Evaluating the Effects of COVID-19 on Mental Health

By

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A thesis submitted to the Department of Pharmacy in partial fulfillment of the requirements for the degree of
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Declaration

It is hereby declared that

1. The thesis submitted is my/our own original work while completing degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Approval

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Ethics Statement

I Shihab Ud Dowla, Department of Pharmacy, Brac University, declare that all the survey participants were informed about the survey's purpose. We took an implied consent from the participants before they could proceed in filling out their responses on the survey form. The participants were also informed that no personal information such as names, email addresses, home addresses, or IP addresses were taken with which a person’s identity could be traced. A person could easily exit from participating in the survey if he/she did not wish to answer a question in the questioner.

This study only involved responses from an online google form for conducting a survey.

No animal or biological samples were used for this study.

Abstract

The corona virus had put the world at a halt. Everyone is going through a tough mental health condition. Non-therapeutic measures such social dancing and home quarantine also contributes to deteriorating mental health conditions of people. The purpose of this study was to carry out an online based survey based on the results of which we can identify the variables or reasons that have a significant effect on mental health. Exploratory data analysis was carried out with the data obtained using the R programing. The key findings were that the females are more prone to getting depressed. Increase in the use of internet during the pandemic causes more depression. People who got tested for COVID-19 were lesser depressed than those who did not. Younger population and lower educated people seemed to be more depressed than their other respective half's. Knowing how many people were quarantined or dead during the COVID-19 pandemic has little impact on a person's depressed condition.

Keywords: Mental health; COVID-19; Quarantine; Social distancing; Depression; Analysis; p-value.

Dedication

Dedicated to my mother and respected supervisors

Acknowledgement

To start, I would like to express my gratitude to Almighty Allah, who has blessed me with tremendous strength throughout this period of study. I offer the respect and gratitude to a few individuals for their unwavering support and supervision, without whom this project would have appeared impossible to complete. I remember them here to show my appreciation. Firstly, I would like to signify my respect, gratefulness and honor to my most esteemed supervisor Professor Dr. Eva Rahman Kabir, Chairperson and Professor, Department of Pharmacy, BRAC University. Working under her direction and guidance was a once-in-a-lifetime experience for me. The continuous support and motivation she gave were enough to get this project done in the shortest period possible. Her constant and continuous efforts and the time she gave in guiding and teaching me the correct methods and research rules will always be remembered. Her commitment to research, as well as her personality, are praiseworthy. I want to express my gratitude and gratefulness to my other supervisor, Easin Uddin Syed, Lecturer, Department of Pharmacy, Brac University who is has been extremely supportive during my project work. His motivational words have inspired me to take new challenges while doing research. This project would not have been possible without his analytical guidance, direction, and encouragement. I am grateful to him for his advice and assistance in the process. Finally, I am thankful to my family and friends for the constant support and encouragement that they have provided me in all stages of my life. I am where I am today as a result of their prayers, inspiration, and devotion.

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BPTS- Total score for the people who were out going before the pandemic

APTS- Total score for the people who were out going after the pandemic

PKQ – Score related to the number of people that the person knows who have been quarantined during the pandemic

PKD - Score related to the number of people that the person knows who have passed away during the pandemic

TDS – Total depression Score

Evaluating the Effects of COVID-19 on Mental Health

1. Introduction

The greatest challenge that we faced since World War II is the coronavirus covid-19 pandemic. It is also one of the most critical global health crises of today. COVID-19 can be defined as a health hazard caused by the new coronavirus, SARS-CoV-2, which is recognized as an acute respiratory syndrome coronavirus 2, also abbreviated as. In the Hubei Province city of Wuhan, located in China, on 31st day of December, 2019, the outbreak of this virus was first reported. It was later identified by the WHO (World Health Organization) on January 30, 2020, as a global health crisis (*Coronavirus Disease 2019 (COVID-19): Practice Essentials, Background, Route of Transmission*, n.d.). WHO eventually announced COVID-19 as a global pandemic on March 11, 2020 The last time the world faced a disaster close to the COVID-19 pandemic was the H1N1 Influenza. The official name for the virus was given by a study group who studied Coronavirus on the International Committee on Taxonomy of Viruses. In order to avoid stigmatization of location, the origin of the virus, and the association of animals, WHO decided to name the disease SARS-COV-2 as COVID-19. It was estimated that the virus spread all over the world between the month of January and February by the Centers for Disease Control and Prevention. The United States of America experienced an extensive infection during that time, On January 23, 2021, with over 412,000 deaths and 24.7 million recorded cases reported (*Coronavirus Disease 2019 (COVID-19): Practice Essentials, Background, Route of Transmission*, n.d.). The CDC announced that all the people irrespective of any symptoms of COVID-19 must put on a face mask on April 2020 (Gorbalenya et al., 2020). The CDC has already assumed that the situation will end with many patients seeking medical treatment

simultaneously, resulting in crowded public health and health services. It can further increase the number of critical cases and deaths in the hospital beds. The CDC advised that non-pharmaceutical interventions could serve as the most critical strategy in delaying viral spread and reducing disease effects (Islam et al., 2020).

1.1 Consequences of the pandemic

Ancient examples illustrate the damaging effect such that of a pandemic may lead to the degradation of mental health. For instance, an analysis of populations affected by Ebola virus disease (EVD) outbreaks resulted in widespread fear, depression, and anxiety from the sudden deaths of friends, colleagues, families, stigmatization, and social isolation of survivors. A meta-analysis showed that in thirty-three to forty-two per cent of the affected people admitted to the extreme severe acute respiratory syndrome clinic, anxiety, depression, diminished memory, and sleeplessness were present (The Lancet Infectious Diseases, 2020). These effects have, in some instances, continued after recovery. Non-pharmaceutical treatments (NPIs) in the case of COVID-19, which is essential to avoid the spread of this contagious virus, have resulted in physical separation and closing down of schools (with unknown consequences on children's growth as well as mental health) also extensive loss of jobs. Substance abuse, especially alcohol, is continuously increasing. Emerging research indicates that there may also be apparent neural effects for COVID-19.

Moreover, not all individuals have been affected. Equally, people with pre-existing disease conditions are affected more. As reported by the WHO, people with pre-existing mental health problems are more affected by limiting access to critical services for mental health care and help. It is much less likely that people with salaried jobs, will suffer more than those who have casual, jobs which pay on a day to day basis, including some high portion on the countries which lower income rated. The healthcare workers experience elevated workload and trauma, leaving them vulnerable to tension, anxiety, fear, and post-traumatic stress disorder (PTSD).

The effectiveness and consequences of suppressing and reducing the viral transmission methods have been rigorously evaluated. Many governments are promoting or implementing them to delay or halt viral transmission. In addition to other measures (e.g. home self-isolation, school, and company closures), the community-wide social distancing of the whole population was strongly recommended. In order to prevent the second wave of viral transmission, these methods may be needed for long periods. As the world faces another increase in COVID-19 infections, the CDC has stepped up its guidelines for reducing transmission. Universal face mask use, physical distancing, avoiding non-essential indoor spaces, delaying travel, improving ventilation, and hand hygiene have been recommended. Individuals at high risk of infection, according to the CDC, include:

· Individuals in areas of continuous local transmission,

· Healthcare staff who care for COVID-19 patients,

· Near contacts of infected individuals

· In addition, travelers are returning from places where the local distribution has been registered.

The CDC has given guidelines for people who are at high risk of complications associated with COVID-19, including older adults and persons with severe underlying health conditions, including:

· Cancer

· Cardiac situations (e.g., heart failure, coronary artery disease)

· COPD

· Chronic kidney sickness

· Obesity (BMI 30 to under 40 kg/m2)

· Extreme obesity (BMI 40 kg/m2 or more)

· Diabetes mellitus type 2

· Disease of sickle cells

· Smoking

COVID-19 may cause a range of Immunocompromised Solid Organ Transplantation Syndrome symptoms, from severe disease to even death. The symptoms can develop within two days or it might even take two weeks to develop. The average incubation period was 5.1 days for a combined study of 181 confirmed COVID-19 cases outside Wuhan, China, and 97.5 per cent of people developed symptoms within 11-12 days after contacting infection (*Coronavirus Disease 2019 (COVID-19): Practice Essentials, Background, Route of Transmission*, n.d.).

COVID-19 can be demonstrated by the following symptoms:

· Chills or fever

· Cough

· Cough A sore throat

· Shortness of breath or breathing problems

· Tiredness

· Muscle or muscle pain

· Headaches

· loss of taste and smell

· Congestion or runniness of the nose

· Diarrhea

· Other symptoms recorded include the following

· Production of sputum

· Malaise

· Respiratory distress

However, pneumonia tends to be the most common severe signs of COVID-19. A complete or little anosmia (Loss of the sense of smell) was identified in people diagnosed with COVID-19. A telephone survey of ambulatory patients with slightly symptomatic COVID-19 showed that an altered sense of odor or taste was indicated by 64.4 per cent of the patients.

COVID-19 is risky for (1) victims with severe signs and symptoms of the lower respiratory tract with no apparent cause or (2) patients with symptoms of the respiratory tract and newly developed fever. Suspicion increases if the patients have been to an area with SARS-CoV-2 has been dominating or have come to a close contact to a person with COVID-19 identified or suspected during the preceding 14 days. For a conclusive diagnosis, microbiologic (PCR or antigen) testing is needed. At starting, the availability of such testing is unsatisfactory. Patients without medical needs are advised to call their healthcare provider over the phone. Infection-control steps should be taken for patients who is a COVID-19 suspect, presenting at a hospital. They should be examined in a private space carefully with the necessary precautions.

All other regular contact and airborne measures should be followed, and eye protection should be worn by health workers attending. Worldwide, testing facilities have become more readily available. While some need an appointment, some are only drive-ups. The most common form is a swab examination. It checks for upper respiratory tract signs of the virus. The sample is taken to a laboratory and checked for viral matter; some locations may have fast tests that does not take more than 15 minutes to conduct. The outcome is positive if the signs of the virus are present and vice-versa. The tests might not be able to detect the infection if it’s too early on the onset. The FDA issues emergency usage permits to acquire and return the ship to the laboratory to examine procedures that include home nasal swab tests. The Organization also accepted multiple fast tests at home. The agency has also approved multiple rapid tests at-home. These must be taken by the patient with a prescription so that the outcomes are reported. Within a few minutes, patients will collect those results.

A swab test can only say if, at that moment, the person has the virus in his or her body. To prove that, suspects might even recommend taking an antibody test if they have ever been exposed to the virus, even though they do not have symptoms. It may also help them to identify the individuals who are immune to COVID-19.

In order to produce further tests, the FDA is collaborating with laboratories across the world. In terms of dealing with the pandemic, countries need to take non-therapeutic preventive steps, including travel restrictions, remote office operations, country lockdown, and, most notably, social distancing. The virus, SARS-CoV-2, spreads primarily from one person to another.

It spreads mostly when an infected person sneezes or coughs. They can spread the droplets containing the virus at least six feet away. The virus will get into our bloodstream if we breathe it in or swallow it. Some individuals who have the virus do not have symptoms, but the virus can still spread.

By touching a surface or item the virus is on, we can also get the virus, then touching our mouth, nose, or even the eyes can be a part of the transmission of the virus inside the body. Many viruses can survive on the surface on which they land for many hours. A study shows that SARS-CoV-2 will last for many hours on different surface types, such as plastic and steel, copper, cardboard requiring surface disinfection to be necessary. On the other side, a few animals have also screened positive for the infection, with a couple of exhibiting sickness signs. However, there is still no proof that human beings can acquire this virus from an animal, Still, it seems that it is transferable from humans to animals.

The rate of transmission is comparatively high. Early research has suggested that one person will distribute the virus between two and three other people. One analysis showed that there was a high chance that a case expanded to 5 to 7 individuals. (Shen et al., 2020).

CDC states there is evidence that the virus can spread if we come within 6 feet of one who is contagious for 15 minutes a day. It was always thought that the exposure would have to be at least around 15 minutes.

We should minimize the transmission rate by washing our hands regularly, keeping the common area clean, minimizing contact with other humans, and wearing fabric face masks when we cannot sit 6 feet away from others. Since the virus spreads from one person to another, it is crucial to restrict our interaction with other people from time to time. Furthermore, skip the major meetings.

Although most businesses have embraced working from home, but for many employees. It is not possible. Many workers are connected to jobs that are vital to ordinary life, for example, healthcare services, public services and law enforcement.

Isolation is keeping infected individuals away from others who are still not infected.

The world has never seen a social gap or isolation of such a magnitude until the coronavirus pandemic in 2019 (COVID-19). Pandemics can induce very high-stress levels and cause mental health problems, including depression, anxiety, and symptomatic stress disorder. Common symptoms of the severe acute respiratory syndrome coronavirus 2 pandemic in Asia, Europe as well as North America is found by researchers (Veer et al., 2021). Social distancing and quarantine steps to minimize the pathogen's transmission may have other harmful psychological consequences, as has already been shown during the ongoing pandemic. The coronavirus disease (COVID-19) epidemic has had a significant effect on people's lives, particularly after the World Health Organization declared a global pandemic in the second week of March 2020. Many countries have also adopted several anti-epidemic initiatives, such as banning transport for foreign visitors, closing public areas and shutting down the whole transportation system to contain the spread of this extremely infectious diseases. The suggested

quarantine of the World Health Organization has proved to be a successful means of reducing the virus's transmission.

On 26 March, the Bangladeshi Government released a stay-at-home order as a public health invention to minimize perpetual transmission incidence. Which lead to the closing of commercial centers. The government of Bangladesh enforced many preventive measures to reduce the spread of this life-threatening virus. However, in Bangladesh, a lower-middle-income country with one of the world's densest populations, these projects face hurdles. This extraordinary feeling of 'home quarantine' in terms of academic and vocational professions has had a wide-ranging effect on students' mental health. For example, A Canadian research focused on quarantine outcomes after a severe acute respiratory syndrome (SARS) outbreak found a connection between a longer quarantine duration, a high quarantine period, and citizen depression. (*Depression and Anxiety among University Students during the COVID-19 Pandemic in Bangladesh: A Web-Based Cross-Sectional Survey*, n.d.). In everyday situations, healthy mental wellbeing is essential to the functioning of a community. COVID-19 depends on health staff, so if their emotional health is jeopardized, we will lose them. Psychological issues may affect the vaccine phase as well as other healthcare obligations. According to research, poor mental wellbeing will render us more susceptible to virus transmission and infection. (The Lancet Infectious Diseases, 2020). People with madness could be at higher risk of getting exposed to COVID-19 due to the consequence of physical distance and forced hygiene. Containment of people with and without a mental disorder in hospitals can raise their risk of infection, as seen in long-term care facilities and prisons. Mental health problems were widespread well before COVID-19, responsible for around 13 per cent of the global burden of illness (The Lancet Infectious Diseases, 2020). Yet, the planet remained shockingly, unable to cope with mental illness of the pandemic. Underinvestment in mental health have left us vulnerable to the harsh situations that we are facing today. It is well known that appropriate

vaccinations and therapies and strict commitments to NPIs can help us cope with the situation. The current COVID-19 pandemic is causing a psycho-emotional chaotic condition as countries have recorded a dramatic rise in mental health problems, including anxiety, depression, stress, sleep disorder, and terror among their population, gradually with a subsequent increase in the drug abuse and often suicidal behavior. Researchers in China have found that greater exposure to misinformation via social networking is more likely to lead to the creation of anxiety, depression, and other mental health issues within people of various socio-economic backgrounds (Shen et al., 2020). Over the fast-growing age, more than one-third of people in China had generalized anxiety disorders, 18% had depressed condition, and comparable people had low sleep quality. And most of them were under 35 years of age. Studies previous to the COVID-19 pandemic have indicated an inverse association regarding television consumption and mental wellbeing. Bangladesh's psychological responses to the COVID 19 pandemic exceed in transmitting terror, anxiety, sleep disruptions, counter lateral remorse to one another, depression, and suicidal thoughts to the community as expected in the uplifting circumstances. Studies claim that the emotional effect is primarily a reaction to anxiety; there are a few explanations for it. In particular, the virus, the death rate, the big mobility constraints, potential instability, media coverage, social networking and communication are causing social hysteria (*Symptoms and Causes - Mayo Clinic*, n.d.). In a lock-down scenario, the general people who remain at home in a monotonous, peculiar and nervous state encounter powerless resent other for being accountable and eventually slide toward mental collapse. Reported or isolated events are likely to have a stressful memory with fear of death. People living in quarantine may feel bored, isolated, frustrated, deprived, sleep disruption, and panic, contributing to self-harm, emotional outburst, and can often be severe. Lastly, there is a profound effect on the environment due to closed conditions in industries, offices and corporate institutions, limits on travel and commitments to stay at home. The bulk of the population of Bangladesh is reliant

on monthly income, and they are unsure whether they will return to work, which has a conflicting effect on their mental wellbeing. Data shows that a country suffered from various mental health problems linked to distress, terror, loneliness, depression, panic, emotional eruption and sleep disruptions after the COVID 19 pandemic (Pan et al., 2021). Symptoms involve feeling depressed, decreased capacity to focus, intense anxiety or concern, or strong feelings of remorse, extreme mood swings, isolation from everything, serious tiredness, or sleep issues and delusions, confusion, struggling with life every day. Psychological symptoms involve post-traumatic stress, frustration, and rage. Mental wellbeing has tremendous importance as it applies to the heart of what makes us human: how we communicate, attach, understand, function and feel pain and pleasure. Strong mental health often makes it easier for individuals to assume important positions in families, neighborhoods and economies. Social wellbeing remains one of the most overlooked health fields. Given the effects of mental health on communities and society, little progress is made in mental health, especially in community-based programs. On average, countries invest just 2 percentage of their overall health expenditures on mental health (Nations, 2020). These details on mental wellbeing during the lock-down era are critical for policy makers. Minimal research is carried out on the impacts of COVID- 19 pandemic on mental health in Bangladesh. Mental health during the COVID-19 pandemic results may vary across demographic groups, which may be a significant discovery, too. In particular, the emotional reactions triggered by the pandemic and its treatment could be more severe among disadvantaged populations, such as individuals with pre-existing psychological conditions. Financial insecurity and small support networks are widespread among people with mental illness; as a consequence of economic crisis and reduced social interaction, the pandemic of COVID-19 may be an unparalleled cause of stress for these individuals. Actions such as national travel bans and quarantine and improvements in the way clinical facilities are delivered may disrupt access to and availability of psychiatric treatment.

There is an immediate need to empirically learn to what degree the COVID-19 pandemic and associated cultural shifts have so far impacted individuals' emotional wellbeing with already existing mental conditions.

1.1.1 Impact of COVID-19 on Mental Health

According to a recent report by WHO, vital mental health programs in 93% of countries the vital mental health programs has been interrupted or stopped by the COVID-19 pandemic (*COVID-19 Disrupting Mental Health Services in Most Countries, WHO Survey*, n.d.). The global evidence demonstrating the harmful effect of COVID-19 on mental health care and underlines the immediate necessity for expanded investment by studying around a hundred and thirty countries.

The WHO has illustrated systemic underinvestment of mental wellbeing previously. Until pandemic, nations invested fewer than 2% of the public health expenditures on mental health and failed to address their populations' demands (*COVID-19 Disrupting Mental Health Services in Most Countries, WHO Survey*, n.d.).

Moreover, the need for mental health treatment is growing due to the pandemic. Depression, isolation, lack of income and anxiety cause mental health problems or worsen current ones. Higher levels of drug and alcohol intake can be associated with sleep problems and distress in many individuals. Meanwhile, COVID-19 will contribute neurological and mental illnesses, such as delirium, stroke, in medical and veterinary patients.

1.1.2 What is the health of the mind?

Mental health is an important and essential part of health care. According to the WHO constitution, "Health is a state of complete physical, mental and social well-being and not

merely the absence of disease or infirmity" (*Mental Health: Strengthening Our Response*, n.d.). A significant aspect of this definition is that mental state is about more than the absence of mental illness or disability. Mental health is a state of health whereby a person understands his or her capacities, can cope with the normal stress of life, can work productively, and can contribute to his or her community. Mental health is critical to our collective and individual ability to think, emote, communicate, earn a living and live a happy life. On this basis, the promotion, protection, and conservation of mental health can be seen as a vital concern of individuals, communities, and societies worldwide.

Multiple social, psychological and biological factors determine a person's level of mental health at any time. Violence and persistent socio-economic pressures, for example, are recognized risks to mental health. The clearest evidence is linked to sexual violence. Poor mental health is also linked to rapid social change, stressful working conditions, gender discrimination, social exclusion, unhealthful lifestyles, physical ill-health and human rights violations. There are specific psychological and personal factors that make people vulnerable to mental health problems. Biohazards include genetic factorsEmotions, thought, conversation, learning, resilience, and self-esteem are all built on the basis of mental wellbeing. Mental health is often important for families, personal and emotional well-being, and social contribution.

Many individuals who suffer from psychiatric disorders are averse to discussing it. Mental disease, on the other hand, is not anything to be afraid of.

Additionally, behavioral wellbeing disorders should be handled. We are constantly advancing our knowledge of how the human brain works, and effective therapies for psychiatric disorders are becoming possible. Mental disorder does not discriminate; it may strike someone regardless of age, gender, geography, income, socioeconomic class, race/ethnic origin, religion/spirituality, sexual preference, or any other form of cultural identification. Although

mental illness may strike someone at any age, three-quarters of all mental disorders begin between the ages of 24 and 25. (EWALT, 1951). Mental illnesses are taking many forms. Some have a very less effect and interfere with daily life only in limited ways, such as specific phobias (abnormal fears). Other mental health conditions are so severe that a person may need to be treated in a hospital.

Mental health encompasses our emotional, psychological and social well-being. It affects the way we think, feel and act. It also helps determine how we deal with stress, how we relate to others, and how we make choices. Mental health is important at every stage of life, from childhood and adolescence to adulthood. If we have mental health difficulties, our thought, mood, also behavior may be affected in life.

1.1.3 Causes

Specific people are at a higher risk of mental problems due to multiple contributing factors, such as social, socioeconomic, and environmental factors, males being more vulnerable to emotional and psychological issues due to gender. Disadvantage occurs in the womb and grows throughout life. A substantial body of study stresses the need for a life-long commitment to identifying and solving emotional and physical wellbeing differences (Hossain & Wahab, 2016). This method takes into consideration the different perception and effect of life-long social determinants. A life-long solution proposes activities to change the circumstances in which individuals are conceived, develop, animate, function also mature. Eliminating detrimental or disruptive actions that contribute to psychiatric illnesses and encouraging mental wellbeing are essential parts of attempts to enhance the health of the people of the world and minimize health injustices. A clear agreement on established preventive and contributing issues for psychiatric illnesses.

Although conventional care for children throughout the early years does not seem so relevant later on in life, children like these still really require various support types over the years. Schooling is essential for creating sensitive stability and impacting a variety of later life results that increase likelihood of behavioral illnesses – such as work, wages, and social engagement. Educational institutions are also essential as organizations that can provide a preventative measure for young adults upstream. Infants and teenagers from poor backgrounds are likely to have increased sensitivity and awareness of impoverished environments and stressful family experiences, much as they were in childhood and early adolescence. There is therefore a need to place a proportionately greater focus on those that are most vulnerable. Poverty makes home-based learning experiences more difficult, such as overcrowding and unhealthy conditions. Having enough money from a career helps parents to make important decisions later in life, such as providing a stable and fair work arrangement that takes into consideration their children's wants and needs. Schools can play an important part in engaging adolescents individually; they can also partner with other programs and provide parents with advice and motivation on coping strategies, as well as potential assistance with job planning or skills training. When adolescents reach the age of adolescence, they are more likely to engage in risky behavior, such as opioid use. It is critical to ensure that youth have the knowledge necessary to make informed decisions, as well as positive influences such as social and emotional motivation, as well as reciprocal interactions with parents, families, and the wider community. Teenagers' depressive disorders are linked to their history of adverse childhood events as well as their present circumstances.

The evidence given by the Global Burden of Disease project shows that psychiatric illnesses and the incidence of mental disorders are rising in the global adult population (Stevens, n.d.). Major depression is the principal cause of years of disabled existence among women, although anxiety is rated 6th in this ranking. Extreme depression is ranked second among adults,

followed by drug overdoses (7th), alcohol abuse disorders (8th), and anxiety disorders (11th and 6th). Despite wide variations in incidence between countries, one in four or five young people (aged 12-24) is expected to have mental disorder in any given year. (Allen et al., 2014). Many mental disorders go undiagnosed and untreated around the world. In England, one of every four people has experienced a psychological condition at any point in their lives, and 17.6% of adults have at least one common mental disease. A sub-threshold of common mental disorder affects 17% of adults. (Allen et al., 2014).

As mentioned in previous sections, adult behavioral illnesses affect the person concerned: they often affect adolescents, families and the broader society, societies, economic growth and subsequent generations. Unemployment and low-quality work are significant contributing factors for mental illnesses. Although the likelihood of unemployment and low-quality jobs is closely related to social class and skill levels, there is a major source of disparity in mental illnesses. The Institute of Health Equity focuses on a new study on correlations between economic downturns and various forms of the disease, especially depression. They find that there is proof that work loss can trigger signs of depression or anxiety and that these health effects tend to be more detrimental to the long-term unemployed. Strategies to minimize long-term unemployment would be especially useful in lowering the likelihood of mental illness in adults. Low-quality employment, such as employment with no or short-term contracts and low-wage and work-control occupations, have significant detrimental effects on mental wellbeing.

Conversely, career satisfaction and a sense of power at work protect healthy mental health. Employers play a major role in either easing or exacerbating psychological issues among working-age populations, and more labor strategies can be implemented to ensure a higher pay and power balance at work, as well as better working conditions. Wages, debt levels, and relative poverty are all linked to the likelihood of mental disorders, as discussed in previous pages. Strategies and ambitions to have adequate income for a healthier lifestyle are relevant

both by social security and minimum wage policies. To near, Mental health issues can have a wide variety of reasons. There may be a complex mix of causes for many people – and some problems than others might more profoundly influence different persons.

Poor mental health could be potentially a consequence of the following factors:

- childhood exploitation, shock, or negligence
- social distancing or isolation
- undergoing discrimination and disgrace
- cultural limitation, debt or liability
- losing someone
- severe anxiety
- a long-term physical problem
- lack of employment
- no permanent house to reside in
- alcohol and drug misuse
- domestic brutality or bullying
- Extreme trauma as an adult, such as military war, being involved in a traumatic event that is feared safety or being a survivor of a violent crime.
- Physical causes – for example, a head injury or a neurological condition such as epilepsy-can impact behavior and mood.
- While lifestyle factors, including job, diet, medications and lack of sleep, can also impair mental wellbeing.

1.1.4 Types of mental health related problems

The types of mental disorders are:

- Anxiety disorders

- Mood disorders
- Schizophrenia disorders

Anxiety disorders

American Association of Anxiety and Depression says, anxiety syndromes are the most prevalent forms of psychiatric illness (Felman, 2020).

People with these disorders experience intense worries or anxieties over certain objects or situations. Anxiety sufferers also attempt to avoid being subjected to whatever triggers their anxiety.

Examples of conditions of anxiety are:

Generalized anxiety disorder (GAD)

The American Psychiatric Association describes GAD as a disproportionate concern that disrupts daily life (*Mental Health: Early Signs, Common Disorders, Early Signs, and Definition*, n.d.).

People can also have physical signs, including

- stressed muscles
- broken up sleep
- restlessness
- tense muscles

In people with GAD, a long period of anxiety problems does not necessitate an exact trigger.

They can experience intense fear when confronted with mundane tasks or appointments that do not pose a direct danger. A person with GAD can experience anxiety for no apparent reason.

Panic disorders

Panic attacks, which cause sudden, debilitating anxiety or a sense of imminent disaster and death, are common in people with panic disorder.

Phobias

The different types of phobias are:

Simple phobias: This can entail a inconsistent fear of particular items, situations, or even fear of animals. A typical example is fear of spiders.

Social phobia: This apprehension of being judged by others is often referred to as social anxiety. People who suffer from social phobia are often less responsive to the social environment.

Agoraphobia: It refers to the fear of getting trapped in a situation where moving out is difficult, such as in an elevator or on a train. Most people confuse this phobia with a fear to being outside.

Phobias are very personal, and physicians are completely unaware of them. There are thousands of phobias, and what might seem strange to one individual may be a serious problem that dominates one's daily life for another.

Obsessive-compulsive disorder (OCD)

Obsessions and compulsions are common in people with OCD. In other terms, they undergo continuous, nervous feelings and a very strong wish to do routine activities, for example hand washing(*Obsessive-Compulsive Disorder (OCD) | Michigan Medicine*, n.d.).

Post-traumatic stress disorder (PTSD)

An individual may develop PTSD after seeing or experiencing a painful or stressful incident.

During this sort of case, the individual believes that their lives or others' lives are in jeopardy. They might be scared or believe they have no say in what is going on.

Trauma and anxiety can then play a role in the development of PTSD.

Mood disorders

Affective diseases and anxiety disorders are terms used to describe personality disturbances.

People with these disorders experience severe mood swings, with mania (a time of high intensity and elation) or depression (a period of low energy and elation) being the most common symptoms.

Examples of mood disorders include:

Major depression: A person suffering from major depression is continuously depressed and lacks concentration in hobbies and events that were loved previously. He or she will be depressed for lengthy periods or be sad.

Bipolar disorder: Bipolar disorder causes unusual variations in a person's temperament, energy level, level of behavior, and capacity to participate in everyday activities. Manic periods are characterized by high mood, while depressed stages are characterized by feeling down.

Seasonal affective disorder (SAD): Minimized exposure to day light causes trigger significant depression during the autumn, winter, and early spring months. It is more prevalent in countries that are far away from equator.

Schizophrenia disorders

Psych health experts are also questioning if schizophrenia is a particular disease or a group of diseases. It's a disease that's really challenging to comprehend.

The National Institute of Mental Health says, symptoms of schizophrenia usually appear between the ages of 16 and 30. The person's thoughts will appear fragmented, and they may find it difficult to process information.

There are both negative and positive symptoms associated with schizophrenia. Delusions, thought disorders and hallucinations are examples of positive symptoms. Withdrawal, a sense of energy, and a flat or inappropriate attitude are negative signs.

1.1.5 Treatments

While psychiatric treatments cannot heal mental disorder, they may sometimes relieve symptoms dramatically. Psychiatric drugs may also help make some therapies, such as psychotherapy, more successful (*Mental Health Basics: Types of Mental Illness, Diagnosis, Treatment*, n.d.) . The right medications will focus on the condition and the reaction of the body with the drug.

The below are some of the most often used prescription drugs:

- Antidepressants- These are medications that relieves stress, anxiety, and additional disorders. These will assist with signs of depression, hopelessness, exhaustion, inability to concentrate, and a loss of involvement in sports. Antidepressants should not induce addiction or dependence.
- Anti-anxiety medications - Anxiety conditions such as generalized anxiety disorder and panic disorder are treated with these medications. They can also assist in the reduction of agitation and insomnia. Antidepressants that often act with distress are often used as long-term anti-anxiety medications. Fast-acting anti-anxiety medications have immediate relaxation, but they also can induce addiction, so they can only be utilized for a limited time.
- Mood-stabilizing medications- The most popular application of mood stabilizers is to combat bipolar diseases characterized by alternating bouts of mania and depression. In

the treatment of depression, mood enhancers are also taken together with anti-depressive drugs.

- Antipsychotic medications - These are the medications that are often used for curing psychiatric conditions, including schizophrenia. Antipsychotic drugs can also be used to combat bipolar conditions and addiction as combined with antidepressants.

Psychotherapy

Chat counselling, commonly known as psychotherapy, entails speaking with a mental health specialist about the illness and associated problems. We can hear about our diagnosis and our moods, emotions, opinions, and actions through psychotherapy. We will develop coping and tension control skills using the experiences and experience we acquire.

There are several different forms of psychotherapy, each with its path to mental health improvement. While psychotherapy may usually be done in a few months, longer-term care will be required in certain circumstances. It may take place in a face to face setting, in community setting, it can also take place among family members.

While selecting a person for therapist, we should get a feeling of ease and trusting in his or her ability to listen and understand what we have to suggest. It is also crucial that the therapist is aware of the events in our past that have shaped how you are and how you interact with others.

Brain-stimulation treatments

Treatments using brain stimulation are often used to manage stress and other behavioral health issues. They are mostly used for cases where drugs and psychotherapy have failed. Treatment options include electroconvulsive therapy, deep brain stimulation, repeated transcranial magnetic stimulation and vagus nerve stimulation. (*Mental Health Disorder Treatments — Project Matilda | Mental Health Awareness* |, n.d.).

Hospital and residential treatment programs

The mental disorder will also progress to the point that one ought to be admitted to a medical facility for treatment. If the patient cannot adequately look after themselves or when they are in imminent danger of hurting themselves or anyone else, this is usually advised.

Residential rehab, which is a safe, safe place to remain, is an option. Such options involve 24-hour inpatient rehabilitation, limited or day hospitalization, and residential therapy. Intensive rehabilitation care is another possibility.

Substance misuse treatment

Substance abuse issues are often associated with psychiatric disorders. It also obstructs therapy and exacerbates psychiatric disorder. A person will need therapy if he/she cannot quit using medications or alcohol on their own. They should consult a physician of care choices.

Mental health therapy

The term "therapy" refers to a variety of different types of talk therapy. Panic disorders, anger issues, anxiety, depression, bipolar disorder, and post-traumatic stress disorder are all disorders that can be treated with therapy.

Therapy aids in the identification of mental health issues as well as harmful behaviors or thought patterns. The patient and therapist can work together to change these thoughts and behaviors during sessions.

Most therapists focus on current issues, things that affect the patient’s daily life, and help him/her find solutions to what they are going through right now, but each doctor takes a different approach.

Mental health first aid

A national public education course called Mental Health First Aid has been developed. Its purpose is to educate people about mental health issues' warning signs and risk factors.

Participants will learn about treatments and approaches that can aid people suffering from mental illnesses during the training.

This training program is designed for people who work with patients regularly in a healthcare setting. Healthcare providers can learn how to help a person in crisis connect with professional and self-help treatment steps through scenarios and role-playing.

Mental health exercises

Physical activity is extremely beneficial to your overall health. Cardio fitness and strength are improved by dancing, swimming, walking, and jogging. They're also beneficial to your mental well-being. They have been shown to help with depression and anxiety symptoms in studies.

1.2 COVID-19 and Mental Health

High levels of tension are predicted as disasters impact people's lives and neighborhoods. Adversity has long been recognized as a contributing feature for both long and short-term mental health issues. The detrimental effects of infectious disease outbreaks on people's mental well-being have been recorded in previous epidemics studies. Given the pandemic's effect on people's lives, people's anxiety is understandable. People are scared of becoming infected, dying, and missing family members during the COVID-19 emergency. Simultaneously, a large number of citizens have already lost or is in danger of losing jobs, people who have socially been alienated from the people they care about and love, and, in certain nations, have had home quarantine rules imposed severely. Domestic violence and harassment against women and children have also risen. Additional main causes of anxiety include widespread misinformation regarding the virus and preventive strategies and profound concern about the future. The anxiety is heightened by television reports of seriously injured patients, deceased bodies, and coffins. The knowledge that people will not be willing to say farewell to dying loved ones and would not be able to participate in the funerals for them adds on to the sadness. Symptoms of depression and anxiety have been shown to be greater than average in many nations, which is

unsurprising. In April 2020, a major analysis in Amhara Regional State, Ethiopia, found a 33 percent occurrence rate of indications associated with depression, three times improvement over figures from Ethiopia prior to the outbreak (Nations, 2020). To cope with the stressors, people can turn to a variety of negative coping mechanisms, such as the alcohol abuse, narcotics, or tobacco, or some other addictive behaviors like online multiplayer gaming. If the financial cost of COVID-19 increases, there will be a comparable toll on mental wellbeing, with significant consequences for individuals, communities, and community as a whole. Concerns have been raised about COVID-19's effects on the brain. In people with COVID-19, neurological symptoms have been recorded in a number of countries. Furthermore, the pandemic's socioeconomic effects may have an effect on the growth of brain wellbeing in young children and teens, as well as cognitive impairment in the elderly.

1.3 Mental health services

Before the pandemic, access to quality, accessible mental health services were still scarce in most countries globally, including in many humanitarian and crisis settings in particular. Due to the COVID-19 pandemic, this access has now been further reduced, as the pandemic has affected networks all over the world. Main issues impacting facilities are

- Danger of transmission and contamination in longer stay settings, which include nursing homes and medical institutions;
- Obstacles to in person contact;
- Mental wellbeing workers contaminated with the coronavirus; and
- Demolition of facilities of mental health to transform into treatment centers for patients with COVID-19 (Nations, 2020) .

Ambulatory care mental treatment clinics around the world have also been hit hard. Fear of infection has significantly reduced need for face-to-face mental health facilities, especially among the elderly. Many of the systems have little choice but to depend on internet behavioral

health services. The emphasis on remote self-help and digital behavioral well-being resources and parenting programs is enhanced. Such interventions may be efficient and flexible, but their disadvantage is that illiterate, disabled and older adults have far fewer access to the Internet or telecommunications. They are not the solution to all of the needs of mental health. Mental well-being and psychosocial care at the group level have also had a critical effect.t Some organizations delivering security and psychosocial assistance to particular communities at heightened risk cannot deal with growing demands. However, limits on travel and fear of contagion inhibit service delivery. Similarly, school-based mental well-being systems have been severely disrupted and many of these services are unable to offer sufficient treatment using remote approaches. Thousands of children who've already dropped out of school, live on the streets, and are constantly subjected to severe and persistent violations of their rights are much more vulnerable to these tremendous challenges and lack of treatment. (*Let's Not Shame People For Having a 2020 Kind of Day | Motivation*, n.d.). Sustaining and improving mental well-being resources and interventions must focus on meeting existing and potential mental health challenges and trying to mitigate an improvement of mental health in the upcoming future.

Mental health providers had to identify creative ways to reorganize and adjust the quality of treatment and maintain treatment consistency during the pandemic. For example, Well over 60% of Madrid's mental health units have been shifted to COVID-19 treatment, resulting in a 75% reduction in the amount of individuals seeking immediate mental health care. (Mendez, 2020). In order to cope with this, mental health providers had to adjust rapidly. People with chronic disabilities have been transferred to private hospitals to maintain quality of treatment as a solidarity action. Local decision leaders have established emergency psychiatry as a critical tool to help mental health providers to begin providing outpatient treatment over the Internet. Home visits have been arranged for more critical situations. Therefore, it was essential to

collaborate with IT professionals to make it possible for mental health personnel operating from home to have access to electronic healthcare data while ensuring confidentiality.

1.4 Current Recommendations

The unforeseen consequences of the pandemic have and will continue having considerable mental health effects. The effects given below could be minimized by implementing the measures developed by the national decision-makers.

1. Apply a whole-of-society solution to mental health promotion, security and treatment

In order to have an impact, both mental and emotional well-being should be taken into account during the Covid-19 response as it encourages individuals to perform better, boosts people's ability to cope with the crisis, decreases deprivation, and is likely to accelerate societies' rehabilitation and reconstruction. The primary objective of the government officials working in various sectors such as defense, health, social care, communication and education must understand the effect of their decisions on mental health during the pandemic. For example, emergency housing interventions (as well as the lifting of these measures) ought to be prepared and enforced through industries in such a way as to reduce the impact on people's emotional wellbeing (Nations, 2020). Commitment and responsibility to residents in a joint attempt to contain the virus promote support of certain interventions and are expected to preserve the mental wellbeing of people, threats to mental health, which are associated with pandemics needs to be prevented, in order to help ensure that no one suffers from any future pandemic-related consequences. To prevent citizens from endangering their own well-being or opportunities and increase inequality, it is imperative that financial and social policies are created to address these issues. Alternative learning options ought to be provided to children and youth outside of classes. The integral part of the COVID-19 response plan should include prevention and remediation of sexual abuse against women, infants, older adults or people with disabilities. Developing and imposing national policies that specifically target staff and patients

in nations where there is evidence of discrimination should provide better working conditions for people who have or have had COVID-19. It is critical to guarantee the well-being and treatment of all community members, regardless of whether the social or health organizations controls it. In addition, the important points policymakers and others will need to raise when talking about COVID-19, should also include the topics of mental health and psychosocial well-being. To minimize the transmission of the epidemic and fear within the public, policymakers and other players, particularly that media sources need to engage with citizens on the most important issues related to the pandemic, giving solid proof information on the latest data available and available on multiple platforms to everyone who wants it. Being able to communicate in this way can encourage and help build a caring attitude. It is important to prevent undue anxiety induced by contradictory, nonsensical or threatening contact.

2. Ensure widespread accessibility of mental wellbeing emergency services and psychological assistance

Group action to improve social harmony, cooperation and healthier functioning, minimize depression and encourage psychosocial wellbeing should be sponsored. Pre-existing and new cultural and voluntary funding structures targeting disabled individuals need to be expanded. This provides assistance for elderly citizens, frontline service staff and people who are facing unemployment. Helping people to maintain social engagement and avoid social isolation is especially important for older adults and teenagers, and helping people feel less lonely is particularly helpful to prevent the accumulation of social problems. The bereaved opportunities to weep in safety, with reverence for their cultural heritage, should be assured. Faith-based organizations and other affiliates of civil society is important to help maintain good mental wellbeing. Accelerated care to meet a range of people's diverse mental health needs has to be provided. Remotes assistance via phone calls, text, video call should be given to patients who has to stay at home. Psychological treatments appear to be similarly successful, irrespective of

being upfront or digitalized. High-quality self-help materials may be useful for many people, particularly if a professional helper directs their distribution. This is an incentive to incorporate behavioral well-being technologies that will further increase potential mental health programs' success. For one thing, any technology-based solutions to be employed, measures are carried out to ensure privacy and equal access. Employee benefits that go above and beyond the call of duty to people who need serious help as well as people with psychosocial problems should be part of the facilities' general concept. Governments must decide whether to provide routine care for all health problems due to the risk of infection. In-patient medication can be given in priority basis such as prenatal and antenatal care should be top on the list and it can also be made available for people with serious mental disorders such as depression, seizures, delirium, or other psychosocial disorders. Emphasis should be given to supporting and enhancing the civil rights of individuals with serious mental health issues and psychosocial disabilities; which are often ignored during national emergencies. Individuals with COVID-19 and mental health problems can receive the equal access to health and social services as other individuals with COVID-19, without discrimination. Individual travel restrictions imposed by public health policies can apply to anyone, whether or not they have a mental health disorder.

3. Focus on the long stabilization of COVID-19 by improving behavioral health services

A much larger overall expenditure is needed in mental health. The current, long-standing concern is mental wellbeing – through healthiness, educational and other fields have become underfunded. Nations invest, on usual, just 2 percentage of their welfare funds on mental health (Covid- et al., 2020). Mental wellbeing services have to be provided with bundles of health benefits and protection plans to guarantee that primary mental health requirements are met. An adequate budget is needed for evidence-based programs that support psychosocial wellbeing. The mental health effects of COVID-19 can also be reduced by investments. The ongoing situation has yet again revealed the latent and elevated threats of operational existence. Many

nations have proven that psychiatric institutions can be closed quickly until treatment is accessible in the neighborhood. As a longer-term effort in increasing consistency, scope and less costly mental health programs, investments be shifted from institutionalization to sustainable. Any programs designed to mitigate or resolve the behavioral health issues caused by a pandemic must be tracked and analyzed. Therefore, it is necessary to consider the nature of the mental health implications (inclusive of the psychological and drug abuse impacts) of COVID-19 and the social and economic ramifications of the pandemic in direct consultation with the impacted communities. Any efforts aimed at reducing or resolving the mental wellbeing problems brought there by a pandemic must be monitored and evaluated. As a result, in direct consultation with the affected groups, the essence of COVID-19's mental wellbeing effects (including psychiatric and opioid addiction impacts) as well as the pandemic's social and economic implications must be considered. Such a study is expected to improve mental health literacy practices as a function of the predicted outcomes.

To reduce the pandemic's mental wellbeing effects, it is important to take the three suggested measures as soon as possible:

1. Apply a all of society approach to improve, guard and consider for mental health

All nations must consider mental wellbeing as a critical component in their response to corona virus. The all of society mental approach means

• To include mental wellbeing and psychosocial issues in national action strategies across relevant fields, such as promoting learning and caring opportunities for restricted children and young people at home;

• Responding proactively to pandemic-related adversities proven to affect mental wellbeing, such as interpersonal abuse and extreme poverty;

2. Make sure that the emergency mental treatment as well as social assistance is readily accessible

In any emergency, mental wellbeing and psychosocial assistance must be present. Accomplishing this goal during the pandemic entails:

• Supportive group efforts that enhance social solidarity and alleviate isolation, such as programs that assist lonely older adults in staying linked

• Investing in online delivery of mental health interventions, such as tele medicine for health-care staff and individuals suffering from depression and anxiety;

•Defending and upholding the civil needs of individuals with severe psychiatric illnesses and psychosocial disorders, for example, by ensuring fair access to treatment with COVID-19.

3. Support COVID-19 treatment by establishing long-term behavioral wellbeing programs.

To aid society's recovery from COVID-19, all impacted populations would need high-quality mental health care, which will necessitate investments in the following:

• Leveraging current engagement in behavioral wellbeing to catalyze mental health changes, such as designing and funding national sector reorganization plans that turn treatment away from hospitals and into neighborhood services (*Policy Brief: COVID-19 and the Need for Action on Mental Health (13 May 2020) - World | ReliefWeb*, n.d.);

•Ensuring that mental wellbeing is included in public health services, such as by providing treatment for physiological, and drug use conditions in health care benefit programs and insurance plans.

•Increase in the number of people who can provide mental health services.

•organizing community-based programs that secure and support people's human rights, such as engaging people with lived experience in program planning, delivery, and tracking.

All countries must adopt a set of guidelines focused on mental health services during the COVID 19 preparedness, epidemic, and post-outbreak phases, as anxiety and panic arise due to a lack of awareness, inadequate adaptability and coping with ineffective healthcare policies on these topics. Zhang and colleagues proposed, as part of preparedness, establishing a group committee, an assistant team, a rescue team, and a mental wellbeing consultant team to deliver mutual assistance, internet service, psychotherapeutic interventions, and eventual supervision and preparation of subordinates (Communication et al., n.d.). The team will focus on providing online resources to the general public and developing a supportive family support matrix for those who are not infected. Aside from reported cases, they will have one-on-one assistance through personal online contact during quarantine, and verified cases can be assisted physically in the hospital. In a pandemic, the healthcare community can use forecasting, planning, and deterring strategies for psychological therapies. During the pandemic, the two-stage model represents stress response, accelerated adaptation therapy, and psychological first aid, and it continues psychological preparation alongside ADP training after the pandemic. Numerous surveys have been conducted supporting online response, instruction, support, and consultation on mental wellbeing for health care providers, public servants, children, the elderly, people with disabilities, inmates, and the elderly. Furthermore, a good diet, access to support, restricted access to social media and news, avoiding unnecessary thought, and daily physical activity must all be emphasized in order to improve mental wellbeing. Liu and colleagues suggest that positive muscle relaxation exercise can help people exposed to the pandemic deal with distress, tension and improve their sleep quality. This can also apply to stable people who are fearful of the pandemic.

The COVID-19 pandemic on social relations due to physical distancing accounts for a large portion of the adversity. However, this does not indicate a lack of endurance. There are several signs of new group support. Indeed, often amid calamitous adversity, both cultures provide biologically existing psychosocial reinforcement and outlets of resilience. People all over the world are demonstrating unity and providing informal psychosocial assistance to one another. Many stories from across the globe of younger people reach out to lonely older adults, assisting them with simple needs and minimizing isolation. Though compelled to sit at home, several people have used the occasion to reconnect with estranged relatives and acquaintances. People's emotional wellbeing has been improved in environments with internet connectivity through the emergence of online support networks and virtual networks to fight isolation and boredom, reinforce social connectedness, disseminate encouraging messages of optimism and solidarity, and encourage community volunteers to assist others in need. Any positive observations regarding solidarity can vanish if people stop believing in and becomes unaccepting to physical separation measures, but history has demonstrated that all societies have valuable, ingrained resources which must be encouraged. Governments should make extra funds towards beneficial local services because, more than ever now, mobilizing and enhancing local resources, particularly for disadvantaged people, and cultivating a sense of community self-help are vital to preserving and facilitating mental health.

As a result, the new report makes the following recommendations:

1. **Contact tracing**

Concerned that touch tracing could not be as effective as many had anticipated, Cebrian teamed up with Quyu Kong of the Australian National University and Ivan Dotu, co-founder and chief technical officer of Moirai Biodesign, a biomedical start-up, in August (Cebrian, 2021). They started looking at various research techniques that could help control a number of epidemics

with restricted and minimal scientific tools to push the boundaries of intelligent touch tracing and testing strategies.

According to their simulation model, COVID-19 is a pandemic which can only be stopped if at least 10% of the community is scanned every day and monitored using a global, strongly oriented contact-tracing method. (Cebrian, 2021). Superspreading incidents must, therefore be stopped. This last phenomenon is controlled by a vector known as the dispersion parameter in the epidemiological literature, which governs the degree to which a virus spread.

2. Apps that will predict the presence of the virus in the body

China has introduced a smartphone app that will alert us whether we had a close contact with the Coronavirus(*Would You Download A Mobile App To Detect The Coronavirus?*, n.d.). The coronavirus app mentioned above is for the people in China who are currently at the most significant risk. However, it raises the query, would this type of software or application be available on mobile devices in our country? This app news was brought to attention by SmartBrief, conducted a poll with their subscribers asking if they would use an app which had access to your location all the time and 70% of those surveyed replied "No." (*Would You Download A Mobile App To Detect The Coronavirus?*, n.d.).

3. Apps that will predict the onset of anxiety

Stress is a popular human emotion, notably among workers and students in developing countries who are under continuous pressure to succeed rationally and efficiently. Psychiatric disorders account for more than 90% of suicides, as per the World Health Organization (WHO). Mental health is seen as a worldwide crisis and an economic challenge by both the Who and World Bank. (Fukazawa et al., 2020). In Japan, the importance of employee mental health has been recognized, and the government has

sponsored many preventive schemes, including a stress review self-reporting program. There are several different kinds of psychiatric illnesses, and fear is a common occurrence in the early stages of any mental condition. Furthermore, fear has been related to an elevated likelihood of experiencing psychotic. As a consequence, identifying subclinical distress at an early stage is important. The traditional solution is based on self-evaluation; nevertheless, constant self-evaluation is challenging to sustain since it takes time and commitment. There have been many biochemical approaches suggested for assessing stress levels. Anxiety levels can be measured in several experiments by amylase and cortisol in saliva, calculating blood pressure, and heart rate. Estimates based on physiological indices are reliable; nevertheless, regular assessment on a regular basis is unrealistic In 2018, 94 percent of US adults aged 18–29 and 89 percent of US adults aged 30–49 held smartphones, respectively (Anthes, 2016). Sensing from a smartphone can be less invasive than advanced wearable sensors due to their widespread use. Furthermore, most smartphones are outfitted with several sensors that collect a variety of data which can be put together to form compound and expressive features. They often collect interactive details like phone calls, text messages, and device activity. As a result, there is increasing interest in utilizing smartphones' passive sensing capabilities to detect stress levels. The Global Health Organization's Behavioral Health Action Plan 2013–2020 calls for self-care, for example, by the use of electric and interactive healthcare technologies." However, technology evolves far quicker than behavioral health science, necessitating adequate clinical research into mental health implementations.

4. Contribution of AI

The area of mental health treatment, like many others, has been influenced by the transition of new technologies and artificial intelligence (AI), has the field of digital mental health already clearly developed with ongoing and evolving work on artificial intelligence driven applications

for mental wellbeing. It is a generic concept that encompasses various methods and approaches to designing computer structures that conduct cognitive tasks unique to humans, such as understanding, reasoning, problem-solving, pattern analysis, generalization, and statistical inference.

Wireless Phenotyping and Smartphones The use of sensor and user information from individual digital devices, mobile phones, to infer qualitative and behavioral information about an individual, which could then be used as input for machine learning methods to predict physiological results and mental health disorders is known as digital phenotyping. (D'Alfonso, 2020). Aside from smartphones, wearables like smartwatches and actigraphy apps have been investigated. There has already been some early discussion of how the Internet of Things may be used to improve mental health. Beyond this AI-specific overview, the reader can read the article on digital phenotyping in this special section for a more general discussion on the subject. Since depression and anxiety are two of the most common psychiatric illnesses, a lot of digital phenotyping research has focused on them.

Recent research suggests that keystroke dynamics such as pressing, punching, scrolling, and swiping may include mental health clues without the need to linguistically interpret inputted character knowledge when it comes to smartphones and screen details. A recent article on touchscreen typing pattern analysis for depression evaluation proposes a machine learning-based method for analyzing suicidal people utilizing smartphone typing patterns as input, as measured by the PHQ-9. Smartphones and other automatic device sensing have been used to study issues other than depression and anxiety, such as diabetes and psychiatric disorders in the early stages of science. (Gamble, 2020). Smartphone sensing information and automatic phenotyping insights can be used to direct AI systems that can offer contextually accurate and

personalized therapy suggestions. A platform like this can often learn about the user over time and change its answers based on user patterns and machine experiences.

5. **Controlling infection sources**

People contaminated with COVID-19 are primary cause of infection. Depending on the nature of their medical problems, Children with novel coronaviruses can be quarantined at home or admitted to authorized hospitals under the supervision of healthcare professionals. (Shen et al., 2020). There is an immense demand for room ventilation, required sanitation, and disinfection for children's products. When caring for the elderly, it is often essential to provide equipment with removable masks that are correctly disposed of during usage.

6. **Blocking transmission routes**

Preventing propagation by droplets in the air and close contact: Cover the nose and mouth with a towel or towel while coughing or sneezing. Clean your children's hands on a daily basis, or teach them how to wash their hands in the seven-step process. When thoroughly washing your hands when visiting public houses, covering your mouth when crying, smoking, or after using the restroom; and disinfecting toys by heating at 56°C for 30 minutes, 75 percent alcohol or chlorine-containing disinfectants, and ultraviolet rays. (Shen et al., 2020). Reduce the risk of illness by avoiding public transportation in outbreak zones and wearing masks while entering busy or badly ventilated public places; stop handling or feeding wild animals, as well as traveling to markets that offer live animals. Children's wellbeing monitoring: Children who have had direct interaction with infectious patients should have their body temperature and clinical features tested daily. When infants exhibit unusual signs, they can be admitted to a specified facility for evaluation. Newborns born to contaminated mothers must undergo pathogen tests and be segregated in a single ward or home, depending on their medical conditions.

7. Boosting immunity

A well-balanced diet, healthy oral hygiene, proper activity, daily rest, preventing unnecessary exhaustion, and improving immunity are also successful ways to prevent illness while still preserving social wellbeing and mental health. Vaccination is an important method of avoiding viral transmission. Anti-virus vaccine study and production are currently underway in China.

1.5 Methodology

An extensive literature review was initially done to identify the possible gaps in understanding mental health during the current pandemic. A questionnaire was prepared using the Likert scale to collect data. The Google Form was used to create the e-questionnaire, and the link was shared across all the social media we could possibly share. The data were collected and cleaned, following which scores were assigned to the data using MS Excel based on our analysis requirements. Further exploratory data analysis using the R program and results obtained were projected for further studies. The survey's main findings and determinants are measured in detail, and a fair conclusion can be drawn regarding their role in the production of depressive disorders.

In our study, the total depression score (TDS) was 42. The point distribution was so that the higher the score is, the more depressed a person is.

TDS is a sum of three sections of the questioner that shows how much a person is depressed depending on how many points a person score. The respective score for the three sections about depression is 16,12,14.

TDS = 16+ 12+ 14

TDS = 42

The decision to set the cutoff score for a person to be depressed was taken by examining the already established standardized depression scales, which include PHQ-9 (Patient Health Questionnaire-9), MADRS (Montgomery-Asberg Depression Rating Scale), BDI (Beck Depression Inventory). The percentage at which these scales set their depression to be moderate was calculated and averaged. The average percentage found was then used to find the cutoff

score for a person to be depressed in our results. It was found that for a person to be depressed the total score had to be greater than or equal to 16 out of 42.

1.6 Aim of the Study

Many countries implement non-therapeutic preventive measures, such as travel bans, work from home, country lockdown, and, most importantly social distancing, as the virus spreads rapidly worldwide. However, in Bangladesh, with an economy of lower-middle-income and with one of the world's densest populations, a lot of challenges are faced by these initiatives. Evidence suggests a nation suffers a wide range of mental health issues related to anxiety, fear, isolation, depression, panic, emotional outburst, and sleep disturbances during COVID 19 pandemic. Limited research on the impact of COVID-19 on the mental health of people in Bangladesh has been conducted. This study aimed to carry out an online based survey based on the results of which we can identify the variables or reasons that have a significant effect on mental health. We also aim to discuss about these significant variables which are responsible for causing the mental health problems during the COVID-19 pandemic. It aims to note the differences on the behavior of the people to go out before the pandemic and compare it to after the pandemic.

1.7 Objective

The research objective was to study the prevalence of mental trauma during the ongoing pandemic of COVID-19. Steps were taken towards categorizing and classifying the types of depression and identifying the signs and symptoms of depression and the reasons that cause depression analyzing the pandemic contributions in different dimensions for causing the depressive symptoms. The presence of any other disease, lifestyle conditions, emotional integrity, and the social distancing that can be associated with the cause of a particular type of depression was also considered.

An attempt was made to identify the possibility of prophylactic treatment of depression by examining any signs and symptoms. Careful analysis of the psychological, psychosocial, biological, and genetic determinants of the patient can be identified due to depressive disorders. Looking at the contribution of artificial intelligence to the diagnosis, treatment, analysis of patients' preferences, assessment, and provision of (mental) health care and as a potential cause of depression. Studying the methods of diagnosis and treatment of different types of depression and finding the best method by analyzing a standard survey carried out by distributing it online through various platforms. Evaluate the effects of COVID-19 on mental health was the main purpose of this study. In Bangladesh, the COVID 19 pandemic's psychological impact significantly affects the health care workers' younger population, diagnosed people and their family and relatives, and the people living in quarantine. A comprehensive strategy is needed to meet the physical and mental health crisis's spreading challenge in this potential horizon of COVID 19.

1.8 Rationale

Bangladesh, a resource-constrained nation with a heavily populated population of 170 million inhabitants, faces a widespread epidemic and immense challenges following the first known cases of COVID-19 on March 8, 2020, as well as the rapid escalation of both verified cases and fatalities in other countries across the world. The Government of Bangladesh and quarantine initially halted some activities, and lockdown steps were imposed as a result. As a result, Bangladeshi people faced the danger of being both poisoned and alienated, putting a significant increased burden on their emotional well-being at a time when they were still experiencing higher rates of psychiatric issues than those registered internationally, as well as higher rates of otherwise unforeseen suicide cases, indicating the need for a national analysis in Bangladesh. In this respect, the current research looked at the incidence of common mental

illnesses in Bangladesh. In addition, logistic models and structural equation modeling are used to describe the interactions between COVID-19-related variables and outcomes.

2. Results

2.1 Demographics for our study

	Female (N=108)	Male (N=102)	Total (N=210)
Age category			
22-25	57 (52.8%)	49 (48.0%)	106 (50.5%)
Greater than 25	10 (9.3%)	31 (30.4%)	41 (19.5%)
Less than 22	41 (38.0%)	22 (21.6%)	63 (30.0%)
Age (years)			
Mean (SD)	22.6 (4.05)	25.7 (7.12)	24.1 (5.93)
Median [Min, Max]	22.0 [18.0, 50.0]	24.0 [16.0, 57.0]	23.0 [16.0, 57.0]
Education			
Highly Educated	8 (7.4%)	25 (24.5%)	33 (15.7%)
Intermediate level of Education	49 (45.4%)	52 (51.0%)	101 (48.1%)
low Education.	51 (47.2%)	25 (24.5%)	76 (36.2%)
Quarantined			
No	73 (67.6%)	86 (84.3%)	159 (75.7%)
Yes	35 (32.4%)	16 (15.7%)	51 (24.3%)
Tested			
No	92 (85.2%)	78 (76.5%)	170 (81.0%)
Yes	16 (14.8%)	24 (23.5%)	40 (19.0%)
Out going before the pandemic			
Not outgoing	64 (59.3%)	47 (46.1%)	111 (52.9%)
Outgoing	44 (40.7%)	55 (53.9%)	99 (47.1%)
Outgoing during the pandemic			
Not outgoing	66 (61.1%)	55 (53.9%)	121 (57.6%)
Outgoing	42 (38.9%)	47 (46.1%)	89 (42.4%)
Use of internet			
High Use	93 (86.1%)	77 (75.5%)	170 (81.0%)
Low use	15 (13.9%)	25 (24.5%)	40 (19.0%)
Total depression score			
Depressed	90 (83.3%)	55 (53.9%)	145 (69.0%)
Not Depresssed	18 (16.7%)	47 (46.1%)	65 (31.0%)
Average depression score			
Mean (SD)	21.5 (6.65)	17.1 (6.55)	19.4 (6.94)
Median [Min, Max]	21.0 [7.00, 39.0]	16.0 [4.00, 36.0]	19.0 [4.00, 39.0]

Table 1 Selected characteristics of the participants

SD: Standard Deviation

In our study, of the 210 participants included in the analysis, about 51% were women; and 49 % were men. in both sexes, the average age was 24 years. The average age for women was 23 years and for the men around 26 years old. This average was a result of getting 51% of the population between the age of 22 and 25. The rest of the age group were 30 % of the population below 22 years of age and the remaining 19 % was above the age of 25.

Among the participants, 49 % of them had an intermediate level of education, which means that 49 % of the population completed the undergraduate degree BA/BS/B.Ed. 16 % of the participants had a master's degree or a Ph. D. and the rest of the people who are undergraduate students or is in high school or has a diploma consisted of 35 % of the population.

76 % of the total number of participants were not quarantined during the pandemic. Only 19 % of the participants got tested for COVID- 19 and of the ones who were tested, most were males, around 24% out of 100% of the males. We can also see that the percentage of people who were outgoing before the pandemic had decreased by almost 5 %. Most of the people i.e. about 81% used more internet during the pandemic.

According to our scale around 69 % of the population were depressed with the average depression score of 19. Among the depressed ones, most of the people were females with 83 % out of 100 % of the women.

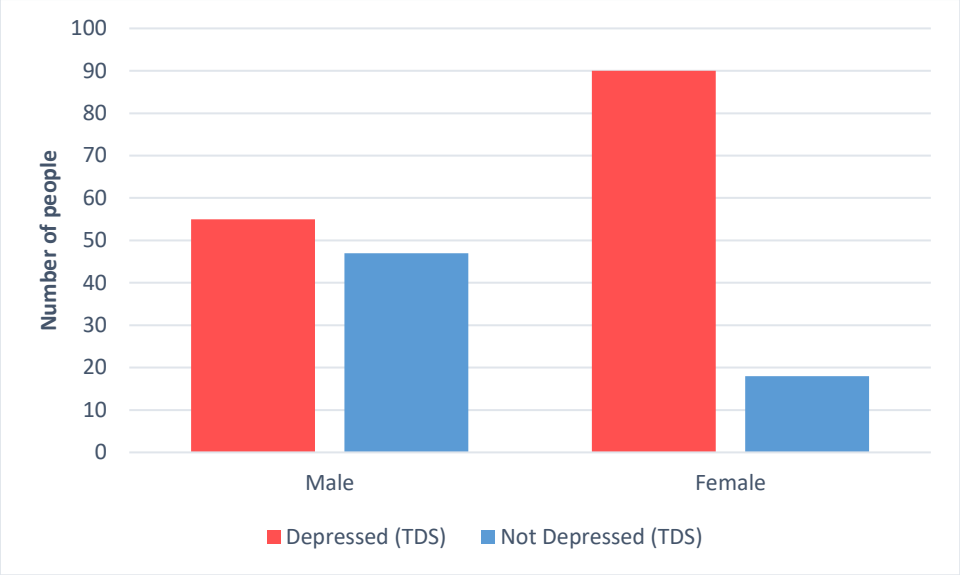

Figure 1 Depressive state and gender

The graph above represents the number of people who are depressed and not depressed with respect to gender. This graph tells us that male population was almost depressed and not depressed, but on the other hand, about 80% of the females who participated were depressed.

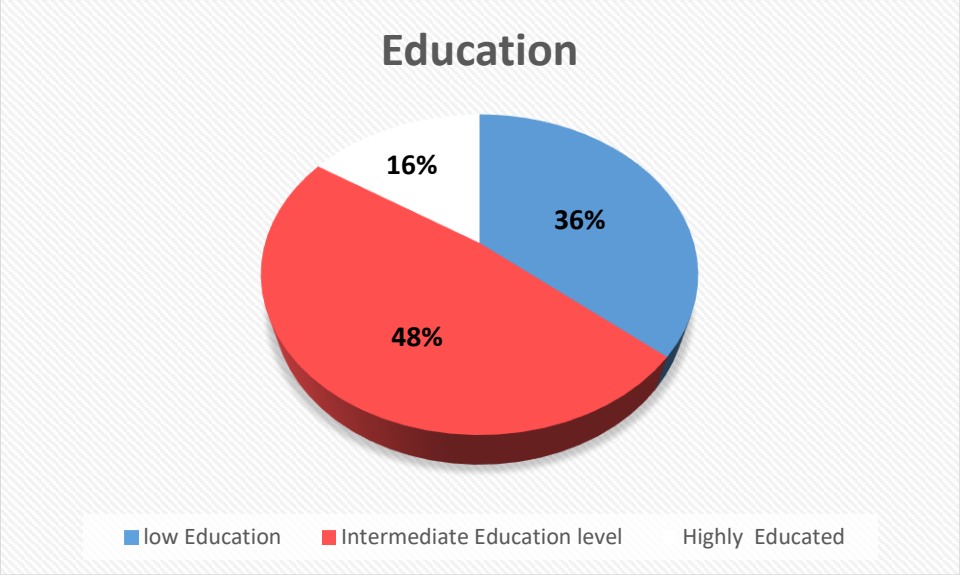

Figure 2 Level of education of participants

This graph shows that almost half of our study population had an intermediate level of education. Close to one-third of the population had a lower level of education and only 16% of the population had a higher level of education.

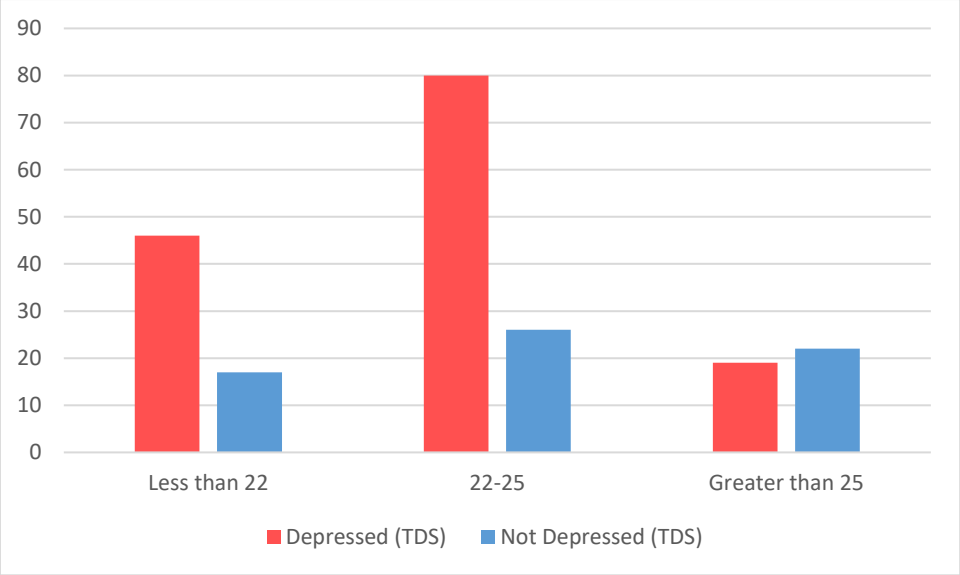

Figure 3 Age and depression

The graph above is a clear comparison of age with depression.

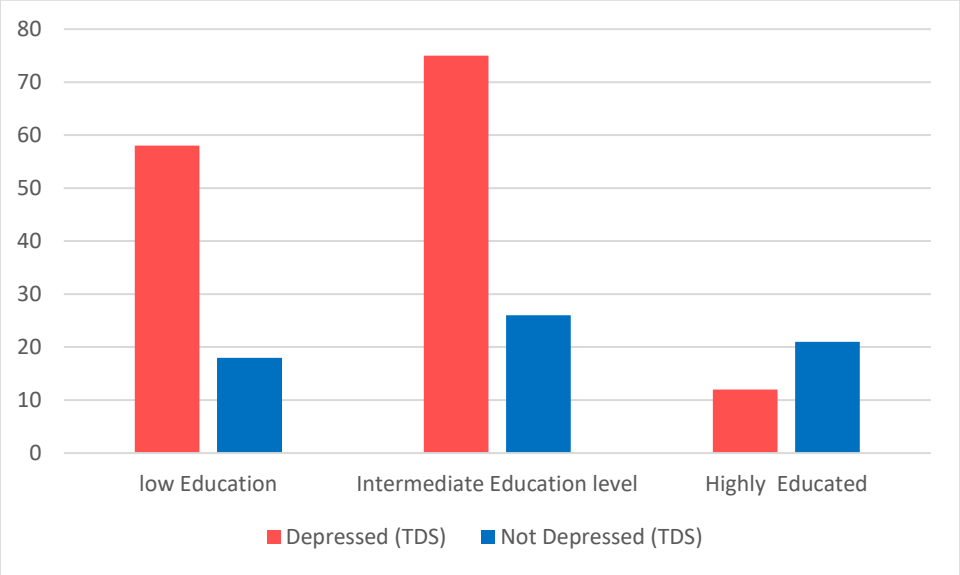

Figure 4 Education and depression

This graph is the comparison of the education level and depression. From it we can see that the patterns are almost similar which might be due the reason that the older a person is the more education he/she received.

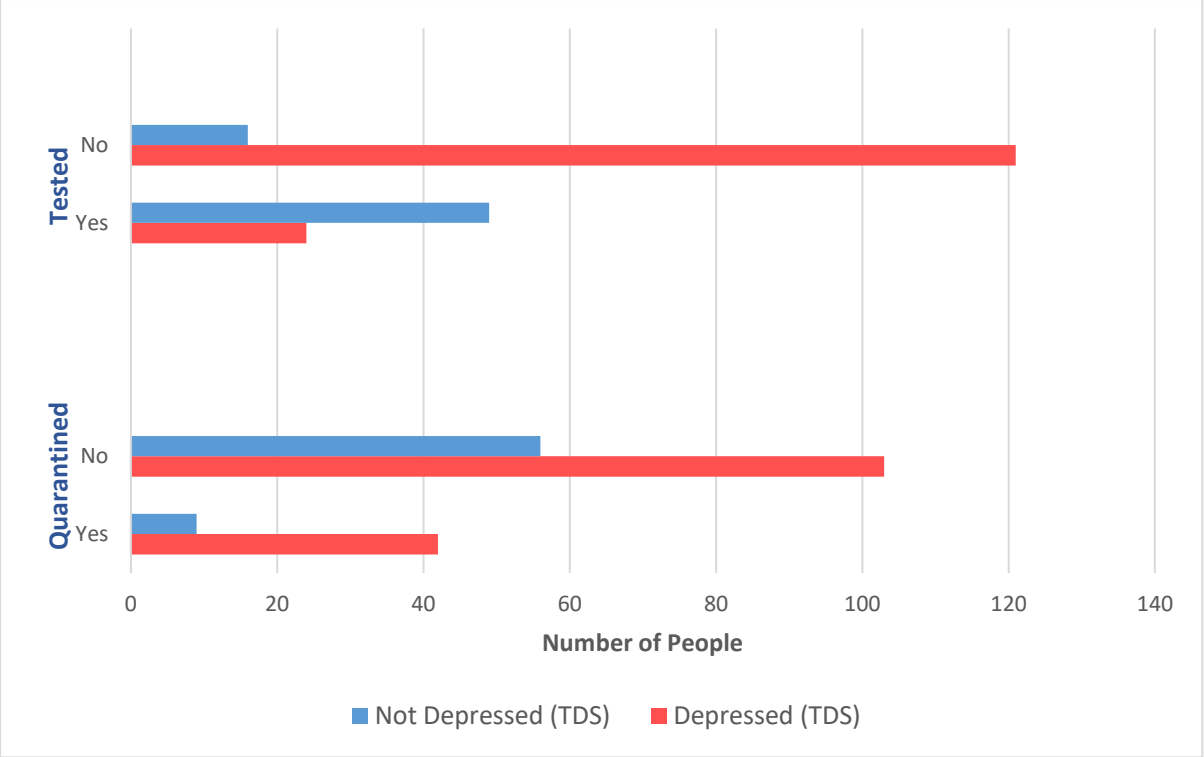

Figure 5 The depressive effects of a person being quarantined or tested

The graph above shows that people who took a test were less depressed compared to the people who did not take a test for COVID-19. There is not much difference with respect to a person being depressed or not when it comes to the question if someone were quarantined or not.

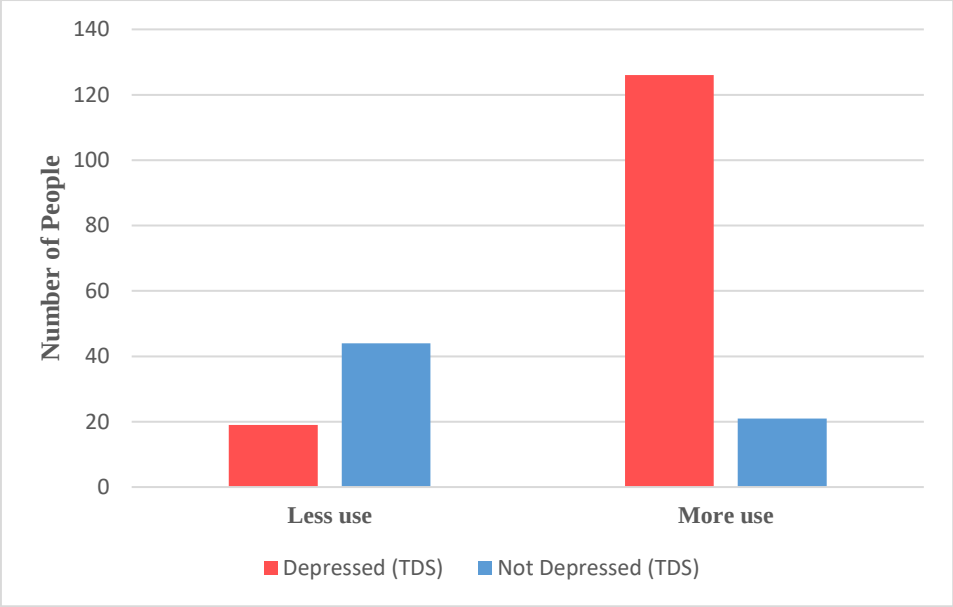

Figure 6 Depressive state and internet use

This graph compares depression to the use of internet during the pandemic. It clearly shows that people who used more internet during the pandemic were more depressed compared to the people who used lesser internet.

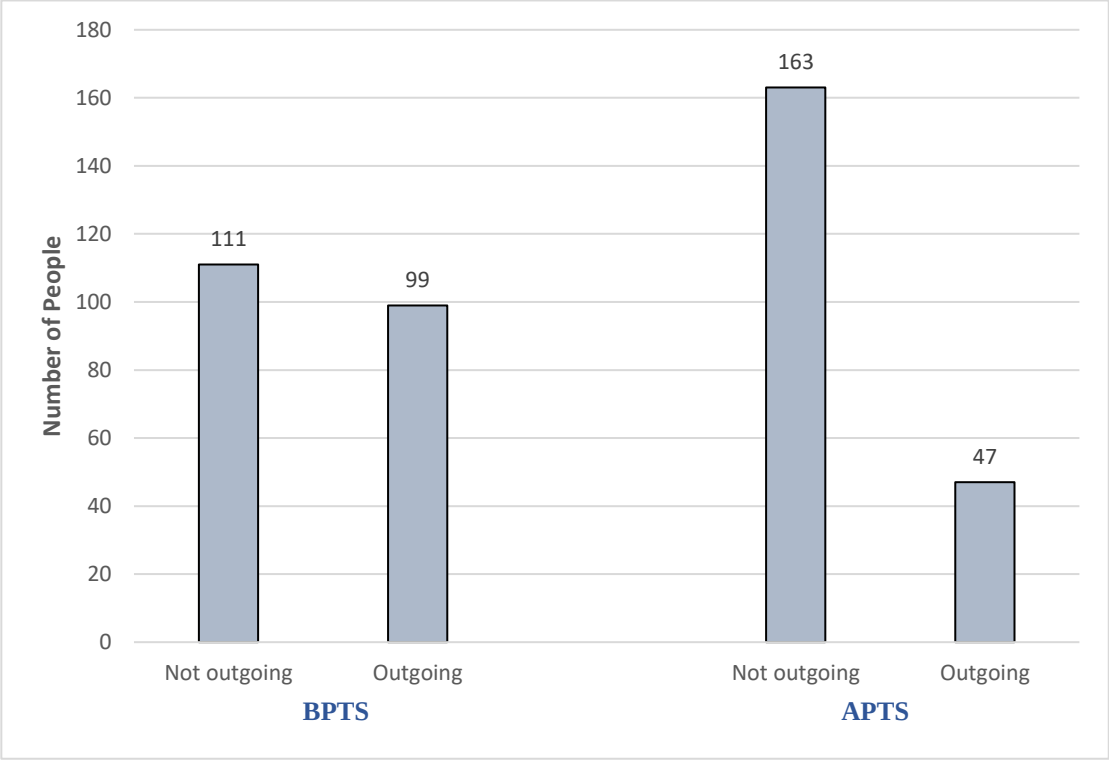

Figure 7 Outgoingness before and during the pandemic

BPTS- Total score for the people who were out going before the pandemic, APTS- Total score for the people who were out going after the pandemic

The graph above compares the number of people who were outgoing and not outgoing, before and during the pandemic. It is seen that the number of people who were outgoing and not outgoing were almost same before the pandemic. The number of people who were outgoing drastically reduced during the pandemic for obvious reasons.

2.2 Validating the Questioner

Sections	Alpha
Section 3 (Outgoing before the pandemic)	0.74
Section 4 (Outgoing during the pandemic)	0.61
Section 5 (Depression related questions)	0.81
Section 7 (Depression related questions)	0.68
Section 8 (Depression related questions)	0.65

Table 2 The test of reliability of the survey components

The survey consisted of eight sections. The first section consisted of the information regarding the survey. The second section consisted of questions related to the demographics. Section three evaluated how out going a person was before the pandemic and section four evaluated a person on how out going a person was during the pandemic. The Cronbach alpha for sections three and four was found to be 0.74 and 0.61 respectively. Section six was a mix set of questions that was not supposed to have any relation within the section. Lastly, section five, seven and eight evaluated how depressed a person was with a Cronbach alpha of 0.81, 0.68 and 0.65 respectively.

Cronbach alpha was invented by Lee Cronbach in 1951. (Cronbach, 1951). It is an indicator of the internal accuracy of the test or of the scale. Internal consistency defines the degree to which all the test objects test the same concept. Internal accuracy should be established before the test can be used for testing or examination purposes to ensure its validity. (Tavakol & Dennick, 2011)

Cronbach's alpha results ranges from 0 to 1. The closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale. George and Mallery (2003) provided the following rules of thumb: as the value of Cronbach's alpha > 0.9 is excellent, > 0.8 is good, > 0.7 is acceptable, > 0.6 is questionable, > 0.5 is poor and < 0.5 is unacceptable (Wadkar et al., 2016).

In our questioner, three parts had an alpha score of greater than 0.6 which means that those sections were acceptable but could be modified for improvement. Section 3 had an alpha score of 0.74 which is acceptable and lastly section 5 was found to have the maximum alpha score of 0.81 which is really good. To conclude, we can infer that all our sections has proven to have internal consistency.

2.3 Examine the association between many variables

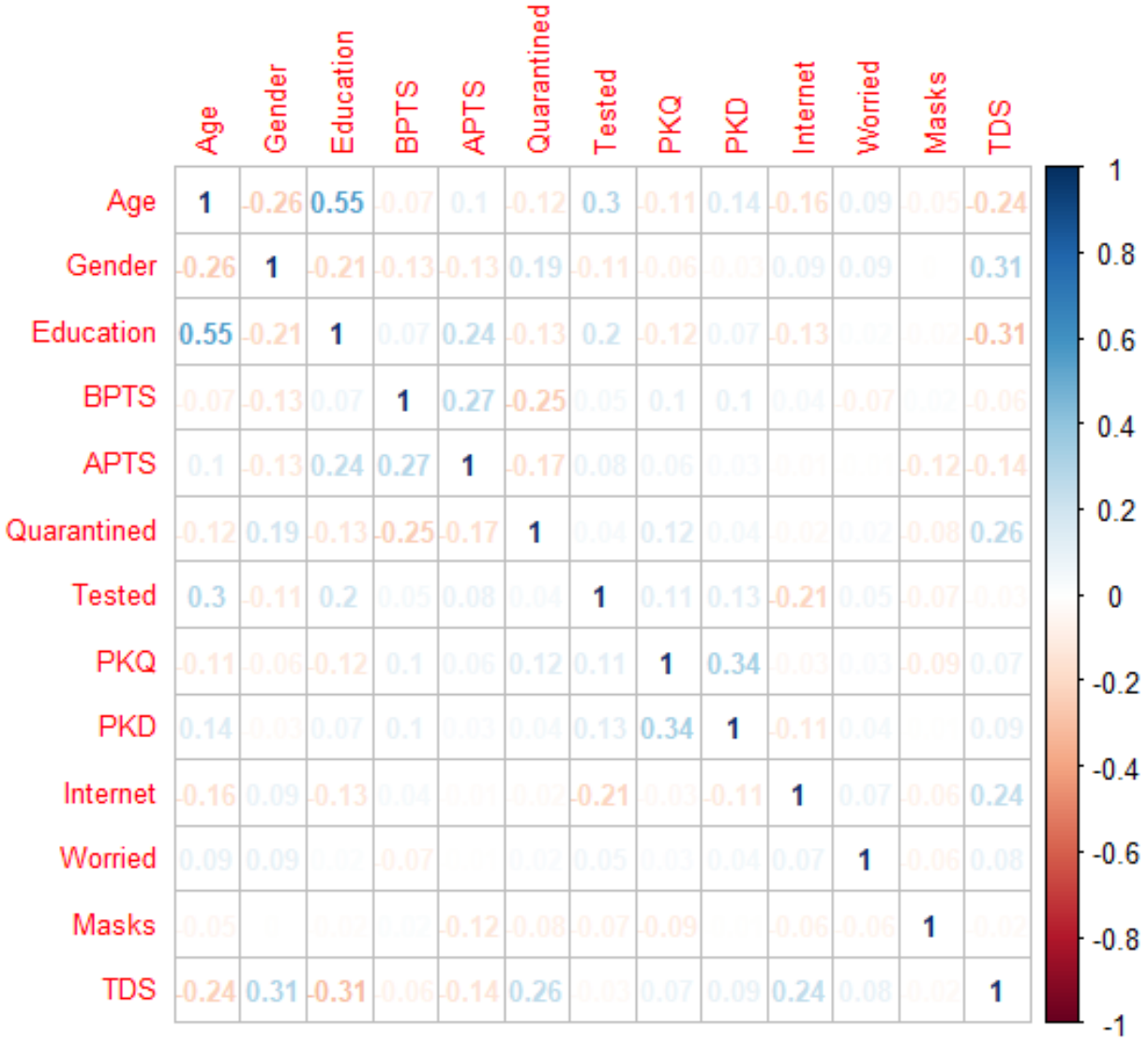

Figure 8 Investigating the correlation between multiple variables

BPTS- Total score for the people who were out going before the pandemic, APTS- Total score for the people who were out going after the pandemic, PKQ – Score related to the number of people that the person knows who have been quarantined during the pandemic, PKD - Score related to the number of people that the person knows who have passed away during the pandemic, TDS – Total depression Score

The diagram above is a correlation plot that shows how much our survey variables are related to each other. The variables can have either positive or negative relationships marked and numbered in blue and red, respectively. The correlations scale thus ranges from -1 to +1. The variables that do not show any relationship with each other have a correlation score of approximately 0 (Marked and numbered in white.)

Overall, it identified variables such as gender, people who have quarantined, and the people who used the internet a lot had a positive correlation with the total depression score. Whereas, Age and education level have a negative correlation with the total depression score. It is also worth considering that Age also has a positive relationship with the number of people who had taken a test for COVID- 19, and the people who were outgoing before the pandemic had a negative correlation with the people who were quarantined during the pandemic.

The gender variable was given a score of zero for the men and a score of 1 for the women. Gender has a positive correlation of 0.31 with the total depression score, which shows that women were the ones who had a greater tendency to go through depression during the pandemic. It had also been observed that the quarantined people during the pandemic had a greater chance of being depressed since there is a positive correlation of 0.26 with the total depression score. People who used the internet more during the pandemic also had a positive correlation of 0.26 with the total depression score.

In terms of negative correlation with the total depression score, Age and education had a correlation of -0.24 and -0.31, respectively, which showed that older people were much less depressed than the younger ones. Also, the highly educated people were less depressed than the people who had lower education.

The positive correlation of 0.3 between the Age and the number of people who got tested for COVID-19 shows that older people got tested more than the younger ones during the pandemic. Lastly, outgoing People before the pandemic were much less quarantined during the pandemic as they have a negative correlation of -0.25.

2.4 Significant dependence between the depressive state and the other categorical variables

Category	Depressed (TDS)	Not Depressed (TDS)	Test	p-value	Inference
Gender (Categorical)					
Male	55 (37.9%)	47 (72.3%)	Chi-Square	0.00001	Significant
Female	90 (62.1%)	18 (27.7%)			
Age (categorical)					
Less than 22	46 (31.7%)	17 (26.2%)	Chi-Square	0.00203	Significant
22-25	80 (55.2%)	26 (40.0%)			
Greater than 25	19 (13.1%)	22 (33.8%)			
Education (categorical)					
low Education	58 (40.0%)	18 (27.7%)	Chi-Square	0.00005	Significant
Intermediate Education level	75 (51.7%)	26 (40.0%)			
Highly Educated	12 (8.3%)	21 (32.3%)			
Quarantined (categorical)					
Yes	42 (29.0%)	9 (13.8%)	Chi-Square	0.02867	Significant
No	103 (71.0%)	56 (86.2%)			
Tested (categorical)					
Yes	24 (16.6%)	49 (75.4%)	Chi-Square	0.23580	Not Significant
No	121 (83.4%)	16 (24.6%)			
PKQ (categorical)					
Few people	96 (66.2%)	41 (63.1%)	Chi-Square	0.77670	Not Significant
Many people	49 (33.8%)	24 (36.9%)			
PKD (categorical)					
At least a few	105 (72.4%)	47 (72.3%)	Chi-Square	0.12070	Not Significant
Many people	40 (27.6%)	18 (27.7%)			
Worried (categorical)					
Worried a lot	82 (56.6%)	28 (43.1%)	Chi-Square	0.09731	Not Significant
Not so worried	63 (43.4%)	37 (56.9%)			
BPTS (categorical)					
Not outgoing	81 (55.9%)	30 (46.2%)	Chi-Square	0.24880	Not Significant
Outgoing	64 (44.1%)	35 (53.8%)			
APTS (categorical)					
Not outgoing	116 (80.0%)	47 (72.3%)	Chi-Square	0.29040	Not Significant
Outgoing	29 (20.0%)	18 (27.7%)			
Internet (categorical)					
Less use	19 (13.1%)	44 (67.7%)	Chi-Square	0.00203	Significant
More use	126 (86.9%)	21 (32.3%)			

Table 3 Variables which are related to depression using chi-square test

BPTS- Total score for the people who were out going before the pandemic, APTS- Total score for the people who were out going after the pandemic, PKQ – Score related to the number of people that the person knows who have been quarantined during the pandemic, PKD - Score related to the number of people that the person knows who have passed away during the pandemic, TDS – Total depression Score

To check whether there is an association between the people who are depressed and not depressed with all the other categorical variables a chi-square test of independence was performed. The null hypothesis that assumes that there is no significant dependence between the total depression score and the other categorical variables.

The null hypothesis was true for most of the cases except gender, age, education and the use of internet. The alternate hypothesis being true for gender, age, education and the use of internet shows that there is a significant relation between depression and these four variables. Gender with a chi-square p-value of 0.00001 shows that is has the greatest significance in determining if a person is depressed or not. Followed by gender, education has the second most significant relation to depression with a p-value of 0.00005. A person's age, weather he/she was quarantined or not and how much internet does a person uses have a chi-square p value of 0.00203, 0.02867 and 0.00203 respectively. Which means they are almost similar in significance in relation to the depressive status of a person.

The null hypothesis assumed for a p-value > 0.05 was true for the rest of the remaining binomial variables. The p- value of 0.23580 indicate that depressive status of a person is not significantly affected by the participants response to being tested for COVID-19 or not. It is also seen that the depression has no relation with the number of people that the responders knew were quarantined or dead during the pandemic. The p-values for the variables being 0.77670 for PKQ and PKD. It is surprising to see that the people who were worried during the pandemic also has no relationship with being depressed or not since the p-value is 0.09731. Since it is just above the 0.05 mark, we can expect it to be significant with a larger population. Lastly,

how outgoing a person was before the pandemic and during the pandemic also has no significant effect on a depressive symptom of a responder. The p-value being 0.24880 and 0.00203 respectively.

2.5 Odds of getting depressed for the sub-groups of the variables

Variable		N	Odds ratio		p
Age	22-25	106		Reference	
	Greater than 25	41		0.87 (0.25, 2.78)	0.822
	Less than 22	63		1.69 (0.71, 4.09)	0.237
Gender	F	108		Reference	
	M	102		3.30 (1.64, 6.86)	0.001
Education	High Edu.	33		Reference	
	Inter. Edu.	101		0.19 (0.05, 0.64)	0.009
	low edu.	76		0.21 (0.05, 0.87)	0.034
BPTS	Not outgoing	111		Reference	
	Outgoing	99		1.34 (0.65, 2.75)	0.425
APTS	Not outgoing	121		Reference	
	Outgoing	89		0.78 (0.36, 1.62)	0.509
Quarantined	No	159		Reference	
	Yes	51		0.42 (0.15, 1.03)	0.068
Tested	No	170		Reference	
	Yes	40		1.06 (0.42, 2.56)	0.901
PKQ	Few people	137		Reference	
	Many people	73		1.20 (0.58, 2.48)	0.626
PKD	At least a few	152		Reference	
	Many people	58		0.74 (0.32, 1.62)	0.451
Internet	High Use	170		Reference	
	Low use	40		2.53 (1.07, 6.03)	0.034
Worried	Not so worried	100		Reference	
	worried a lot	110		0.64 (0.32, 1.27)	0.204

Table 4 Risks of becoming depressed

BPTS- Total score for the people who were out going before the pandemic, APTS- Total score for the people who were out going after the pandemic, PKQ – Score related to the number of people that the person knows

who have been quarantined during the pandemic, PKD - Score related to the number of people that the person knows who have passed away during the pandemic

All odd ratios in this plot is determined for TDS – Total depression Score

A forest plot is a graphical representation of the individual results of each study included in a meta-analysis together with the combined meta- analysis result. The forest plot presented below is generated using data collected from the questioner that was sent out for evaluating the effects of COVID-19 on mental health. It shows the odds of a variable to determine person being depressed or not depressed generated by creating a general logistic model.

The first column (on the left) lists the variables which were considered to have statistical significance with an individual being depressed or not. The next column consists of responses to the variables in the first column. The third column consists of the number of people for a particular response. This data is then used to generate an odd ratio between the responses for each variable. This is presented numerically and also graphically by plotting a black square over the horizontal line. The horizontal line represents the 95% confidence intervals of the variable result, with each end of the line representing the confidence interval's boundaries. Black squares to the right of the vertical line, also called the line of no effect, indicate that the variable is significant in determining the results. In contrast, those to the left or the variable whose horizontal line is crossing the line of no effect seem not so significant in the determination of a result. The reference values indicate the exact odd ratio for a variable with a 95% confidence interval range. Alongside it lies the column for P-value for every variable in our model.

The most significant variable in our model was gender. It had a narrower horizontal line that is also entirely to the right of the line of no effect, i.e., 95% confidence intervals do not cross the vertical line. Such a small interval and a p-value of 0.001 indicate that the variable significantly affects the outcome. The odd ratio of 3.30 between female and male with a 95% confidence

interval that ranges from 1.64 – 6.86) shows that the odds are it is 3.30 times greater that a male will be depressed compared to a female.

Another significant variable in our model was found to be the use of the internet. Although it had a wider horizontal line yet, it was situated entirely to the right of the line of the line of no effect. The 95% confidence intervals are just enough to make it through an odd ratio of 1. The p-value is also 0.034 indicates that there is only 3.4% chance that the null hypothesis in this finding is true. The odd ratio of 2.53 between the people who used more internet during the lockdown period and the people who used less internet during the lockdown period with a 95% confidence interval that ranges from 1.07 – 6.03) shows that the odds are that it is 2.53 times likely for a person who used lesser internet during the lockdown to be depressed compared to a person who uses more internet.

We can also see a statistical significance in the education variable. Despite having a long horizontal axis of the variable's outcomes, it does not cross the line of no effect. There is a lesser chance for an Intermediately educated person and a person with lower education to be depressed than a highly educated one. The odd ratios being 0.19 and 0.21, respectively, about the people that are highly educated.

The rest of the variables that remain seem insignificant to determine if a person is depressed or not since they all cross the vertical line and have a p-value of more than 0.05.

3. Discussion

When the coronavirus outbreak spread across the globe, several nations adopted non-therapeutic prevention steps such as travel restrictions, remote office activities, nation lockdown, and, most importantly, social distancing. These policies, however, pose problems in Bangladesh, a lower-middle-income economy with one of the world's densest populations. During the COVID 19 pandemic, evidence shows that a country struggles with a wide variety of mental health problems linked to anxiety, paranoia, loneliness, depression, panic, emotional outburst, and sleep disruptions. There has been no study on the effect of COVID-19 on people's mental well-being in Bangladesh. This study aimed to address Bangladesh's mental health challenges and possible responses to them. It also aims to point out the differences in mental disorders before and during the pandemic so that steps can be made to prepare for such a situation in the future and identify the determinants of depression and anxiety.

Our finding's critical aspects are that there is a substantial difference between the males and females in our study population when it comes to obtaining the total depression score. It is seen that females were more depressed as compared to males. The correlation plot in figure 8 shows that Gender has a positive correlation of 0.31 with total depression ranking, indicating that women were more likely to suffer from depression during the pandemic since a higher score is set for women. If we also look at figure 1, we can see that proportionately, the female population was more depressed. To get the exact percentage, we can refer to table 3, where we can see that out of the total number of people who were depressed, males were only 37.9 % compared to females, which comprised 62.1%. The p-value of < 0.05 in the same table also suggests a significant dependence of this variable on depression. A similar study reported that females are experiencing more severe anxiety symptoms than men during the COVID-19 outbreak (Hou et al., 2020). Depression, anxiety, psychological distress, sexual harassment, domestic violence, and rising rates of drug use all impact women more than men in various

countries and settings. Pressures from their various positions, gender inequality, and other factors such as poverty, hunger, malnutrition, overwork, domestic violence, and sexual harassment contribute to women's poor mental health. There is a correlation between the occurrence and severity of such social factors and the occurrence and severity of women's mental health problems. Severe life events that cause feelings of loss, inferiority, embarrassment, or entrapment may foreshadow depression. According to a study published in NCBI indicates that the variations in depression in gender may mainly result from biological sex differences and depend less on age, culture, diet, education and economic factors.(Albert, 2015). Hormonal variations may be a cause of depression. Female hormones, such as estrogen, have been implicated in stress in primate and rat tests. However, this should not result in a gender bias, and it should also be given equal importance when it comes to psychological support during the pandemic. We have found that odds are 3.30 times greater than a male will be depressed compared to a female when we look at table 4, which describes the statistical significance of different variables with the odds of getting depressed.

The most effective method to prevent the spread of COVID-19 was social distancing and home quarantine; however, it is seen that going into quarantine increased the chances of getting depressed. If we look at table 3 for reference, we will see that the variable quarantine has a significant dependence on depression as the chi-square test p-value is less than 0.05. A positive correlation score on the figure 8 also indicates the same thing. According to one study, more extended periods of quarantine were correlated with worse mental well-being, precisely post-traumatic stress symptoms (Hawryluck et al., 2004). One study (Reynolds et al., 2008) showed that those quarantined for more than ten days experienced substantially more post-traumatic stress symptoms than those quarantined for less than ten days.

These maybe are due to many of the reasons discussed in the beginning. To highlight some, longer duration, Inadequate information, Inadequate supplies, finances, fear of getting infected, etc.

Use of internet is also found to have direct adverse effects on mental health. Since the use of the internet increased during the pandemic, Figure 6, we could infer that it can also contribute to psychological distress. A positive correlation between the use of the internet and depression in figure 8 supports this statement. The chi-square test between the use of the internet and depression also has a p-value of less than 0.05, which further shows significant dependence of the use of the internet to depression. According to the first large-scale study by University of Leeds psychologists, people who spend much time browsing the internet are more likely to show depressive symptoms (Morrison & Gore, 2010). Our findings also match with this study. The main reason may be sad news. People only see sad news on social networking sites during the pandemic, which might have caused the mental illness to grow. Cyberbullying is also a factor. Some people have nothing to do during the quarantine, may misuse this time to bully potential victims online, which can cause a massive deal of mental stress and trauma. It is not unusual to see users sharing happy pictures while browsing through different social media profiles. This, however, can trigger feelings of envy. Some people begin to believe that someone else is happier and more successful in life. A drug or alcohol addiction is somewhat close to internet addiction. If someone is addicted to social media, the person will inevitably neglect their real-world obligations. She/He will immediately log in to a social networking site when they wake up in the morning. Failure to get their regular dose of social media may result in a sudden bout of depression.

In figure 5, we can see that most of the people who got tested for COVID-19 were not depressed. However, the chi-square test p-value of 0.23580 indicates that this variable does not significantly depend on depression. “COVID-19 diagnosis and treatment are more likely to be

traumatic than other medical conditions due to the potential severity of the illness, the novelty of the illness and associated uncertainty in its treatment, and the isolation involved," says Stern, PhD, a psychologist and clinical assistant professor with the Department of Psychiatry at NYU Langone Health (Wang et al., 2021). The above statement is a counterargument to the results that we have found. To justify, we can say that most of the people in our survey who got tested may have tested negative, for which they are less depressed. We could ask the test results of participants for further studies if they took a test for COVID-19 and further analyze the results. For now, we have limited information. Another reason could be a low number of participants for the survey. We might have got a better result if we had a larger sample size.

It is also found that age has a significant role in depression. Younger people had a greater depression score when compared to the elder ones. The correlation plot in figure 8 shows age and depression are negatively correlated. This means the lesser the age of a person, the more depressed they are like to be. We can also see in table 3 that depression is significantly dependent on age since it has a chi-square p-vale lesser than 0.05. The above findings can further be supported by a report in the business insider, which states that researchers discovered that more young people, especially those in their early 20s, are experiencing prolonged periods of loss of interest in life and leisure activities. This growth in depression is at a higher rate than the same age group did just a decade ago, based on data from more than 600,000 people across the United States (*Depression Rates by Age: Young People Are Experiencing More Depression*, n.d.). The reasons for the increase in the depression among young the young population maybe because of study, income, expenditures, family, increase in responsibility, facing the harsh reality of life, hormonal imbalance, isolation from friends and loved ones, fear of getting infected, and lastly being depressed over the loss of golden years of life under lockdown.

Our results seemed that the number of people a person knows who has been quarantined or has passed away does not affect or contribute to the total depression score. If we look at the

correlation plot in figure 8, we will observe that the correlation between (PKQ, PKD) with the total depression score (TDS) is almost close to zero. This means no correlation exists between these variables. This is also supported by the chi-square test performed on table 3 where we observed that both of these variables, PKQ and PKD, is insignificant to the depressive state of a person. We can conclude that a person knowing how many people have been quarantined or dead during the COVID-19 pandemic does not affect the depressive state of a person. There is no research work available when this research is being carried out that supports or argues against our hypothesis. Further research and analysis can be done to confirm this report.

People who were highly educated were lesser depressed when compared to the people who had an immediate level or a lower level of education. The negative correlation of -0.31 on figure 8 indicates that as education increases, the total depression score decreases. The education variable's significant dependence on depression is also verified in the table 3 using the chi-square t-test. Several tests have shown that those who are more educated have less depression problems than others who are less educated. (Bauldry, 2015; ten Kate et al., 2017). This report supports our findings. There can be many reasons for this, and maybe with education, the people gain more knowledge on why mental health is essential and how it can be controlled. Financial and emotional stability can also be why the people who have reached their peaks of intellectual needs would have already satisfied the other necessary needs that the younger population is struggling to achieve.

4. limitations of study

There are certain drawbacks to this study. To begin with, owing to health concerns, a face-to-face interview was avoided; nevertheless, self-reporting has drawbacks as opposed to face-to-face interviews, and it would be preferable to include a greater sampling size to confirm the results; however, due to the present environment, it was not feasible to gather tests on a wide

scale. The age distribution in our data w not uniform. Almost half of the people who were surveyed aged between 22 to 25.

5. Conclusion

To conclude we can say that we have managed fulfill the aim of our study which was to highlight the important factors associated with mental health. It was found that the females are more prone to getting depressed compared to men. Increase in the use of internet during the pandemic is also responsible to cause greater depression. People who got tested has a lesser depression score compared to the ones who did not take the test. Younger population seemed to be more depressed than that of the older ones. Knowing how many people were quarantined or dead during the COVID-19 pandemic has little impact on a person's depressed condition and People with a high educational standard were less depressed than those with an immediate or lower level of education.

Mental health is an important aspect of life, every year, every day. COVID-19 has made is rather difficult to focus on this aspect of health. In all our other worries we sometimes subconsciously stress out and neglect mental peace and meditation for a healthy mental health. Fear and anxiety are normal responses to a state of crisis and uncertainty. We should take care of ourselves by eating properly, exercising, getting adequate sleep, and reducing all other forms of stress. We should avoid negative content and unnecessary news viewing, and we should never let information about the pandemic's progression overwhelm us.

6. Reference

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