

The impact of Covid-19 Epidemic on general population mental health

Grašić, Ivana Katarina

Master's thesis / Diplomski rad

2021

Degree Grantor / Ustanova koja je dodijelila akademski / stručni stupanj: **University of Zagreb, School of Medicine / Sveučilište u Zagrebu, Medicinski fakultet**

Permanent link / Trajna poveznica: <https://um.nsk.hr/um:nbn:hr:105:764286>

Rights / Prava: [In copyright](#) / [Zaštićeno autorskim pravom.](#)

Download date / Datum preuzimanja: **2024-07-23**



Repository / Repozitorij:

[Dr Med - University of Zagreb School of Medicine Digital Repository](#)



UNIVERSITY OF ZAGREB

SCHOOL OF MEDICINE

Ivana Katarina Grasic

**The impact of Covid-19 Epidemic on general
population mental health**

GRADUATE THESIS



Zagreb, 2022.

The graduate thesis was completed at the Department for Psychiatry and Psychological Medicine under the guidance of Marina Sagud, MD, PhD, Associate Professor of Psychiatry, and was submitted for evaluation in the academic year of 2021/2022.

Contents

CONTENTS	3
1. SUMMARY	4
2. INTRODUCTION	7
3. METHODS	12
4. MEASUREMENT TOOLS	12
5.1 DEPRESSION, ANXIETY, STRESS-DURING LOCKDOWNS	14
5.1A ITALY'S LOCKDOWN	14
5.1B UK'S LOCKDOWN	16
5.2 ANXIETY OF GENERAL POPULATION DUE TO COVID-19	18
5.3 COVID-19 COMPARED TO OTHER INFECTIOUS DISEASES	19
5.4 HABITS PICKED UP DURING COVID-19	20
5.5 SUICIDE, SELF-HARM, AND SUICIDAL IDEATIONS	22
6. CONCLUSION	24
7. REFERENCES	26
8. BIOGRAPHY	29

1. Summary

Introduction

The Covid-19 epidemic represents general psychosocial stressor, which affected all individuals in given society. The aim of the thesis is to analyze the impact the corona virus disease 2019 (Covid-19) had on mental health, depression, anxiety, suicide, and stress in the general population.

Methods

The methods used to obtain the articles were through PubMed, with keywords of General population and Covid-19. This review article will analyze and summarize the findings of a few articles.

Results

The results of the articles showed evidence of Covid-19 contributing to worsening mental health, as well as proof that little attention was directed towards promoting and protecting mental health. The articles used obtained their data through the usage of questionnaires and surveys. The frequent questionnaires used were Depression, anxiety, and stress scale-21 (DASS-21), and Patient Health Questionnaire 9 (PHQ-9), Patient Health Questionnaire 2 (PHQ-2). The results from the articles showed that mental health of the population was greatly impacted, anxiety of the general population was 27.3%, general anxiety of those infected with Covid-19 was 39.6%, depressive symptoms of Italians post lockdown went up to 38.9%, suicide ideations increased to a percentage of 30.7%, there was an increase of 75% in time spent watching television and gaming.

Conclusion

Due to worsening of mental health in community, the next steps should be to provide the general population with resources and access to the necessary means to deal and cope with the stress and fear brought upon by the Covid-19 epidemic.

1. Sažetak

Uvod

Epidemija Covid-19 predstavlja opći psihosocijalni stresor, koji je utjecao na sve pojedince u društvu. Cilj rada je analizirati utjecaj korona virusne bolesti 2019 (Covid-19) na mentalno zdravlje, depresiju, anksioznost, samoubojstvo i stres u općoj populaciji.

Metode

Metode korištene za prikupljanje članaka su pretraživanje PubMed-a s ključnim riječima "opća populacija" i "Covid-19". Ovaj pregledni članak će analizirati i sažeti rezultate nekoliko članaka.

Rezultati

Rezultati ovih članaka pokazali da je Covid-19 pridonio pogoršanju mentalnog zdravlja te su također pokazali da je malo pažnje usmjereno na promociju i zaštitu mentalnog zdravlja. Članci su za prikupljanje podataka koristili upitike i ankete. Često korišteni upitnici bili su Depression, anxiety, and stress scale-21 (DASS-21) i Patient Health Questionnaire 9 (PHQ-9), Patient Health Questionnaire 2 (PHQ-2). Rezultati članaka pokazali su da je mentalno zdravlje stanovništva uvelike pogođeno, anksioznost opće populacije bila je 27,3%, opća anksioznost zaraženih Covidom-19 bila je 39,6%,

depresivni simptomi Talijana nakon zaključavanja porasli su na 38,9%, samoubilačke ideje povećale su se na postotak od 30,7%, došlo je do povećanja od 75% u vremenu provedenom gledajući televiziju i igrajući igre

Zaključak

Zbog tih rezultata trebali bi biti poduzeti koraci u smislu pružanja resursa općoj populaciji i pristup potrebnim sredstvima za suočavanje sa stresom i strahom koji je donijela epidemija Covida-19.

2. Introduction

Mental health is the well-being of an individual when examining them emotionally and psychologically. Mental health may vary depending on where the individual was raised, their social upbringing, their culture, and on the health professional who analyzes them. Mental health is subjective; however, a salubrious mental health is one in which a person is successful and capable of achieving tasks, and actions, and can function accordingly. A person who is mentally healthy is seen as someone who can deal with problems and challenges. (1) The mental health of humans is one element that must be analyzed. Mental health affects many factors within a person's life, for example mental health affects relationships. People who are in a good mental state can form and keep relationships, they are capable of effectively communicating, and they are helpful and valuable in a team setting. When there is proper communication there is a good team dynamic, that allows for successful and productive tasks to be accomplished. When people are in a good mental state there is the absence of negativity, avoidance, resentment, and aggressiveness which all contribute to a better living and working environment. Furthermore, mental health also affects the health of a person, both emotionally and physically. When a person is physically healthy, they maintain a balanced and beneficial lifestyle, and live in a clean environment. People who have poor mental health struggle to get out of bed, to be active, to try new things which ultimately contributes to a deterioration in their status. By being indoors, one excludes themselves from others and the outside world. By being indoors there is limited exposure to vitamin D and fresh air, thus affecting the overall well-being of the individual. When a person has a positive outlook on life and is feeling well, they are more productive, responsible

and are thus more successful. When a person is more productive at work, goals are met, tasks are completed, and responsibilities are fulfilled on time. When a person struggles with their mental health their work gets affected, deadlines get pushed, and money which could have been made gets lost. Many sick days are taken by these people to try and cope with their issues. As a result, this ultimately costs companies, taxpayers, and the country millions of dollars to accommodate for the absence and lack of efficiency of these individuals. Poor mental health needs to be addressed because of the correlation to violence, crime, suicide; it also needs to be addressed because of the large impact it has on many factors in a person's life. (2) The mental state of a person is fragile and can be affected by many factors such as traumatic events, loneliness, neglect, and isolation. Many of these factors were experienced during the Covid-19 epidemic. Since a person's mental state has a huge impact on a person's life it needs to be valued, protected, and nurtured.

Mental illness on the other hand, is considered when an individual presents with an abnormal state of mental health. These abnormalities can present as personality disorders, anxiety disorders, mood disorders (example being depression), psychotic disorders, and many more. These abnormalities can prevent an individual from achieving and completing daily tasks and adds a level of difficulty to their completion. (3,4)

Anxiety disorders are characterized by excessive anxiety as a dominant symptom. While experiencing occasional anxiety, stress-related anxiety is a part of everyone's life.

Anxiety in people with anxiety disorders is the uncontrollable fear related to non-existent and unimportant things. It leads to an overpowering sense of fear and nervousness.

These individuals will also present with physical manifestations, some being: palpitations, shortness of breath, loss of focus, tachycardia, restlessness.

Mood disorders are related to a disruption in one's emotional state such as depression. Symptoms of depression include decreased self-esteem, depressed mood, suicidal ideation, weight changes, energy loss, anhedonia, dissociation from others, a decrease in libido, a change in one's ability to concentrate. When a few of these symptoms are present and are lasting more than two weeks this is when an individual presents with major depressive disorder.

Due to the rapid spread of the Covid-19 virus globally in a short duration of time there was a lot of fear, increased stress and anxiety experienced by many people. The maintenance of mental health was a difficult task during the epidemic since many elements were contributing factors to its deterioration, ranging from the strict regulations, the fear of transmission, the fear of infection, the absence of a cure, the social distancing and isolation, the closure of businesses, the loss of jobs, and limited accessibility to health care. Numerous people suffer from mental health issues and unfortunately many were unable to obtain the necessary resources during the epidemic. Mental health needs to be promoted and unfortunately during the epidemic of Covid-19 it was often neglected.

What is Covid-19?

Covid-19 is Coronavirus disease 2019 which is a contagious respiratory disease that originated from Wuhan, China in December of the year 2019. It is a virus transmitted by respiratory droplets. The symptoms of Covid-19 vary with some symptoms being loss of smell and taste, low temperature, chills, muscle aches, headache, fever, and cough. However, the symptoms and severity differ depending on the individual, age, and particularly patient comorbidities. In the beginning of the epidemic, little was known about the virus and its severity, and as a result lots of precautions were taken globally. To prevent the transmission of the virus people were forced into lockdown, isolation, advised to always stay two meters apart from others, to wear masks, and to be in quarantine if traveled abroad. Through these regulations there was a lack and a deprivation of human interaction, touch, facial expression- which was hidden by mask wearing, and a lack of normalcy. Initially, countries were willing to be in lockdown for two weeks, however because of a lack of knowledge and variations in severity of the disease the lockdowns were prolonged. Due to changes in the viral genes the Covid-19 virus mutated resulting in many variants. The variants which arose due to the viral mutation are the wild type, Alpha variant, the Beta variant, the Delta variant, and the Omicron variant. The Delta variant also known as the Indian variant, was detected in India in the later months of 2020. (5) The Delta variant is due to mutation in genes encoding its' spike protein. The Delta variant is highly contagious, is more dangerous, and is more likely to hospitalize people once infected. The Omicron variant for example is less severe than the Delta variant but it multiplies 70 times faster. The Omicron

variant was first detected in South Africa in November of 2021. (6) Since the virus is constantly mutating, there is a new level of knowledge which must be learned and attained. Since there are many mutations, it is hard to say which mutation will be the last and to know when the end of this epidemic will take place.

3. Methods

The studies that were used were identified by using the platform PubMed Database. Only articles written in English were used. The period of paper searching was up to the year 2021, starting from the onset of the Covid-19 epidemic (31/12/2019). The search was performed on November 8th, 2021. The search terms that were used on PubMed were: ('mental health disorder' [Title/Abstract] AND "Covid-19" [Title/Abstract]), ("mental health disorder" [Title/Abstract] AND "general population" [Title/Abstract] AND ("Covid-19" [Title/Abstract] OR "SARS-CoV-2" [Title/Abstract])).

4. Measurement tools

Most of the studies performed questionnaires and surveys. One of the most frequently used questionnaires was DASS-21 scale. This scale assesses symptoms of depression, anxiety, and stress. The test is comprised of 21 statements that rank how frequently these situations are experienced by the individual. The statement is ranked by assigning a grade from zero to three. Zero representing never, one-sometimes, two-often, and three- almost always. Each statement is associated with one of the disorders. For example, one statement is "I couldn't seem to experience any positive feeling at all", and this is a depression related item. After the survey is completed, it is graded and interpreted. Each disorder is graded independently, and its classification is dependent on how many scores are accumulated for that particular disorder. For example, a score of 0-4 in the category of depression is seen as normal, while a normal value for anxiety is 0-3, and a normal value for stress is 0-7. (7) Other methods that were used varied

from PHQ-9 (Patient Health Questionnaire 9) to SDS (Self-rating depression scale). The PHQ-9 is comprised of nine statements, each statement scored from 0-3 depending on how frequent the individual experienced the stated situation. There is also a final question which asks, if any of the columns are graded above 0 what its gravity on work was. In the end the scores are tallied, with a value of 1-4 representing minimal depression, 5-9 mild depression, 10-14 moderate, 15-19 moderately severe depression, and 20-27 severe depression. The PHQ-9 is a self-examination questionnaire that aids to measure depressive symptoms and diagnose provisionally. (8)

5.1 Depression, Anxiety, Stress-during lockdowns

5.1a Italy's lockdown

Below is presented the article "The Covid-19 pandemic in Italy: Depressive symptoms immediately before and after the first lockdown", which is a review on the impact the lockdown had on its citizens. (9) Italy was one of the first countries to be severely affected by Covid-19. Italy went into lockdown for over two months from March 9, 2020 to May 18, 2020. Within this study they analyzed 1,690 adult twins and analyzed the percentage of recruits that had depression before and after the lockdown. The first survey took place in February 2020, and the second survey took place in June 2020. A nine-item version of Patient Health Questionnaire (PHQ) was used to measure depressive symptoms. A total score ranged from 0-6, and the higher the value, the higher the level of distress, with more depressive symptoms. Answers to two items- depressed mood and anhedonia were induced and concluded a PHQ2 score of 1.11 before the lockdown and a score of 1.20 after, while a score of 2 or above was 33.6% and after it went up to 38.9%. (9) From this questionnaire it also showed an increase of depression in those of a younger age, those with a lower level of educational, and a poor social support. These factors also made these groups more vulnerable to the effects of Covid-19. The researchers suggested, younger individuals were more vulnerable because they are at a fragile age where the opinions of others have a large impact on their perspective on life. Also, young adults are in the age group where they start to go out and attend gatherings; through this epidemic these events and gatherings could not take place. The researchers also hypothesized, those with a lower level of education may lack the basic knowledge disallowing them to understand the situation,

and through the lack of understanding be frustrated, have a higher level of fear and as a result have a higher level of depression and sadness. With regards to those with a lower level of social support- this adds to isolation and the feeling of loneliness. The lack of social support was emphasized especially when going into lockdown and when stronger measures were implicated. Through these restrictions there were less gatherings, less social interactions, and fewer physical needs being met. Furthermore, another risk factor that contributed to the development of depression was economically struggling households. Through regulations many businesses shutdown and many individuals lost their jobs. There was a financial burden, and many did not know where they were to get the financial aid and did not know how they were going to survive without a financial income. Another finding was that females presented with a higher percentage of depression when compared to males. The odds ratio was found to be 1.42.

(9) Females are the child bearers, and they have a natural instinct to protect their young. Women were concerned for their children; they did not know the severity to which Covid-19 would have on their children. Furthermore, when schools closed it was the mothers who primarily cared for, and home schooled their children.

5.1b UK's lockdown

Another article called “Longitudinal analysis of the UK COVID-19 Psychological Well-being Study: Trajectories of anxiety, depression and COVID-19-related stress symptomology” looked at the trajectory of anxiety, depression, and Covid-19 related traumatic stress during United Kingdom's lockdown. (10) This study dealt with a survey comprised of three waves, held online, with certain requirements participants needed to meet. The survey asked a wide assortment of questions, ranging from age, gender, to previous and/or current physical and mental health status, stress level related to Covid-19, impact of school and university closures, and many others. In total 1958 individuals participated with 80% completing all three waves. The first wave was held a few days before the UK went into lockdown, which lasted 12 weeks, the second wave was held a month later, and the third wave one month after that. (10) Participants were broken up into four groups. The groups were divided based on the symptomology of the mental health. One group labelled “high and stable” were those with consistently high levels of recorded symptomology of mental health at all time points. Another group, “low and stable” had consistently low symptomology of mental health across all time points. The “increasing” group were comprised of individuals who at baseline had low symptomology and with delayed onset developed significant symptoms. The last group, “improving”, were those with high symptoms at baseline who then improved to a lower degree of symptoms.

The “high and stable” group had higher scores in depression, anxiety, and Covid-19-related stress. Individuals who had previous mental illnesses were two times more likely to be in the “high and stable” group.

Those who were separated/divorced/widowed were more likely to be in the “increasing” group. In addition, those who had higher Covid-19-related stress scores and worried more about being infected and being exposed were at an increased risk of being in the increasing symptomology.

The “low and stable” had a large portion of people who were resilient to the demands of lockdown, which contributed to their lower level of symptomatology. However, even a small fraction of those who were mentally strong still suffered a mental illness from this epidemic.

Media had a huge impact on the psychological distresses. The media instilled a lot of fear, by advertising the gravity of the situation in countries such as Italy and Spain. (10)

On repeat people were told the number of deaths, the number of individuals infected, and the number of individuals on respirators. People were constantly reminded of the regulations and measures that must be taken to protect the vulnerable and to prevent transmission.

5.2 Anxiety of general population due to Covid-19

A further article looked at anxiety among the general population through analyzing 103 studies, involving a sample size of 140732. The literature used involved many continents and regions of the World Health Organization. It was found that 27.3% represented the prevalence of anxiety in the general population while the prevalence of anxiety in those infected by Covid-19 was 39.6%. (11) In general, there is a greater risk of getting an infection when under persistent anxiety since it weakens the immune system and leads to an increased state of vulnerability. This study found that in the non-infected population women presented with higher anxiety, 32.4%, when compared to men, 24.9%. When speaking of the non-infected group, the highest prevalence of anxiety was presented in Africa with 61.8%, followed by America with 34.9%, and then Europe with 30.7%. Africa is a developing country, with a limited number of medical facilities, a lack of resources, and poor sanitary conditions making it difficult to deal with many illnesses. Furthermore, due to the crash of many economies, through the closing of many businesses, loss of many jobs, low employment rates, many countries were not able to support, send funds, nor equipment to the developing countries, such as Africa. (11)

5.3 Covid-19 compared to other infectious diseases

A different article compared other infectious disease outbreaks and the prevalence of post-traumatic stress symptoms (PTSS). (12) The disease outbreaks compared to Covid-19 were: Severe Acute Respiratory Syndrome (SARS) which took place in 2003, Influenza A (H1N1) which took place in 2009, and Ebola virus disease (Ebola) which took place in 2014. Due to disease outbreaks people can experience a vast array of events such as spectating and experiencing sufferings and death, psychological trauma, isolation, social distancing, etc. The findings showed that the prevalence of Post Traumatic Stress Syndrome (PTSS) was more strongly impacted from Covid-19 than any other infectious disease. The results were Covid-19 having 26.75%, while SARS 16.42%, Ebola 15.99%, and HINI with 2.03%. Covid-19 had by far the highest prevalence. Covid-19 had extensive media coverage; there were constant headlines, constant reminders of the number of ill, infected, and dead. Covid-19 regulations prevented human interaction, created social distancing, and implemented a constant sense of fear, contributing to the stress, and anxiety. (12)

5.4 Habits picked up during Covid-19

Due to isolation, many individuals engaged in new activities to keep themselves occupied. One article analyzed the behaviors of young Swiss men during March to June of 2020 during the Covid-19 epidemic. (13) It was found that there was a 75% increase of time dedicated to watching television (series, movies), as well as a 75% increase of time dedicated to gaming. There was a 0.67 increase in time spent watching pornography. There was also an increase in internet usage and usage of social media platforms. Attributable to the work at home order, closure of schools and universities, closing of businesses and institutions, time spent in isolation and quarantine, there was an increase in the amount of time people spent at home. People needed to find ways of distracting themselves to occupy their time, resulting in the increase of habits presented. Since more time was spent sitting in front of electronics (TV screens, tablets, cellular devices...etc.) there was less time dedicated towards physical activity. (13) It is shown that through an appropriate amount of physical activity there is a benefit to an individuals' mental state. Through physical activity there is an increase in monoamine transmission which has similar effects to antidepressants; there is also an increase in the levels of endorphins, endogenous opioids. Due to the new regulations, many people had to stay in closed quarters of modest sized living conditions, such as studio apartments, thus limiting their daily actions. Since peoples' daily routines and environment were the same, the only change people were experiencing were those received from electronics. Through gaming people felt less lonely, felt as if they were interacting with others, "even if it meant virtually". In addition, by watching TV and being

on social media platforms people were attempting to distract and entertain themselves in order to mask the feeling of loneliness.

5.5 Suicide, Self-Harm, and Suicidal Ideations

Furthermore, another topic which was reviewed was suicide, self-harm, and suicidal ideations. This systematic review and meta-analysis was based on nineteen studies which included 79 cases speaking of suicide while 13 spoke of attempted suicide. Those who attempted suicide ranged in age, gender, and mental health condition. Some examples of suicidal cases were: an Indian male who took his own life in fear of spreading Covid-19 in his village (15), a mother and son taking their lives unable to cope with online schooling (16), cases of nurses who died of opioid overdose.(17) The ages of these nurses varied but they were under quarantine restrictions and lacked suitable personal protective equipment. There are many more examples of suicide which took place, as well as suicide attempts. Some cases of attempted suicide were those who had a strong sense of guilt of infecting others, those who had an extensive amount of worry about infecting others. (18) Others became too preoccupied with the media coverage of Covid-19 that they could not see beyond it. (19) The prevalence of suicide ideations was 12.1%. (20) Risk factors which contributed to the increase in numbers were the measures that were taken to prevent the transmission of Covid-19 such as isolation, quarantine, at home order, social distancing. It was found that there was a strong association with self-harm and suicidal ideation due to mandatory quarantine (41.2% versus 12.3%). Over a three-month period, there was an increase of suicidal ideation from 17.6% to 30.7%. (21) Due to quarantine people were too isolated and as a result felt an extreme amount of loneliness.

Furthermore, one study looking at 50000 adults in the UK during lockdown found that 18% experienced suicidal ideations or thoughts of self-harm, while 5% reported harming themselves. Around 43.5% of those reporting to thinking of self-harm or of suicide had a mental health diagnosis. Thus, having a mental illness was a contributing factor, but this also showed that those who were mentally healthy prior to Covid-19 were also seriously impacted by the regulations. Lives were lost in the timeframe of Covid-19, but unfortunately not all were due to the virus itself. Due to the inattention towards mental health and a lack of interventions the mental status of many were gravely reduced.

(20) (21)

6. Conclusion

From the research done, it can be shown that there was a substantial increase of stress, anxiety, and depression in individuals. Many unhealthy habits were adopted because of the lockdowns, such as increased usage of technologies, decreased physical activity, increased viewing of pornography, and increased gaming. As well, the poor management of circumstances led to a number of suicidal ideations, suicide and situations of self-harm. The measures taken by the government with respect to isolation, quarantine, social distancing, over disinfecting and mask wearing engraved a huge sense of fear and anxiety into the population. (22) Due to Covid-19 there was a huge change in people's daily routines, and the norms people once had were now unattainable due to all the restrictions. People were required to adapt to the changes while receiving none or very little assistance. Closures of many schools, universities, institutions, businesses limited people's resources. Very little attention was attributed to mental health, and this is an issue. Individuals thrive when they are in a good and positive state of mind. From the fear that was instilled in people, as well as the lack of social interaction, and complete isolation, there was a deterioration in mental health with very little attention attributed to protecting and improving it. The human mind is a powerful structure which is also quite fragile, and it needs to be valued and sheltered. To solve this problematic issue, mental health services should be provided by physicians, psychologists, and social workers. Being in a state of good mental health should be a priority and thus services and institutions should be available to all. Being in a healthy mental state should be promoted, and those who are suffering should have

access to and be provided with the necessary means, and resources to achieve and maintain a good mental state.

7. References

1. Mental health [Internet]. Psychology Wiki. [cited 2022Dec12]. Available from: https://psychology.fandom.com/wiki/Mental_health .
2. Top ten reasons why mental health is so important [Internet]. PlanStreet. 2021 [cited 2022 Mar 23]. Available from: <https://www.planstreetinc.com/top-ten-reasons-why-mental-health-is-so-important/>.
3. Mental disorder [Internet]. Wikipedia. Wikimedia Foundation; 2022 [cited 2022Dec12]. Available from: https://en.wikipedia.org/wiki/Mental_disorder .
4. Psychology [Internet]. Wikipedia. Wikimedia Foundation; 2022 [cited 2022Feb12]. Available from: <https://en.wikipedia.org/wiki/Psychology>.
5. SARS-COV-2 delta variant [Internet]. Wikipedia. Wikimedia Foundation; 2022 [cited 2022Jan16]. Available from: https://en.wikipedia.org/wiki/SARS-CoV-2_Delta_variant.
6. SARS-COV-2 omicron variant [Internet]. Wikipedia. Wikimedia Foundation; 2022 [cited 2022Jan27]. Available from: https://en.wikipedia.org/wiki/SARS-CoV-2_Omicron_variant.
7. Ciorniciuc V. DASS 21 - depression anxiety stress scale test [Internet]. <https://www.thecalculator.co>. [cited 2022 Mar 19]. Available from: <https://www.thecalculator.co/health/DASS-21-Depression-Anxiety-Stress-Scale-Test-938.html?msclkid=5e86507fa76c11ecae6e96bf07370910>.
8. Sciencedirect.com. [cited 2022 Mar 23]. Available from: <https://www.sciencedirect.com/topics/medicine-and-dentistry/patient-health-questionnaire-9?msclkid=aa0854e2aa9711ecb9474b5b6f99d025>.

9. Medda E, Toccaceli V, Gigantesco A, Picardi A, Fagnani C, Stazi MA. The COVID-19 pandemic in Italy: Depressive symptoms immediately before and after the first lockdown. *Journal of Affective Disorders*. 2022 Feb 1;298:202–8.
10. McPherson KE, McAloney-Kocaman K, McGlinchey E, Faeth P, Armour C. Longitudinal analysis of the UK COVID-19 Psychological Wellbeing Study: Trajectories of anxiety, depression and COVID-19-related stress symptomology. *Psychiatry Research*. 2021 Oct 1;304.
11. Pashazadeh Kan F, Raofi S, Rafiei S, Khani S, Hosseinifard H, Tajik F, et al. A systematic review of the prevalence of anxiety among the general population during the COVID-19 pandemic. Vol. 293, *Journal of Affective Disorders*. Elsevier B.V.; 2021. p. 391–8.
12. Qiu D, Li Y, Li L, He J, Ouyang F, Xiao S. Infectious Disease Outbreak and Post-Traumatic Stress Symptoms: A Systematic Review and Meta-Analysis. Vol. 12, *Frontiers in Psychology*. Frontiers Media S.A.; 2021.
13. Changes in substance use and other reinforcing behaviours during the COVID-19 crisis in a general population cohort study of young Swiss men. *Journal of Behavioral Addictions*. 2021 Oct 28;10(4):901–11.
14. Olaya B, Pérez-Moreno M, Bueno-Notivol J, Gracia-García P, Lasheras I, Santabárbara J. Prevalence of depression among healthcare workers during the covid-19 outbreak: A systematic review and meta-analysis. Vol. 10, *Journal of Clinical Medicine*. MDPI; 2021.
15. Griffiths MD, Mamun MA. Covid-19 suicidal behavior among couples and suicide pacts: Case study evidence from press reports. *Psychiatry Research*. 2020;289:113105.

16. Mamun MA, Chandrima RM, Griffiths MD. Mother and son suicide pact due to covid-19-related online learning issues in Bangladesh: An unusual case report. *International Journal of Mental Health and Addiction*. 2020;
17. Rahman A, Plummer V. Covid-19 related suicide among hospital nurses; case study evidence from worldwide media reports. *Psychiatry Research*. 2020;291:113272.
18. Liu Y, Cao L, Li X, Jia Y, Xia H. Awareness of mental health problems in patients with coronavirus disease 19 (covid-19): A Lesson from an adult man attempting suicide. *Asian Journal of Psychiatry*. 2020;51:102106.
19. Goyal K, Chauhan P, Chhikara K, Gupta P, Singh MP. Fear of COVID 2019: First suicidal case in India ! *Asian Journal of Psychiatry*. 2020;49:101989.
20. Farooq S, Tunmore J, Wajid Ali M, Ayub M. Suicide, self-harm and suicidal ideation during COVID-19: A systematic review. *Psychiatry Research*. 2021;306:114228.
21. Killgore WDS, Cloonan SA, Taylor EC, Allbright MC, Dailey NS. Trends in suicidal ideation over the first three months of Covid-19 Lockdowns. *Psychiatry Research*. 2020;293:113390.
22. Stang A. Critical evaluation of the newcastle-ottawa scale for the assessment of the quality of nonrandomized studies in meta-analyses. *European Journal of Epidemiology*. 2010;25(9):603–5.

8. Biography

My name is Ivana Katarina Grasic. I was born in Etobicoke, Canada in the year of 1997. I am the second youngest of five children. I come from a proud Croatian family; to get a sense of my Croatian heritage I was fortunate enough to see the breathtaking Adriatic coast every summer. I followed in my two older brothers' footsteps in completing a medical degree at the University of Zagreb. I grew up always playing and training in a wide variety of sports, ranging from tennis, track and field, to ice hockey. Studying at the University of Zagreb allowed me to be part of the Croatian Women's National Ice Hockey team. Through sport, I developed a large skill set: coordination, communication, team work, leadership skills, strategic thinking, commitment, self-discipline, time management, trust, as well as a competitive mindset. I developed goals of always striving for more, never settling for less, and always giving my best. I have learnt that if you are unsuccessful on the first try, you persevere, analytically think through the situation, patiently find your mistakes, and adapt to be successful in the future.