is its cost. It is a matter of fact that E-gaming requires investment as well which in most of the games is a bit of a high amount too that is needed to be paid. This makes E-gaming an expensive mode of gaming to. While there are many free E-games available, most of the popular ones require a significant investment in terms of hardware and software. To play the latest games with high graphics, a powerful computer or gaming console is required, which can be expensive. Moreover, many games require regular updates and additional content, which also adds to the cost. In conclusion, while E-gaming has its advantages such as convenience and improved brain function, it also has its fair share of disadvantages. It is important to strike a balance between indoor and outdoor activities, and to prioritize physical health and social interactions over excessive screen time.

Pros of Physical gaming:

Considered as good as a loving gift, Physical Gaming through outdoor sports has been historically viewed as the most beneficial form of gaming. Since ancient times, people have engaged in outdoor activities for leisure, which can improve physical fitness, muscular strength, and promote healthy growth in children. Outdoor sports not only enhance physical health but also contribute to mental well-being. Existing studies has shown that those who participate in outdoor activities tend to have higher levels of self-confidence compared to e-gamers. This is because outdoor sports require active participation and upkeep of physical appearances, which is not necessarily a requirement for online gaming. The self-confidence is a source of vision which happens we have faith in our own selves and the Physical gamers have a lot to do by themselves.

With this confidence, an individual feels like they have rebound and recovered as they learn to overcome their obstacles in life as if it is a field game and with time it develops. The more they are onto something they get to learn more about the livings at even a single step in the environment

shows them more as the vision. Some play Physical Games can serve as a means of relaxation after a long day at work, particularly for those who spend most of their day sitting in front of a computer. Engaging in physical activity can greatly reduce the risk of health-related issues for individuals with sedentary 9-5 jobs. While Physical games relax the mind of people, it also helps gain strength in day-to-day activities. This implies that a lot is learning are done by the physical gaming players.

In addition to improving physical health, playing physical games can also have a positive impact on mental health. It is seen that also some Procurement of mental health happens via physical gaming. Studies have shown that physical activity can reduce symptoms of depression and anxiety, improve mood and cognitive function, and increase self-esteem and confidence. They are also considered a source of gaining Interpersonal Intelligence because Physical games offer an excellent opportunity for individuals to develop and improve their social skills. Being much involved in some public activities is the way a person can get to know about the true needs of life i.e. communication. Participating in team sports, for example, requires communication, cooperation, and collaboration, which can help individuals learn to work effectively with others. Physical games also provide opportunities for individuals to make new friends and strengthen existing relationships. Playing physical games can be an effective way to relieve stress and improve overall mental well-being. Physical activity releases endorphins, which are natural mood-boosters, and can help individuals feel more relaxed and energized.

Perhaps the most obvious advantage of physical gaming is that they are enjoyable and fun. Playing physical games allows individuals to engage in friendly competition, challenge themselves, and have a good time while improving their physical and mental health. Overall, physical games offer numerous benefits for individuals of all ages and abilities.

Whether an individual is looking to improve their physical health, mental well-being, or social skills, playing physical games is an excellent way to achieve these goals while having fun and enjoying.

Cons of Physical gaming:

While most people only see the health and social benefits of physical gaming, this study uncovered some downsides that are mostly overlooked. The biggest downside of physical games is the potential physical damage that comes with them. Not all sports can harm, for example games like tennis, badminton, and others will cause little or no harm, but sports like rugby and soccer can cause brain and bone damage. Don't let that stop it from stepping onto the pitch. Injuries as such are very rare. If we take the necessary precautions, it will protect us. Unfortunately, playing outdoors can be difficult during times of flu and even the spread of disease. The company only shows the energy of physical games. These words are not there to make an individual believe otherwise but to emphasize the fact.

If unfortunately an individual is not with decent health then unless they have a strong immune system to fight off any illness, in seasons of such, they would have to stay indoors playing E-games to stay safe. Especially children are highly prone to different skin diseases and it is often sadly hyped so much that many youngsters and kids get depressed if they have been the victims of it. Physical games can also be a little inconvenient given the fact that they are played well – outside as for some people reaching spaces that have an open space for gaming is at a lot of distance. Weather could disrupt, so does renovations and close downs. If an individual play a team sport and if their partners cancel the plan, they would have to back out as well. In addition to the possible physical injuries and inconvenience, there are other disadvantages to physical gaming that are often overlooked. One of these is the cost associated with participating in certain sports. Some sports require expensive equipment or facility fees, which can be a financial burden for some families or individuals. This could limit accessibility for those who cannot afford to participate in these activities.

Another disadvantage is the time commitment required for physical gaming. Many sports require regular practices and games, which can take up a significant amount of time. This could interfere with other commitments such as work or school. In contrast, E-gaming can be played at any time, making it more convenient for those with busy schedules. Furthermore, physical gaming can be very competitive and stressful, especially for those who participate in organized leagues or competitions. The pressure to perform well and win can lead to anxiety and other negative emotions.

In contrast, E-gaming can be a more casual and relaxing activity, providing a way to unwind and de-stress. Lastly, physical gaming may not be accessible for individuals with certain physical disabilities or limitations. In these cases, E-gaming provides a way for these individuals to participate in gaming and enjoy the benefits it provides. In conclusion, physical gaming has many benefits for both physical and social health. However, it is important to also consider the possible drawbacks such as physical injuries, cost, time commitment, stress, and accessibility limitations. Ultimately, it is up to each individual to decide which type of gaming best suits their needs and preferences.

1.3 Expected outcome:

- How can the positive/negative effects of them increase/decrease through the ways that we are going to suggest?
- What type of a change (technical / general) in them can help in leading the players to an even better stage in life?
- Positive noted feedback from a professional of the medical department will lead people to believe that the things that are being suggested and defined by us are going to be helpful.

1.4 Software Specifications

- Software Specifications
    1. Python 3.11.3
    2. Pandas
    3. Matplotlib
    4. Numpy
    5. Seaborn

Chapter 2: Literature Survey

2.1 Existing Work

The primary objective of studying all the researches in the interest of effects of e-games and physical games was to gain an understanding of the previous research conducted in the field related to our project. During our review of the existing literature, we discovered that there were numerous idolizing points which gave various unique perspectives and approaches that could be incorporated into our project to make it more viable and beneficial for our target audience. The more people it will reach, the more awareness could be made is one of the ambitions in the mindset of every researcher. By examining the works of other researchers, we gained valuable insights into the challenges and opportunities associated with similar projects. Through this process, we came up with really positive points that were completely in the favor of humanity as we were able to identify potential areas of improvement and innovation that could enhance the overall effectiveness of our project and reach the people as some health balancing messages.

In order to be working by being aware of the methods the world is currently moving with the matter to gaming, our aim was to gather relevant information about the existing practices and strategies utilized by other researchers in the field. This enabled us to gain a comprehensive understanding of the current trends and best practices, which we could then incorporate into our own work. Moreover, we also identified various gaps and limitations in the existing literature that could be addressed by our project.

The things that were currently lacking in the literature really needed to be the upfront of both types of gaming so that the players are well aware of the consequences and benefits of them both at multiple origins and factors. By analyzing the previous research and literature, we were able to identify new research questions and areas that require further exploration. Overall, our survey of the existing literature has helped us to refine our approach and identify new opportunities for innovation and improvement.

By incorporating these insights into our work, we hope to create a project that is both impactful and sustainable for our target audience. A project that will provide substantial analytical results of the various types of gaming. It will be showcasing contents in such a form that proper hindrance of any factor.

To date, there are several studies that determine the positives and negatives of E-games and Physical games, but no research has been found which shows detailed comparative analysis between both the industries.

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In the Research by Department of Human Kinetics and Health Education [3], University of Ibadan, Ibadan Nigeria it was found that children playing video games for a long time were found with musculoskeletal problems, Obesity, vision issues, Seizures (Epileptic).

A different study [6] was done on male and female by School of Education, University of Isfahan, Isfahan, Iran [2] which shows cased computer games addiction affects multiple dimensions of health and increasing physical problems, anxiety and depression, while reducing social functioning disorder.

An article in Indian express stated that teenagers may be inclined to sacrifice their studies to ambition for athletic distinction. They put lots of physical strain on their body. This causes harm to their physical and mental fitness.

A contradictory study done by a Professor of Gambling Studies in the Psychology Division, Nottingham Trent University [7] stated that video games for educational purpose were proved to be beneficial as they can assist children in setting goals, ensuring goal rehearsal, providing feedback, reinforcement, and maintaining records of behavioral change moreover Videogames attract participation by individuals across many demographic boundaries.

A study done by Termez State University Lecturer, Faculty of Sports Activity and Management [6] Concluded with Outdoor games should be used as educational and recreational tools Socialization of the individual. They can intensify the educational process and provide a motivating basis for the formation of physical and mental qualities and personal self-regulation of school children.

The study, conducted by two researchers from The Role of the Body in E-sports, A Scope Review, was a comprehensive study, and this review included fully documented literature that contributes to understanding the role of the body in e-sports and competitive gaming [9] It is a person's body through which every action is carried out. Be it when playing on the field or in the digitized area, e.g. B. Online gaming, all this is available through a well-functioning human body. The core element of this research has been disclosed and the result of the analysis has provided us with strong data on the front lines. The body is a key area of study in e-sports and it is important to study this topic when researching e-sports. They also showed that physicality can be observed in both types of games. Physical and digital, e.g. Sports. E-sports also has its dominance in the field of sports or creative activities. There has been a steady increase in the popularity of electronic sports. E-sports is just a few steps away from becoming the face of gaming. This makes it clear that the body is worth studying not only for a player's physical health or competitive motor skills but also to address body-related issues that may not be immediately apparent in sports.

The study by three renowned researchers on Online Digital Gaming Addiction. How Social Relationship Affects Gaming Addiction [10] was a very reputable study that was a comprehensive example of how important relationships are and how gambling addiction brings happiness and pain. Relationships with family and friends are among the most important needs. Through this research we have found that we ourselves, or sometimes by others, are being led into the growing gaming industry i.e. Online gaming is an alternative to physical games. It is also a well-formed platform for networking.

Social learning theory deposits that behaviors are learned by observing others in a social context. This study focused directly on how offline and online social relationships contribute to online

gaming addiction. The study of the social-relational factors that lead to online gambling addiction offers professionals an opportunity to find ways to help pathological individuals break free from gambling addiction.

While some would love to go to a field and play rough, others don't mind staying home and playing in their own kingdom. Staying indoors is something that easily elevates a person living in a room that doesn't have much space available to play on the field to becoming an electronic game player. Both variants of the game have become a trend in today's world. E-gaming is where an individual play sports games indoors. Physical gaming is the traditional way of playing sports and then the more recent addition, online betting. Originally this was hosted in betting centers where people would drop by to place their bets, but today there are reliable betting portals on the internet for land based games. The best betting sites are based on bonuses and the highest positive reviews. Instead of going to the betting center, a user can choose their team and place their bets online.

However, the conversation about online and physical gaming provided some facts and some related facts, but it became a lot of surprising facts as we looked deeper and dug as the whole analysis had a lot more to do with it.

2.2 Proposed System:

This research project involves comparing and analyzing data from previous research papers and coming to a conclusion with an open mind. It includes data from various datasets, which are combined to provide the most accurate result. To date, no research has been conducted that outlines the pros and cons of both E-gaming and physical games, as well as suggesting measures to minimize the harm caused by both activities. The aim of this research project is to fill this gap by providing comprehensive information on the benefits and drawbacks of E-gaming and physical games.

The study uses a comparative analysis approach to examine the datasets of previous research papers, which have investigated E-gaming and physical games. The data is analyzed to identify common trends and patterns, and to gain a better understanding of the effects of these activities on individuals. The research project aims to provide an unbiased analysis, with no preconceived notions or biases towards either E-gaming or physical games.

The research project is unique in that it aims to provide practical suggestions for minimizing the potential harm of both E-gaming and physical games. This includes identifying potential health risks associated with each activity and providing recommendations on how to mitigate these risks.

This involves recognizing potential fitness risks guide each endeavor
Additionally, the project aims to provide insight into how individuals can balance their time between E-gaming and physical games to maximize the benefits of both activities.

Overall, this research project seeks to provide a comprehensive analysis of E-gaming and physical games, with the aim of providing practical recommendations to minimize harm and maximize benefits. The study is expected to fill a gap in the existing research on this topic, and to provide valuable insights to individuals, researchers, and policymakers.

2.2 Feasibility Study

- Technical feasibility

    a. Any standard PC or laptop
    b. Windows Operating System/Linux/Mac OS
    c. Python 3.11.3
    d. Each of the technology is freely available and the technical skills required are manageable.

    .

Therefore, the proposed project is technically feasible.

- Operational feasibility

Resources that are required for the project include:

1. Programming device (Laptop or computer)
2. Programming tools (freely available)
3. Programming individuals
4. Everything on the project is code based and open source so it will be easy to develop the tool.

Therefore, the project has operational feasibility.

Chapter 3: System Design and Analysis

3.1 Project Perspective

1. The primary aim of this project is to address a significant issue by thoroughly studying and analyzing multiple datasets. The goal is to provide an all-encompassing solution that minimizes harm while engaging in both physical and e-games. No previous research has comprehensively explored the positive and negative aspects of these games and offered specific recommendations to mitigate the potential hazards. This research is unique in that it combines the findings from various datasets to offer the most effective solution.

2. This project aims to improve the quality of life of the individuals by providing them with relevant information and knowledge that can make their lives more comfortable. By conducting research and analyzing data related to the pros and cons of physical gaming and E-gaming, the project seeks to educate individuals on how to make informed decisions about their leisure activities.

3. The project recognizes that in today's fast-paced world, people are constantly looking for numerous sorts of ways to unwind and relax, and gaming has become a popular leisure activity. However, with the rise of the E-gaming, there are growing concerns about the potential harm which it can cause, such as physical inactivity and social isolation. On the other hand, physical gaming has its own set of risks, such as injuries and exposure to weather-related illnesses.

4. By conducting a comparative analysis of various datasets, this project aims to provide a comprehensive understanding of the pros and cons of both types of gaming. This information will be used to develop a set of guidelines and recommendations that individuals can follow to ensure that they are able to enjoy their leisure time in a safe and healthy manner very well. Ultimately, the goal is to improve the well-being and comfort of the individuals who are the players and promote a healthier lifestyle.

5. This research is aimed at making a positive impact on the lives of people, particularly those who are between the ages of 13 and 30. This age group is particularly important because it is during this time that people are establishing habits and patterns that can shape the rest of their lives. By providing valuable information on the benefits and the unfortunate drawbacks of both physical gaming and E-gaming, we hope to empower individuals to make informed decisions about their leisure time and create healthy habits that they can carry with them into the future.

6. We all reach the point of being aware of the fallout consequence or also the defensive threshold. As we all believe that Education is important in the context of healthcare for a common man even which will be considered as the knowledge of that person to be taking those steps in his/her life which immensely ensure that the player who regardless of the purpose of being onto the gaming, simply does not cause any factor to turn into a problematic statistic. The calmness of the player gives a brief assurance of the need “I know the movements in respect to the different types of circumstances and vice-versa”.

3.2 Performance Requirements

The requirements which should be satisfied in order for the successful completion of the project are as follows:

1. Python3.11.3
2. Pandas
3. Matplotlib
4. NumPy
5. Seaborn
6. Large Dataset

3.3 System Requirements

1. System

Chapter 4: Methodology

The methodology of research consists of following stages:
(I) Data collections

(ii) Data analysis

(iii) Data visualization

4.1 For Data collection,

A database [9] was selected and Data analysis was performed using bibliometric analysis, which represented the objective approach. Bibliometrics refers to "the collection, management, and analysis of quantitative bibliographic data derived from scientific publications". Collection was made by the answered obtained by 50 research questions that were put up in the front of the gamers. Accordingly, the aim of this section was to explore how gamers made sense of any sort of game (be it an Online game or Physical game) and at different situations even. After collecting data of 13465 gamers, Data analysis was done of the different analytics processes that have been proposed earlier by different analysts so that we can get to know about the shortcomings of the works that have been in-use for quite some time now.

Data collected for the analysis of both types of games i.e. Physical games and E-Games were collected from different sources. It led to obtaining sufficient amount and appropriate data for all the types of questions from kaggle that were needed to be answered by the gamers so that the impact of the games can be well understood. It consists of general descriptive statistics (e.g. Platform being used to play, time spent at it, etc.) and more sophisticated questions like the purpose (Hobby/money source).

Instead of being looking at a small amount of data, we did not decide of approaching a

particular group of players, the data collected was of numerous Games of E-gaming as well as of Physical gaming. This gave our research even more factors to be looking at and come up with results and analysis of them all in different cases and situations.

This entire and numerous staged working on the data of 13465 gamers has had multiple stages of observing at every step and by observing the step of the gamer turned into pick-up points.

Looking at whether the gamer is playing solely or are they competing as mostly gamers are worried about the Results of the game in the case of competence known as Gaming Anxiety Data (GAD) which depicts Gaming and its association with anxiety, life satisfaction and social phobia.

4.2 For Data Analysis,

With all the analysis of the things mentioned above, Analytic processing was done in order to get to know about their workings. The Python programming language was used for this purpose as the libraries of it namely pandas, matpotlib and numpy were used in this process.

An objective bibliometric analysis was performed, supported by subjective ratings based on studies focused on the link between both types of gaming and healthcare. Bibliometric analysis represented the objective approach. We also analyzed the help/service provided by the tools that are being used by which it clearly shows the situation of the Gamers in their normal lives. Gamers are playing those games in their common lives which might affect the loads on them.

This Bibliometric reasoning was administered, supported by established studies on emotional estimates which met on the linking of two together types of games in concerned relevance to healthcare.Bibliometric study represented the objective approach. We too resolved the duty determined for every human-being for the sake of humanity by the finishes that are being secondhand bywhich it certainly shows the situation of the Gamers in their sane lives.

Gamers are gambling those entertainments in their lives. In addition to the attainable tangible harms and inconvenience, skilled are additional troubles to tangible gaming that are frequently missed. One of these is the cost guide playing in sure sports.

This is posted by the acronym SWL which stands for (Safe Working Load) in the analysis. Regression analysis reflects the characteristics of Eigen values of the dataset and uses a function for expressing the relation in data mapping to check the dependency between values of the attributes to apply the research to predict and correlate data series.

We consider a dependent variable y to correlate with independent variables

x_1, x_2, ..., x_k as:

$$v = v_0 + v_1x_1 + v_2x_2 + ... v_kx_k + e$$

Where e = (0, σ^2)

Using sampling, the data can be obtained in n groups of observation as

$y_{1\rightarrow}x_{11}, x_{21}, x_{31}, \ldots . x_{k1}$

$y_{2\rightarrow}x_{12}, x_{22}, x_{32}, \ldots . x_{k2}$

....

$y_{n\rightarrow}x_{1n}, x_{2n}, x_{3n}, \ldots , x_{kn}$

Where x_{ij} is the j^{th} are observed values of the independent variable x_i, while y_j is the j^{th} observed value of the dependent variable y.

On substitution of the above formula, the model's data structure becomes:

$$y_1 = b_0 + b_1x_{11} + b_2x_{12} + ... b_kx_{k1} + e_1$$
$$y_2 = b_0 + b_1x_{12} + b_2x_{12} + ... b_kx_{k2} + e_2$$
$$\ldots.$$
$$y_n = b_0 + b_1x_{1n} + b_2x_{1n} + ... b_kx_{kn} + e_n$$

The above equations present a model based on k^{th} element normal linear regression with unknown parameters b_0, b_1, b_2, …, b_k, and σ^2 to be assessed, and the independent parameters ε_1, ε_2, ε_3, ..., ε_n are identically distributed over (0, σ^2)

Complex correlation analysis is performed on dependent variable y, and k independent variables $x_1, x_2, \quad x_3, \ldots , x_k$. Now, the multivariate linear regression model needs to meet the

Gaussian hypothesis of the multivariate regression. We use the least square method for estimating the regression coefficients b_0, b_1, b_2, …,b_k as:

$$l_{11}b_1 + l_{12}b_2 + l_{13}b_3 + \cdots + l_{1k}b_k = L_{1y}$$

$$l_{21}b_1 + l_{22}b_2 + l_{23}b_3 + \cdots + l_{2k}b_k = L_{2y}$$

$$l_{k1}b_1 + l_{k2}b_2 + l_{k3}b_3 + \cdots + l_{kk}b_k = L_{ky}$$

$$b_0 = \bar{y} - b_1\overline{x_1} + b_2\overline{x_2} + b_3\overline{x_3} + \cdots + b_k\overline{x_k}$$

The above linear regression model depicts the analysis results on both kinds of games presented in the analysis section.

The data analysis has given us a good proof of the quality, reliability, performance, etc. of the software. The analysis covered software systems ranging from desktop software to telecom switching systems. This was even better than a simple case study of how data from users of the released game can inform further development as it gave the knowledge to know about how weak the gamer's body has become physically or mentally that they faced problems at a specific point of time or situation.

This thing will help us even more in bringing up some suggestive measures of both the types, be it of the changes in the game development or the way gamers' are constantly playing. This was even better than just a record of what happened of by what method got collected from consumers of an announced game can apprise after incident as it was a present to hear the knowledge about in what way or manner the gamer's crowd has enhance concerning matter or rationally that they faced questions at a distinguishing point momentary or position.

4.3 For Data Visualization,

Data visualization was used to present a scientific map and the result of data analysis. Drawing graphic displays to show data was another step taken so that the people can understand the entire analysis in a moment. Statistical summaries are shown. The main goal of this step was to visualize statistics, being able to obtain even more clearance when making attempts for deciding the suggestive measures to be shown.

Data visualization was used as a step to come up with a proper and easy to understand graphical mode to be used in order to make even a common man understand the statistics. It shows a learning map. Statistics framed as a proper graphical image clearly displays the data to show things in a wise way was another step captured so that people can think about the complete study and obtain help in the form of guidance or alertness.

As presented in the below mentioned graph where the graphics are specifying a chart that is in a way a type of map which is helping us to understand that how many people of all the Genders (Male, Female, Other) are spending on E-gaming.

As it can be observed well that which gender is spending the most time at gaming and after the analysis of the collected data the data shows that Male gamers are spending close to 140 hours at it, Female gamers are spending about 120 hours and the gamers from the other gender are spending almost 95 hours.

This straight away is telling us that Male gamers are spending most times at it so this can be a point to be taken a look at very well so that we can look well at the data collected as the Male Gender is spending the most time out of all the Genders so they must be probably having bad GAD and SWL.

So, while looking to come up with suggestive measures as firstly status of GAD and SWL

of the gamer and this graph is helping us in this.

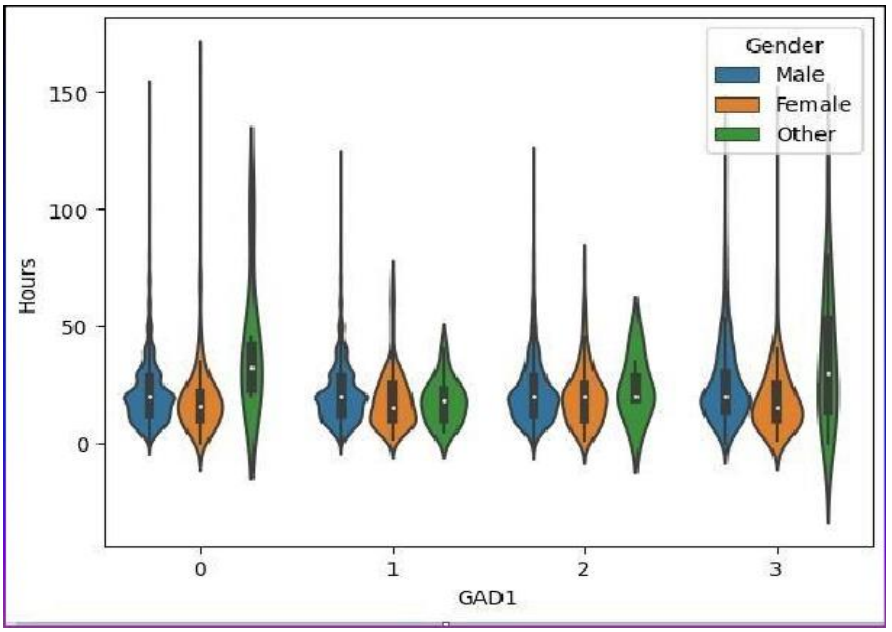

Figure 4.3.1: Gender spending most time

GAD- Gaming Anxiety Data
SWL-Safe Working Load

Now, In the below mentioned image the graphics are specifying a chart that is in a way a type of map which is helping us to understand that how many people of different age groups (10-20, 21-30, 31-40, 41-50, 51-60 and above 60) are spending on E-gaming. It can be seen well that which age group is spending the most time at gaming out of all the age groups and after the analysis of the collected data it is clear that that the age group of 21- 30 plays the game's most out of all and the group of 31-40 use it as second most.

Without any objectionable context or doubt, this is telling us the summary of the entire age group criteria that has to be looked at while making the predictions and suggestive measures. So this will also be a point to be taken a look at with priority notes so that the data collected can be dig well.

Without some unpleasant circumstances or doubt, entire group of same status tests that has expected look at while making the prophecies and other measures. So this will further be a point to stop living and examine accompanying arrangement outline for fear that the case study has collected.

So, while working to come up with suggestive measures as firstly need of the status of GAD and SWL of the gamers via their Gender and the Age Groups they are of by co-relating the entire context and graphs.

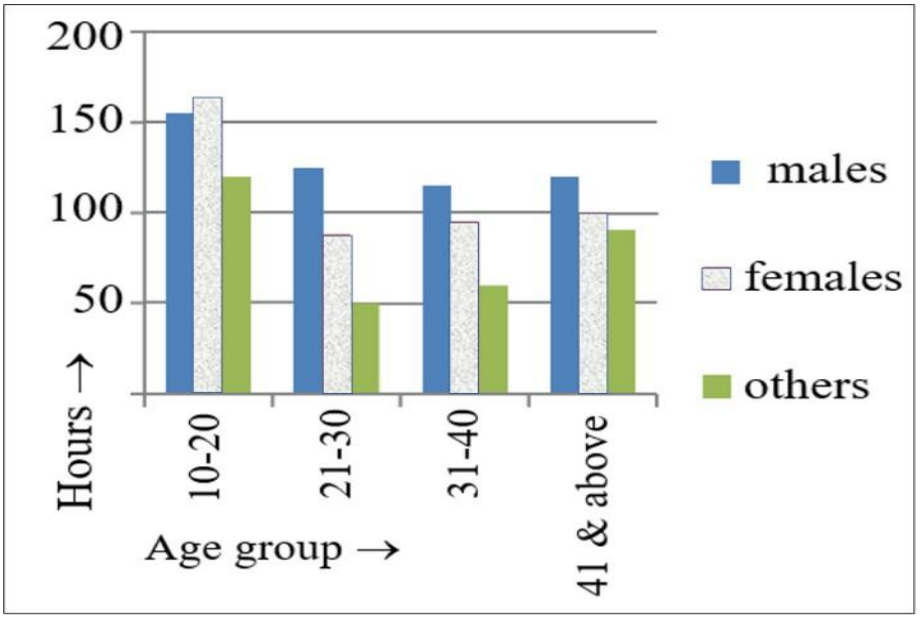

Figure 4.3.2: Age group spending most time

4.4 Planning of work:

This involves taking the data from the dataset [8] and processing it or training it with the help of apache-spark and after that finding the problem under linear regression.

Table- 4.4.1: Correlation between addiction to computer games and physical disorders

Correlation coefficients	Addiction to e-games		
Parameters	R	P	N
Physiological issues	0.1980	0.002	486
Mental issues	0.3480	0.002	483
Societal malfunction	0.1040	0.201	477
Despair indications	0.2500	0.002	487
Total	0.3160	0.002	445

Based on the findings presented in table 4.4.1, correlation between addiction to computer games and physical complains, anxiety and sleep disorder, disorder in social functioning and depression were significant in level $P \leq 0.05$. Therefore, there was a direct relationship between addiction to computer games and physical disorders such as anxiety, sleep disorder and depression. But, there was a positive correlation between addiction to computer games and social dysfunction. In other words, based on coefficient of determination, 4% variance of addiction to computer games is common with physical disorder, 12% with anxiety and sleep disorder, 1% with disorder of social functioning and 6%with depression.

The table 4.4.1 has been made by observing the analysis and regressions held while working to come up to the actual fact of this factor.

Linear regression is a mathematical technique model that majorly forms or observes the

relationship between a response and multiple explanatory variables.

In our working, multiple linear regression was the type of linear regression that was chosen to be used.

Table 4.4.2: Correlation between addiction to computer games and social dysfunction

Correlation coefficients	Addiction to e-games		
Parameters	R	P	N
Physiological issues	0.2260	0.001	265
Mental issues	0.4400	0.001	261
Societal malfunction	0.1420	0.230	258
Despair indications	0.3310	0.001	265
Total	0.3720	0.001	243

Based on the findings presented in table 4.4.2, correlation between addiction to computer games and physical complains, anxiety and sleep disorder, social dysfunction and depression were significant in level $P \leq 0.05$. Therefore, there was a direct relationship between addiction to computer games and physical disorder, anxiety, sleep disorder and depression. But, the relationship between addiction to computer games and social dysfunction is reverse. In other words, based on coefficient of determination, 5% variance of addiction to computer games is common with physical disorder, 19% with anxiety and sleep disorder, 2% with disorder of social functioning and 10% with depression.

Table 4.4.3: Direct relationship between addiction to computer games and physical disorder

Correlation coefficients	Addiction to E-games		
Parameters	R	P	N
Physiological issues	0.1810	0.006	222
Mental issues	0.3550	0.002	485
Societal malfunction	0.0970	0.021	218
Despair indications	0.2410	0.002	221
Total	0.3180	0.002	201

Based on the findings presented in table 4.4.3, correlation between addiction to computer games and physical complains, anxiety and sleep disorder, social dysfunction and depression were significant in level $P \leq 0.05$. Therefore, there was a direct relationship between addiction to computer games and physical disorder, anxiety, sleep disorder and depression. But, the relationship between addiction to computer games and disorder of social functioning is reverse. In other words, based on coefficient of determination, 3% variance of addiction to computer games is common with physical disorder, 12% with anxiety and sleep disorder, 0.9% with social dysfunction and 5% with depression.

Table 4.4.4: Relationships between variables

Correlation coefficients / Parameters	Standard coefficient	Standard error T		Test results
Physiological issues	0.420	-	0.000	-
Mental issues	0.880	0.820	7.510	Positive
Societal malfunction	-0.200	-0.360	-3.590	Positive
Despair indications	0.700	0.500	7.830	Positive
Health and addiction to e-games	0.380	0.410	5.950	Positive

The results in the table 4.4.4 show that all relationships between variables 2 x 2 are significant. The effects of health with addiction to games is 0.38 which is significant in level 0.99 and shows the positive effects of addiction to games on general health of students.

Table 4.4.5: Suitability of the model

Index variable	Estimated value
Goodness of fit index	0.990
Adjusted goodness of fit index	0.970
Root mean square deviation	0.054
Chi-square	11.350
Degree of freedom	5.000
Level of significance	0.044

Based on the results presented in Table-4.4.5, all indices show the suitability of the model. Figure 4.4.6 and 4.4.7 show standard coefficient of path analysis and t-chart of path analysis of relationship of health components and addiction to computer games respectively.

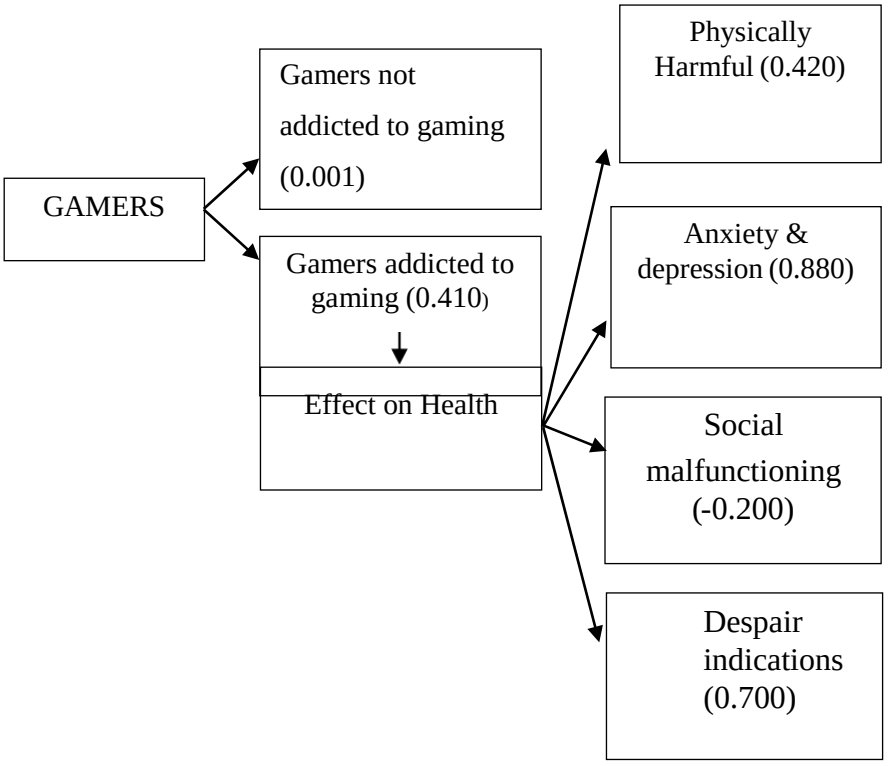

Figure 4.4.6: Show standard coefficient of path analysis

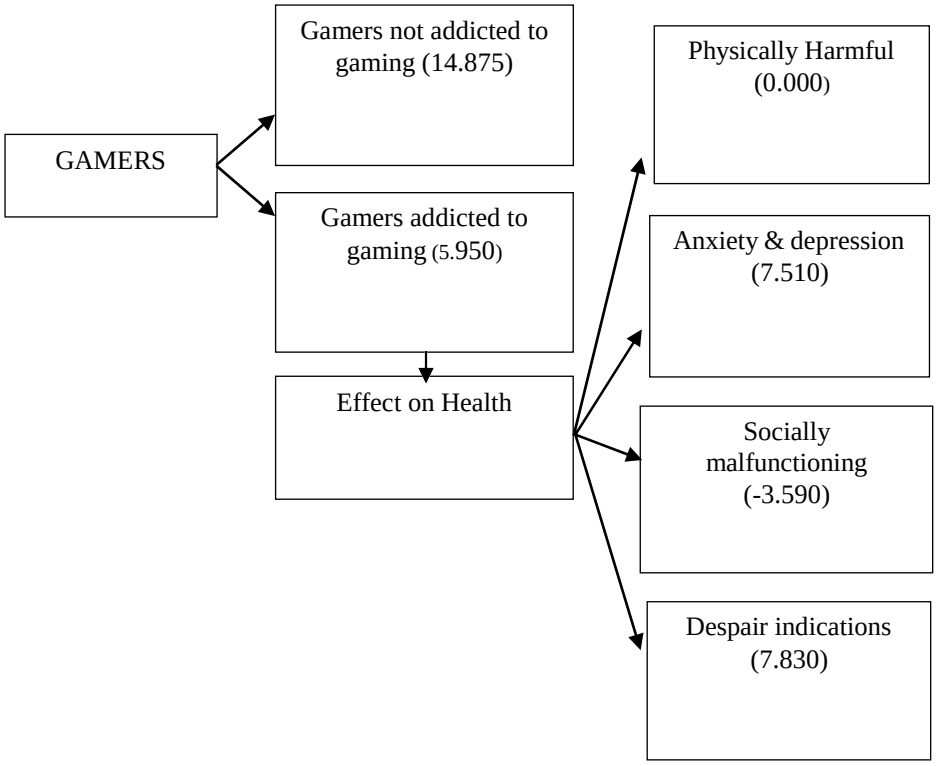

Figure 4.4.7: t-chart of path analysis of relationship

Gamers who play action-oriented E-games are at higher risks. The more they are involved in these kinds of games, the more they are going to have bad effects on few sections of their brain. It is that part of the brain which is considered to be the center of nervous system, memory and emotion. Some drastic Neuro-situations may make person vulnerable to multiple neuropsychiatric complications. After looking at all the data and chartings above, it is able to observe this well that E-gaming is really causing a lot of Neuro-problems as well because it is a fact that anxiety symptoms, depression, social malfunctioning are all completely related to the neurological condition of the human beings.

The primary factor contributing to these co-morbidities is the individual's difficulty in managing and regulating their emotions, including but not limited to feelings of anger, sadness, and fear. This is due, in part, to the perception of video games as a means of emotional avoidance.

According to study's result [11], players experienced a significant increase in their cortisol and α-amylase levels following gameplay, indicating heightened physiological arousal in response to the game's threatening content.

Numerous video games are characterized by their high-energy, thrilling gameplay, which can stimulate the body's production of adrenaline. This natural response helps individuals react more quickly to perceived threats, such as the danger of virtual death in shooting games.

It has been noted that engaging in gaming activities can elicit the release of cortisol, a hormone commonly associated with stress, particularly in response to perceived threats. If excessive gaming leads to persistent cortisol activation, it may disrupt the normal functioning of the brain's neurotransmitters, including serotonin.

Cortisol is a naturally occurring hormone that originates in the adrenal glands and is secreted into the bloodstream. Hormones are chemical messengers that communicate with organs, skin, muscles, and other tissues throughout the body, providing instructions on various functions and timing of events.

Cortisol is a type of steroid hormone. It can bring bad effects to all of the bodily tissues and control metabolism in muscles, fat, liver and bones. Cortisol plays many important roles, including:

Regulating body's stress response. [Reason why it is called stress hormone]

- Regulating blood pressure.
- Regulating blood sugar.
- Cardiac attack.
- Brain stroke.
- Helping control sleep-wake cycle

Body of everyone and in every situation is continuously a depiction of the order to maintain a state of balance or homeostasis, it is important for cortisol levels in the body to remain stable. Abnormally high or low levels of cortisol can have negative effects on overall health and wellbeing. Regardless of it to be Acute/chronic/traumatic.

On analysis, we got to know about the ways cortisol is getting affected by different types of gaming. By this, the variations of the concentration of the salivary cortisol were observed solemnly.

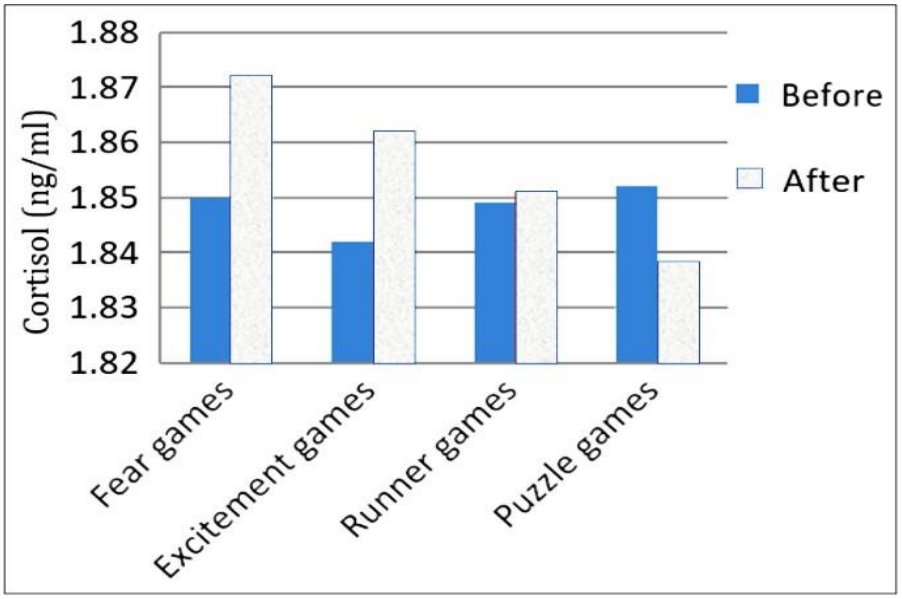

Figure 4.4.8: The mean concentration of the cortisol

In gameplay of the four games, there was a notable and statistically significant increase in the average cortisol concentration levels among the participants.

After the body gets back to the stage of Normal, it becomes capable enough to battle with stress. One can be onto gaming after some break and some health concerned way. In any form, one should always ensure that in case he/she is a player of any type of an E-game after obtaining sufficient amount of rest so that their becomes affluent of Confidence again.

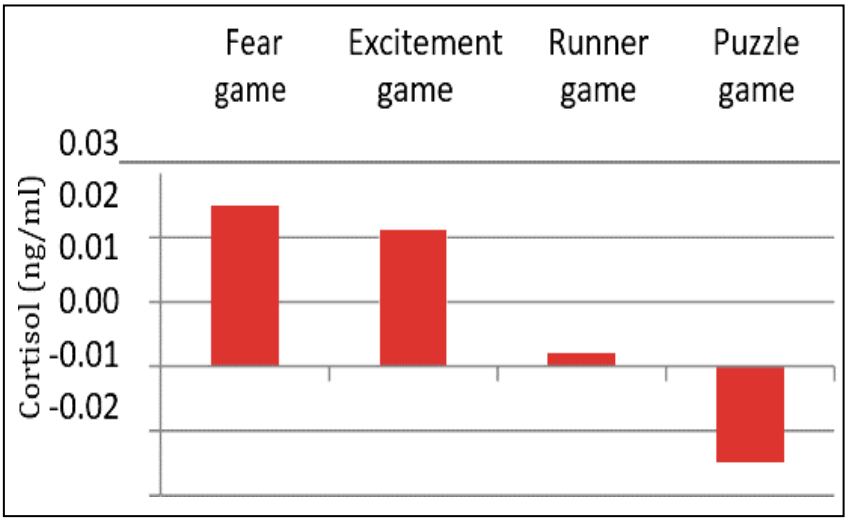

Figure 4.4.9: Change in cortisol playing fear games

The mean variations of the concentration of cortisol after playing the game showed that thehighest change was caused by the fear game.

Studies have demonstrated that cortisol is the primary hormone released by the human adrenal cortex in response to stress, highlighting its critical role in the body's stress response system. So, in order to see how stress is getting tempered by excessive gaming the below graph describes it well.

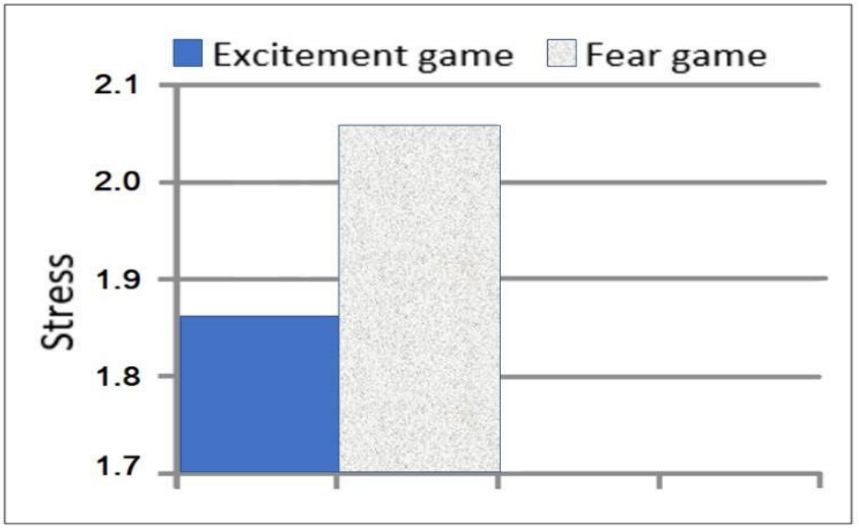

Figure 4.4.10: stress getting tempered by excessive gaming

The data presented clearly indicates that the impact of E-games varies significantly based on different factors, such as age, gender, and type of games played. Firstly, age is an important factor that influences the way E-games affect gamers. Younger players tend to be more immersed in the game world and may be more susceptible to addictive behaviors. This is particularly true for games that offer rewards or incentives for prolonged play, such as in-game currency or cosmetic items. On the other hand, older players may be less likely to experience these addictive tendencies and may instead prioritize social aspects of the game, such as playing with friends or engaging in community events. Secondly, gender also plays a role in how E-games impact players. Studies have shown that male gamers tend to have more competitive and aggressive tendencies, which may be exacerbated by certain types of

games. In contrast, female gamers tend to be more social and cooperative, and may prefer games that offer opportunities for collaborative play.

Lastly, the type of game being played can also have a significant impact on the player's experience. For example, fast-paced action games may lead to heightened levels of stress and aggression, while puzzle or strategy games may promote problem-solving and critical thinking skills. Additionally, multiplayer games may offer opportunities for social interaction and team building, while single-player games may provide a more introspective and immersive experience.

Chapter 5: Result and Discussion

The study conducted a thorough investigation into the effects of both e-games and physical games on individuals' lives, examining both the positive and negative aspects. One notable finding of the study was the impact of e-games on individuals' cognitive skills and behavior, which was found to be linked to the fluctuation of cortisol levels in the body. Cortisol is a hormone responsible for stress and uneasiness, among other aspects, and its fluctuation was observed in both figure 6 and figure 7 of the study.

Additionally, the study found that the age group of 10-20 spent the most time playing e-games, with a reduction of around 50% for individuals aged 21 and above. This indicates that as individuals get mature and take more responsibilities, they tend to spend less time playing e-games.

The study also examined the correlation between addiction to e-games and various dimensions of health. The correlation coefficient was found to be significant ($P<0.05$) for all dimensions except for social malfunction, which had a correlation coefficient of ≥ 0.20. Mental issues, societal malfunctioning, despair indications, health, and addiction to e-games were all observed to be positively correlated.

Another interesting finding was the impact of different types of e-games on cortisol levels. The study found that fear e-games had the highest fluctuation in salivary cortisol levels, while puzzle games had the lowest fluctuation. Furthermore, the mean concentration of cortisol while playing fear e-games was observed to be the highest, while the lowest mean concentration was observed for puzzle e-games.

In terms of future scope, the study suggests that further analysis could be conducted using machine learning algorithms to provide more comprehensive insights into the impact of e-games on individual’s lives. The study could also provide suggestive measures that individuals could follow to lower the negative aspects of e-games, such as setting time limits for playing or engaging in physical activity outside of gaming. Overall, this study sheds light on the complex relationship between e-games and individuals' lives and highlights the need for further research in this area.

Chapter 6: Conclusion

The data clearly indicates that the impact of E-games varies significantly based on different factors, such as age, gender, and type of games played. On the other hand, older players may be less likely to experience these addictive tendencies and may instead prioritize social aspects of the game, such as playing with friends or engaging in community events. In contrast, female gamers tend to be more social and cooperative, and may prefer games that offer opportunities for collaborative play. Lastly, the type of game being played can also have a significant impact on the player's experience.

A greater awareness of signs and symptoms of gaming on daily activities, physical and mental health, and social relationships is encouraged. If persistent gamers experience depression or anxiety, it is recommended that they seek medical or behavioral health professionals.

Observing consistent increase in the popularity of digital gaming and relevance of digital gaming are continuously growing and digital gaming is on the way to becoming the field of gaming towards which the growing generation is mostly paying attention to. This research paper will be making a mark straight on the pathway to the danger zone of digital gaming with a claim and be as an advisory board which has numerous analysis as facts to save the world from causing themselves a harm.

Observing this study, many people will think of working on matters concerned to saving humanity with a positive mindset when they will see people adapting to the suggestive measures. Youngsters and the growing generation will realize that anything can be done to everything but our own body is something we always need to be careful about.

Code

CD is attached with the code and instructions:

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