Examining Subjective Mental Health during the COVID-19 Pandemic in Canada

by

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ABSTRACT

The COVID-19 pandemic is an unprecedented global crisis. The viral outbreak may trigger long term lasting consequences on mental health status and well-being of citizens. This pandemic also presents an opportunity to identify the most vulnerable subgroups and improve the quality of mental health services delivered, while increasing coverage of vulnerable populations by expanding to innovative platforms. This study aims to examine the vulnerable groups at higher risk of showing symptoms of mental health illnesses during the COVID-19 pandemic, its impacts on risky health behaviors in the Canadian population, as well as its relationship with economic concerns indicators. A unit increase in the individuals who have financial impact concerns is associated with a decrease of one fifth of the standard deviation of the Self Perceived Mental Health (SPMH) score, and a decrease one half of the standard deviation of the Generalized Anxiety Disorder (GAD) score. My results also suggest that youth, women, and those currently absent from work are among the most vulnerable subgroups. On average, women are reportedly associated with a decrease of one fourth of a standard deviation on the SPMH score and a decrease of one fourth of a standard deviation on the GAD score. Rates of frequency of risky health behaviors have also risen steadily, with those showing increased frequencies in alcohol consumption were associated with 3.1% more likely to report poor mental health status, and 6.5% fair mental health. In addition, a unit increase in the alcohol consumption respondents is 7.9% less likely to report excellent mental health status. providing evidence for government interventions to prevail such behaviors on targeted vulnerable cohorts.

LIST OF ABBREVIATIONS USED

SPMH   Self Perceived Mental Health

GAD   Generalized Anxiety Disorder

OLS   Ordinary Least Squares

WHO   World Health Organization

CPSS   Canadian Perspectives Survey Series

COVID   New strain of Coronavirus disease

RHB   Risky Health Behaviors

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CHAPTER 1: INTRODUCTION

On March 11, 2020, The World Health Organization (WHO) declared the COVID outbreak as a global pandemic (WHO, 2020). COVID is an infectious virus caused by the acute respiratory coronavirus (WHO, 2020). While the disease originated in the city of Wuhan in China, it has spread rapidly across the world, resulting in life losses of over 2.8 million deaths as of March 30th, 2021(WHO, 2021). The world's largest economies are among the ones that have been the most affected (Baldwin and Di Mauro, 2020).

The first reported case of COVID in Canada was on January 25, 2020 (Health Canada, 2020). To prevent further spread of the virus, the Canadian federal and provincial authorities implemented laws and policies such as shutting down schools, community centres, and non-essential businesses. In addition, mass gatherings have been prohibited, and lockdown measures were imposed for those returning from travelling abroad. However, all these measures have created challenges for citizens, impacting their mental health and well-being (Beland et al, 2020; Choi et al, 2020; Dozois, 2020; Mazza et al, 2020).

COVID has also significantly impacted the global economies and the financial markets. Increased unemployment rates, large pay cuts, as well as disruption of supply chain distributions, are among the consequences of the pandemic (Pak et al. 2020). Because of high transportation connectivity, globalization, and economic innovations, it has been costly to mitigate the importation risks once the virus started to spread in multiple locations. Lenzen et al (2020) conducted a spillover costs analysis where, based on information as of May 2020, they showed that global consumption losses amount to 3.8$tr, triggering significant job (147 million full-time equivalent) and income (2.1$tr) losses.

The closure of businesses and schools affected about 3.1 million Canadians that experienced a direct job loss or reduced work hours as of May 2020 (Statistics Canada 2020a). Many other Canadians transitioned to working from home due to the public

health orders that encouraged social distancing and isolation at home when needed. Roughly 41% of jobs in Canada had shifted to telework or work from home. As a result, the downturn in economic activity due to COVID is expected to have an effect unlike any other past recessions in Canada (Lemieux et al. 2020).

There is considerable evidence that countries globally are experiencing substantial levels of distress and depression as a result of COVID pandemic (Choi et al, 2020; Dozois, 2020; Mazza et al, 2020). Furthermore, the potential impact of COVID on the mental health of the population is significant and unprecedented (Montemurro, 2020). The virus continues to expose the weaknesses of our healthcare systems, media, political institutions, and our economies. Much of the efforts up to date have been focused on the immediate costs of COVID, with mortality, business closures, job losses, etc. While these are potential outcomes of the pandemic, damage to human mental health and well-being should be studied immensely, to understand the long run effects of this crisis. Even though the COVID policies are mostly focused on the number of cases and deaths from the virus, attention must be paid to those at higher risk of mental health illnesses during the pandemic.

The difference between the current pandemic compared to the previous ones is the presence of an acute public health crisis, alongside a significant downturn of economic activities, resulting in a slowdown of the global economy. The mental health problems triggered by the viral outbreak might have long term lasting consequences in our well-being. The challenges of social distancing and safer at home practices, reduced ability to work and reduced interaction with the society might lead to greater anxiety, loneliness, and stress.

In this paper I examine the subjective mental health status of Canadians, using as a proxy of mental health, two direct measures of subjective mental health indicators such as the self perceived mental health (SPMH), and the generalized anxiety disorder severity index (GAD) found in CPSS2. Firstly, I ask, what are the most vulnerable cohorts that are severely affected due to the current pandemic? How are financial instability,

transition of working from home as well as concerns regarding food insecurity affecting Canadians? Are Canadians engaging in risky health behaviors as a result of the pandemic?

My analysis uses a unique web panel survey provided by Statistics Canada called "The Canadian Perspectives Series" to assess the mental health status of the Canadian population during the COVID pandemic. Because CPSS2 asks questions about mental health, health behaviours, labour market activities and food insecurity, I examine the vulnerable cohorts that are mostly affected by the current pandemic, to highlight evidence for effective policy implementations by the authorities.

I find that the subpopulations most likely to report low mental health status are youth aged 15-24 years old, women, those who currently reside in an urban area, and those who are born in Canada. In addition, I find that perceived mental health is lower among the most affected workers. Those who are currently absent from work due to COVID or absent due to other reasons, are 4.8% more likely to report poor mental health status compared to the other labor force outcomes. Lastly, I find that individuals who are absent from work and report higher engagement in risky health behaviors, are more likely to be diagnosed with severe anxiety symptoms, as well as report low self-perceived mental health status. Those showing increased frequencies in alcohol consumption were associated with 3.1% more likely to report poor mental health status, and 6.5% more likely to report fair mental health.

This study contributes to the ongoing literature that assesses mental health during the COVID pandemic, where my focus will be in the Canadian context. To the best of my abilities, only Beland et al (2020), Zajacova et al (2020), and Findlay et al (2020) have examined the mental health status of Canadians during the COVID pandemic. However, my study complements the three forementioned studies by briefly examining the most vulnerable subpopulations in Canada using a non-linear model, as well as quantify the extent of socioeconomic factors that impact subjective mental health. Moreover, I examine the effects of other economic stressors such as financial impact, food

insecurity, as well as the impact of the transition of working from home, to build on the current literature that highlights the determinants of subjective mental health outcomes. In addition, my study contributes to the literature that examines Risky Health Behaviors during health pandemics, building on a recent study by Zajacova et al (202), which highlighted the socio-demographic disparities that arise as a result of the health behavioral changes. As Hobin and Smith (2020) have stated in their recent commentary[1], there is evidence for policy implementation for controlling public access of alcohol during the pandemic across Canada.

This paper is presented as follows: Chapter 2 presents the previous literature on the effects of COVID on mental health. Chapter 3 discusses the data, Chapter 4 discuses the variable selection, Chapter 5 presents the methodology, Chapter 6 presents the descriptive and main results, , Chapter 7 provides the robustness checks and limitations and Chapter 8 presents the discussion of the results , and Chapter 9 presents the conclusion.

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[1] Taken from the recent Canadian Journal of Economics Commentary provided by Hobing and Smith (2020).
 See here: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7301768/pdf/41997_2020_Article_360.pdf

CHAPTER 2: LITERATURE REVIEW

Within the first month of the COVID pandemic, evidence from all over the world has shown the increased incidences in mental health distresses. Deteriorating mental health outcomes have been well documented in the UK (Pierce et al. 2020) and China (Qiu et al. 2020). In Canada, the toll on mental health as a result of the pandemic is not well known. Mental health is explicitly highlighted as a priority under the Canada Health Act, which states that "the primary objective of Canadian health care policy is to protect, promote and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to health services without financial or other barrier"[2]. As a result, the tracking of the populations' well-being and addressing the disproportionate effect of the pandemic on the mental health among minority groups should be a priority. As Ben Bernanke and Thomas Jefferson have suggested, increasing subjective well-being (SWB) might be the ultimate goal of government policy[3].

In the economics field, there has been increasing interest in studying SWB, which can help inform the policies of governments and central banks who must meet important objectives. This increased interest has risen given the concerns regarding macroeconomic measures such as GDP and its ability to track current and future quality of life and living conditions (OECD, 2013). More than ever, the evidence for effective policy is crucial to implement guidelines on how to recover from this global pandemic. Previous research has stated that shocks such as pandemics or natural disasters impact individual's emotions, which are detrimental to the mental well-being (Folkman & Greer 2020, Maunder et al, 2003).

Golberstein et al (2020) argue that due to the unique combination of the global crisis with economic uncertainties and public health orders, mental health incidents among youth will skyrise during this pandemic. Since most mental health disorders begin in

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[2] Taken from the Research Publications in the Library of Parliament of the Government of Canada. See here: https://lop.parl.ca/sites/PublicWebsite/default/en_CA/ResearchPublications/201954E?
[3] Taken from an Economic Measurement Speech during his time as a Chairman in 2012. See here: https://www.federalreserve.gov/newsevents/speech/bernanke20120806a.htm

childhood, these conditions must be identified and treated early (Centers for Disease and Prevention Control, 2020). Counselling services that are often in the school systems are now disrupted. A study estimated that 13.2% of adolescents in the United States received mental health services from a school setting (Lipari et al. 2016). Those adolescents from minority ethnical groups with lower family incomes, or those without health insurance will be among the most vulnerable US cohorts to not receive the mental health treatments they would otherwise receive (Ali et al. 2019). In addition, adolescents are more sensitive to social connectedness than adults (Choudhury et al, 2006).
A recent study in England highlights the effects of school closures during the two lockdowns and its impact on increased declines in the children's mental health (Blanden et al. 2021). Hence, they might be more affected by the negative psychological consequences arisen due to safer at home public health practices.

Like many developed countries, Canada has an aging population, with roughly 16.9% of its 35 million citizens are aged 65 years or older (Statistics Canada, 2017a). Even though the virus can be transmitted to anybody, older cohorts are more vulnerable to serious respiratory illnesses and infections due to the decline in their immune system (Verity et al. 2020), as well as other pre-existing health conditions (Nikolich-Zugich et al. 2020). Reducing the growth rate of the number of the infections is crucial in protecting these vulnerable age cohorts from developing further health complications, as well as putting enormous pressure on our health care systems. Isolations will likely have a profound effect on older people to be more likely to report loneliness (Wu, 2020), and have a higher likelihood of developing depression and psychological distress (Taylor et al, 2018).

During the pandemic, studies have shown that females tend to be more vulnerable to develop symptoms of various forms of mental disorders including depression, anxiety, PTSD, and stress (Ahmed et al. 2020, Lei et al. 2020). Women also represented a higher percentage of the workforce on those absent from work during COVID due to jobs in retail, service industry, and healthcare according to a recent report by Statistics Canada (2020a). Several papers also suggest that women exhibit differential neurobiological

responses when exposed to stressors, providing the reason behind the overall rate of lower subjective mental health reports (Goel et al. 2014, Eid et al. 2019).

The effects of the COVID pandemic are not only seen in healthcare as an acute respiratory virus, but there are also immense economic consequences as a result of severe job loss and shutdowns of non-essential services temporarily. The short-term labor market consequences of COVID in Canada have been vastly studied in the literature (Beland et al. 2020; Lemieux et al. 2020; R.G Jones et al. 2020; Gallacher and Hossein, 2020). This pandemic has led to significant increases in unemployment, reduced hours of work, as well as reduced labor force participation (Beland et al. 2020; R.G Jones et al. 2020). According to a review conducted by Leppin and Aro (2009), there is no solid theoretical framework for the underlying risk perceptions that may have influenced RHBs in similar pandemics (i.e., SARS and Avian influenza); the majority of studies examining risk perceptions and protective behaviors are not model-based and only preliminary insights are usually provided.

Past papers have looked at presenting evidence on the effect of unemployment on subjective well-being in Canada (Malla et al. 2018; Chen and Hou, 2018). Their results find that the unemployed will rate their mental health and well-being lower than the employed individuals. The past literature also shows how mental health might lead to shorter life expectancy, as well as high comorbidity with physical health problems (Lesage et al. 2017). If SRMH is a good predictor for mental health status, it might help prevent the high rates of smoking and substance use for Canadian youth (Sawatski et al. 2010). Schwandt and von Wachter (2019) showed that transitioning from school to work during an economic downturn has negative consequences later in life for socioeconomic status, health, and mortality. Previous findings from Statistics Canada's CPSS1 suggested that fewer Canadians reported excellent or very good mental health during COVID compared to data from 2018 (Findlay and Arim, 2020a). Through all this evidence, the impact of the current pandemic on the mental health conditions for individuals is quite significant.

Watson and Osberg (2018) find an association between economic insecurity and mental health. Unemployment can also affect the well-being of those who worry about becoming unemployed, especially the youth transitioning from school to work, even if they have never experienced unemployment. However, their pooled OLS methodology also showed that much of the psychological distress/job insecurity correlation may be due to the unobservable confounding factors. In a more recent study, they also showed through fixed effects and instruments that an initial one standard deviation increases in economic insecurity, predicted a rise in psychological distress of about 0.57 standard deviations (Watson and Osberg, 2019).

The temporal halt of the economy due to COVID has resulted in worsening labour market outcomes for the Canadian labor force. Among the most affected cohorts are youth transitioning from school to work. As past crisis have shown, youth are most likely to be the first ones to lose their jobs during a crisis, and the last ones to get a job given the higher job competition for fewer opened positions (Kahn 2010). Financial and job insecurity should also affect the long-term health due to various uncertainties arising from the downturn of the business cycle.

The last financial crisis in 2008 had enormous impact on the young people who were seeking employment after graduation. For example, out of the world 's estimated 211 million unemployed people in 2009, nearly 40 per cent were between 15 and 24 years of age (ILO, 2011). A year later, International Labor Office (ILO) members signed a Global Jobs Pact, pledging to mitigate the impact of recession on the youth labor force. This report found evidence that countries with weaker employment protection legislation such as Canada and US suffered larger employment losses (ILO, 2011).

Due to raised childcare needs caused by school and daycare closures, many are prevented from working, especially women, who also, have recorded higher unemployment rates during the pandemic (Statistics Canada, 2020). As a result, the transition of working from home has implications to overwhelm these parents. A recent study showed that family factors play a significant role in Canadians' mental health

during the current crisis. Individuals with at least one child in the household were less likely to report better mental health (Findlay et al, 2020).

The state of the pandemic also often determines things like freedom of mobility through lockdown measures. In those cases where strict measures have been implemented, other critical public health issues such as loneliness might arise (McQuiad et al. 2021). Research has shown that the impacts of loneliness and social isolation were strongly correlated with depression (Pitman et al. 2018), as well as increased vulnerability to develop depression symptoms (Hawkley and Cacioppo, 2010). Now more than ever, social connectedness due to for instance, imposed quarantine, has been shown to dramatically affect mental health (Brooks et al. 2020).

The disruption of daily life also leads to changes in health behaviors. A recent study in a Canadian context found that those who are physically active, become more active, whereas inactive individuals become less active (Lesser and Nienhuis, 2020). In addition, a Statistics Canada report found higher increase in alcohol usage (Roterman 2020). The impacts of COVID on morbidity (Choi et al. 2020) and mortaility (Nayak et al. 2020), might increase the frequency in risky health behaviors due to a coping stress mechanism. A recent study also highlighted the socio-demographic disparities that arise as a result of the health behavioral changes (Zajacova et al. 2020).

CHAPTER 3: DATA

To understand the extent of the pandemic effect on a variety of social topics such as education, health and justice for Canadians, Statistics Canada has constructed a series of surveys called the Canadian Perspectives Survey Series. There are 6 ongoing series that capture how Canadians view emerging challenges that arise due to the current crisis, as well as help policy makers to implement effective policies. These questionnaires ask the same group of participants to complete these surveys over the course of a year. The cross- sections are designed by randomly inviting sample units that participated in the Labor Force Survey for the months between April 2019 and July 2019.

In this paper, I use the CPSS 2 – Monitoring the Effects of COVID, to analyze the socioeconomic impacts of COVID. This survey was conducted from May 4 to May 10, 2020 and contained information about observations during the two reference weeks (the two weeks before the survey was conducted). For this survey, four rotation groups from the LFS were used for the ten provinces. The sample for this second wave is approximately 4600 individuals. The response rate to this survey was 23%, which is lower than the other national surveys. An explanation could be the shorter timeframe for the data collection and the uncertainties associated with the pandemic. This second wave contains information regarding respondents' demographic characteristics, their health measures, labor market outcomes, as well as behavior changes related to COVID. The target population is those residents living across the ten provinces that are 15 years or older. This survey excludes information for those individuals in the military, living in the reserves, living in the territories, the institutionalized population and those in extremely rural areas with low population density.

CHAPTER 4: VARIABLES

I use two different outcome variables that capture the extent of mental health illnesses due to COVID, both found in the CPSS2 questionnaire. First, the self-perceived mental health variable can be used as a proxy for mental health indicators. Second, I utilize a generalised anxiety index called GAD-7, which is based on the variables that describe the frequency in the last two weeks of survey participants' current mental health conditions such as feeling nervous or anxious, not being able to stop worrying, having trouble relaxing, being so restless, feeling afraid as if something awful might happen, or becoming easily annoyed or irritable. GAD-7 is used in population health surveys to identify anxiety disorders and is a great approximation of predicting mental health status (Statistics Canada, CPSS2). Since all these behaviors are categorized under mental health illness symptoms, this strategy will highlight the extent of subjective mental health status for Canadians.

The Primary Care Evaluation of Mental Disorders (PRIME-MD) was an instrument developed and validated in the early 1990s to efficiently diagnose five of the most common types of mental disorders presenting in medical populations (PHQ Instructions Manual). To assess and diagnose generalized anxiety disorder, the GAD-7 is also used as a good proxy to screen for panic and social anxiety, and post-traumatic stress disorder. This score is generated by adding the scores 0-3 of seven items that compose the GAD-7. Scores of 5, 10 and 15 represent mild, moderate, and severe anxiety conditions. A recommended 10-point score cut-off is suggested for anxiety disorders screenings (PHQ Instructions Manual). According to preliminary analysis by Statistics Canada, it is estimated that 1 in 5 Canadians reported symptoms of moderate to severe anxiety (Statistics Canada, CPSS2).

The variable being used as a proxy for mental health derives from the online questionnaire which asked: "In general, how would you describe your mental health?" where their answers varied from either Poor, Fair, Good, Very Good or Excellent. Self perceived mental health (SPMH) is a variable which takes values ranging from 1 (Poor)

to 5 (Excellent). This question was answered by the vast majority of the survey participants, making the sample size for the purpose of this study 4590 individuals.

Because of the nature of the constructed anxiety variable, I generate this new dependent categorical variable where I group severity of anxiety outcomes into 5 groups; the scores 0-6 represent severe anxiety, scores 7-11 represent moderate, 12-16 represent mild, 17-20 represent minimal and 21 shows no signs of anxiety. These five categories are given values ranging from 1 (Severe) to 5 (None). This anxiety severity variable was constructed based on the GAD-7 manual that uses this same methodology to examine anxiety on subjective mental health survey data.

As per the existing literature and the availability of questions assessed in the CPSS2, I considered a variety of demographic variables (sex, age group, marital status, immigration status), socioeconomic variables (employment status, financial concerns, food insecurity) and geographic variable (urbanicity), which are known to be associated with mental health outcomes.

Age is categorized in intervals of 10 starting with age group 15 to 24, 25 to 34 years old until 75 years and older. Sex of the responded is a dichotomous variable with values 0=Male and 1= Female. Immigration status is a binary variable with values 0=born in Canada and 1= being born outside Canada. Employment status is categorized in 4 outcomes; not employed, employed but not working due to COVID, employed but not working due to non-COVID reasons, and employed. Urbanicity is a geographical dichotomous variable with values 0= Rural and 1=Urban for whether a person resides in the city or rural area.

CHAPTER 5: METHODOLOGY

Part I

Given the nature of the ordered outcome dependent variable, multiple OLS regressions and Ordered Probit nonlinear models will be used to examine the impacts of COVID on the mental health indicators of Canadians. . Compared to OLS linear regressions, this method has advantage of treating the outcome variables as ordinal instead of continuous Even though there are numbers assigned to each ordered category, the difference between the first and second outcome may not be the same as the difference between the second and third outcome. In addition, I test the proportional odds assumption for each variable of model specification (1), where the result implied that the assumption was not violated. Hence, the forementioned strategies are the appropriate models for correct model specifications. Marginal effects will be used to estimate the probability of a change in the independent variable in any of the 5 categories that describe each of the dependent variables.

For the purpose of this study, the following model is estimated:

$$(1)\ Y_i = \alpha + \beta Z_i' + X_i + \varepsilon_i \text{ where;}$$

y_i describes the subjective mental health indicator (SPMH or GAD). Vector X_i contains all the socio-demographic characteristics of each individual such as age group, gender, marital status, born in Canada or not, and whether they live in an urban or rural region. Z_i' corresponds to the economic context covariates as well as life stressors that might impact mental health. Other economic variables included are for instance employment status categories based on whether individuals are employed or not during the pandemic. Financial impact refers to the financial insecurity/ impact due to COVID and it is a dummy categorized as moderate/major impact versus minor/no impact/too soon to tell. Food insecurity captures the extent of food insecurity impact due to COVID and it is a constructed dummy showing whether there is an impact or not.

Part II

This model specification aims to answer the question of how negative health behaviors are impacting the mental health status of Canadians as a result of the drastic measures placed to prevent the further viral transmission.

The following is estimated:

$$Y_i = \alpha + \beta Z_i' + X_i + \varepsilon_i \quad \text{where;}$$

y_i describes the individual *i's* subjective mental health indicators (SPMH or GAD). Vector $\mathbf{X_i}$ contains all the socio-demographic characteristics of each individual such as age group, gender, marital status, born in Canada or not, and whether they live in an urban or rural region. Vector Z_i' corresponds to all the RHB of each survey respondent by capturing the change in frequency of substance consumption during the past two weeks prior to reference week. The variables of interest are alcohol, tobacco, and cigarette consumption.

I reconstruct each RHB variable by creating two dummies for each substance consumption, in order to capture the variation of the respondents that had shown increased or decreased substance consumption during the reference weeks, to accurately examine these behavior changes.

CHAPTER 6: RESULTS

6.1 DESCRIPTIVE RESULTS

In Table 6.1.1, I provide weighted percentages for the categorical variables of interest for this study. Columns refer to the various ways the observations are divided based on their employment status. These columns include those who are considered employed (columns 1, 2 & 3) such as those who worked or were absent for reasons related or not to COVID. Column 4 refers to those who are unemployed. Based on this sample, 42% are unemployed.

Roughly a fifth (19.4%) of individuals report their mental health as Fair or Poor. An interesting comparison rises between columns (1) and (4), which shows that those at work perceive their mental health as Fair or Poor roughly 20%, compared to about 17% for those at column (4) representing the unemployed. Comparing SPMH to the second dependent variable GAD, approximately 14% of the respondents would show symptoms for severe and moderate generalized anxiety disorders.

Besides the perceived mental health, another key characteristic that might arise as a result of the crisis is the individual's ability to "meet their financial obligations or essential needs". As seen in the middle panel of Table 6.1.1, over half of the respondents (54.3%) report as COVID having no impact on their financial challenges and this is similar across those employed and unemployed.

Table 6.1.2 provides an overall description of perceived mental health for the survey respondents based on their socio-demographic characteristics. Columns refer to how each respondent ranks on a scale from 1-5 their self-perceived mental health with 1 being "Poor" and 5 rated as "Excellent".

In the first-row panel are the age categories of the respondents. Comparing within categories, only 9% of the age group 25 to 34 years old report excellent mental health status, and 21% report poor outcomes. In contrast, 26% of the age groups 65 to 74 years old rate their mental health as excellent, as opposed to only 4% reporting poor perceived mental health. These results align with another recent study that examined age differences in risk perceptions during the pandemic (Bruine de Bruin, 2020).

Moreover, of those reporting excellent perceived mental health, 56% are male, compared to 44% being females. On the other side of the spectrum, 59% of women report poor mental health, as opposed to 41% of men. In addition, independent group t-tests were conducted to compare means of same variable between two groups, assuming the variances for the two populations are the same. When looking at both of the subjective mental health indicators across gender, the average subjective mental health indicator for female was different than for the average subjective mental health indicator for male[4].

Only 21% those who have a child under the age of 18 in their dwelling reported their mental health as "excellent" compared to 80% of those who do not have a child that reported the same value on the mental health scale. This suggests that parents with their kids at home might face more challenges as they need to balance out their work from home as well as taking care of their young ones. In contrast, 82% of those that live in urban areas reported "Poor" perceived mental health, and only 18% of those living in the rural areas stated the same.

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[4] The student t statistic value= 7.39, with degrees of freedom=4501. My results provided a p<0.01, hence we reject the null hypothesis of the two means being the same, and I conclude that the difference of means in subjective mental health indicators between males and females is different from 0.

Table 6.1.3 provides a frequency summary of the main mental health illness symptoms under which 19% of the survey respondents rated their perceived mental health as "Poor" or "Fair". About 17% of them stated that they have felt anxious or nervous very frequently in the past two weeks, showing the magnitude of COVID impact on Canadians. Similarly, 14% showed that they have been worrying too much about things in the past two weeks as well. Other reports of potential mental illness symptoms such as the consideration of main job loss in the next 4 weeks shows that about 14% of survey respondents share these concerns. 12% also reported high frequencies of feeling afraid as if something might happen to them, reflecting the sentiment around the pandemic and its effect on individuals' decision-making process.

6.2 MAIN RESULTS

I begin my analysis by firstly running an OLS regression methodology, followed by nonlinear ordered probit model. The objective of this estimation is to investigate the impact of COVID on the mental health status of the survey respondents. The OLS estimation results are summarized in Table 4. I define a specification starting from a base model with current employment status and controlling for socio-demographic variables such as age categories, gender, whether they were born outside of Canada, whether they are married/common law or single/separated, and whether they live in a rural or urban region. I add stress factors such as financial impact and food insecurity in the second specification. Lastly, I add telework status characteristics by using information about where individuals are currently working.

Table 6.2.1 shows the results of my OLS regressions with the dependent variables being perceived mental health and anxiety severity. The findings across all 6 columns of Table 6.2.1 are consistent with the expectations that the most impacted individuals that rate their mental health the lowest during COVID are the vulnerable sub cohorts such as youth (aged 15-24), women, and those who live in an urban area (Beland et al, 2020, Zajacova et al, 2020). In addition, those who are born outside of Canada and those married or in common law report higher scores across both mental health indicators.

Columns (1) and (4) of Table 6.2.1 report how employment status affects mental health indicators. Those who are currently employed but absent from work for reasons not related to COVID as well as those absent from work due to COVID, indicate lower scores on the mental health outcomes and is a statistically significant result. A unit increase in the number of people absent from work due to COVID, is associated with a decrease of one fourth of a standard deviation in the SPMH score and a decrease of one fifth of a standard deviation in the GAD score. In contrast, individuals who are not employed show no change in their mental health indicators. Age categories 25 to 54 and age over 54 report higher scores on mental health outcomes across both scales. Lastly, individuals who are either married or common law indicate higher mental health scores.

The findings in columns (2) and (5) indicate that individuals who might have life stressors such as concerns regarding food insecurity or financial impact are both associated with lower scores in perceived mental health and anxiety severity scores. A unit increase in the individuals who have financial impact concerns is associated with a decrease of one fifth of the standard deviation of the Self Perceived Mental Health score, and a decrease one half of the standard deviation of the Generalized Anxiety Disorder score. Lastly, those who live in an urban area indicate a lower mental health status, which is an anticipated outcome given the public health stay at home safety measures during the time of this study. The findings in columns (3) and (6) in Table 4 represent sociodemographic characteristics with indicators of work location. Those who work outside home report a higher perceived mental health status. In contrast, column (6) shows that those who are currently absent from work are the ones who report higher anxiety severity scores.

For estimation purposes, both ordered probit and ordered logit models were constructed for model specification (1) as robustness checks. However, the logit estimations were roughly 1.6 times larger, due to the higher standard errors. As a result, I consider the ordered probit specifications and appropriate average marginal effects are also presented. Marginal effects are estimates of the change in an outcome for a change in one independent variable, holding all other variables constant. Margins command computes the partial derivative with respect to the categorical variable and computes the discrete change for factor (dummy) variables. Predicted probabilities will also be used to examine how vulnerable cohorts differ from the impacts of COVID on their mental health.

Table 6.2.2 presents the ordered probit coefficients of the specification (1). Given the nature of the nonlinearity of the model, these coefficients of the table 5 must be interpreted accurately due to difference in scale factor.

Column 1 results show consistent outcomes compared to the OLS model presented in Table 6.2.1. Individuals that are employed but absent from work for non COVID related reasons as well as those absent due to COVID, are more likely to report lower perceived

mental health status, as well as lower anxiety score. In addition, individuals who have showed food insecurity concerns are more likely to report lower scores across both mental health indicators. Both results are statistically significant. In contrary, those currently working outside from home are more likely to report higher mental health conditions. Given that most of the individuals who work outside their home during this pandemic are most likely to be working in the essential services, this is a surprising outcome. Consistent to the OLS specification, youth aged 15 to 24, females, and those living in urban areas, are more likely to report lower mental health.

Table 6.2.3 presents the marginal effects of employment status on self perceived mental health. The base model for Table 6.2.3 is the currently employed category. Column 1 represents those who are currently employed but absent due non COVID related issues. The individuals in this group are 2.5% more likely to report poor mental health, 5% more likely to report fair mental health, and 6.5% less likely to report excellent mental health, and are statistically significant. With respect to the other employment categories, columns (2) represent individuals who are currently absent from work due to COVID. Individuals in this employment status group are 1.1% more likely to report poor mental health status and 2.6% more likely to report fair perceived mental health. Comparing across these two columns, individuals who are absent due to non COVID reasons are more likely to score lower mental health status, and less likely to score excellent mental health status. Column 3 shows non-monotonic results for individuals who are currently unemployed. These results suggest that the temporal labour market freeze and reduced working hours as a result of COVID, is taking a toll on the mental health of Canadians.

Table 6.2.4 reports the ordered probit average marginal effects of employment categories on general anxiety scores. The base model for Table 6.2.4 is the currently employed category. A unit increase in the number of individuals who are employed but currently absent for non-COVID related reasons, would be associated with 3% more likely to have severe anxiety, 2.5% more likely to have moderate anxiety, and 6% less likely to not report any generalized anxiety symptoms. In addition, a unit increase in the individuals that are currently employed but absent due to COVID is associated with

4.7% more likely of reporting severe anxiety, 3.8 % more likely reporting moderate anxiety, and about 9% less likely to not report any anxiety symptoms. Comparing across these two columns, individuals who are absent due to non COVID reasons are less likely to show severe anxiety symptoms and less likely to score no anxiety symptoms. Lastly, column 3 shows non-monotonic results for individuals who are currently unemployed.

In Figure 1, I present the adjusted predictions of the probabilities using representative values of employment status categories on perceived mental health outcomes. The horizontal lines represent the dependent variable categories, which are rated from 0 "Poor" to 4 "Excellent". The vertical lines show the predicted probabilities. As seen in Figure 1, panels (i) to (iv) show consistency across all employment categories. Individuals show higher probabilities of reporting improved mental health status.

Table 6.2.5 presents the results of the adjusted predictions (or predictive margins) of employment status on mental health. Column 1 presents the adjusted probabilities of each perceived mental health outcome for employed individuals. 3.5% of employed cohorts are predicted to report poor perceived mental health, and 14.9% are predicted to report fair status. As expected, those employed are the ones with the smallest predicted probabilities of reporting poor mental health compared to the other employment status outcomes.

Column 3 presents the predicted probabilities of perceived mental health for those who are currently absent from work for reasons related to COVID. 4.8% of these individuals are predicted of reporting poor perceived mental status, 17.7 % are expected to report fair mental health, and 16% are predicted to report excellent mental health. This category is expected to have one of the highest probabilities of reporting poor mental health status, as well as one of the lowest probabilities of reporting excellent mental health status. Columns 2 and 4 are comparisons of the employed and not employed individuals. All these results are robust and statistically significant.

Out of all the labor market categories, those absent from work in the reference week due to non-COVID reasons, are more likely to score low on the SPMH, and those in the employed categories are more likely to score high on the SPMH.

In Figure 2, I present the adjusted predictions of the probabilities using representative values of employment status categories on anxiety severity outcomes. The horizontal lines represent the dependent variable categories, which are rated from 0 "Severe Anxiety" to 4 "No Anxiety". The vertical lines show the predicted probabilities. As seen in Figure 2, panels (i) to (iv) show consistency across all employment categories. Compared to the adjusted predictions on perceived mental health, the visual representation of anxiety severity indicates that individuals will have higher probabilities of showing improved mental health status.

Table 6.2.6 presents the results of the adjusted predictions of employment status on mental health. Column 1 presents the predicted probabilities of each anxiety severity outcome for employed individuals. 5.9% of employed cohorts are predicted to report severe anxiety symptoms, and 8.8% are predicted to report moderate anxiety. Lastly, 25% of this outcome are predicted to report no anxiety symptoms. As expected, those employed are among the ones with the smallest predicted probabilities of reporting severe anxiety symptoms compared to the other employment status outcomes.

Column 2 presents the predicted probabilities of anxiety severity symptoms for those who are currently absent from work for reasons not related to COVID. 8.8% of these individuals are predicted to report severe anxiety symptoms, and 11.3 % are predicted to report moderate anxiety. Lastly, 18.8% of this outcome are predicted to report no anxiety symptoms.

Column 3 presents the predicted probabilities of anxiety severity symptoms for those who are currently absent from work for reasons related to COVID. This category is expected to have the highest probability of reporting a severe anxiety with 10.6% of those falling under this category, as well as the lowest probability of reporting no anxiety

symptoms with 16.1% predicted. Column 4 shows the predicted probabilities of anxiety severity symptoms for those who are currently not employed. 26% of them are predicted to report no anxiety symptoms, among the highest compared to the other labor force outcomes. All these results are robust and statistically significant.

Part II

The next estimation investigates the engagement in risky health behaviors of Canadians due to COVID. I begin with the effects of labour force status and control for socio-demographic covariates, and on each column, I extend to the behaviors that survey respondents implement to reduce their exposure to mental health chronic illnesses. These behaviors are given if terms of frequency in the last 2 weeks of April, prior to the reference week of when the survey was conducted.

The findings in columns 1 and 4 of Table 6.2.7 show the effects of alcohol consumption change on each of the subjective mental health indicators. Across both specifications, a unit increase in the alcohol consumption behavior is associated with a decrease of one third of a standard deviation on the SPMH score, and a decrease of one third of a standard deviation on the GAD score and are statistically significant results. These results indicate that individuals who engage in increased substance consumption are associated with reporting poor subjective mental health during the COVID pandemic.

Columns 2 and 5 examine the effects of tobacco consumption change on SPMH and GAD scores. Across each specification, a unit increase in the tobacco consumption is associated with 0.61 units on the SPMH score and a decrease of 3.68 units on the GAD score. These are the largest magnitudes which suggest that tobacco might be among one of the substances that is more closely associated with poor mental health status. Columns 3 and 6 examine the effects of cannabis consumption, and the results suggest that a unit increase in the decreased cannabis consumption is associated with a decrease of a half of a standard deviation on the SPMH score and a decrease of one tenth of a standard deviation on the GAD score and it is a statistically robust result. This surprising result might be an indicator of how the legalization of cannabis has played a role in

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people's perception on using these behavior mechanisms to cope with stress and anxiety. An explanation for this result is supported from a recent US National Institute on Drug Abuse (NIDA) study, which showed that 30% of cannabis consumers had some degree of marijuana use disorder, indicating that marijuana addiction might be more severe across the three substance consumptions (NIDA, 2020). A comparison across all columns suggests that an increased tobacco consumption is more strongly associated with poor mental health status on both indicators.

Table 6.2.8 shows the ordered probit estimations of the effects of the change in frequency of substance consumption on both of the subjective mental health indicators. Columns 1 and 2 results suggest that increased alcohol consumption is more likely to be associated with lower mental health status. Similarly, an increased frequency in tobacco consumption and a decreased frequency in cannabis consumption is more likely associated with lower subjective mental health scores.

Table 6.2.9 presents the marginal effects of each risky health behavior dummy on self perceived mental health. Considering the results in column 1, those who have showed increased alcohol consumption versus those who have shown no change, are 3.1% more likely to report poor mental health status, and 6.5% fair mental health. In addition, a unit increase in the alcohol consumption respondents is associated are 7.9% less likely to report excellent mental health status. A unit increase of respondents who have shown increased frequency in tobacco consumption in this timeframe are associated with a 7.5% more likely chance of reporting poor mental health status, and a 3.3% less likely chance of reporting excellent mental health. Lastly, a unit increase in frequency of cannabis consumption is associated with a 5.6% more likely chance of reporting poor mental health, and 10% less likely to report excellent mental health status. These results suggest evidence for policy implementation for controlling substance use during the pandemic. Given the significant economic burden that mental illness has in Canada, it is crucial that authorities must design targeted consumption policies to prevent permanent behaviors that could contribute to long term, chronic, and costly health problems.

CHAPTER 7: LIMITATIONS

To examine the SMH indicators, I make use of the cross- sectional CPSS2 as the only available dataset at the time of the study. Since the study was carried out at a point in time during the pandemic, there cannot be conclusions drawn about the long-term effects. An important caveat is that the response rate for the survey series was relatively low (24%), perhaps due to the short time available for Statistics Canada to collect the data. Given that this was an online survey, the sample was not fully representative of the overall population of Canada. Individuals who do not have internet access or internet services, and those living in rural "blackout zones", are therefore not represented in this study. Lastly, it was not possible to explore a more refined breakdown of important socio-economic categories such as age categories or employment categories.

Since the dependent variables are ordinal but not continuous in that the metric used to code the variables is substantively meaningful, the ordered probit/logit models are used. As a robustness check, all the ordered logit models and results are found on the Appendix. The use of these non-linear models allows for relaxation of the single index assumption, which is widely applied in the health literature to control for reporting bias in the subjective measures. As a robustness check, I use two subjective mental health indicators available from the survey to identify whether the effects from the pandemic affect these indicators differently. However, both the self-perceived mental health and the generalized anxiety index scores yielded similar outcomes with respect to the effects of the pandemic. In addition, given the construction of the survey, more detailed measures of mental health such as specific symptoms of mental health disorders were not collected.

Another limitation of this study is that instead of using clinical mental health assessments, I use subjective mental health indicators to define mental health. As a result, I utilize the subjective mental health indicators as a proxy of mental health status. However, the literature finds that sometimes this proxy might be an overrepresentation of mental health illnesses (Bostrom et al. 2016). Moreover, mental health is a complex concept and is defined differently for mental illnesses: there are people that have low

levels of mental health but do not suffer from a psychopathology (Westerhof and Keyes 2010). Attitudes and beliefs of individuals about mental health illness are shaped by personal knowledge about mental illness, cultural stereotypes, or having someone who is living with a mental illness. Since it is identified by how an individual recognize and estimate their outcomes and prognoses, this interpretation will vary from person to person.

For mental well-being, we need to ask how much of the variable of mental health status is driven by latent factors such as health-related genetics and personality trains, and by how much these correlate with observable factors. In the context of mental health, an interesting candidate for the composition of the unobserved effect is cognitive ability, a factor widely acknowledged by labour economists that study the wage biases in wage regressions if left unaccounted for cognitive ability (Newson et al. 2020).

The biggest empirical challenge regarding this study is the effect of heterogeneity on SMH indicators. Across the scope of mental health research and diagnosis, there are a range of questionnaires available for use by community health researchers. Individual heterogeneity plays a key role in explaining variation in self reported health assessments such as well-being or life satisfaction. It is also hypothesized that the influence of this heterogeneity varies over levels of health and increases over the life cycle.

However, unobserved heterogeneity is not readily available for categorical measures of subjective mental health status. The cross-sectional CPSS also lack a meaningful pre-COVID comparison group to examine the true impact of COVID on mental health, not allowing for examination of mental health changes within individuals for a causal interpretation. In other words, due to the absence of panel data, fixed effects panel data modelling is not possible to account for time invariant unobserved heterogeneity. As a result, ordered probit models have been used for the categorical dependent variable outcomes. In addition, this will help examine the link between mental well-being and observable factors such as labor force status and other socioeconomic variables, and how this can be assessed reliably in the presence of confounding latent variables.

Another limitation to my research is the model specification regarding the risky health behaviors. Given the cross- sectional nature of my data, I did not have a valid comparison of how these risky behaviors have changed since the beginning of the pandemic. However, given that my results showed that those who were employed but not working due to COVID and that showed increased frequency in alcohol consumption were the ones to report lower mental health status. Moreover, I cannot distinguish whether the observed patterns in RHB are age-driven or inherent to different birth cohorts. In addition, the division of marital status onto a dichotomous variable as married/common law versus single/divorced/widow was carefully not interpreted in my results given that they might have different mental health status.

It is very important to distinguish how mental health has changed over the course of the pandemic. An interesting further project could be an experimental design to examine and measure the changes in mental health as the pandemic progresses. Given that the government implemented economic relief support programs at different timelines, it is difficult to establish whether mental health status has improved during the presence of these generous packages. This is an important caveat in order to formulate effective policy implementations that target the various demographic groups mostly impacted. The absence of a panel dataset in a Canadian context that tracks mental health and well-being would solve this issue and provide evidence for policy intervention in the long term.

CHAPTER 8: DISCUSSION

In this section, I focus on the results of my estimation strategy conducted to estimate the consequences of the COVID pandemic on subjective mental health of the Canadian population. The ordered probit/logit models are used to identify the vulnerable cohorts who report poor or fair perceived mental health, or those who show moderate or severe anxiety symptoms. My estimations suggest that the most affected individuals who are more likely to report poor mental health outcomes are youth aged 15-24 years old, women, those that live in urban areas, and those that are born in Canada. The age difference and mental health outcomes is an interesting result, which has been also noted in important studies that have shown that older adult age was associated with less depression and anxiety symptoms (Bruine de Bruin, 2021). Even though my results are consistent with the research that shows how the perceived COVID threat may impact individuals' mental health (Usher et al, 2020; Killgore et al, 2020; Lima et al, 2020), individuals also have shown worsen mental health status due to them experiencing fear as a result of the threat perception by COVID (Paredes et al, 2021). These outcomes suggest that the older adults appear to have a more optimistic point of view and mental health perceptions regarding the pandemic.

After running each regression model, the observations with any missing values in both independent and dependent variables get omitted from the model. As a result, there are 129 observations omitted since they did not provide any responses for the outcome variables. In addition, 700 observations were omitted when financial insecurity was added onto the model, and approximately 2000 observations were omitted when the telework variable was added given that these questions had a moderate extent of missing values.

In an effort to prevent the further spread of the virus, public health officials introduced various measures such as social distancing, lockdowns, and self-isolation. However, the number of patients contracting the disease as well as death rates continue to climb. Nonetheless, these measures can have a detrimental effect on the mental health and well-being of the society. A recent study in England estimated the trajectories of anxiety and depression over the 20 weeks of the lockdown and showed that as the number of COVID

cases increase, so do the reports of mental health incidents (Fancourt et al. 2020). To infer causality between these two variables, one would have to be extremely careful with the interpretation, as the direction of causality could go both ways. As people become more depressed due to the lockdown measures, they reach for social interaction in a less cautious way, which could generate infection spikes. While this is still an open question, it would be an important research question that would benefit authorities to have a better preparation in the event of an unexpected public health crisis.

Consistent with other studies, my findings suggest that labor force status also affects the subjective mental health indicators. Those that are currently absent from work due to COVID as well as those absent due to non COVID related reasons, are more likely to show symptoms of mental health illness. Based on my results, 61% and 45% of these two groups respectively reported good, fair or poor mental health. Using adjusted predictions of the probabilities with representative values of employment status categories on subjective mental health indicators, those employed are the ones with the smallest predicted probabilities of reporting poor mental health compared to the other employment status outcomes. Beland et al (2020) predicted similar outcomes to the methodology used in this study.

In an effort to provide emergency support for its citizens, the Canadian government introduced generous social assistance packages such as the Canadian Emergency Response Benefit (CERB). These packages were implemented to assist individuals who lost employment during the pandemic with $2000 each month (Service Canada, 2020). The initial rollout of this program saw 6.73 million unique applications, which is about one third of the Canadian labor force, with a total value of $19.8 billion (Service Canada, 2020). Even though these policies are a target of efficient and appropriate recovery for the changes in the labor markets, the economic insecurities have risen not only from those who have lost their jobs, but also those who believe that might be in risk of losing their job. Using the Canadian Labor Force Survey, Beland et al (2020) find a substantial decrease in business ownerships between February and May 2020. Given that small businesses play a crucial role in our economy, it will be very interesting to see how this pandemic will affect

their survivorship. Investigating the extent of temporal and permanent business shutdowns due to this pandemic would be an important caveat for future research. These business foreclosures would significantly impact the perceptive well-being of these individuals due to the financial insecurities.

As the concerns regarding the spread of COVID and the impact it has on the labor markets of the Canadian economy, its effects are also seen in other life stressors. In my study, I examine whether the concerns of meeting the financial obligations and food insecurity were also linked with reporting poor mental health outcomes. My results suggest that those individuals that are impacted by these socio-economic concerns were more likely to report low perceived mental health as well as higher anxiety severity scores. These outcomes add to the literature that uses subjective well-being factors for predicting economic outcomes, with the assumption that these subjective variables are highly reliable.

Moreover, the greatest distress of the pandemic may be caused by the widespread viral transmission resulting in fear of sickness and death. The type of information an individual can access through the internet can influence their perception of risk and psychological responses to an outbreak. This information can come from various sources such as mass media, or social media, which sometimes can lead to lower levels of stress and depression if individuals receive accurate information (Wang et al, 2020). Perhaps social support by consulting and socializing with your significant others could be a treatment option if the mental illness was not very severe. With the aid of technology, this is a viable option that would aid on how social support influences health.

While the vulnerable subgroups highly impacted by COVID are highlighted in this study, I also investigate the risky health behaviors (RHB) of the survey respondents. Literature indicates that underlying risk perceptions have influenced RHBs in the previous pandemics of SARS and Avian influenza (Leppin and Aro, 2009). My results suggest that those who are currently absent from work and engage in increased substance consumption frequencies during the pandemic, are more likely to report lower mental health. This implies that the

higher frequencies of RHBs during COVID confinement might have a higher burden on our healthcare system in the long term.

Using adjusted probabilities, my estimations reveal that those absent from work that have reported increases in alcohol use, are predicted to report poor mental health. This suggests that labor force status is important in predicting subjective mental health status. As a result, the current employment benefits provided by the government might help throughout the course of the pandemic to alleviate some of these mental health concerns.

Even though the COVID policies have been tracking the number of new cases and deaths, these indicators miss out on the real significant connection between the pandemic and our mental health, which is impacting a greater number of people than those who have been infected with COVID. An interesting area of research would be to examine the relationship between mental health status and COVID sentiment, and to establish a causal relationship between the two.

CHAPTER 9: CONCLUSION

On January 25, 2020 Canada recorded its first official case of COVID. On March 11th, the WHO declared COVID a global pandemic. The deterioration of mental health due to COVID is unprecedented and multifold, making it an important case study to understand its long-term implications for those directly and indirectly affected by it.

My results demonstrate that subjective mental health is reported lower among those workers affected by this crisis. When examining the socioeconomic characteristics of the survey respondents, my results suggest that youth, females, those who live in urban regions, and those born in Canada are the vulnerable subpopulations that are more likely to report mental health illnesses due to their lower subjective mental health ratings. These results highlight not only the social effects on the impacts of people and communities, but also expose some of the economic impacts on material well-being and economic activities. While many can be resilient, others may experience psychological impairment and others experience increased symptoms of mental health illnesses.

My findings coincide with the previous literature that studies the subjective mental health status in Canada during the COVID pandemic[5]. These research efforts are crucial for policy makers to efficiently allocate resources to support individuals facing the diverse impacts of COVID. It is likely that the negative effects of public health orders and social distancing restrictions will carry over long term. Ultimately, how people react to the pandemic is likely due to a combination of objective effects (health, finances to name a few) and subjective effects related to the varying ways that people perceive and adapt to the pandemic.

Lastly, the evidence on the increased frequencies of RHB during the COVID pandemic should be a concern for authorities with respect to substance purchasing. Future studies should highlight those vulnerable cohorts, to allow for more intervention policies to disallow further deterioration in these risky health behaviors.

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[5] Some of the most recent literature include the following: Beland et al 2020; Findlay et al 2020; Zajacova et al 2020

REFERENCES

Ahmed, Warish, Nicola Angel, Janette Edson, Kyle Bibby, and Aaron Bivins. "First confirmed detection of SARS-CoV-2 in untreated wastewater in Australia: A proof of concept for the wastewater surveillance of COVID-19 in the community." (August 2020). https://www.sciencedirect.com/science/article/pii/S0048969720322816

Alon, Titan, Matthias Doepke, Jane Olmstead-Rumsey, and Michèle Tertilt. "This Time It's Different: The Role of Women's Employment in a Pandemic Recession." Institute of Labor Economics (August 2020). http://ftp.iza.org/dp13562.pdf.

Béland, Louis-Philippe, Abel Brodeur, Derek Mikola, and Taylor Wright. "The Short-Term Economic Consequences of Covid-19: Occupation Tasks and Mental Health in Canada." Social Science Research Network (May 2020). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3602430.

Bostrom, Petra, Jakob Asberg Johnels, Maria Thorson, and Malin Broberg. "Subjective Mental Health, Peer Relations, Family, and School Environment in Adolescents with Intellectual Developmental Disorder: A First Report of a New Questionnaire Administered on Tablet PCs." Journal of Mental Health Research in Intellectual Disabilities 9, no. 4 (2016).

Brooks, Samantha K., Rebecca K. Webster, Louise E. Smith, Lisa Woodland, and Simon Wessely. "The psychological impact of quarantine and how to reduce it: rapid review of the evidence." The Lancet 395 (March 14, 2020). https://www.thelancet.com/action/showPdf?pii=S0140-6736%2820%2930460-8

Chen, Wen-Hao, and Feng Hou. "The Effect of Unemployment on Life Satisfaction: A Cross-national Comparison Between Canada, Germany, the United Kingdom and the United States." Statistics Canada (2018). https://www150.statcan.gc.ca/n1/en/pub/11f0019m/11f0019m2018408-eng.pdf?st=S-E54YD3

Choudhury, Suparna, Sarah J. Blackmore, and Tony Charman. "Social cognitive development during adolescence." Social Cognitive and Affective Neuroscience 1, no. 3 (December 2006). https://academic.oup.com/scan/article/1/3/165/2362733

de Bruin, Wandi B. "Age Differences in COVID-19 Risk Perceptions and Mental Health: Evidence from a National U.S. Survey Conducted in March." The Journals of Gerontology 76, no. 2 (February 2021): e24-29. https://pubmed.ncbi.nlm.nih.gov/32470120/

Dozois, D.J.A, & Mental Health Research Canada. "Anxiety and Depression in Canada during the COVID-19 Pandemic: A National Survey." Canadian Psychology. Advance online. (August 27, 2020).
https://psycnet.apa.org/record/2020-63541-001

Fancourt, Daisy, Steptoe Andrew and Bu Feifei. "Trajectories of anxiety and depressive symptoms during enforced isolation due to COVID-19: longitudinal analyses of 36,520 adults in England", no.1 (November 2020).
https://www.medrxiv.org/content/10.1101/2020.06.03.20120923v3.full.pdf+html

Findlay, Leanne, and Rubab Arim. "Canadians report lower self-perceived mental health during the COVID-19 pandemic." Statistic Canada (April 2020).
https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00003-eng.htm

Gallacher, Guillermo, and Iqbal Hossain. "Remote Work and Employment Dynamics under COVID-19: Evidence from Canada." University of Toronto Press (August 2020).
https://www.utpjournals.press/doi/full/10.3138/cpp.2020-026.

Gilmour, Heather. "Self-perceived mental health and health-related behaviours of Canadians during the COVID-19 pandemic." Statistics Canada (May 2020).
https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00011-eng.htm

Golberstein, Ezra, Hefei Wen, and Benjamin F. Miller. "Coronavirus Disease 2019 (COVID-19) and Mental Health for Children and Adolescents." JAMA Pediatrics (April 2020).
https://jamanetwork.com/journals/jamapediatrics/article-abstract/2764730.

Hang Choi, Edmond, Bryant Hung Hui, and Eric Fai Wan. "Depression and Anxiety in Hong Kong during COVID-19." International Journal of Environmental Research and Public Health 17, no. 10 (2020).
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7277420/

Hawkley, Louise C., and John T. Cacioppo. "Loneliness Matters: A Theoretical and Empirical Review of Consequences and Mechanisms." Annals of behavioral medicine : a publication of the Society of Behavioral Medicine 40, no. 2 (2010): 218-27.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3874845/

International Labour Organization. "The impact of the economic and financial crisis on youth unemployment." Measures for labour market recovery in the EU, Canada and US, International Labour Organization, International Labour Organization, 2011.
https://www.ilo.org/employment/Whatwedo/Publications/working-papers/WCMS_154365/lang--en/index.htm

Jones, Stephen R., Fabian Lange, W. Craig Riddell, and Casey Warman. "Waiting for Recovery: The Canadian Labour Market in June 2020." University of Toronto Press (August 2020). https://www.utpjournals.press/doi/abs/10.3138/cpp.2020-078.

Killgore, William J., Sara A. Cloonan, Emily C. Taylor, and Natalie S. Dailey. "Loneliness: A signature mental health concern in the era of COVID-19." Psychiatry Research 290 (2020). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7255345/

Lei, Shaoqing, Fang Jiang, Wating Su, Chang Chen, and Jingli Chen. "Clinical characteristics and outcomes of patients undergoing surgeries during the incubation period of COVID-19 infection." The Lancet 21 (April 2020). https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(20)30075-4/fulltext

Lemieux, Thomas, Kevin Milligan, Tammy Schirle, and Mikal Skuterud. "Initial Impacts of the COVID-19 Pandemic on the Canadian Labour Market." University of Toronto Press 46, no. s1 (July 2020). https://www.utpjournals.press/doi/full/10.3138/cpp.2020-049.

Lenzen, Manfred, Mengyu Li, Arunima Malik, Francesco Pomponi, and Ya-Yen Sun. "Global socio-economic losses and environmental gains from the Coronavirus pandemic." PLoS ONE 15, no. 7 (July 2020). https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0235654

Lesser, Iris A., and Carl P. Nienhuis. "The Impact of COVID-19 on Physical Activity Behavior and Well-Being of Canadians." International Journal of Environmental Research and Public Health 17, no. 11 (May 2020). https://pubmed.ncbi.nlm.nih.gov/32486380/

Lima, C., Carvalho, P., Lima, I., Nunes, J., Saraiva, J. S., de Souza, R. I., da Silva, C., & Neto, M. "The emotional impact of Coronavirus 2019-nCoV (new Coronavirus disease)." Psychiatry Research 287 (2020). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7195292/

Lipari, Rachel N., Sarra Hedden, Gary Blau, and Lisa Rubenstein. "Adolescent Mental Health Service Use and Reasons for Using Services in Specialty, Educational, and General Medical Settings." The CBHSQ Report (May 2016). https://www.ncbi.nlm.nih.gov/books/NBK362074/.

Mazza, Cristina, Eleonora Ricci, Silvia Biondi, Marco Colasanti, and Stefano Ferracuti. "A Nationwide Survey of Psychological Distress among Italian people during the COVID-19 Pandemic: Immediate Psychological Responses and Associated Factors." International Journal of Environmental Research and Public Health 17, no. 9 (2020). https://pubmed.ncbi.nlm.nih.gov/32370116/

Montemurro, Nicola. "The emotional impact of COVID-19: From medical staff to common people." Brain, Behavior and Immunity 87 (March 2020). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7138159/pdf/main.pdf

McQuiad, Finn C., Nicky McCreesh, Jonathan M. Read, Tom Summer, and Reim G. Houben. "The potential impact of COVID-19-related disruption on tuberculosis burden." European Respiratory journal (2020). https://erj.ersjournals.com/content/early/2020/06/04/13993003.01718-2020

Nikolich-Zugich, Janko, Kenneth S. Knox, Carlos T. Rios, Bhupinder Natt, and Deepta Bhattacharya. "SARS-CoV-2 and COVID-19 in older adults: what we may expect regarding pathogenesis, immune responses, and outcomes." GeroScience(April 2020). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7145538/

Pak, Anton, Oyelola A. Adegboye, Adeshina I. Adekunle, Kazi M. Rahman, and Emma S. McBryde. "Economic Consequences of the COVID-19 Outbreak: the Need for Epidemic Preparedness." Frontiers in Public Health. Last modified (May 2020). https://www.frontiersin.org/articles/10.3389/fpubh.2020.00241/full.

Paredes, Mario R., Vanessa Apaolazza, Cristobal Fernandez-Robin, Patrick Hartmann, and Diego Yanez-Martinez. "The impact of the COVID-19 pandemic on subjective mental well-being: The interplay of perceived threat, future anxiety and resilience." Personality and Individual Differences 170 (February 15, 2021). https://pubmed.ncbi.nlm.nih.gov/33071413/

Pierce, Matthias, Holly Hope, Tamsin Ford, Stephani Hatch, and Matthew Hotopf. "Mental health before and during the COVID-19 pandemic: a longitudinal probability sample survey of the UK population." The Lancet, Psychiatry 7, no. 10 (July 21, 2020). https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(20)30308-4/fulltext

Pitman, Alexandra, Farhana Mann, and Sonia Johnson. "Advancing our understanding of loneliness and mental health problems in young people." The Lancet, Psychiatry 12 (December 2018). https://pubmed.ncbi.nlm.nih.gov/30477651/

Qian, Yue, and Sylvia Fuller. "COVID-19 and the Gender Employment Gap among Parents of Young Children." University of Toronto Press (August 2020). https://www.utpjournals.press/doi/abs/10.3138/cpp.2020-077.

Qiu, Jianyin, Shen Bin, Wang Zhen, Xie Bin and Xu Yifeng. "A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations" General Psychiatry, vol.33 (February 2020). https://gpsych.bmj.com/content/gpsych/33/2/e100213.full.pdf

Roterman, Michelle. "Canadians who report lower self-perceived mental health during the COVID-19 pandemic more likely to report increased use of cannabis, alcohol and tobacco." Statistics Canada Catalogue No. 45280001. (May 2020). https://www150.statcan.gc.ca/n1/en/pub/45-28-0001/2020001/article/00008-eng.pdf?st=AWfj-TQD

Sawatsky, Richard, Pamela A. Ratner, Joy L. Johnson, Jacek A. Kopec, and Bruno D. Zumbo. "Self-reported physical and mental health status and quality of life in adolescents: a latent variable mediation model." Health and Quality of Life Outcomes 8 (2010): 17. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2829530/

Schwandt, Hannes, and Till von Wachter. "Unlucky Cohorts: Estimating the Long-Term Effects of Entering the Labor Market in a Recession in Large Cross-Sectional Data Sets." Journal of Labour Economics 37, no. S1 (January 2019). https://www.journals.uchicago.edu/doi/abs/10.1086/701046

Usher, Kim, Navjot Bhullar, and Debra Jackson. "Life in the pandemic: Social isolation and mental health." Journal of Clinical Nursing (April 2020). https://onlinelibrary.wiley.com/doi/full/10.1111/jocn.15290

Verity, Robert, Lucy C. Okell, Ilaria Dorigatti, Peter Winskill, and Charles Whitt. "Estimates of the severity of coronavirus disease 2019: a model-based analysis." The Lancet 20, no. 6 (June 2020). https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30243-7/fulltext.

Watson, Barry, and Lars Osberg. "Can positive income anticipations reverse the mental health impacts of negative income anxieties?" Economics and Human Biology 107, no. 122 (December 2019). https://pubmed.ncbi.nlm.nih.gov/31319364/

Watson, Barry, and Lars Osberg. "Job insecurity and mental health in Canada." Applied Economics 50, no. 38 (February 2018). https://www.tandfonline.com/doi/abs/10.1080/00036846.2018.1441516.

Westerhof, J. Gerben and Keyes, L.M Corey. "Mental Illness and Mental Health: The Two Continua Model Across the Lifespan". Journal of Adult Development no.2 (August 2009). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2866965/

World Health Organization, "Numbers at a Glance" (April 2021).
    https://www.who.int/emergencies/diseases/novel-coronavirus-2019

Zajacova, Anna, Anthony Jehn, Matthew Stackhouse, Patrick Denice, and Howard Ramos.
    "Changes in health behaviours during early COVID-19 and socio-demographic
    disparities: a cross-sectional analysis." Canadian Journal of Public Health 111 (2020):
    953-62.
    https://link.springer.com/article/10.17269/s41997-020-00434-y#citeas

Zheng, Jason, Talia Morstead, Nancy Sin, Patrick Klaiber, and Debra Umberson. "Psychological
    distress in North America during COVID-19: The role of pandemic related stressors."
    Social Science & Medicine 270 (February 2021).
    https://www.sciencedirect.com/science/article/pii/S0277953621000198

APPENDIX A: DESCRIPTIVE STATISTICS

Table 6.1. 1. Summary Statistics of Mental Health Indicators based on Employment status

	Employment status Categories				
	Employed			Unemployed	Total
	At Work (1)	Absent not related to COVID (2)	Absent due to COVID (3)	(4)	(5)
	Count	Count	Count	Count	Count
Perceived mental health					
Excellent	17.18	16.39	15.48	22.68	19.31
Very good	31.63	22.13	29.10	32.50	31.56
Good	31.09	31.15	30.96	27.93	29.78
Fair	16.24	18.85	19.50	13.91	15.58
Poor	3.86	11.48	4.95	2.97	3.77
Total	100.00	100.00	100.00	100.00	100.00
COVID-19 impacts ability to meet financial obligations or essential needs					
Major impact	4.89	4.92	28.40	7.34	7.58
Moderate impact	11.66	11.48	24.38	13.09	13.15
Minor impact	19.02	21.31	23.15	18.04	18.97
No impact	54.28	51.64	14.51	48.75	49.10
Too soon to tell	10.14	10.66	9.57	12.77	11.20
Total	100.00	100.00	100.00	100.00	100.00
Scale- I might lose main job or main self-employment income next 4 weeks					
Strongly agree	3.86	5.74	26.32	0.00	6.66
Agree	6.69	4.10	14.86	0.00	7.56
Neither agree nor disagree	15.44	14.75	26.32	0.00	16.72
Disagree	28.99	23.77	18.27	0.00	27.46
Strongly disagree	45.02	51.64	14.24	0.00	41.60
Valid Skip	0.00	0.00	0.00	100.00	0.00
Total	100.00	100.00	100.00	100.00	100.00
GAD construction in terms of severity cutoff point					
Severe	5.71	10.83	8.95	5.78	6.11
Moderate	8.98	11.67	15.65	7.86	9.06
Mild	29.43	31.67	33.23	22.75	27.02
Minimal	35.33	30.00	27.80	31.04	32.90
None	20.54	15.83	14.38	32.57	24.92
Total	100.00	100.00	100.00	100.00	100.00

Source: CPSS Wave 2. Author's own percentage calculations

Table 6.1. 2. Perceived Mental Health based on key socio-demographic characteristics

	Perceived mental health					
	Excellent (1)	Very good (2)	Good (3)	Fair (4)	Poor (5)	Total (6)
	Count	Count	Count	Count	Count	Count
Age Group of Respondent						
15 to 24 years old	2.02	4.01	4.97	8.54	16.18	5.08
25 to 34 years old	8.53	9.48	16.09	20.03	20.81	13.33
35 to 44 years old	11.67	14.67	19.82	20.03	23.12	16.78
45 to 54 years old	14.14	17.37	15.07	18.21	20.81	16.32
55 to 64 years old	24.35	22.28	22.53	20.73	14.45	22.22
65 to 74 years old	25.93	24.64	16.17	9.66	4.05	19.26
75 years and older	13.36	7.54	5.34	2.80	0.58	7.02
Total	100.00	100.00	100.00	100.00	100.00	100.00
Sex of Respondent						
Male	55.78	48.37	41.04	39.36	41.62	45.97
Female	44.22	51.63	58.96	60.64	58.38	54.03
Total	100.00	100.00	100.00	100.00	100.00	100.00
Household Food Insecurity						
Food secure	91.47	93.56	86.51	78.47	68.64	87.78
Marginally food insecure	3.80	3.18	6.03	6.36	5.92	4.74
Moderately food insecure	3.46	2.48	5.58	10.12	14.79	5.24
Severely food insecure	1.27	0.78	1.88	5.06	10.65	2.24
Total	100.00	100.00	100.00	100.00	100.00	100.00
Rural/ Urban Indicator						
Rural	26.49	22.77	19.17	16.11	17.92	21.20
Urban	73.51	77.23	80.83	83.89	82.08	78.80
Total	100.00	100.00	100.00	100.00	100.00	100.00
Child U18 Resides in Dwelling						
No Child Residing	79.24	77.16	70.74	70.59	67.05	74.25
Child under 18 Residing	20.76	22.84	29.26	29.41	32.95	25.75
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: CPSS Wave 2. Author's own percentage calculations

Table 6.1. 3. Summary of mental health symptoms found on the CPSS2 questionnaire

Feeling afraid as if something awful might happen - Freq last 2 weeks	Frequency	Percent
Not at all	2641	57.79
Several days	1363	29.82
More than half the days	310	6.78
Nearly every day	256	5.60
Total	4570	100.00

I might lose main job or main self-empl income next 4 weeks		
Strongly agree	179	6.67
Agree	202	7.53
Neither agree nor disagree	450	16.77
Disagree	737	27.47
Strongly disagree	1115	41.56
Total	2683	100.00

Feeling nervous, anxious or on edge - Freq last 2 weeks		
Not at all	1940	42.37
Several days	1853	40.47
More than half the days	438	9.57
Nearly every day	348	7.60
Total	4579	100.00

Worrying too much about different things - Freq last 2 weeks		
Not at all	2259	49.53
Several days	1648	36.13
More than half the days	370	8.11
Nearly every day	284	6.23
Total	4561	100.00

Perceived mental health		
Excellent	891	19.41
Very good	1445	31.48
Good	1367	29.78
Fair	714	15.56
Poor	173	3.77
Total	4590	100.00

Source: CPSS Wave 2. Author's own percentage calculations

Table 6.2 1. OLS Regressions of Mental Health Indicators during the COVID Pandemic

VARIABLES	Self Perceived Mental Health			Anxiety Severity Score		
	(1)	(2)	(3)	(4)	(5)	(6)
Absent from work, not COVID	-0.28*			-1.21*		
	(0.11)			(0.51)		
Absent from work, COVID	-0.16*			-1.61**		
	(0.07)			(0.31)		
Not employed	-0.05			-0.02		
	(0.04)			(0.17)		
Age 25 to 54	0.23**	0.20*	0.24*	1.13**	1.07**	1.21*
	(0.08)	(0.08)	(0.12)	(0.40)	(0.39)	(0.53)
Age over 55	0.70**	0.62**	0.61**	2.94**	2.48**	2.33**
	(0.08)	(0.08)	(0.12)	(0.39)	(0.39)	(0.54)
Female	-0.20**	-0.21**	-0.20**	-1.05**	-1.20**	-1.06**
	(0.03)	(0.03)	(0.04)	(0.14)	(0.14)	(0.19)
Urban area	-0.19**	-0.20**	-0.17**	-0.66**	-0.68**	-0.61*
	(0.04)	(0.04)	(0.05)	(0.17)	(0.18)	(0.24)
Immigrant	0.17**	0.20**	0.18**	0.25	0.44*	0.32
	(0.04)	(0.05)	(0.06)	(0.19)	(0.20)	(0.26)
Married/Common Law	0.20**	0.16**	0.15**	0.39*	0.11	0.23
	(0.03)	(0.04)	(0.05)	(0.16)	(0.16)	(0.21)
Financial impact		-0.17**			-2.43**	
		(0.04)			(0.21)	
Food insecurity		-0.39**			-2.71**	
		(0.06)			(0.30)	
Work at home			0.02			-0.07
			(0.06)			(0.28)
Work outside home			0.11*			0.25
			(0.05)			(0.24)
Absent from work			-0.13			-1.39**
			(0.07)			(0.31)
Observations	4,471	3,902	2,608	4,471	3,902	2,608
R-squared	0.09	0.11	0.06	0.07	0.16	0.05

Notes: Author's calculations. Data from the CPSS2. All regressions are estimated using OLS. Robust standard errors are in parentheses. ** $p<0.01$, * $p<0.05$. The dependent variable in columns (1) to (3) is a ranking of perceived mental health from 0 (Poor) to 4 (Excellent). The dependent variable in columns (4) to (6) is a score of generalized anxiety score from 0(Poor) to 21 (Excellent). The base category across all columns is male, currently employed, age 15 to 24, lives in a rural area, was born in Canada and is single or separated. All independent variables are dummy variables. Observations with missing values in dependent and independent variables were omitted from the model. Columns 1 and 4 contain information about sociodemographic characteristics with indicators of employment status. Columns 2 and 5 contain information about concerns about meeting their financial obligations due to COVID and whether they share concerns about food insecurity. Columns 3 and 6 report information about sociodemographic characteristics and locations of work.

Table 6.2. 2. Ordered Probit Regressions of Mental Health Indicators during the COVID pandemic

VARIABLES	Self Perceived Mental Health			Anxiety Severity Score		
	(1)	(2)	(3)	(4)	(5)	(6)
Absent from work, not COVID	-0.27*			-0.22*		
	(0.11)			(0.10)		
Absent from work, COVID	-0.15*			-0.32**		
	(0.07)			(0.06)		
Not employed	-0.05			0.05		
	(0.04)			(0.04)		
Age 25 to 54	0.23**	0.20*	0.25*	0.22**	0.20**	0.26**
	(0.08)	(0.08)	(0.12)	(0.07)	(0.08)	(0.10)
Age over 55	0.70**	0.63**	0.61**	0.66**	0.60**	0.55**
	(0.08)	(0.08)	(0.12)	(0.07)	(0.08)	(0.10)
Female	-0.20**	-0.22**	-0.20**	-0.26**	-0.31**	-0.25**
	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)
Urban area	-0.20**	-0.21**	-0.17**	-0.16**	-0.17**	-0.15**
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.05)
Immigrant	0.18**	0.21**	0.19**	0.05	0.10*	0.08
	(0.04)	(0.05)	(0.06)	(0.04)	(0.05)	(0.06)
Married/Common Law	0.19**	0.16**	0.15**	0.07*	0.02	0.03
	(0.03)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
Financial impact		-0.18**			-0.56**	
		(0.04)			(0.04)	
Food insecurity		-0.39**			-0.50**	
		(0.06)			(0.06)	
Work at home			0.03			0.00
			(0.06)			(0.06)
Work outside home			0.12*			0.11*
			(0.05)			(0.05)
Absent from work			-0.12			-0.25**
			(0.07)			(0.06)
Observations	4,471	3,902	2,608	4,471	3,902	2,608

Notes: Author's calculations. Data from the CPSS2. All regressions are estimated using OProbit. Robust standard errors are in parentheses. ** $p<0.01$, * $p<0.05$. The dependent variable in columns (1) to (3) is a ranking of perceived mental health from 0 (Poor) to 4 (Excellent). The dependent variable in columns (4) to (6) is a score of generalized anxiety score from 0(Poor) to 21 (Excellent). The base category across all columns is male, currently employed, age 15 to 24, lives in a rural area, was born in Canada and is single or separated. All independent variables are dummy variables. Observations with missing values in dependent and independent variables were omitted from the model. Columns 1 and 4 contain information about sociodemographic characteristics with indicators of employment status. Columns 2 and 5 contain information about concerns about meeting their financial obligations due to COVID and whether they share concerns about food insecurity. Columns 3 and 6 report information about sociodemographic characteristics and locations of work.

Table 6.2. 3. Marginal Effects of Employment status on Self Perceived Mental Health

Mental Health	Absent, not COVID	Absent, COVID	Not Employed
	(1)	(2)	(3)
Poor	0.0255**	0.0128**	0.00355
	(0.0126)	(0.00605)	(0.00296)
Fair	0.0518**	0.0283**	0.00841
	(0.0217)	(0.0124)	(0.00694)
Good	0.0263***	0.0168***	0.00564
	(0.00745)	(0.00639)	(0.00461)
Very Good	-0.0379**	-0.0193**	-0.00534
	(0.0179)	(0.00904)	(0.00441)
Excellent	-0.0658***	-0.0386**	-0.0123
	(0.0236)	(0.0157)	(0.0101)
Observations	4,471	4,471	4,471

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The base model is the reported number of individuals that are currently employed. The dependent variable in columns (1) to (3) is a ranking of perceived mental health from 0 (Poor) to 4 (Excellent)

Table 6.2. 4. Marginal Effects of Employment status on Generalized Anxiety Severity

VARIABLES	Absent, not COVID	Absent, COVID	Not Employed
	(1)	(2)	(3)
Severe	0.0298**	0.0473***	-0.00482
	(0.0150)	(0.0105)	(0.00424)
Moderate	0.0252**	0.0375***	-0.00471
	(0.0114)	(0.00740)	(0.00418)
Mild	0.0301***	0.0407***	-0.00691
	(0.0113)	(0.00633)	(0.00617)
Minimal	-0.0218*	-0.0361***	0.00276
	(0.0121)	(0.00866)	(0.00243)
None	-0.0633**	-0.0893***	0.0137
	(0.0257)	(0.0152)	(0.0122)
Observations	4,471	4,471	4,471

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The base model is the reported number of individuals that are currently employed. The dependent variable in columns (1) to (3) is a ranking of anxiety severity scores. Scores between 0 and 6 represent severe anxiety, scores 7-11 represent moderate, 12-16 represent mild, 17-20 represent minimal and 21 shows no signs of anxiety.

Table 6.2 5. Adjusted Predictions of Employment Status on Self Perceived Mental Health

VARIABLES	Employed	Absent, not COVID	Absent, COVID	Not Employed
	(1)	(2)	(3)	(4)
Poor	0.0350***	0.0605***	0.0478***	0.0385***
	(0.00288)	(0.0130)	(0.00644)	(0.00343)
Fair	0.149***	0.201***	0.177***	0.157***
	(0.00600)	(0.0219)	(0.0127)	(0.00679)
Good	0.294***	0.321***	0.311***	0.300***
	(0.00716)	(0.00994)	(0.00897)	(0.00719)
Very Good	0.319***	0.281***	0.299***	0.313***
	(0.00716)	(0.0186)	(0.0107)	(0.00752)
Excellent	0.203***	0.137***	0.164***	0.191***
	(0.00779)	(0.0233)	(0.0150)	(0.00782)
Observations	4,471	4,471	4,471	4,471

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The dependent variable is a ranking of perceived mental health from 0 (Poor) to 4 (Excellent).

Table 6.2. 6. Adjusted Predictions of Employment Status on Generalized Anxiety Severity

VARIABLES	Employed	Absent, not COVID	Absent, COVID	Not Employed
	(1)	(2)	(3)	(4)
Severe	0.0590***	0.0888***	0.106***	0.0541***
	(0.00390)	(0.0153)	(0.0108)	(0.00427)
Moderate	0.0880***	0.113***	0.126***	0.0833***
	(0.00452)	(0.0121)	(0.00866)	(0.00472)
Mild	0.269***	0.299***	0.309***	0.262***
	(0.00719)	(0.0129)	(0.00900)	(0.00730)
Minimal	0.334***	0.312***	0.297***	0.336***
	(0.00711)	(0.0135)	(0.0103)	(0.00735)
None	0.251***	0.188***	0.161***	0.264***
	(0.00848)	(0.0253)	(0.0142)	(0.00941)
Observations	4,471	4,471	4,471	4,471

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The dependent variable is a ranking of anxiety severity from 0 (Severe) to 4 (None).

Table 6.2 7. OLS Regressions of Risky Health Behaviors on Subjective Mental Health Indicators

VARIABLES	Self Perceived Mental Health			Anxiety Severity Score		
	(1)	(2)	(3)	(4)	(5)	(6)
Absent from work, not COVID	-0.28*	-0.30**	-0.25*	-1.23*	-1.37**	-1.15*
	(0.11)	(0.11)	(0.11)	(0.50)	(0.51)	(0.51)
Absent from work, COVID	-0.15*	-0.15*	-0.16*	-1.55**	-1.47**	-1.61**
	(0.07)	(0.07)	(0.07)	(0.31)	(0.31)	(0.32)
Not employed	-0.07	-0.05	-0.06	-0.12	-0.07	-0.11
	(0.04)	(0.04)	(0.04)	(0.17)	(0.17)	(0.18)
Age 25 to 54	0.24**	0.25**	0.20*	1.13**	1.25**	0.99*
	(0.08)	(0.08)	(0.08)	(0.39)	(0.39)	(0.39)
Age over 55	0.66**	0.70**	0.64**	2.73**	2.99**	2.66**
	(0.08)	(0.08)	(0.08)	(0.38)	(0.38)	(0.39)
Female	-0.21**	-0.20**	-0.21**	-1.12**	-1.08**	-1.17**
	(0.03)	(0.03)	(0.03)	(0.14)	(0.14)	(0.14)
Urban area	-0.17**	-0.18**	-0.17**	-0.57**	-0.68**	-0.57**
	(0.04)	(0.04)	(0.04)	(0.17)	(0.17)	(0.17)
Increased alcohol consumption	-0.33**			-1.66**		
	(0.04)			(0.20)		
Decreased alcohol consumption	-0.13*			-0.84**		
	(0.06)			(0.28)		
Increased tobacco consumption		-0.61**			-3.68**	
		(0.08)			(0.44)	
Decreased tobacco consumption		-0.12			-0.98	
		(0.14)			(0.54)	
Increased cannabis consumption			-0.50**			-2.62**
			(0.07)			(0.37)
Decreased cannabis consumption			-0.57**			-2.98**
			(0.15)			(0.73)
Observations	4,401	4,284	4,245	4,401	4,284	4,245
R-squared	0.10	0.10	0.10	0.09	0.10	0.09

Notes: Author's calculations. Data from the CPSS2. All regressions are estimated using OLS. Robust standard errors are in parentheses. ** $p<0.01$, * $p<0.05$. The dependent variable in columns (1) to (3) is a ranking of perceived mental health from 0 (Poor) to 4 (Excellent). The dependent variable in columns (4) to (6) is a score of generalized anxiety score from 0(Poor) to 21 (Excellent). The base category across all columns is male, currently employed, age 15 to 24, lives in a rural area, was born in Canada and is single or separated. All independent variables are dummy variables. Observations with missing values in dependent and independent variables were omitted from the model. Columns 1 and 4 contain information about changes in alcohol consumption behaviors. Columns 2 and 5 contain information about changes in tobacco consumption behavior. Columns 3 and 6 report information about changes in cannabis consumption behavior.

Table 6.2 8. Ordered Probit Regressions of Risky Health Behaviors on Subjective Mental Health Indicators

VARIABLES	Self Perceived Mental Health			Anxiety Severity Score		
	(1)	(2)	(3)	(4)	(5)	(6)
Absent from work, not COVID	-0.28*	-0.30**	-0.25*	-0.23*	-0.26**	-0.21*
	(0.11)	(0.11)	(0.11)	(0.10)	(0.10)	(0.10)
Absent from work, COVID	-0.15*	-0.15*	-0.16*	-0.31**	-0.30**	-0.33**
	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)
Not employed	-0.07	-0.05	-0.05	0.03	0.04	0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Age 25 to 54	0.24**	0.25**	0.21*	0.23**	0.25**	0.20**
	(0.08)	(0.08)	(0.08)	(0.07)	(0.07)	(0.07)
Age over 55	0.67**	0.71**	0.65**	0.61**	0.67**	0.60**
	(0.08)	(0.08)	(0.08)	(0.07)	(0.07)	(0.07)
Female	-0.22**	-0.21**	-0.22**	-0.28**	-0.27**	-0.29**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Urban area	-0.18**	-0.19**	-0.17**	-0.14**	-0.16**	-0.14**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Increased alcohol consumption	-0.34**			-0.39**		
	(0.04)			(0.04)		
Decreased alcohol consumption	-0.13*			-0.19**		
	(0.06)			(0.06)		
Increased tobacco consumption		-0.61**			-0.71**	
		(0.08)			(0.08)	
Decreased tobacco consumption		-0.12			-0.25*	
		(0.14)			(0.12)	
Increased cannabis consumption			-0.50**			-0.53**
			(0.07)			(0.06)
Decreased cannabis consumption			-0.56**			-0.64**
			(0.15)			(0.14)
Observations	4,401	4,284	4,245	4,401	4,284	4,245

Notes: Author's calculations. Data from the CPSS2. All regressions are estimated using Ordered probit. Robust standard errors are in parentheses. ** $p<0.01$, * $p<0.05$. The dependent variable in columns (1) to (3) is a ranking of perceived mental health from 0 (Poor) to 4 (Excellent). The dependent variable in columns (4) to (6) is a score of generalized anxiety score from 0(Poor) to 21 (Excellent). The base category across all columns is male, currently employed, age 15 to 24, lives in a rural area, was born in Canada and is single or separated. All independent variables are dummy variables. Observations with missing values in dependent and independent variables were omitted from the model. Columns 1 and 4 contain information about changes in alcohol consumption behaviors. Columns 2 and 5 contain information about changes in tobacco consumption behavior. Columns 3 and 6 report information about changes in cannabis consumption behavior.

Table 6.2 9. Marginal Effects of RHB frequency changes on Self Perceived Mental Health

VARIABLES	Alc Inc (1)	Alc Dec (2)	Tob Inc (3)	Tob Dec (4)	Can Inc (5)	Can Dec (6)
Poor	0.0310***	0.0116**	0.0751***	0.0106	0.0557***	0.0672***
	(0.00472)	(0.00547)	(0.0148)	(0.0131)	(0.0110)	(0.0249)
Fair	0.0648***	0.0250**	0.119***	0.0228	0.0977***	0.106***
	(0.00836)	(0.0110)	(0.0158)	(0.0260)	(0.0144)	(0.0273)
Good	0.0321***	0.0141***	0.0287***	0.0126	0.0316***	0.0279***
	(0.00337)	(0.00537)	(0.00389)	(0.0123)	(0.00253)	(0.00421)
Very Good	-0.0486***	-0.0176**	-0.103***	-0.0162	-0.0810***	-0.0912***
	(0.00693)	(0.00821)	(0.0162)	(0.0197)	(0.0137)	(0.0279)
Excellent	-0.0793***	-0.0331**	-0.120***	-0.0298	-0.104***	-0.110***
	(0.00886)	(0.0136)	(0.0117)	(0.0316)	(0.0117)	(0.0209)
Observations	4,401	4,401	4,284	4,284	4,245	4,245

Notes: Author's calculations, Data from CPSS2. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05 and *p<0.1. The base model for column 1 is when alcohol increase frequency dummy=0. The base model for column 2 is when alcohol decrease frequency dummy=0. The base model for column 3 is when tobacco increase frequency dummy=0. The base model for column 4 is when tobacco decrease frequency dummy=0. The base model for column 5 is when cannabis increase frequency dummy=0.The base model for column 6 is when cannabis decrease frequency dummy=0. The dependent variable across columns is a ranking of SPMH from 0 (Poor) to 4 (Excellent).

Table A.1.1. OLS Regressions of Mental Health Indicators during the COVID Pandemic

VARIABLES	Perceived Mental Health			Anxiety Severity Score		
	(1)	(2)	(3)	(4)	(5)	(6)
Absent from work, not COVID	-0.30			-1.55*		
	(0.18)			(0.71)		
Absent from work, COVID	-0.19			-1.91**		
	(0.10)			(0.68)		
Not employed	-0.08			-0.17		
	(0.07)			(0.38)		
Age 25 to 54	0.16	0.20	0.21	0.75	1.24*	1.06
	(0.14)	(0.13)	(0.23)	(0.62)	(0.60)	(0.92)
Age over 55	0.66**	0.66**	0.56*	2.47**	2.31**	1.48
	(0.12)	(0.13)	(0.23)	(0.56)	(0.61)	(0.98)
Female	-0.17**	-0.22**	-0.22**	-1.02**	-1.28**	-1.06**
	(0.06)	(0.06)	(0.07)	(0.27)	(0.28)	(0.34)
Urban area	-0.14*	-0.16*	-0.10	-1.01**	-1.02**	-0.71
	(0.07)	(0.07)	(0.09)	(0.28)	(0.32)	(0.43)
Immigrant	0.15	0.16	0.09	-0.09	0.10	-0.52
	(0.08)	(0.09)	(0.11)	(0.37)	(0.40)	(0.51)
Married/Common Law	0.24**	0.20**	0.25**	0.69*	0.39	0.36
	(0.06)	(0.06)	(0.08)	(0.31)	(0.31)	(0.36)
Financial impact		-0.13			-2.50**	
		(0.07)			(0.35)	
Food insecurity		-0.31**			-2.73**	
		(0.09)			(0.57)	
Work at home			0.02			0.15
			(0.09)			(0.43)
Work outside home			0.01			-0.15
			(0.09)			(0.40)
Absent from work			-0.21*			-1.89**
			(0.10)			(0.56)
Observations	4,471	3,902	2,608	4,471	3,902	2,608
R-squared	0.10	0.12	0.06	0.07	0.17	0.04

Notes: Author's calculations. Data from the CPSS2. All regressions are estimated using OLS and appropriate weights. Robust standard errors are in parentheses. ** $p<0.01$, * $p<0.05$. The dependent variable in columns (1) to (3) is a ranking of perceived mental health from 1 (Poor) to 5 (Excellent). The dependent variable in columns (4) to (6) is a score of generalized anxiety score from 0(Poor) to 21 (Excellent). The base category across all columns is male, currently employed, age 15 to 24, lives in a rural area, was born in Canada and is single or separated. All independent variables are dummy variables. I omit observations that did not respond to the dependent variable outcomes. Columns 1 and 4 contain information about sociodemographic characteristics with indicators of employment status. Columns 2 and 5 contain information about concerns about meeting their financial obligations due to COVID and whether they share concerns about food insecurity. Columns 3 and 6 report information about sociodemographic characteristics and locations of work.

Table A.1 2. Ordered Probit Regressions of Mental Health Indicators during the COVID pandemic

VARIABLES	Perceived Mental Health			Anxiety Severity Score		
	(1)	(2)	(3)	(4)	(5)	(6)
Absent from work, not COVID	-0.29			-0.27		
	(0.18)			(0.14)		
Absent from work, COVID	-0.18			-0.34*		
	(0.10)			(0.13)		
Not employed	-0.07			0.00		
	(0.07)			(0.07)		
Age 25 to 54	0.16	0.20	0.22	0.19	0.27*	0.23
	(0.13)	(0.13)	(0.22)	(0.12)	(0.12)	(0.17)
Age over 55	0.66**	0.67**	0.56**	0.62**	0.61**	0.40*
	(0.12)	(0.13)	(0.22)	(0.11)	(0.12)	(0.19)
Female	-0.17**	-0.22**	-0.21**	-0.25**	-0.31**	-0.26**
	(0.06)	(0.06)	(0.07)	(0.06)	(0.06)	(0.07)
Urban area	-0.14*	-0.16*	-0.10	-0.22**	-0.23**	-0.17
	(0.07)	(0.07)	(0.09)	(0.06)	(0.08)	(0.10)
Immigrant	0.14	0.17	0.09	-0.02	0.02	-0.09
	(0.08)	(0.10)	(0.11)	(0.07)	(0.09)	(0.10)
Married/Common Law	0.24**	0.21**	0.24**	0.12*	0.08	0.05
	(0.06)	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)
Financial impact		-0.14			-0.57**	
		(0.07)			(0.07)	
Food insecurity		-0.31**			-0.47**	
		(0.09)			(0.12)	
Work at home			0.03			0.08
			(0.09)			(0.09)
Work outside home			0.02			0.03
			(0.09)			(0.08)
Absent from work			-0.19			-0.29**
			(0.10)			(0.11)
Observations	4,471	3,902	2,608	4,471	3,902	2,608

Notes: Author's calculations. Data from the CPSS2. All regressions are estimated using OProbit and appropriate weights. Robust standard errors are in parentheses. ** $p<0.01$, * $p<0.05$. The dependent variable in columns (1) to (3) is a ranking of perceived mental health from 1 (Poor) to 4 (Excellent). The dependent variable in columns (4) to (6) is a score of generalized anxiety score from 0(Severe) to 21 (No Anxiety). The base category across all columns is male, currently employed, age 15 to 24, lives in a rural area, was born in Canada and is single or separated. All independent variables are dummy variables. I omit observations that did not respond to the dependent variable outcomes. Columns 1 and 4 contain information about sociodemographic characteristics with indicators of employment status. Columns 2 and 5 contain information about concerns about meeting their financial obligations due to COVID and whether they share concerns about food insecurity. Columns 3 and 6 report information about sociodemographic characteristics and locations of work.

Table A.1 3. Ordered Logit Regressions of Mental Health Indicators during the COVID pandemic

VARIABLES	Perceived Mental Health			Anxiety Severity Score		
	(1)	(2)	(3)	(4)	(5)	(6)
Absent from work, not COVID	-0.45*			-0.37*		
	(0.20)			(0.17)		
Absent from work, COVID	-0.27*			-0.57**		
	(0.11)			(0.11)		
Not employed	-0.09			0.08		
	(0.07)			(0.07)		
Age 25 to 54	0.37*	0.32*	0.35	0.39**	0.35*	0.44*
	(0.15)	(0.15)	(0.21)	(0.13)	(0.14)	(0.17)
Age over 55	1.16**	1.04**	0.97**	1.15**	1.05**	0.95**
	(0.14)	(0.15)	(0.22)	(0.13)	(0.14)	(0.18)
Female	-0.37**	-0.39**	-0.35**	-0.45**	-0.52**	-0.42**
	(0.06)	(0.06)	(0.07)	(0.05)	(0.06)	(0.07)
Urban area	-0.34**	-0.37**	-0.31**	-0.25**	-0.28**	-0.24**
	(0.07)	(0.07)	(0.09)	(0.07)	(0.07)	(0.09)
Immigrant	0.29**	0.35**	0.32**	0.10	0.18*	0.14
	(0.08)	(0.08)	(0.10)	(0.07)	(0.08)	(0.10)
Married/Common Law	0.32**	0.25**	0.24**	0.13*	0.04	0.06
	(0.06)	(0.07)	(0.08)	(0.06)	(0.06)	(0.08)
Financial impact		-0.32**			-0.94**	
		(0.07)			(0.07)	
Food insecurity		-0.70**			-0.89**	
		(0.11)			(0.10)	
Work at home			0.05			0.02
			(0.10)			(0.10)
Work outside home			0.19*			0.21*
			(0.09)			(0.09)
Absent from work			-0.21			-0.43**
			(0.12)			(0.11)
Observations	4,471	3,902	2,608	4,471	3,902	2,608

Notes: Author's calculations. Data from the CPSS2. All regressions are estimated using OLogit. Standard errors are in parentheses. ** $p<0.01$, * $p<0.05$. The dependent variable in columns (1) to (3) is a ranking of perceived mental health from 1 (Poor) to 4 (Excellent). The dependent variable in columns (4) to (6) is a score of generalized anxiety score from 0(Severe) to 21 (No Anxiety). The base category across all columns is male, currently employed, age 15 to 24, lives in a rural area, was born in Canada and is single or separated. All independent variables are dummy variables. I omit observations that did not respond to the dependent variable outcomes. Columns 1 and 4 contain information about sociodemographic characteristics with indicators of employment status. Columns 2 and 5 contain information about concerns about meeting their financial obligations due to COVID and whether they share concerns about food insecurity. Columns 3 and 6 report information about sociodemographic characteristics and locations of work.

Table A.1 4. Ordered Logit Regressions of Mental Health Indicators during the COVID pandemic

VARIABLES	Perceived Mental Health			Anxiety Severity Score		
	(1)	(2)	(3)	(4)	(5)	(6)
Absent from work, not COVID	-0.53			-0.51*		
	(0.33)			(0.24)		
Absent from work, COVID	-0.36			-0.59*		
	(0.19)			(0.24)		
Not employed	-0.18			-0.06		
	(0.13)			(0.13)		
Age 25 to 54	0.21	0.30	0.22	0.35	0.49*	0.41
	(0.23)	(0.22)	(0.38)	(0.21)	(0.21)	(0.31)
Age over 55	1.09**	1.11**	0.81*	1.17**	1.12**	0.78*
	(0.20)	(0.22)	(0.37)	(0.19)	(0.22)	(0.33)
Female	-0.32**	-0.41**	-0.37**	-0.44**	-0.52**	-0.42**
	(0.10)	(0.11)	(0.13)	(0.10)	(0.10)	(0.12)
Urban area	-0.25*	-0.31*	-0.22	-0.34**	-0.36**	-0.25
	(0.12)	(0.13)	(0.16)	(0.11)	(0.13)	(0.17)
Immigrant	0.25	0.29	0.18	-0.02	0.04	-0.14
	(0.15)	(0.17)	(0.19)	(0.13)	(0.14)	(0.17)
Married/Common Law	0.40**	0.35**	0.39**	0.19	0.13	0.09
	(0.11)	(0.11)	(0.13)	(0.11)	(0.12)	(0.12)
Financial impact		-0.24			-0.93**	
		(0.12)			(0.12)	
Food insecurity		-0.56**			-0.83**	
		(0.17)			(0.21)	
Work at home			0.04			0.12
			(0.15)			(0.16)
Work outside home			0.03			0.07
			(0.15)			(0.14)
Absent from work			-0.38*			-0.53**
			(0.18)			(0.20)
Observations	4,471	3,902	2,608	4,471	3,902	2,608

Notes: Author's calculations. Data from the CPSS2. All regressions are estimated using OLogit and appropriate probability weights. Standard errors are in parentheses. ** $p<0.01$, * $p<0.05$. The dependent variable in columns (1) to (3) is a ranking of perceived mental health from 1 (Poor) to 4 (Excellent). The dependent variable in columns (4) to (6) is a score of generalized anxiety score from 0(Severe) to 21 (No Anxiety). The base category across all columns is male, currently employed, age 15 to 24, lives in a rural area, was born in Canada and is single or separated. All independent variables are dummy variables. I omit observations that did not respond to the dependent variable outcomes. Columns 1 and 4 contain information about sociodemographic characteristics with indicators of employment status. Columns 2 and 5 contain information about concerns about meeting their financial obligations due to COVID and whether they share concerns about food insecurity. Columns 3 and 6 report information about sociodemographic characteristics and locations of work.

Table A.1 5. Marginal Effects of Employment status on Perceived Mental Health

Mental Health	Absent, not COVID (1)	Absent, COVID (2)	Not Employed (3)
Poor	0.0189*	0.0104**	0.00336
	(0.0101)	(0.00490)	(0.00240)
Fair	0.0543**	0.0314**	0.0106
	(0.0257)	(0.0139)	(0.00746)
Good	0.0311***	0.0209***	0.00801
	(0.00975)	(0.00789)	(0.00557)
Very Good	-0.0430**	-0.0240**	-0.00772
	(0.0217)	(0.0111)	(0.00543)
Excellent	-0.0613***	-0.0387**	-0.0142
	(0.0237)	(0.0155)	(0.00998)
Observations	4,471	4,471	4,471

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The base model is the reported number of individuals that are currently employed. The dependent variable in columns (1) to (3) is a ranking of perceived mental health from 1 (Poor) to 4 (Excellent). Marginal effects are estimated from an ordered logit model.

Table A.1 6. Marginal Effects of Employment status on General Anxiety

VARIABLES	Absent, not COVID (1)	Absent, COVID (2)	Not Employed (3)
Severe	0.0243*	0.0407***	-0.00396
	(0.0124)	(0.00905)	(0.00350)
Moderate	0.0277**	0.0441***	-0.00494
	(0.0132)	(0.00892)	(0.00440)
Mild	0.0367***	0.0515***	-0.00825
	(0.0142)	(0.00782)	(0.00743)
Minimal	-0.0262*	-0.0455***	0.00332
	(0.0145)	(0.0106)	(0.00296)
None	-0.0625**	-0.0908***	0.0138
	(0.0252)	(0.0149)	(0.0124)
Observations	4,471	4,471	4,471

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The base model is the reported number of individuals that are currently employed. The dependent variable in columns (1) to (3) is a ranking of anxiety severity scores. Scores between 0 and 6 represent severe anxiety, scores 7-11 represent moderate, 12-16 represent mild, 17-20 represent minimal and 21 shows no signs of anxiety. Marginal effects are estimated from an ordered logit model.

Table A.1 7. Adjusted Predictions of Increased Alcohol Use on Anxiety Severity

VARIABLES	Employed (1)	Absent, not COVID (2)	Absent, COVID (3)	Not Employed (4)
Severe * No increased consumption	0.0543***	0.0737***	0.0933***	0.0491***
	(0.00429)	(0.0163)	(0.0117)	(0.00447)
Severe * Increased consumption	0.0716***	0.154***	0.138***	0.0860***
	(0.00840)	(0.0337)	(0.0247)	(0.0127)
Moderate * No increased consumption	0.0844***	0.102***	0.118***	0.0790***
	(0.00480)	(0.0141)	(0.00949)	(0.00492)
Moderate * Increased consumption	0.100***	0.154***	0.146***	0.112***
	(0.00819)	(0.0178)	(0.0149)	(0.0107)
Mild* No increased consumption	0.267***	0.291***	0.307***	0.259***
	(0.00756)	(0.0170)	(0.0102)	(0.00776)
Mild* Increased consumption	0.289***	0.327***	0.325***	0.302***
	(0.0113)	(0.00877)	(0.00965)	(0.0121)
Minimal*No increased consumption	0.339***	0.326***	0.309***	0.342***
	(0.00744)	(0.0143)	(0.0113)	(0.00760)
Minimal* Increased consumption	0.327***	0.258***	0.271***	0.316***
	(0.00896)	(0.0277)	(0.0212)	(0.0121)
None*No increased consumption	0.255***	0.208***	0.173***	0.271***
	(0.00971)	(0.0327)	(0.0172)	(0.0107)
None* Increased consumption	0.212***	0.107***	0.120***	0.185***
	(0.0183)	(0.0265)	(0.0231)	(0.0218)
Observations	4,401	4,401	4,401	4,401

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is an interaction term of anxiety severity symptoms ranging from 0 (Severe) to 4 (No Anxiety) with a constructed dummy of increased substance use 0 (No Increase) and 1 (Increase). Each employment category probability predictions sum up to 100%.

Table A.1 8. Adjusted Predictions of Increased Cannabis Use on Perceived Mental Health

VARIABLES	Employed	Absent, not COVID	Absent, COVID	Not Employed
	(1)	(2)	(3)	(4)
Poor* No increased consumption	0.0363***	0.0587***	0.0533***	0.0398***
	(0.00346)	(0.0133)	(0.00761)	(0.00403)
Poor* Increased consumption	0.0309***	0.0600	0.0163*	0.0536***
	(0.00967)	(0.0524)	(0.00888)	(0.0189)
Fair* No increased consumption	0.152***	0.198***	0.188***	0.160***
	(0.00637)	(0.0227)	(0.0136)	(0.00729)
Fair* Increased consumption	0.138***	0.200**	0.0935***	0.189***
	(0.0274)	(0.0918)	(0.0333)	(0.0375)
Good* No increased consumption	0.296***	0.319***	0.316***	0.301***
	(0.00735)	(0.0107)	(0.00898)	(0.00742)
Good* Increased consumption	0.286***	0.320***	0.240***	0.316***
	(0.0242)	(0.0317)	(0.0431)	(0.0182)
V. Good*No increased consumption	0.318***	0.284***	0.292***	0.313***
	(0.00754)	(0.0192)	(0.0117)	(0.00795)
V. Good* Increased consumption	0.326***	0.282***	0.342***	0.292***
	(0.0157)	(0.0763)	(0.00831)	(0.0295)
Excellent*No increased consumption	0.198***	0.140***	0.151***	0.186***
	(0.00790)	(0.0246)	(0.0150)	(0.00816)
Excellent* Increased consumption	0.219***	0.137	0.308***	0.150***
	(0.0460)	(0.0988)	(0.0818)	(0.0437)
Observations	4,245	4,245	4,245	4,245

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The dependent variable is an interaction term of perceived mental health ranging from 0 (Poor) to 4 (Excellent) with a constructed dummy of increased substance use 0 (No Increase) and 1 (Increase). Each employment category probability predictions sum up to 100%.

Table A.1 9. Adjusted Predictions of Increased Cannabis Use on Anxiety Severity

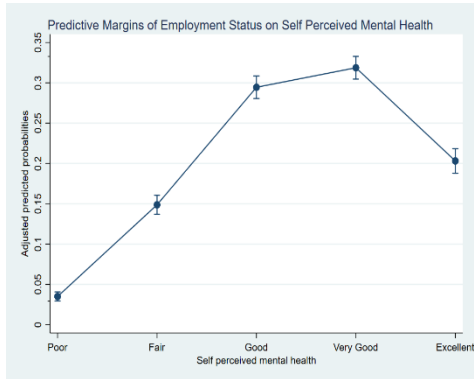| VARIABLES	Employed	Absent, not COVID	Absent, COVID	Not Employed
	(1)	(2)	(3)	(4)
Severe * No increased consumption	0.0599***	0.0825***	0.111***	0.0561***
	(0.00456)	(0.0153)	(0.0118)	(0.00502)
Severe * Increased consumption	0.0469***	0.159***	0.0641**	0.0663***
	(0.0134)	(0.0536)	(0.0288)	(0.0210)
Moderate * No increased consumption	0.0881***	0.108***	0.128***	0.0844***
	(0.00472)	(0.0124)	(0.00899)	(0.00501)
Moderate * Increased consumption	0.0750***	0.155***	0.0920***	0.0940***
	(0.0154)	(0.0266)	(0.0273)	(0.0200)
Mild* No increased consumption	0.272***	0.296***	0.315***	0.266***
	(0.00739)	(0.0143)	(0.00922)	(0.00760)
Mild* Increased consumption	0.251***	0.327***	0.277***	0.280***
	(0.0278)	(0.00982)	(0.0384)	(0.0280)
Minimal*No increased consumption	0.335***	0.318***	0.295***	0.337***
	(0.00748)	(0.0135)	(0.0110)	(0.00775)
Minimal* Increased consumption	0.342***	0.254***	0.332***	0.331***
	(0.00849)	(0.0434)	(0.0207)	(0.0161)
None*No increased consumption	0.245***	0.195***	0.152***	0.256***
	(0.00869)	(0.0272)	(0.0143)	(0.00986)
None* Increased consumption	0.285***	0.105**	0.234***	0.229***
	(0.0513)	(0.0416)	(0.0740)	(0.0531)
Observations	4,245	4,245	4,245	4,245

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is an interaction term of anxiety severity symptoms ranging from 0 (Severe) to 4 (No Anxiety) with a constructed dummy of increased substance use 0 (No Increase) and 1 (Increase). Each employment category probability predictions sum up to 100%.

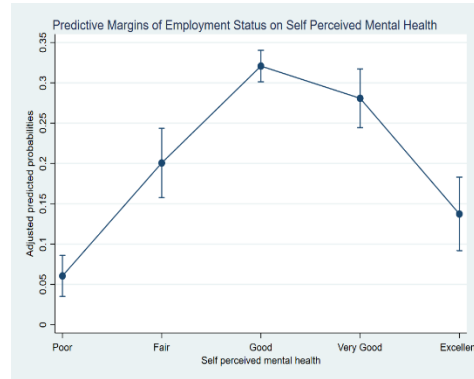**Table A.1 10. Adjusted Predictions of Increased Tobacco Use on Perceived Mental Health**

VARIABLES	Employed	Absent, not COVID	Absent, COVID	Not Employed
	(1)	(2)	(3)	(4)
Poor* No increased consumption	0.0327***	0.0595***	0.0481***	0.0345***
	(0.00292)	(0.0132)	(0.00691)	(0.00331)
Poor* Increased consumption	0.0669***		0.0432**	0.155***
	(0.0211)		(0.0216)	(0.0412)
Fair* No increased consumption	0.149***	0.206***	0.184***	0.153***
	(0.00629)	(0.0228)	(0.0137)	(0.00710)
Fair* Increased consumption	0.218***		0.174***	0.311***
	(0.0346)		(0.0477)	(0.0295)
Good* No increased consumption	0.296***	0.325***	0.317***	0.300***
	(0.00736)	(0.00987)	(0.00910)	(0.00744)
Good* Increased consumption	0.328***		0.312***	0.313***
	(0.0106)		(0.0258)	(0.0185)
V. Good*No increased consumption	0.323***	0.280***	0.298***	0.320***
	(0.00748)	(0.0196)	(0.0117)	(0.00788)
V. Good* Increased consumption	0.269***		0.306***	0.173***
	(0.0305)		(0.0353)	(0.0345)
Excellent*No increased consumption	0.200***	0.130***	0.153***	0.193***
	(0.00804)	(0.0229)	(0.0151)	(0.00835)
Excellent* Increased consumption	0.118***		0.166***	0.0474***
	(0.0325)		(0.0591)	(0.0174)
Observations	4,284	4,284	4,284	4,284

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is an interaction term of perceived mental health ranging from 0 (Poor) to 4 (Excellent) with a constructed dummy of increased substance use 0 (No Increase) and 1 (Increase). Each employment category probability predictions sum up to 100%.
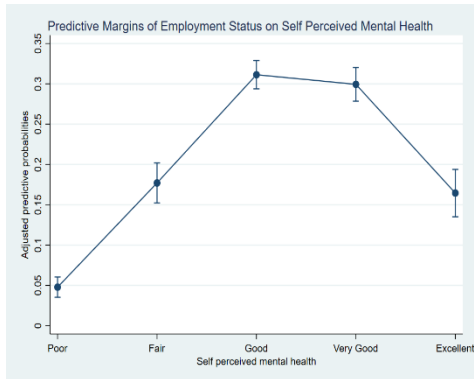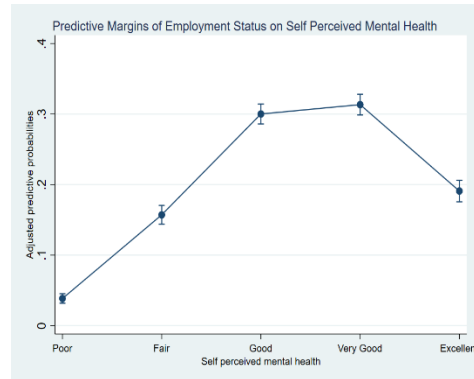
Table A.1 11. Adjusted Predictions of Increased Tobacco Use on Anxiety Severity

VARIABLES	Employed	Absent, not COVID	Absent, COVID	Not Employed
	(1)	(2)	(3)	(4)
Severe * No increased consumption	0.0547***	0.0874***	0.0982***	0.0493***
	(0.00392)	(0.0155)	(0.0110)	(0.00424)
Severe * Increased consumption	0.0971***		0.156***	0.172***
	(0.0269)		(0.0462)	(0.0422)
Moderate * No increased consumption	0.0867***	0.116***	0.124***	0.0811***
	(0.00462)	(0.0126)	(0.00910)	(0.00486)
Moderate * Increased consumption	0.123***		0.158***	0.166***
	(0.0203)		(0.0236)	(0.0196)
Mild* No increased consumption	0.272***	0.307***	0.314***	0.263***
	(0.00742)	(0.0131)	(0.00958)	(0.00766)
Mild* Increased consumption	0.313***		0.331***	0.331***
	(0.0179)		(0.00888)	(0.00807)
Minimal*No increased consumption	0.338***	0.312***	0.302***	0.341***
	(0.00738)	(0.0145)	(0.0109)	(0.00762)
Minimal* Increased consumption	0.303***		0.253***	0.240***
	(0.0242)		(0.0378)	(0.0330)
None*No increased consumption	0.249***	0.178***	0.162***	0.265***
	(0.00874)	(0.0250)	(0.0151)	(0.01000)
None* Increased consumption	0.164***		0.102***	0.0911***
	(0.0392)		(0.0349)	(0.0274)
Observations	4,284	4,284	4,284	4,284

Notes: Author's calculations. Data from the CPSS2. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is an interaction term of anxiety severity symptoms ranging from 0 (Severe) to 4 (No Anxiety) with a constructed dummy of increased substance use 0 (No Increase) and 1 (Increase). Each employment category probability predictions sum up to 100%.

i) Currently Employed
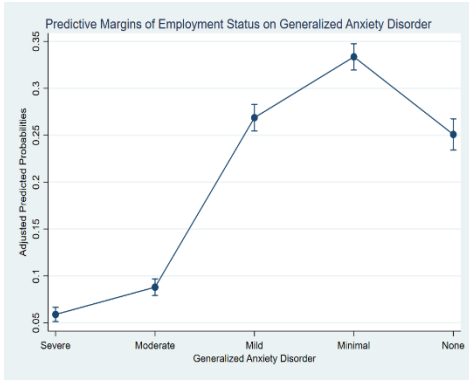
(ii) Employed, but absent not COVID
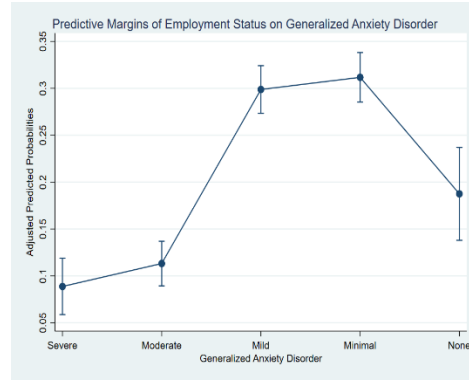
iii) Employed, but absent COVID
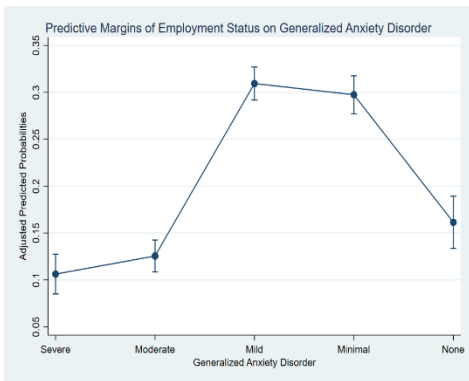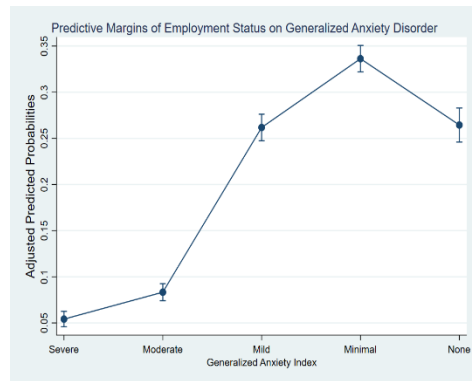
(iv) Not Employed

Figure 6.1 1. Adjusted Predictions of Employment Status on Perceived Mental Health

(i) Currently Employed

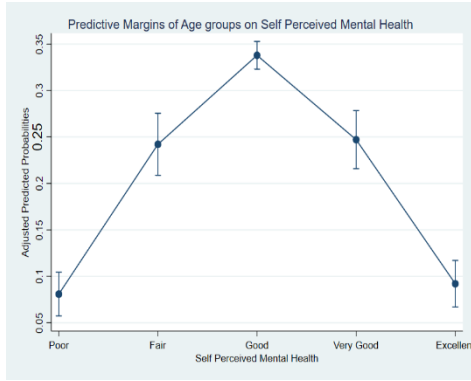(ii) Employed, but absent not COVID
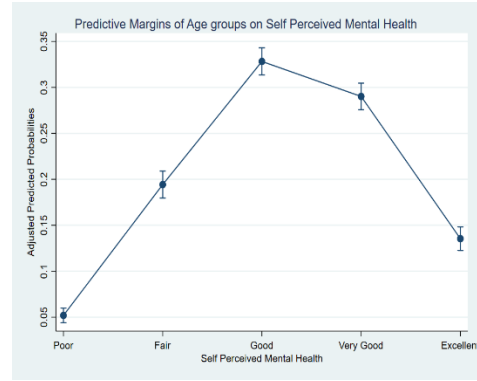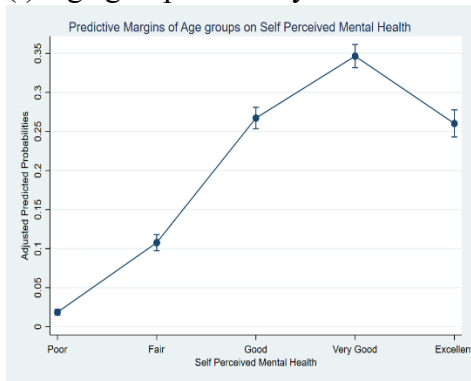

(iii) Employed, but absent COVID

(iv) Not Employed

Figure 6.1 2. Adjusted Predictions of Employment Status on Anxiety Severity
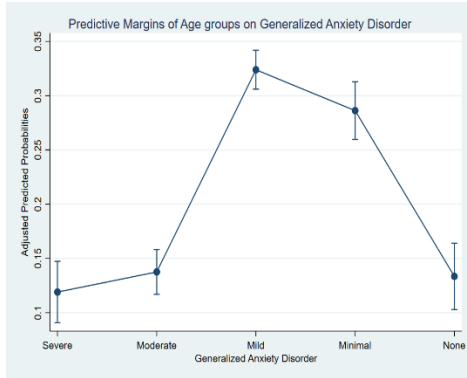
(i) Age group 15 – 24 years old

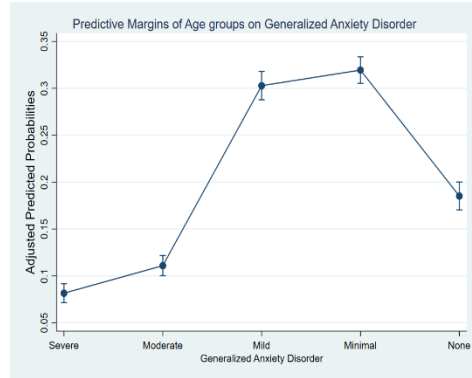(ii) Age group 25 – 54 years old
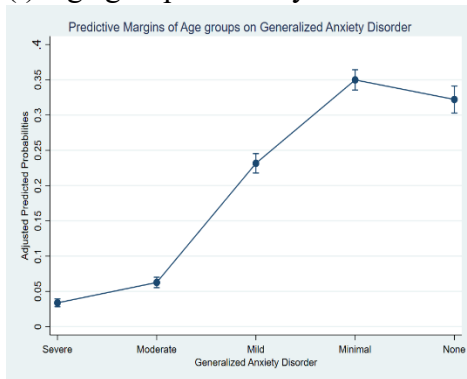

(iii) Age group over 55 years old

Figure A.2 1. Adjusted Predictions of Age Categories on Self Perceived Mental Health

(i) Age group 15 – 24 years old

(ii) Age group 25 – 54 years old

(iii) Age group over 55 years old

Figure A.2 2. Adjusted Predictions of Age Categories on Anxiety Severity