

SCIENCE FAIR LOGBOOK
2024

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6B



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TIMELINE

Thought about a topic I should research about that could help me with a real life situation.	Nov 23, 2023
Came up with the topic and created a question.	Dec 05, 2023
Found the problem with the question.	Dec 15, 2023
Did Research to find out about social media and mental health.	Dec 17,2023
I conducted a survey to prove my hypothesis.	Dec 18-19, 2023
Tried to find online research and investigations done by professionals on mental health of preadolescents.	Dec 22, 2023
Got an appointment to interview with a doctor to find out about how scientifically the brain works and feels when going through mental disorder .	Dec 23 , 2023
Had arranged another interview with a different doctor, a pediatrician, to see the effects of peer pressure on stress levels and to prove my hypothesis and research.	Dec 24, 2023
Data analysis and inference	Dec 31,2023
Came to a conclusion	Jan 02, 2024
Finish editing and bibliography along with acknowledgements.	Jan 03, 2024

TOPIC

EFFECTS OF SOCIAL MEDIA **ON PRE-ADOLESCENTS** **MENTAL HEALTH**

QUESTION

*DOES SOCIAL MEDIA
AFFECT MENTAL HEALTH OF
PRE- ADOLESCENTS?*

HYPOTHESIS

In my opinion, during recent years the technology landscape has rapidly evolved, with social media now playing a central role in the lives of preadolescents (the age from 9-12). The more frequent use of social media is associated with various mental health concerns.

If preadolescents have the awareness and guidance of dealing positively and responsibly with social media, they can also deal with more difficult situations in the future. When preadolescents limit their time on social media, with a healthy mental state they can do more productive things.

RESEARCH

PROBLEM:

As the preadolescent advances into higher grades, the exposure and involvement to social media might increase. While many of us enjoy staying connected on social media, excessive use can fuel feelings of addiction, anxiety, depression, isolation, and FOMO (Fear Of Missing Out). Young people are more exposed to social media harm because of their innocence and immaturity.

Most of the kids use social media for extended periods of time. On social media, certain posts might make young adolescents think that they want to be like them. This affects that youth's overall personality. An example is when people try to be skinny like a person's picture by trying to lose weight in a bad way such as purposely vomiting after eating.

The specific social media experiences and lack of awareness, guidance, and responsibility of using social media may influence preadolescents mental health. If one uses too much social media, they can be addicted and will be in a habit of using it more frequently. This will affect the concentration, time management, productivity, academic performance, and other aspects in their daily lives. If the child can try to manage and balance the use of social media in the lower grades, it will be easier for them to cope with their well-being in the teenage phase .

WHAT IS SOCIAL MEDIA?

Social Media is a digital platform which involves people interacting online by sharing knowledge, creating posts and texting with each other on the internet.

Three main words that describe social media are:

- **Connectivity**: Primarily, this platform connects people together regardless of geographic distance.
- **Interaction**: The main purpose of social media is to interact with people.
- **Content**: Social media is driven by content, creation, and consummation.

Social media could be regarded as a double-edged sword

- Social media typically features user-generated content that lends itself to engagement via likes, shares, comments, and discussion.
- More than 4.7 billion people around the world use social media.
- The largest social media platforms worldwide are Facebook, YouTube, WhatsApp, Instagram, TikTok and WeChat text messaging and messaging apps, social gaming tools, and more.

WHAT IS MENTAL HEALTH?

“Mental health is a state of well-being and how well someone copes with their problems.” States Dr.Maria.

Everyone can have issues with mental health. Mental health can be affected if a person goes through a difficult life experience, or experiences too much stress. Having a mental illness does not mean one cannot take steps towards a better mental health. A person with positive mental health has the following characteristics:

- 1- A sense of purpose
- 2- Strong relationships
- 3- Feels connected to others
- 4- Higher self-esteem
- 5- Deals with stress effectively
- 6- Enjoys life

Achieving or maintaining a good mental health might not be only one person's journey. In fact, one's setting, situation, and the interaction with other people can affect one's well being.

Maintaining healthy mental health means to work towards achieving positive perspectives within one's environment. Having a positive mindset can help one achieve good mental health.

HOW CAN SOCIAL MEDIA AFFECT MENTAL HEALTH?

Social media has an enormous impact on mental health. It can promote connection, self-esteem, and sense of belonging. However, it can also cause a lot of stress, peer pressure, and feelings of despair and isolation.

Dr. Maria states: “Social media platforms are designed to snare your attention, keep you online, and have you repeatedly checking your screen for updates. Social media use can also create psychological cravings. When you receive a like, a share, or a favourable reaction to a post, it can trigger the release of dopamine (neurotransmitter or chemical messenger) in the brain. This makes a kid happy or satisfied for a while.”

WHAT TYPES OF DISORDERS ARE CAUSED BY SOCIAL MEDIA?

SLEEP DISORDER

There's no doubt that social media has transformed the world we live in. Unfortunately, social media and sleep don't mix well. Excessive use of social media, particularly close to bedtime, can reduce sleep quality and increase the risk of a multitude of sleep issues.

Sleep Disruption: Social media at night might disrupt a child's sleep. Children between the ages of 5 and 16 should get between 9 and 11 hours of sleep every night.

Getting inadequate sleep can have a detrimental effect on their learning at school and increase their risk for depression and anxiety. Following are some factors :

- Fear of missing out (FOMO) and a never ending desire to stay connected
- Impact of blue light exposure (when phone is checked blue light enters eye, wavelengths trigger brain to think it is 'daytime' and then it is hard to sleep)
- Circadian Rhythms: the 24-hour internal clock in our brain that regulates cycles of sleep by responding to light changes in our environment.
- "Young people have a hard time regulating their schedules and sometimes when they're doing something that is very attention grabbing they have a hard time sleeping."

ANXIETY DISORDERS

There are four types of anxiety disorders:

- Generalised anxiety disorder (GAD)
- Panic disorder
- Phobias
- Separation anxiety

Generalised anxiety disorder (GAD)

The meaning of this disorder is when the feeling of unrealistic worry comes even if there is nothing triggering it. With GAD, worry of many things can occur such as health, work, school, and friendship. The worry continues from one thing to the next.

Panic disorder

With panic disorder, intense and sudden panic attacks can happen. The feeling of this attack can come suddenly or unexpectedly. These attacks can also happen because of a trigger such as facing a situation that is deeply feared.

The symptoms of a panic disorder are:

- Fear of losing control
- Heart palpitations (feeling like the heart is pounding)
- Sense of unreality
- Sweating

Phobias

Phobias are an intense fear for a certain situation or object. Some fear might make sense such as fear of the dark because someone posted some imaginary thing that is in the dark. But most of the time the fear does not make sense such as presenting in front of people. When preadolescents are exposed to wrong information online, it can make young people afraid of something that they should not be afraid of.

Some phobias include:

- Animals, such as spiders, dogs or snakes
- Blood
- Heights
- Injections (Covid Vaccine shots)

Social anxiety disorder

Healthcare providers used to call this condition social phobia. With social phobia, preadolescents can have overwhelming worry and self consciousness with daily situations.

Eating disorders & Body dysmorphic disorder

Eating disorders are behavioural conditions characterised by severe and persistent disturbance in eating behaviours and associated distressing thoughts and emotions.

Body dysmorphic disorder (BDD), or body dysmorphia, is a mental health condition where a person spends a lot of time worrying about flaws in their appearance.

The excessive exposure to social media puts kids into a comparison race between their peers and or other virtual social groups. For example:

- Pictures of celebrities
- People want to look like them even if they know it is not healthy
- Concerns on weight and body image
- Snapchat dysmorphia (editing of photos which creates body image disorder)
- Dieting
- Bad for self esteem

Mood disorders

A mood disorder is a mental health condition that mainly affects a pre adolescents emotional state. They can cause persistent and intense sadness, and anger. In a mood disorder extreme happiness and extreme sadness happen. To make sure it is a mood disorder, these conditions must remain for several weeks or even more. Mood disorder can affect behaviour and performance in tasks such as work or school.

HOW CAN CYBERBULLYING HAVE AN IMPACT ON WELLBEING?

Cyberbullying is the use of technology to harass, threaten, embarrass, or target another person.

Cyberbullying can also lead to mental health problems, elevated levels of stress and anxiety, sadness, violent outbursts, and low self-esteem. Even when the bullying has stopped, cyberbullying can have lingering emotional impacts. “Some people can be exposed to negativity on the internet and that can affect preadolescents confidence and self-esteem.”

HOW IS SELF-ABSORPTION IMPACTED?

“Self absorption is when people think too much about themselves and their own feelings,” states Dr.Maria. She also says: “Sometimes social media can introduce people to other people and it helps stay connected with others so preadolescents get less interested in just themselves.” Social media can lead to unhealthy self-centeredness and a disconnection from real-world relationships when you share endless selfies and all of your innermost thoughts.

WHY ARE PREADOLESCENTS MORE VULNERABLE TO SOCIAL MEDIA?

As preadolescence is a critical period of development during which different areas of the brain begin to combine. The brain is mainly open to learning and growing, and preadolescence may have higher sensitivity to the nature of social media, states Dr.Ilyas.

The positive and negative aspects of social media may be more apparent to young people. Brain areas linked to peer attention, feedback, and reinforcement become increasingly responsive during adolescent development. The parts of the brain related to self-control have not yet reached adulthood.

“Preadolescents are very exposed to peer pressure and they want to have close connections with other people thus social media helps preadolescents connect with people that have similar interests as them,” Dr.Maria expresses. Dr.Maria also states “preadolescents are always still developing which is also a reason they are exposed.”

The pre adolescents phase is a very delicate time in one's life. The proper or improper impact of social media can build or break youth's future. Preadolescence is a vulnerable phase of development

Additionally, social media can create unrealistic views of people's lives, leading to peer pressure and unhealthy comparisons.

Social comparison may be another risk associated with adolescents' social media use. Individuals frequently engage in selective self-presentation on social media, resulting in a stream of posts and images that are often carefully crafted to portray users in a positive light. This may lead some youth to engage in negative social

comparisons regarding their own accomplishments, abilities, or appearance. Studies have shown that higher levels of online social comparison are associated with depressive symptoms in youth, and that appearance-specific comparisons on social media may heighten risk for disordered eating and body image concerns

Adolescence also involves physiological changes. These young people are continuously moving around increasing choices, forming their identities, developing relationships and more. Furthermore, the potential effects of social media during this vulnerable phase warrant particular attention.

Additionally, social media-induced fear of missing out, or “the pervasive apprehension that others might be having rewarding experiences from which one is absent,” has been associated with depression, anxiety, and neuroticism.

DOES SOCIAL MEDIA MOSTLY HAVE A NEGATIVE IMPACT OR A POSITIVE IMPACT?

“It depends on the person that is using social media. On some people if they are not able to separate social media from their regular life then it can have a negative impact. But for some people it can help introduce them to things that they otherwise would not know about,” describes Dr. Maria .

Social media’s positive impact is when someone does not have any friends it can help them make friends online instead. Young people can do research on a lot of topics and learn different things based on what people post. If it is used for good purposes it can help being educational and connect to other people.

Additionally, social media can create unrealistic views of people’s lives, leading to peer pressure and unhealthy comparisons.

DATA ANALYSIS

For the research, I read and analyzed numerous websites where investigations and articles were performed by professionals. Also, I conducted a survey to prove my hypothesis.

METHOD

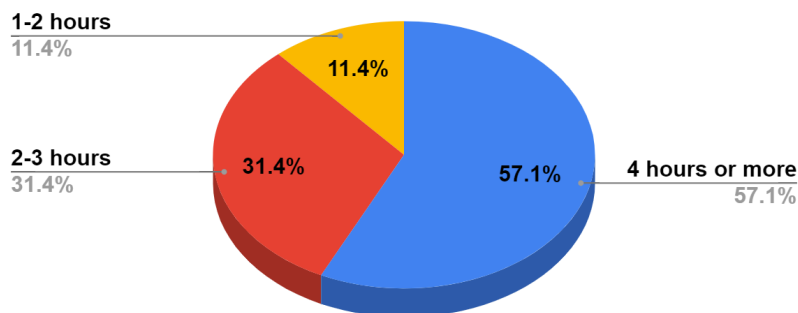
The survey was performed by creating a questionnaire. The survey was taken by preadolescent age (10-12).

RESULTS

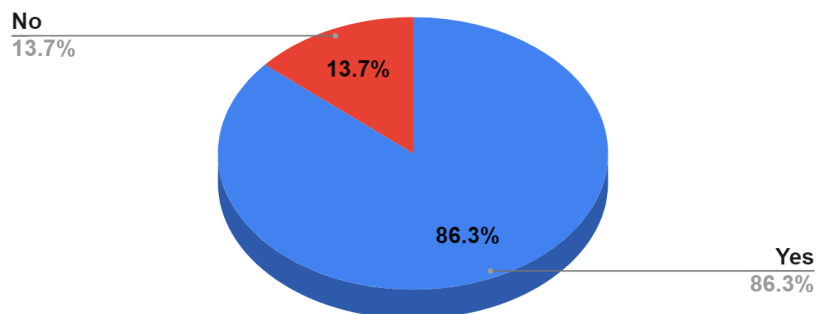
- Most people (94.4%) use social media as their number one choice for spare time
- 55.6% of the population stated that they use social media for 4 hours or more
- 33.3% of the population answered they use it for 2-3 hours
- Only 11.1% of the population uses social media for 1-2 hours

This shows a correlation that the more time people spend on social media, the more they use it as a number one choice for their spare time.

Count of How much time do you spend on Social Media per day?



spare time?

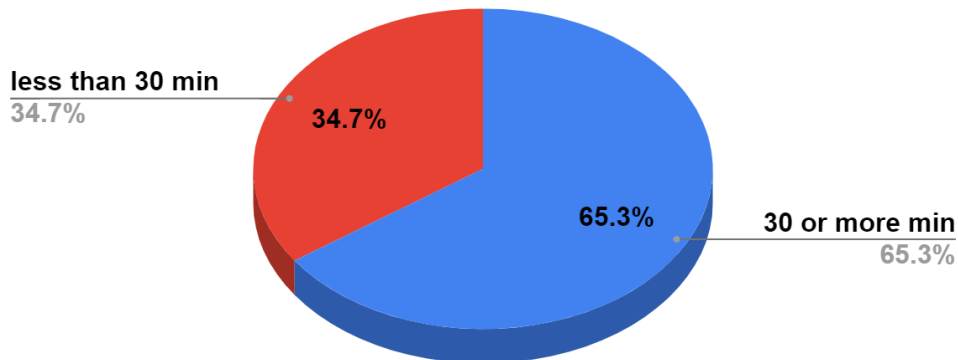


RESULTS

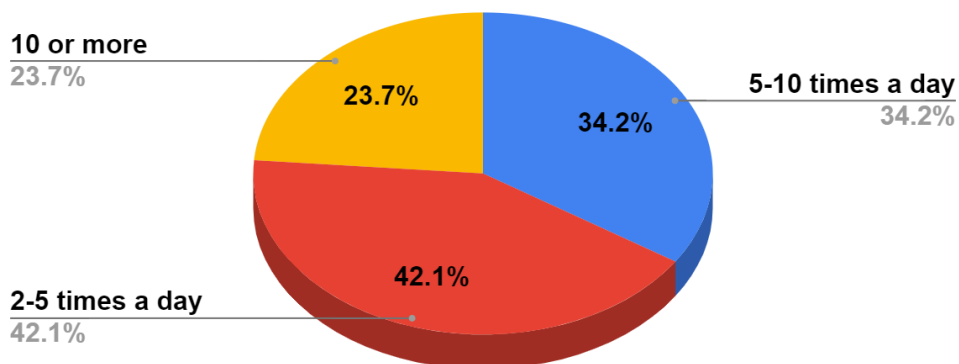
- Most people (66.7%) fall asleep after 30 or more minutes after checking social media.
- 42.1% of the population check social media 2-5 times a day
- 34.2% of the population checks social media 5-10 times a day'
- The rest of the population (23.7%) checks 10 times or more.

This proves that the more one looks at social media the harder it is to sleep.

Count of How much time do you need to go to sleep?



Count of How many times a day do you look at social media?

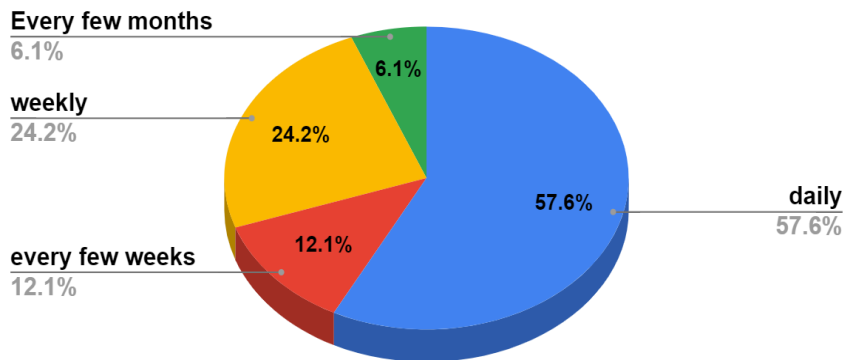


RESULTS

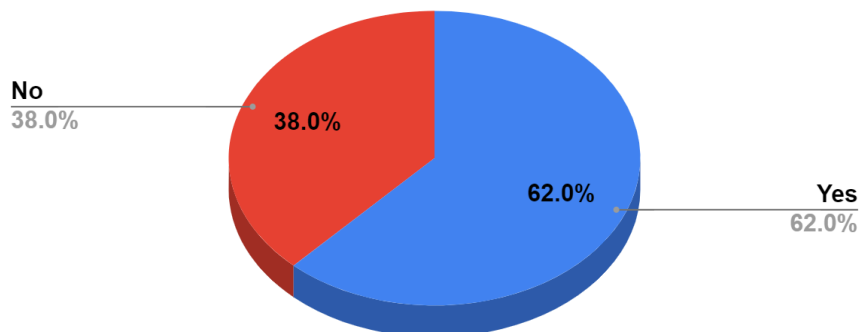
- Nearly $\frac{3}{4}$ of the population (64.6%) continuously check posts and chase likes on social media
- 56.3% of the population post on social media daily
- Weekly, 25% of the population post on social media
- 12.4% of people post every few weeks on social media
- The rest (6.3%) post every few months

The final results show that since most people post daily more people anxiously check posts and chase likes.

Count of How often do you post on Social Media?



Count of Do you anxiously check posts or chase likes?

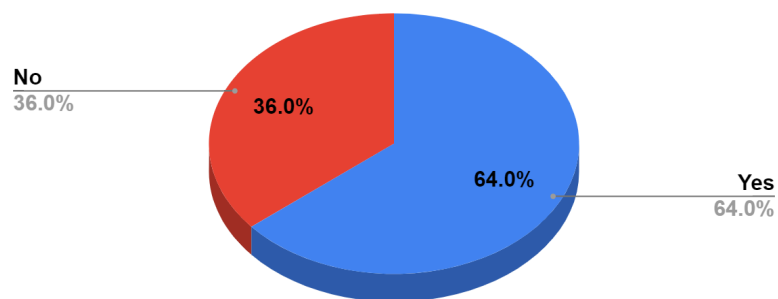


RESULTS

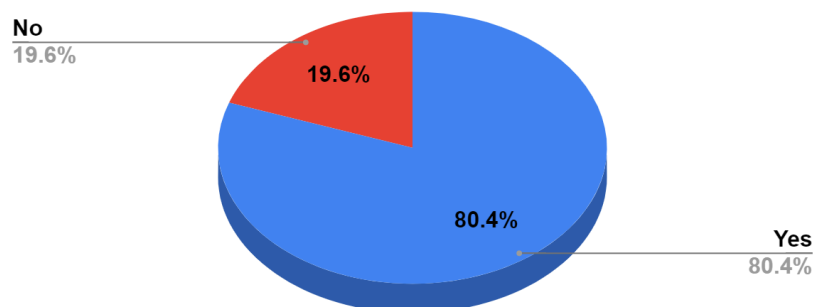
- More than half of the population (63.8%) answered that social media affects the sense of depression , anxiety, loneliness, or self-image.
- 80.9 percent of the population have been cyber bullied.
- Since more people have been cyber bullied on social media,

Most people's sense of depression , anxiety, loneliness, or self-image is affected.

Count of Does social media affect your sense of depression, anxiety, lonlieness, or self image?



Count of Have you been cyber bullied on social media?

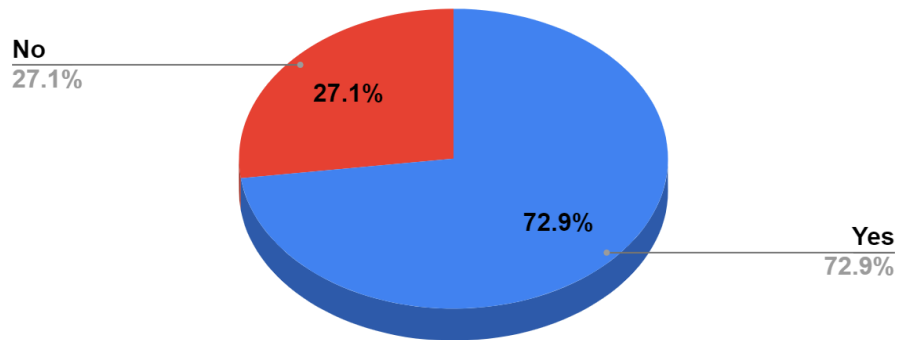


RESULTS

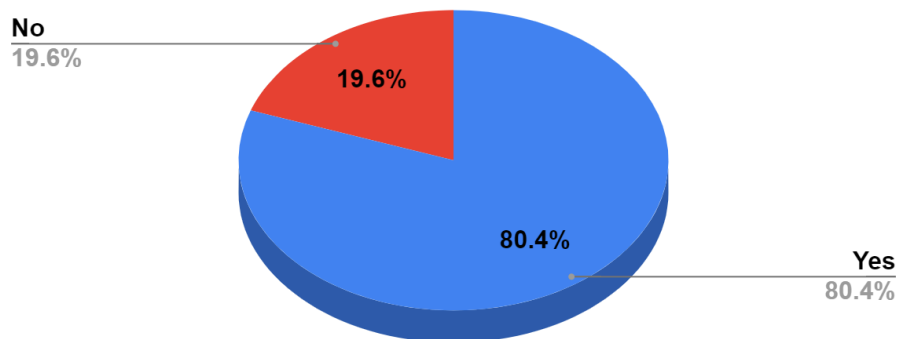
- 80.9 percent of the population have been cyber bullied.
- Only 19.1 percent of people have not been cyber bullied.
- Around $\frac{3}{4}$ of the population (72.9%) talk to strangers online.
- 27.1 of the population does not talk to strangers online

This concludes that the more people talk to strangers the more they have been cyber bullied.

Count of Do you socialize with strangers on Social Media ?



Count of Have you been cyber bullied on social media?

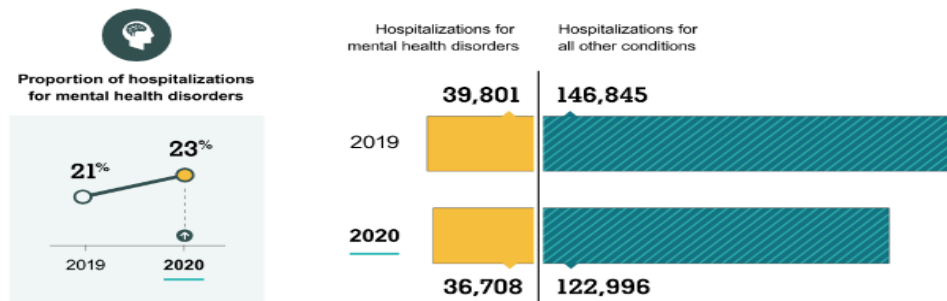


RESEARCH STATISTICS:

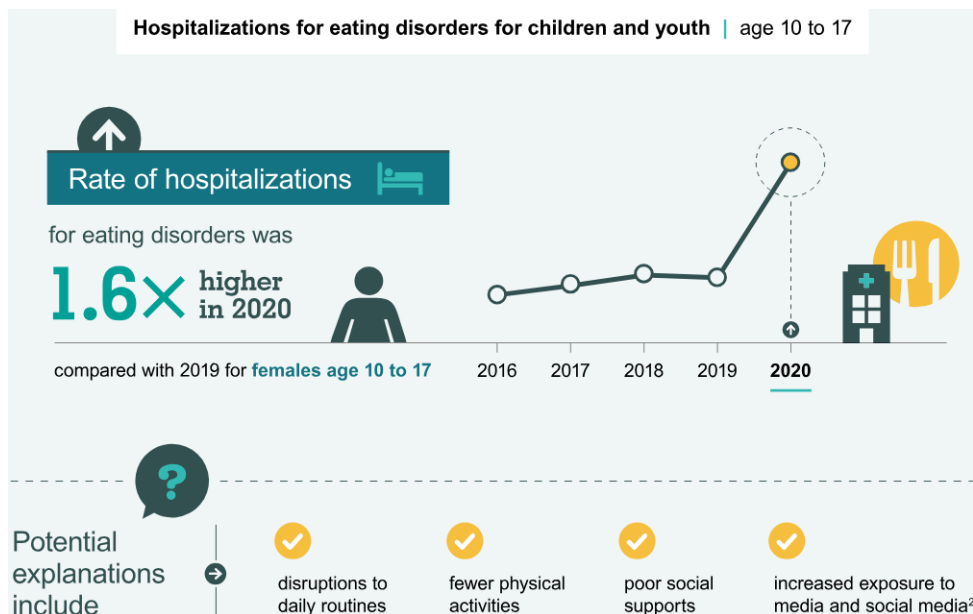
Nearly 1 in 4 hospitalizations for children and youth were because of mental health problems

Children and youth mental health in Canada

Number of children and youth hospitalizations | age 5 to 24



The study has found that about 52% of girls and 45% of boys opt for skipping meals, heavy exercise, and other behaviours associated with eating disorders. Of all participants, about 75% of girls and 70% of boys have been found to have at least one social media account, with Instagram being the most common.



INFERENCE OF DATA ANALYSIS

Numerous studies show that higher levels of social media used among preadolescents are linked to adverse effects including depression and anxiety, inadequate sleep (which can disrupt neurological development and lead to depression), low self-esteem, poor body image, eating disorder behaviours and online harassment. These risks are greater for girls versus boys and for those already experiencing mental health issues.

The theory and research further describes the cumulative effects of social media on mental health in pre adolescents will lead to higher risk towards depression in youth. The more exposure to social media in childhood, the higher the mental stress will become.

Research further states that nearly 2 in 3 adolescents are “often” or “sometimes” exposed to hate-based content on social media. Studies have found a connection between social media cyberbullying and depression among young people.

Some studies show that children can benefit from small-group interactions online, while other studies show an increase in anxiety, depression, and eating disorders.

The deeper investigation also reveals that the vulnerability towards social media leads young people to find new ways to connect with each other, contributing to inappropriate discussions and bullying, among others. When individuals see they are not included in an activity on the internet, it can influence their thoughts and feelings, as well as their physical wellbeing. This might also cause them to feel socially useless, loneliness, low self-confidence, sadness, lower academic productivity and other symptoms of depression.

INTERVIEW QUESTIONS

In addition to my research and survey, to prove my hypothesis I planned to conduct online interviews from professionals Dr. Maria (M.D. Gainesville U.F.) and Dr. Ilyas (M.D. Pediatrician Jacksonville U.F.). Following are the questions that I asked from the doctors.

- What is mental health?
- How does social media impact?
- What is social media?
- Does social media have a negative impact or a positive impact?
- Is the preadolescent mind immature and still growing?
- What is self absorption?
- How is self absorption impacted?

CONCLUSION

In conclusion, the pre adolescents phase is a very delicate time in one's life and the proper or improper use of social media can build or break youth's future.

From this research project I have come to an understanding that yes, social media does affect the mental health of preadolescents. This also proves my hypothesis to be correct.

Social media is a strong force and its excessive use will have an unfavourable effect on preadolescents mental health and well being.

If preadolescents have the awareness and guidance of using social media positively and responsibly, they will be able to deal with more difficult situations effectively during their teenage phase later on. When preadolescents limit their time on social media, they will develop a healthy mental state and they can do more productive things.

APPLICATION

Preadolescents are spending a significant amount of their time on social media. As they are still in a fast mental development stage, their immaturity leads to high chances of getting addicted to the internet. Parents and teachers must pay close attention to signs that their children might be experiencing from cognitive damage from social media. It is also important that they teach children safe online practices so that they do not become victims of exposing their personal information or suffering cyberbullying.

Children and young people's mental health can be adversely impacted by social media usage. There are a range of consequences, including anxiety, depression, body image concerns, and self-harm. Social media is a powerful tool for young people to network, stay in touch with friends, exchange information, gain support and advice, and find a lot of knowledge. The use of social media by children and preadolescents should not be prohibited, given all its benefits, but rather balanced. Children need to be protected from harm by schools, parents, and companies in the digital industry by taking a positive approach.

In today's world, many of us rely on social media platforms such as Facebook, Twitter, Snapchat, YouTube, and Instagram to find and connect with each other. While each has its benefits, it's very important to remember that social media can never be a replacement for real-world human connections and conversations.

If society identifies the development of mental health disorders due to social media in young adolescents, it could help prevent future depression and help youth maintain a positive mindset after going through stressful situations on social media.

HOW TO MANAGE WITH SOCIAL MEDIA

Continuous use of social media for too long makes it difficult for preadolescents to leave social media, which may result in mental disorders and bullying. That is why there are proper techniques to be followed in order to avoid and deal with a situation:

- Young people should limit their screen time
- Leave any unknown social media groups and join one with known people
- Preadolescents should not compare their lives with other people on social media
- Tell someone in the family about the situation that is being faced
- Engage in normal exercises like taking a walk or talking face to face with people around you in order to not get addicted to social media.
- Focus energy on more productive things which are “screen free,” or decide for some “hands on experience.”

ACKNOWLEDGEMENT

The important people that helped me with my science fair project are:

- Maria Ilyas (M.D.)
- Dr. Muhammad Ilyas (M.D.) pediatrician
- Ayesha Saad (sister , student of grade-10)
- Saema Saad (mother) MBA in Human Resources
- Nawal Binafif (Teacher of CIS, helped in filling out questionnaire)
- Khedidja Bennacer (Teacher of CIS, helped in filling out questionnaire)

I truly appreciate their quality time, teaching and assistance during my project.

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QUESTIONNAIRE

<https://docs.google.com/forms/d/1KoxoeJPMj79YFRoHwgq4r3pHLOx sjWAoReroKEVe6-s/edit>

https://docs.google.com/spreadsheets/d/1MsYw6oTBu0NZPJlvHwRwTEkeLnZpAya8Oz4cAju6_g/edit#gid=1634819840