In Sickness and in Wealth: Mental Health, Income Levels, and COVID-19

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Globally, COVID-19 has brought upon many challenges to mental health. Social distancing and isolation have led people to experience greater anxiety and negative affect, and financial distress has increased due to economic changes. Demographic features may differentiate the severity of distress individuals face. Using data from The Centre for Addiction and Mental Health (CAMH), the present study examined measures of psychological distress across a Canadian sample, identifying differences in age, sex, and income levels. Trends over time were observed. Lower-income Canadians reported higher distress. Women may be at greater risk than men, as well as younger compared to older Canadians. Psychological distress has remained relatively stable throughout the pandemic, although COVID-19 financial worry has lessened as people are not as worried about their finances. The findings of this study are informative of socioeconomic, sex, and age differences in mental health throughout the pandemic in a Canadian sample.

Keywords: COVID-19, mental health, socioeconomic disparities, sex differences, age differences

Globalement, la COVID-19 a créé des défis au niveau de la santé mentale. La distanciation sociale et l'isolation ont augmenté les taux d'anxiété et d'affect négatif et les changements économiques ont causé de la détresse financière. Certaines caractéristiques démographiques peuvent influencer la sévérité des défis rencontrés. Grace au donnés du CAMH, cet article examine les niveaux de détresse psychologique d'un échantillon de la population canadienne en tenant compte des différences d'âge, de sexe et de revenu. Au fil du temps, certaines tendances ont été observées. Les Canadiens à faible revenu vivaient plus de détresse que les mieux nantis. Les femmes étaient plus à risque de détresse que les hommes et les jeunes étaient plus à risque que les plus âgés. Les niveaux de détresse psychologique sont demeurés plutôt stables durant la pandémie, tandis que les soucis économiques se sont atténués. Les résultats de cette étude renseignent sur la santé mentale de la population canadienne selon le sexe, l'âge et le statut socio-économique pendant la pandémie.

Mots-clés : COVID-19, santé mentale, disparité socio-économique, différence de sexe, différence d'âge

Since the coronavirus COVID-19 pandemic was declared in March 2020, specifically in the West, its impacts have been drastic throughout the world, and it has had serious deleterious harmful effects on people and society. Despite the recent vaccination efforts (with over seven billion doses administered to date), 260 million people have been infected with the virus, and over five million people have lost their lives (World Health Organization [WHO], 2021). Many have lost loved ones or their jobs, and had their whole lives upturned because of COVID-19. To help prevent greater tragedy, governments around the globe have instituted lockdowns, mask mandates, social gathering limits, travel bans, and more. With a rising death toll and many isolated from friends, unable to enjoy activities like before the pandemic (such as going to concerts and weddings), and isolated from family living far away, COVID-19 is becoming became a topic no one can escape. Many people are living in significant fear of the virus and experiencing damaging effects on their mental health. People are afraid of getting sick, getting loved ones sick, losing their jobs, and more. Amid this, most have likely heard that the virus does not discriminate (Gupta, 2020; Racine, 2020); whether you are rich or poor or are somewhere in between, everyone is at risk of contracting the virus. Although everyone is at risk to some degree, many argue that some people at higher risk are significantly disadvantaged in terms of contracting the virus than others (Baena-Díez et al., 2020; Bambra et al., 2020; Oronce et al., 2020; Wildman, 2021), there is sparse research examining how those experiencing greater financial strain are coping with the virus, especially in a Canadian sample. The relationship between income level,

COVID-19, and mental health is important to examine, as the pandemic is still prevalent, mental health is reportedly deteriorating for many (Jenkins et al., 2021), and the financial effects impact of COVID-19 on individuals and families are significant. The present study will investigate how income level and mental health are related during in the context of the pandemic, seeking to determine how those of different income levels are doing psychologically throughout the pandemic, while also adding to the body of literature on socioeconomic health disparities.

Health disparities among individuals of differing income levels are well documented throughout history (Lowcock et al., 2012; Lynch et al., 1997). Research since the start of the pandemic has confirmed these findings, suggesting that lower-income individuals face greater health risks and complications during the COVID-19 pandemic as well (Baena-Díez et al., 2020; Bambra et al., 2020; Finch & Finch, 2020; Jay et al., 2020). These findings are important, as they contribute to the distress these groups must face throughout the pandemic because of their identity including being of lower income statuses. Recent research has confirmed that the COVID-19 global health crisis has increased psychological distress for many (Jenkins et al., 2021), but given that the effects of coronavirus COVID-19 may be worse (and more impactful) for lower-income individuals, it is necessary to determine study how these groups are coping throughout with the pandemic. Research prior to the pandemic has corroborated that lower-income individuals are more likely to have faced psychological distress under pre-coronavirus COVID-19 conditions (Lynch et al., 1997; Wood et al., 2012), and research during the pandemic has confirmed that lower-income individuals may be experiencing greater stress throughout the pandemic as well (Kikuchi et al., 2021; Kimhi et al., 2021; Pieh et al., 2020; Rudbenstine et al., 2020; Yue et al., 2020). Importantly, researchers have also identified age and gender differences in psychological distress throughout the pandemic, further suggesting that other facets of identity can place some individuals at higher risk for psychological distress than others (Kibbey et al., 2021; Mazza et al., 2020; Qiu et al., 2020; Solomou & Constantinidou, 2020; Wang et al., 2020).

Income Level and Coronavirus

Prior to the COVID-19 pandemic, research has consistently found that lower-income individuals are at greater risk for facing health complications, and fare worse than those with higher incomes when health complications arise. For example, Lowcock et al. (2012) found that during the H1N1 pandemic, individuals facing higher material deprivation, lower education, and higher unemployment were more likely

to be hospitalized for H1N1 than those of higher socioeconomic statuses. Likewise, Lynch et al. (1997) found that individuals facing economic hardship experienced greater difficulties in physical functioning activities required for daily living (e.g., walking, dressing, housework, etc.). Similar socioeconomic health disparities have been found disseminated reported throughout the coronavirus pandemic. Given that Spain has a similar universal healthcare system to Canada, such that socioeconomic status should theoretically not be a barrier to receiving care (Avanzas et al., 2017), Spanish data were reviewed. Researchers in Spain found that income level was associated with a higher incidence rate of COVID-19 in Barcelona (Baena-Díez et al., 2020). They examined COVID-19 positivity rates and gathered mean income data for each district of Barcelona, comparing incidence rates of COVID-19 to income levels. It was found that as mean income level increased in a district, coronavirus incidence rates significantly decreased (Baena-Díez et al., 2020). Another study found that lower-income individuals tend to fare worse than higher-income individuals once they get ill with COVID-19 (Finch & Finch, 2020). Researchers examined COVID-19 incidence and mortality rates throughout the United States at the beginning of the pandemic, while also utilizing a poverty index to assess levels of deprivation in counties to compare COVID-19 incidence and mortality to deprivation levels. They found that, although counties with the greatest deprivation experienced more cases at the beginning of the pandemic, a curvilinear trend emerged such that higher-income counties ended up with higher incidence rates. However, even though incidence rates shrunk among lower-income counties, mortality rates remained high in the counties experiencing the greatest deprivation (Finch & Finch, 2020). These results suggest that even if lower-income individuals experience lower incidence rates, the effects of COVID-19 on their health could be more deleterious harmful than those with higher incomes.

Although the United States and Canada are different, data may still be compared given the two countries' geographical proximity and well-known cultural similarities. More importantly, although income inequality is higher in the United States, it is also increasing in Canada, which may bring with it many detrimental effects to society (Marchand et al., 2020).

Other researchers offer suggestions as to why lower-income individuals may fare worse with COVID-19. In a review conducted by Bambra et al. (2020), researchers suggest that lower-income individuals are significantly disadvantaged by the impacts of COVID-19 due to social determinants of

health. They suggest that individuals of lower-income levels are more likely to have many of the health risk factors for COVID-19 (e.g., obesity, hypertension, asthma, etc.), work outside the home in essential services with high exposure rates, and rely on public transportation, all while having less access to healthcare (Bambra et al., 2020). These suggestions have been supported by researchers, such as Jay et al. (2020), who examined physical distancing among Americans with of varying income levels. In their study, mobility data from cellular phones were gathered in over 210 000 census blocks, allowing tracking of mobility for several months. Census blocks that fell in the higher-income quintiles contained individuals who were able to stay home significantly more than those in lower-income quintiles, thereby physically distancing significantly more. Likewise, the quintiles with the highest incomes observed more people working from home. Results also indicated that those in lower-income quintiles experienced greater declines in visiting places like carryout takeout restaurants and stores, suggesting that even though lower-income individuals may have tried to stay home more when they could (such as fewer visits to stores), they ultimately had to leave the house more for work, whereas higher-income individuals had the privilege of working from home (Jay et al., 2020). Therefore, those with lower incomes may experience greater health implications of COVID-19 than those with higher incomes due to factors such as having to work outside the home, having more health risk factors, not being able to socially distance, and less access to healthcare.

Income and Mental Health

Prior to the pandemic, research has found that individuals of lower-income levels experience greater mental health difficulties than those with higher-incomes. In a cohort study by Wood et al. (2012), researchers measured psychological distress (i.e., anxiety and depression) and overall physical functioning. They then examined demographic information, such as income level, and income relative to others in their region. It was found that income level was associated with greater distress when income was analyzed relative to others, suggesting that income acts as a proxy for social rank, such that when inequalities are large, lower-income individuals experience greater psychological distress. Authors suggest the increase in distress is due to factors of their income rank compared to others, like having fewer resources (Wood et al., 2012). Psychological distress has also been found to increase as income level decreases by Lynch al. (1997). Researchers used measures to assess demographic information and psychological functioning, including depression, and it was found that those who experienced greater

economic hardship were significantly more likely to be clinically depressed and have a cynically hostile temperament (Lynch et al., 1997). Together, these findings suggest that lower-income individuals generally face greater difficulties with psychological distress due to factors such as less access to resources compared to higher-income individuals.

Researchers thus far into the pandemic have corroborated findings that those with lower incomes are facing more mental health struggles amidst COVID-19 than those with higher-incomes. Kikuchi et al. (2021) tracked the mental health of nearly 2000 individuals in Tokyo, also obtaining demographic information such as age, gender, and income level. It was found that participants in the lower-income groups experienced higher levels of severe psychological distress compared to those in the higher-income groups. Results also indicated that as the pandemic progressed, lower-income participants were more likely to develop new severe psychological distress compared to higher-income groups, suggesting that lower-income participants experienced greater mental health declines compared to higher-income participants (Kikuchi et al., 2021). Although Canada and Japan are different in many ways, these nations can be compared in this way given their similarities in their healthcare systems (Esmail, 2013). Likewise, Rudenstine et al. (2020) examined demographic and psychological variables for over 1800 university students at The City University of New York. Depressive and anxious symptoms were assessed, as well as COVID-19 stressors (such as COVID-related job loss and financial strain), and demographic information. Results demonstrated that over half of the participants met the criteria for depression, and over 40% met the criteria for anxiety. As income increased, rates of depression and anxiety decreased, and those with the highest levels of anxiety and depression experienced greater COVID-19 stressors, like decreased access to resources and financial troubles related to COVID-19 (Rudenstine et al., 2020).

Similarly, researchers in Israel found that those with lower-incomes experienced greater mental health difficulties (Kimhi et al., 2021). Given that Israel and Canada have close cultural, social, and economic links, data from Israel was explored (Government of Canada, 2022a). Researchers examined demographic and mental health variables of over 800 Israelis throughout the pandemic. Results were organized into four categories to explain participants' frequency of symptoms throughout the pandemic. Income level was found to significantly predict the frequency of symptoms, such that those in the lower income categories experienced the most symptoms. Small effects were also found regarding economic

difficulties, such that those who experienced the least amount of COVID-19 related economic troubles were the most resilient to symptoms of anxiety, but not depressive symptoms (Kimhi et al., 2021). Others have confirmed that lower-income individuals are more likely to suffer greater mental health difficulties throughout the pandemic. For example, an Austrian study examined the effects of demographic variables on mental health among 1000 participants during Austria's first COVID-19 lockdown (Pieh et al., 2020, Budimir & Probst, 2020). In all measures of psychological distress, lower-income individuals were at greater risk for experiencing higher stress, anxiety, and depression (Pieh et al., 2020). Although healthcare in Austria is ranked higher than Canada in many measures (Moir & Barua, 2021), Austria has a similar universal healthcare system as to Canada, thereby justifying this comparison. A final study highlights similar findings, examining over 1300 families with children in China during the pandemic in China (Yue et al., 2020). Parents with lower-income levels were found to report more symptoms of anxiety, depression, and post-traumatic stress disorder, suggesting that the mental health of parents with children during COVID-19 is significantly worse for those in of lower income levels (Yue et al., 2020). Moreover, these findings demonstrate the detrimental effects of COVID-19 on individuals' mental health during the pandemic. Canada and China are vastly different nations, both of which have large wealth gaps. Importantly, China is witnessing a largely increasing wealth gap, thus making these two nations comparable in this respect (Jain-Chandra et al., 2018).

Sex Differences in Mental Health

Throughout the pandemic, research has shown that there are going to be differences in mental health depending on the sex of the person. One study in Cyprus sought to determine whether demographic variables could predict increased prevalence of depression and anxiety (Solomou & Constantinidou, 2020). Over 1600 adults were asked questions about on their sociodemographic data, COVID-19 knowledge, and safety measures, quality of life, and mental health. Results indicated that women were significantly more likely to have higher anxious and depressive symptoms compared to men, suggesting that having certain demographic characteristics, such as being a woman, make one more likely to suffer greater mental health consequences (Solomou & Constantinidou, 2020). Notably, Canada and Cyprus are vastly different countries with different cultures; moreover, gender differences in mental health should be examined under the presumption that results in Canada may be different. Arguably, these differences may matter less in the context of COVID-19, as the pandemic brought upon challenges in both nations.

Researchers in New Jersey have confirmed findings that women are at greater risk for mental health impairments during the pandemic than men (Kibbey et al., 2021). They sought to test whether certain demographic characteristics could predict higher psychological distress in university students at the start of the pandemic. Participants were asked about their demographic data, as well as anxiety, depression, and health anxiety symptoms. Results indicated students who were women were over two times more likely to suffer from more anxiety and depression symptoms compared than to students who were men (Kibbey et al., 2021). In an Italian study, Mazza et al. (2020) examined whether factors such as gender could predict higher risk of psychological distress during the pandemic. Due to the large proportion of Canadians with Italian backgrounds, and the cultural and social similarities between the two nations, data from Italy may be especially pertinent to Canada (Government of Canada, 2022b). Over 2700 participants were asked about their sociodemographic data, depression, anxiety, and stress levels (Mazza et al., 2020). Indeed, respondents who were women reported higher levels of depression, anxiety, and stress (Mazza et al., 2020).

To explore the psychological impact of mental health on young adults in China at the start of the pandemic, Wang et al. (2020) examined demographic information, knowledge about COVID-19 (such as patient knowledge, concerns, precautionary measures, etc.), psychological impact of COVID-19, and participant mental health status. Women reported a significantly higher psychological impact of the pandemic, as well as increased levels of stress, anxiety, and depression (Wang et al., 2020). Another final study in China at the beginning of the pandemic examined demographic risk factors for psychological distress during the beginning of the pandemic in China (Qiu et al., 2020). Over 52 000 adults were asked about their demographic data, anxiety, depression, phobias, and more. Results indicated that being a woman predicted higher psychological distress (Qiu et al., 2020). Together, these findings suggest that being a woman places one at a higher propensity for increased mental health issues, especially during the pandemic.

Age Differences in Mental Health

Several studies have also found age differences in psychological distress throughout the pandemic. Solomou and Constantiniodou (2020) examined whether the age groups predicted increased distress during the pandemic among four age groups: 18-29, 30-49, 50-59, and 60+. The youngest age group (ages 18-29) experienced the highest levels of anxiety and depression, followed by the 30-49 age group. Interestingly, the two older groups (50-59 and 60+)

did not demonstrate significant differences in psychological distress, suggesting that certain demographic characteristics, such as being under age 50, predict increased risk for psychological distress during the pandemic (Solomou & Constantinidou, 2020). Likewise, Mazza et al. (2020) examined differences in stress, anxiety, and depression levels by age. Interestingly, age was only significantly associated with stress levels, such that younger participants experienced increased levels of stress compared to older participants, but was not significantly associated different with depression or anxiety levels (Mazza et al., 2020). An Italian study examining predictive factors for increased psychological distress among students during the pandemic among students asked about demographic information, psychological distress, and mindfulness (Conversano et al., 2020). It was found that older respondents had significantly lower levels of distress compared to their younger counterparts, further suggesting that younger age to be is a risk factor for increased distress during the pandemic (Conversano et al., 2020). Qiu et al. (2020) also explored age differences in psychological distress throughout the pandemic. They found that those in the younger age group (18-30) and those aged 60+ experienced the highest distress, suggesting that psychological distress may display a curvilinear trend across ages, such that distress is high when participants area younger, drops in for middle-aged participants, and is once more elevated in older participants (Qiu et al., 2020).

While the world is still combatting the COVID-19 virus, individuals continue to battle the mental health struggles associated with the pandemic. The world still faces a long battle with COVID-19. So too, individuals continue to battle mental health struggles produced associated by with the virus pandemic. Importantly, lower-income individuals have been shown to be at greater risk for facing health complications (Lowcock et al., 2012; Lynch et al., 1997), and these effects appear to persist throughout the pandemic. Those with lower-income levels have also been found to be at greater risk for contracting the virus and faring worse when ill due to factors like an increased health risk, not being able to socially distance, and lesser access to healthcare (Baena-Díez et al., 2020; Bambra et al., 2020; Finch & Finch, 2020; Jay et al., 2020). Importantly, individuals of lower-income levels have been found to have experienced greater psychological distress pre-pandemic (Wood et al., 2012; Lynch et al., 1997), and these increased stress levels in lower-income individuals appear especially pronounced throughout the pandemic (Kikuchi et al., 2021; Kimhi et al., 2021; Pieh et al., 2020; Rudenstine et al., 2020; Yue et al., 2020). Other demographic characteristics have been found to

predict increases in distress throughout the pandemic, such as being female a woman (Kibbey et al., 2021; Mazza et al., 2020; Solomou & Constantinidou, 2020; Wang et al., 2020; Qiu et al., 2020) and young er age (Conversano et al., 2020; Mazza et al., 2020; Solomou & Constantinidou, 2020; Qiu et al., 2020). Although there is research on the effects of income level, health outcomes, and psychological distress both before and during the pandemic, there is a gap in the literature on how these variables impact a Canadian sample during COVID-19. In a time where more Canadians are facing increased mental health struggles (Jenkins et al., 2021) and the threat of the virus is still prominent, research is needed to fill this gap and determine how income, gender, and age have impacted Canadians' mental health during in response to the coronavirus COVID-19 pandemic.

Present Study and Hypotheses

The purpose of the present study is to assess the relationship between income level, age, and and gender, and to anxiety, negative affect, COVID worry, and COVID financial worry. This study will also consider the wave of the survey (early in the pandemic vs. late in the pandemic) to assess how these variables change over time as the pandemic progresses.

Based on those who have found that lower-income individuals are more likely to experience heightened psychological distress (Lynch et al., 1997; Wood et al., 2012), especially during the pandemic (Kikuchi et al., 2021; Kimhi et al., 2021; Pieh et al., 2020; Rudenstine et al., 2020; Yue et al., 2020), it was hypothesized (H1) that respondents of lower-income levels will experience higher negative affect, anxiety, COVID worry, and COVID financial worry.

Based on those who have found that women are more likely to experience more psychological distress at a greater level than men—especially during the pandemic (Kibbey et al., 2021; Mazza et al., 2020; Qiu et al., 2020; Solomou & Constantinidou, 2020; Wang et al., 2020), it was hypothesized (H2) that females women would report higher levels of negative affect, anxiety, COVID worry, and COVID financial worry than men.

Finally, based on those who have found that younger individuals are more likely to experience psychological distress (Conversano et al., 2020; Mazza et al., 2020; Qiu et al., 2020; Solomou & Constantinidou, 2020), it was hypothesized (H3) that younger respondents would have the highest levels of anxiety, negative affect, COVID worry, and COVID financial worry.

Methods

The present study is an archival design based on research conducted by the Centre for Addiction and Mental Health (CAMH) in collaboration with Delvinia, a global research and data collection company (2021). This study utilized data collected by The CAMH during the COVID-19 pandemic. The *CAMH COVID-19 National Survey* is a national cross-sectional study assessing Canadians' demographic information, mental health experience, and substance use throughout the pandemic. Questions were asked in a Likert scale format. Data CAMH were gathered data in eight waves, on encompassing approximately 8000 Canadians in total, assessing how responses changed over time as the pandemic progressed.

Procedures

CAMH and Delvinia utilized *Methodify*, an online survey platform, to create their survey. Participants were recruited via the interactive research platform, *Asking Canadians,* which is a website through which individuals throughout Canada can create an account and agree to be contacted to participate in several surveys per month. Those who met the demographic criteria for the survey, such as being over 18 and being an English-speaking Canadian, were contacted. Participants would then log on to the *Asking Canadians* website, through which they were redirected to the survey. Approximately thirty questions in each wave were asked per wave, ranging from demographic questions, such as age and genders, to questions on substance abuse, feelings of loneliness, and more. See Appendix A for the full survey.

Participants

The full sample contained responses from 8022 Canadians; however, 1416 were removed due to missing items (namely providing an answer other than male or female for gender or indicating *prefer not to answer* for income level). Each wave contained an approximately equal number of respondents (about 1000 per wave). In each wave, approximately 40% of respondents were between 18-39 years of age, 30% were between 40-59, and 30% were 60 or older. Each wave had an approximately even gender distribution, with about 50% identifying as men and 50% identifying as women (69 respondents were removed for providing an answer other than man or woman). Regarding annual household income, each wave varied slightly; however, approximately 12% made less than $40 000, 25% made between $40 000 and $79 000, 25% made between $80 000 and $119 000, and 25% made above $120 000. Approximately 13% per wave did not indicate an answer and thus were excluded from analysis. Participants were distributed throughout the country; each wave differed slightly, but approximately 15% resided in British Columbia, 15% in Alberta, 10% in Saskatchewan or Manitoba, 40% in Ontario, and 20% in Quebec or Atlantic Canada.

Measures

This study considered whether there are differences in negative affect, anxiety, COVID worry, and COVID financial worry by age, gender, income level, and wave. Respondents were asked to indicate their total annual household income level they and other members of their household received in 2019. Eight income groups were listed; for this study, income level was condensed into four groups: less than $40 000, $40 000 to $79 999, $80 000 to $119 000, and above $120 000. Respondents were also asked to indicate their age groups. Six age groups were listed in the survey; however, age was condensed into three categories: younger (18-39), middle-aged (40-59), and older (60+). Respondents were asked as well to indicate their gender identity from the following choices: man, woman, transgender man, transgender woman, non-binary (genderqueer, gender fluid), questioning/not sure of my gender identity, and identity not listed. However, only 69 respondents provided an answer other than man or woman, and were thus excluded from analysis. To assess wave, waves 1-4 were merged into an early waves category and waves 5-8 into a later waves category. Each individual wave was then further examined when significant differences were found in early vs. later waves.

Negative affect was assessed via three items in the survey, which was then used to create a negative affect composite score based on a respondent's answers to these three questions. CAMH asked respondents: *In the past seven days, how often have you felt depressed?*, *In the past seven days, how often have you felt lonely?*, and *In the past seven days, how often have you felt hopeful about the future?* Respondents could indicate an answer of: *rarely* or *none of the time* (less than 1 day), *some* or *a little of the time* (1-2 days), or *occasionally* or *a moderate amount of the time* (3-4 days), and *most* or *all of the time* (5-7 days).

Anxiety was assessed via seven questions in the survey, which was then used to create an anxiety composite score. CAMH asked respondents: *Over the past two weeks, how often have you been bothered by the following problem?* The problems were: (9) *feelings nervous, anxious, or on edge*, (10) *not being able to stop or control worrying*, (11) *worrying too much about different things*, (12) *trouble relaxing*, (13) *being so restless that it's hard to sit still*, (14) *being easily annoyed or irritable*, and (15) *feeling*

afraid as if something awful might happen. Respondents could indicate an answer of: *not at all*, *several days*, *over half the days*, or *nearly every day*.

COVID worry was measured via a respondent's answer to the question: *How worried are you that you or someone close to you (close friend or relative) will get ill from COVID-19?* to which respondents could indicate an answer of: *very worried*, *somewhat worried*, *not very worried*, or *not at all worried*.

Finally, COVID financial worry was measured via a participant's response to the question *How worried are you about the impact of the COVID-19 pandemic on your personal financial situation?*, to which respondents could answer: *very worried*, somewhat *worried*, *not very worried*, or *not at all worried*.

Statistics

Using SPSS (Version 26), all analyses employed a significance level of $p < .05$. Due to mild deviation from normality in several dependent variables (anxiety and negative affect), nonparametric analyses (using ranked scores, free of derivational assumptions) were conducted alongside the parametric statistics to confirm any significant results. Using negative affect, anxiety, COVID worry, and COVID financial worry as dependent variables, and age (younger, middle, older), gender (male, female), income level (less than 40k, 40-79k, 80-119k, 120k+), and wave (earlier vs. later waves) as independent variables, a multivariate analysis of variance (MANOVA) was conducted. Table 1 outlines the descriptive statistics for all independent variables, as well as correlations among them, thus justifying the use of multivariate analysis of variance. Wilks' lambda (Λ) was reported as an estimate of *unexplained* multivariate variance, whereas its complement (1-Λ) represents *explained* multivariate variance. For follow-up, univariate analyses of variance (ANOVA) explained variance was estimated using η^2. Post hoc Student-Newkam-Keuls (S-N-K) tests indicated within which level of the variable the differences existed.

Results

Overall, results indicated four significant main effects, as well as an age x wave interaction and an age x income interaction ($p < .05$).

Main Effects

After inputting age, gender, wave, and income level as independent variables and negative affect, anxiety, COVID worry, and COVID financial worry as dependent variables, a significant multivariate effect was observed for wave, ($\Lambda = 0.93$, $F(4, 6603) = 11.55$, $p < .001$). The ANOVAs revealed significant differences in COVID financial worry by wave,

($F(1, 6606) = 37.56$, $p < .001$, $\eta^2 < 0.01$). Waves were split into two groups (the first four waves vs. the last, more recent four waves), and it was found that respondents in the early waves had significantly higher COVID financial worry scores ($M = 2.74$) compared to respondents in the later waves ($M = 2.58$). Upon further examination of each individual wave, post hoc Student-Newman-Keuls tests confirmed significant differences in COVID financial worry by wave. When considering all eight individual waves, it was found that respondents in wave 1 had the highest COVID financial worry scores ($M = 2.83$), compared to respondents in waves 2, 3, 4, 5, and 6 ($M = 2.72, 2.69, 2.72, 2.67, 2.72$), who were higher than respondents in wave 7 ($M = 2.52$). Respondents in wave 8 had the lowest COVID financial worry scores ($M = 2.42$). These results were confirmed using nonparametric (ranked) statistics.

To test whether respondents of different income levels would have different levels of negative affect, anxiety, COVID worry, and COVID financial worry, a MANOVA was conducted, and also pulled outfound significant multivariate effects for income level, ($\Lambda = 0.95$, $F(12, 17470) = 29.79$, $p < .001$). The 1,322 respondents who indicated *prefer not to answer* were withdrawn from the present analysis. Univariate ANOVAs revealed significant differences in negative affect scores for those in the fourth income step ($120k+) ($M = 5.64$) compared to those in the third income step ($80-119k; $M = 6.04$) who had significantly lower negative affect scores than respondents in the second income step ($40-79k, $M = 6.30$). Respondents in the first income step (less than $40k) were significantly different from other groups, with the highest negative affect scores ($M = 6.74$). Significant differences were also found in anxiety scores by income level, ($F(3, 6606) = 24.20$, $p < .001$, $\eta^2 = 0.01$). Respondents in the fourth income step ($120k+) experienced the lowest anxiety scores ($M = 12.12$). Respondents in the third income step ($80-119k) experienced lower anxiety scores ($M = 12.57$) compared to those in the second step ($40-79k; $M = 13.05$) who were lower than the first step (less than $40k), who observed reported the highest anxiety scores ($M = 13.73$). Significant differences were also found in COVID worry by income level as well, ($F(3, 6606) = 4.84$, $p = .002$, $\eta^2 < 0.01$). Respondents in the fourth income step ($120k+) had the lowest COVID worry scores ($M = 2.84$), but were not significantly different from those in the third income step ($80-119k; $M = 2.89$). Respondents in the second income level ($40-79k) had higher COVID worry scores ($M = 2.94$) than the fourth income level, but were not significantly different from the third income level (the third income level fit into two subsets). Respondents in the lowest income level (less than 40k) had the highest COVID

worry scores ($M = 2.97$), and were significantly differ-rent from the third and fourth income levels, but not the second (the second income level also fit into two subsets). Finally, significant differences were also found in COVID financial worry depending on income level, ($F(3, 6606) = 73.59$, $p < .001$, $\eta^2 = 0.03$). Respondents in the fourth income step (above \$120k) had the lowest COVID financial worry scores ($M = 2.44$) compared to the third income step (\$80-119k; $M = 2.62$), who were lower than the second income step (\$40-79k; $M = 2.74$). Respondents in the first income step (less than \$40k) had the highest levels of COVID financial worry ($M = 2.91$). These results were confirmed using nonparametric statistics based on ranked scores.

Multivariate effects were also observed for gender, ($\Lambda = 0.99$, $F(4, 6603) = 22.99$, $p < .001$). The 69 respondents who provided an answer other than male or female were withdrawn from the present analysis. Significant differences were observed in negative affect scores by gender, ($F(1, 6606) = p < .001$, $\eta^2 < 0.01$). Females had significantly higher negative affect scores ($M = 6.23$) compared to males ($M = 5.88$). Significant sex differences were also observed in anxiety levels, ($F(1, 6606) = 60.81$, $p < .001$, $\eta^2 = 0.01$); wherein women had significantly higher anxiety scores ($M = 13.20$) compared to men ($M = 12.03$). Finally, significant sex differences were also observed in COVID worry levels, ($F(1, 6606) = 45.75$, $p < .001$. $\eta^2 = 0.01$). These results were confirmed using nonparametric (ranked) statistics.

Multivariate effects were also observed for age, ($\Lambda = 0.92$, $F(8, 13206) = 67.98$, $p < .001$). Significant differences in negative affect scores were observed for age, ($F(2, 6606) = 158.35$, $p < .001$, $\eta^2 = 0.05$). Older respondents had the lowest negative affect scores ($M = 5.41$) compared to those in the middle-aged group ($M = 6.20$), who had significantly lower negative affect scores than the younger age group ($M = 6.47$). Anxiety levels also significantly differed by age ($F(2, 6606) = 201.54$, $p < .001$, $\eta^2 = 0.03$). Older respondents had the lowest COVID financial worry scores ($M = 2.47$) compared to middle-aged and younger respondents ($M = 2.76$ and 2.73, respectively), who were not significantly different from one another. These results were confirmed using nonparametric (ranked) statistics.

Interactions

Several multivariate interaction effects were observed. A multivariate interaction effect was observed by age, ($\Lambda = 0.997$, $F(8, 13206) = 2.33$, $p = .017$). ANOVAs indicated significant differences in COVID worry by age and wave, ($F(2, 6606) = 5.83$, $p = .003$, $\eta^2 < 0.01$). In the earlier waves, age groups did not significantly differ in COVID worry scores.

However, in the later waves, younger respondents had the highest COVID worry scores ($M = 2.96$), followed by middle-aged ($M = 2.92$) and older respondents ($M = 2.86$). A simple effects test revealed that in later waves, only younger respondents had significantly different COVID worry scores compared to older respondents ($p < .001$). Figure 1 shows mean COVID worry scores by age and wave. Upon further examination of each individual wave (Figure 2), younger, middle-aged, and older respondents followed a similar trend of COVID worry over time. Results were confirmed using nonparametric (ranked) statistics; however, in the later waves only, younger respondents were significantly different than older respondents, and older respondents were significantly different than middle-aged respondents. Younger and middle-aged respondents were not significantly different from one another.

A multivariate interaction effect was also found for income and age, $\Lambda = 0.99$, $F(24, 2306) = 1.83$, $p = .008$. Significant differences were found in negative affect scores by income and age, ($F(6, 6606) = 2.37$, $p = .027$, $\eta^2 < 0.01$). ANOVAs revealed a similar trend across ages, such that as income bracket increased, negative affect scores decreased. Simple effects tests indicated that older respondents in the first three income brackets (less than \$40k, \$40-79k, and \$80-119k) had lower mean negative affect scores compared to middle-aged and younger respondents, who were not significantly different from one another. In the fourth income bracket (above \$120k), older respondents once more had significantly lower negative affect scores than younger and middle-aged respondents. Additionally, middle-aged respondents had significantly lower negative affect scores than younger respondents in the highest income bracket (above \$120k only). Figure 3 shows mean negative affect scores by age and income. Due to the mild skew (0.63) of negative affect, nonparametric tests were conducted to confirm these results. However, using ranked scores it was determined that these results were no longer significant when using ranked scores ($p = .106$).

Significant differences were also found in anxiety levels by age and income, ($F(3, 6606) = 2.48$, $p = .021$, $\eta^2 < 0.01$). An indicated a trend across each age group such that as income bracket increased, anxiety decreased (Figure 4). In the lowest income bracket (less than \$40k), older respondents had significantly lower anxiety scores compared to middle-aged and younger respondents, who were not significantly different from one another. In the remaining income brackets (\$40-79k, \$80-119k, and above \$120k), older respondents had the lowest anxiety scores, followed by middle-aged respondents, who were significantly lower than younger

respondents, who reported the highest anxiety scores. Due to the mild skew (1.04) of anxiety, nonparametric tests were conducted to confirm these results. However, ranked parametric statistics revealed only marginally insignificant differences ($p = .053$).

Significant differences in COVID worry also emerged by income and age, ($F(6, 6606) = 2.61$, $p = .016$, $\eta^2 < 0.01$). A trend emerged such that younger and middle-aged respondents saw decreases in COVID worry as income increased, whereas older respondents saw relatively stable COVID worry regardless of income bracket (Figure 5). In the lowest income bracket (less than $40k), older respondents had significantly lower COVID worry scores compared to middle-aged and younger respondents, who were not significantly different from one another. In the second income bracket ($40-79k), older respondents had significantly lower COVID worry compared to middle-aged respondents, but were not significantly different from younger respondents. Middle-aged and younger respondents were not significantly different from one another. The third- and fourth-income brackets saw that age groups were not significantly different from one another in terms of COVID worry. These results were confirmed using nonparametric statistics based on ranked scores.

A final significant difference was found in COVID financial worry scores by age and income level, ($F(6, 6606) = 3.73$, $p = .001$, $\eta^2 < 0.01$). A trend emerged across income brackets such that as income increased, COVID financial worry decreased (Figure 6). Simple effects tests revealed that throughout each income bracket, older respondents demonstrated the lowest levels of COVID financial worry. In the second income bracket only, middle-aged respondents had significantly higher COVID financial worry compared to younger respondents; however, in the first, third, and fourth income brackets, middle-aged and younger respondents were not significantly different from one another. Results were confirmed using nonparametric statistics based on ranked scores.

Discussion

The present study conducted a multivariate analysis of variance test to examine whether there were differences in anxiety, negative affect, COVID worry, and COVID financial worry varied by demographic factors such as age, gender, and income level. Trends were also assessed in these variables over time as the pandemic progressed. Regarding the hypotheses that individuals of different ages, genders, and income levels would demonstrate differing levels of anxiety, negative affect, COVID worry, and COVID financial worry, findings were mixed.

Income Differences

The first hypothesis–that lower-income individuals would have higher levels of negative affect, anxiety, COVID worry, and COVID financial worry–was supported. Canadians who participated in the survey had higher negative affect scores throughout the pandemic if they were in a lower income level compared to those in higher income levels. As income bracket increased, significant decreases were found in negative affect scores. It was also observed that those who participated in the survey experienced higher anxiety levels if they were in a lower income bracket compared to those in higher income brackets, such that as income level increased, anxiety decreased. It was also found that those who participated in this survey experienced higher COVID worry and COVID financial worry if they were in a lower income bracket compared to those in higher income brackets. Indeed, as income level increased, both COVID worry and COVID financial worry decreased.

The respondents in lower income levels had higher negative affect, anxiety, COVID worry, and COVID financial worry, which supports existing literature that lower-income individuals face greater psychological distress (Lynch et al., 1997; Wood et al., 2012), especially during the pandemic (Kikuchi et al., 2021; Kimhi et al., 2021; Pieh et al., 2020; Rudenstine et al., 2020; Yue et al., 2020). These findings contribute to research on socioeconomic disparities in mental health, further highlighting that the pandemic is no exception. Differences in anxiety and negative affect by income levels may indicate that those of lower incomes face unique struggles contributing to the distress that those with higher income levels do not have to face (Kikuchi et al., 2021; Kimhi et al., 2021; Pieh et al., 2020; Rudenstine et al., 2020; Yue et al., 2020). Lower-income individuals may be more likely to work in settings where job security is not stable, such that they may be more likely to face pandemic related layoffs than those with higher incomes, such as factories or service industries (i.e., hair salons). Lower-income individuals may also be working in essential services, such as grocery stores or restaurants, that are increasingly busy due to the pandemic, and facing effects of current staffing crises in many industries (Rao et al., 2021). These groups may also face other stressors that those with high incomes do not have to face, such as food insecurity, loss of essential income if they contract COVID, and more (Kikuchi et al., 2021; Kimhi et al., 2021; Pieh et al., 2020; Rudenstine et al., 2020; Yue et al., 2020). Working conditions may play a role in higher COVID worry and COVID financial worry as well. Lower-income individuals may work more in on-site congregate settings, such as service industries and factories, compared to higher-income individuals who often had the privilege of

working from home (Rao et al., 2021). This higher exposure may contribute to these groups feeling more afraid of getting ill. Lower-income individuals may also have less in savings (Mian et al., 2021); coupled with the increased risk of pandemic-related layoffs (Parker et al., 2020) and dips in the economy throughout the pandemic, this might also contribute to greater financial distress. Although higher-income groups face the risk of pandemic-related layoffs as well, they have more money in the bank as a protective cushion and do not have to live paycheck-to-paycheck like many lower-income individuals (Mian et al., 2021). Together, these scenarios may contribute to lower-income groups feeling more distress throughout the pandemic, which manifest as negative affect, anxiety, COVID worry, and COVID financial worry.

Sex Differences

The second hypothesis–that women would demonstrate higher negative affect, anxiety, COVID worry, and COVID financial worry–was partially supported. Indeed, women reported higher negative affect and anxiety. These findings support the literature on psychological health and sex, which asserts that women are more likely to experience more psychological distress than men, especially during the pandemic (Kibbey et al., 2021; Mazza et al., 2020; Qiu et al., 2020; Solomou & Constantinidou, 2020; Wang et al., 2020). The finding that men and women did not differ significantly in terms of COVID financial worry was contrary to our hypothesis. Although it was expected that women would experience greater COVID financial worry given this is a source of psychological distress, it could be that men and women are equally providing for themselves and their families financially. In Canada, men and women represent an approximately equal percentage of the workforce, so they may be equally worried about the future or their financial stability (The World Bank, n.d.).

Age Differences

The hypothesis that younger respondents would experience higher negative affect, anxiety, COVID worry, and COVID financial worry was partially supported. That younger respondents had the highest negative affect and anxiety compared to middle-aged and subsequently older respondents (who had the lowest scores) supports the existing literature on age differences in mental health (Conversano et al., 2020; Mazza et al., 2020; Qiu et al., 2020; & Solomou & Constantinidou, 2020). That older respondents had lower COVID financial worry compared to younger and middle-aged respondents also partially supports these findings. Although the literature states that younger individuals should have the highest distress, it

makes sense that middle-aged respondents would have similar distress levels in this domain. Older adults are most often retired and do not have to worry about layoffs from work; however, younger and middle-aged individuals are most likely working and must worry about losing income (Statistics Canada, 2023). That there were no differences in COVID worry did not support our hypothesis. Different ages may experience similar COVID worry for different reasons; younger adults may be most worried about exposure through friends and work, middle-aged adults may be worried about their children and elderly parents getting ill, and older adults may be worried about pre-existing health conditions placing them at greater risk. Future research should further explore these avenues.

Although not hypothesized, interactions were observed between income and age. In the lowest three income levels, older adults had the lowest negative affect scores, and middle-aged and younger adults were not different from each other. However, the highest income bracket saw all three age groups differ in negative affect, such that older adults had the lowest scores followed by middle-aged and younger respondents. The lowest income level saw older adults have lower anxiety scores than middle-aged and younger adults, who were not significantly different. The subsequent three income levels saw younger adults have the highest anxiety scores, followed by middle-aged and then older adults. These findings support the literature that older adults experience fewer mental health effects of the pandemic, whereas younger adults experience the greatest detriment (Conversano et al., 2020; Mazza et al., 2020; Qiu et al., 2020; Solomou & Constantinidou, 2020). These findings also support existing literature on income differences, which states that those higher income levels face lower psychological distress compared to those in lower income levels, especially during the pandemic (Lynch et al., 1997; Kikuchi et al., 2021; Kimhi et al., 2021; Pieh et al., 2020; Rudenstine et al., 2020; Wood et al., 2012; Yue et al., 2020). This interaction also highlights differences in COVID worry and COVID financial worry by age and income. As income level increased, COVID worry decreased for younger and middle-aged adults; however, income and age only mattered in the lowest two income levels, such that middle-aged and younger adults were not different from one another but had higher COVID worry than older adults. Importantly, the two highest income levels did not see differences by age in terms of COVID worry. This supports our hypothesis such that the lower income brackets had higher COVID worry, but the higher income brackets did not significantly differ. Finally, all age groups saw decreases in COVID financial worry as income increased, such that older respondents had the lowest COVID financial worry, regardless of income level.

Younger and middle-aged adults were not different from one another, except in the second income bracket. These findings support our hypotheses, suggesting that distress regarding finances during COVID is greatest for younger and middle-aged adults of lower income levels.

Wave Differences

Differences in negative affect, anxiety, COVID worry, and COVID financial worry by wave of survey were further explored to examine how responses changed with time throughout the pandemic. Only COVID financial worry changed significantly by waves, such that early waves saw higher COVID financial worry than later waves, predicting that Canadians became less worried about their money and more acclimated to new spending habits. It may be predicted that people have become habituated to new budgets (such as paying less for gas due to working from home or having hours reduced and making less money), finding new work after pandemic-related layoffs, or returning to pre-pandemic schedules after pandemic-related layoffs. Negative affect, anxiety, and COVID worry did not significantly change as time progressed, suggesting that there are factors about the pandemic that negatively contributed to mental health that are not directly related to financial situation. However, it should be noted that although distress in these domains is not improving with time, distress is also not getting significantly worse either.

Interactions were also observed between age and wave. That younger respondents had higher COVID worry scores than middle-aged and older respondents in later waves only supports the literature that younger adults experience poorer mental health effects throughout the pandemic (Conversano et al., 2020; Mazza et al., 2020; Qiu et al., 2020; Solomou & Constantinidou, 2020). Perhaps in early waves, individuals faced mass confusion surrounding the pandemic as information was constantly changing; everyone was still trying to figure COVID-19 out; however, in the later waves, younger adults became more worried as they continued to work, go to school, and possibly be more exposed, whereas middle-aged and older adults may have gotten used to working from home or being retired and being able to stay home, thereby having lower exposure and less worry about getting ill (Pew Research Center, 2022).

Strengths and Limitations

There are various strengths of this study worth mentioning. This study fills a gap in the literature examining how mental health differs across different ages, genders, and income levels are experiencing mental health throughout the pandemic in Canada. Few studies have examined these independent variables together, especially during the pandemic. As well, there is a dearth of research on socioeconomic mental health disparities in Canada, and the present study highlights these disparities while also utilizing a large and diverse sample size. Moreover, a unique study design was used consisting of both parametric and nonparametric statistics to examine a large database.

There are also various limitations worth mentioning. This study was not causal, and therefore no causal conclusions can be drawn from this research. The sensitive nature of topics covered in the survey may have led people to inaccurately report their levels of distress. For example, one may have not wanted to admit how anxious or worried they were about their finances they felt due to the stigma that often comes associated with mental illness. The present study did not differentiate between clinical and nonclinical populations, and it can be presumed that most respondents were from a nonclinical population; however, it is possible that some respondents met diagnostic criteria (e.g., for an anxious or depressive disorder), and this could have skewed results. Additionally, The CAMH collected data on various gender identities, yet very few indicated an identity other than man/woman. As such, these identities were excluded from analysis. Moreover, this study does not consider how individuals who identify with gender identities other than man/woman experienced changes in mental health throughout the pandemic. Additionally, although a unique method of utilizing parametric and nonparametric statistics was utilized, no corrections were made for familywise errors in the parametric analyses. Finally, reasons for feelings of anxiety, negative affect, COVID worry, or COVID financial worry were not assessed. As was examined, sometimes different ages, for example, had equal COVID worry, and it is likely that the age groups were worried for different reasons, such as higher exposure in younger adults and pre-existing health conditions in older adults. Future research should examine the causes of differences between groups.

Directions for Future Research

Future research should examine a more diverse population to analyze how those of different ages, sexes, and incomes respond. It would be especially useful to examine differences in regions where socioeconomic health and mental health disparities are more pronounced, such as the United States. It could be hypothesized that there would be greater differences in these four domains of psychological distress in a nation where healthcare expenses are left to the individual and many lower-income individuals do not have insurance. Future research should also examine why differences occur between groups and

what these differences are, such as why younger and older respondents differ in COVID worry, for example. Finally, it would be beneficial to determine whether differences observed between groups in this study are replicable in clinical vs. nonclinical populations. It could be that in nonclinical populations, levels of anxiety and negative affect may be different; however, when examining clinical populations, those struggling with depression and anxiety may have similar degrees of severity regardless of age, gender, and income level.

Conclusion

Findings in this study largely support the existing literature that suggests that certain groups (like lower income individuals, younger individuals, and women) may be more likely to experience heightened psychological distress, especially during the pandemic. It was found that lower income individuals experienced greater psychological distress in terms of negative affect, anxiety, COVID worry, and COVID financial worry, providing important insights into socioeconomic disparities in mental health. It was also found that women may experience greater distress in Canada during the pandemic in terms of negative affect, anxiety, and COVID worry, suggesting that women cope differently with the stressors of a global pandemic than men, and thus may need more mental health help during these trying times. Younger adults also experienced greater distress in terms of negative affect, anxiety, and COVID financial worry. These individuals may be more susceptible to distress due to varying circumstances, such as greater exposure, or possibly less developed coping skills, than older adults. Mental health initiatives should focus on ensuring these groups are receiving adequate care, and direction should be taken to help them as it appears these domains are not improving as the pandemic progresses (except for COVID financial worry).

Moreover, this study contributes to research on socioeconomic mental health disparities and differences in psychological distress throughout the pandemic by gender and age. Individuals and communities are still facing unique challenges due to the pandemic, and psychological distress is undoubtedly still heightened for many. Due to the isolating nature of the COVID-19 pandemic, which had a negative impact of individuals' wellbeing, it is most pertinent to engage in greater social support and find ways to further promote wellbeing in these groups. As was demonstrated in this study, certain demographic features may contribute to worsening mental health; further, individuals and government initiatives should focus efforts onto improving the mental health experience of these individuals.

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Appendix A

Survey Questionnaire

CAMH/Delvinia

Examining the Impact of COVID-19 on Mental Health and Substance Use among Canadians
Invitations to participate in the survey were sent to participants 18 years and older, currently living in Canada, from the AskingCanadians panel. Participants were invited based on quota sampling by age, gender, and region (proportional to the English-speaking Canadian population 18+). The survey includes questions on sociodemographic characteristics, COVID-19 related information and experience, mental health, and substance use.

NOTE: THE SKIP PATTERN AT Q18 AND Q20 CHANGES FROM WAVE 2 ONWARDS

1. In which province or territory do you currently live?
   Alberta
   British Columbia
   Manitoba
   New Brunswick
   Newfoundland and Labrador
   Northwest Territories
   Nova Scotia
   Nunavut
   Ontario
   Prince Edward Island
   Quebec
   Saskatchewan
   Yukon
   I currently live outside of Canada

   {NOTE: Some web panel members might have moved outside of Canada. Respondents who indicate that they currently live outside of Canada will be excluded/exited from the survey.}

2. To which of the following age groups do you belong?
   18 to 29 years
   30 to 39 years
   40 to 49 years
   50 to 59 years
   60 to 69 years
   70 years and over

3. How do you describe your gender identity?
   Man
   Woman
   Transgender man
   Transgender woman
   Two-spirit
   Non-binary (genderqueer, gender fluid)
   Questioning/Not sure of my gender identity
   Identity not listed
   Prefer not to answer

The next few questions are related to the COVID-19 pandemic.

4. Have you, or those close to you (e.g., close relative/friend), tested positive for COVID-19 or are at high risk of COVID-19 (check all that apply)
   I, or someone close to me, has tested positive for COVID-19
   I, or someone close to me, has had symptoms of COVID-19 but has not been tested
   I, or someone close to me, has been tested for COVID-19 but it was negative (i.e., they did not have COVID-19)
   I, or someone close to me, is elderly and/or has a health condition that increases the risk of serious illness from COVID-19
   I have a job that exposes me to high risk of getting COVID-19

Someone close to me has a job that exposes them to a high risk of getting COVID-19

None of the above

5. How worried are you about the impact of COVID-19 on your personal financial situation?

Very worried

Somewhat worried

Not very worried

Not at all worried

6. How have physical distancing measures due to the COVID-19 pandemic affected your employment situation? (check one only)

I have continued working, but now I am working from home instead of my usual location

I am not currently working, or I have been laid off/let go, due to the pandemic (***Skip to Question 8)***

I was working from home due to the pandemic, but now I am back working at my usual location outside the home

I was previously not working/ laid off/let go due to the pandemic, but now I am back at work with the same or a new employer

No change – I have continued working outside my home, as I always did

No change – I have continued working from home, as I always did

No change – I was not employed prior to the pandemic (e.g., retired, student, paid leave, recently graduated) and I have remained unemployed (***Skip to Question 8***)

Other

7. On average, how has the number of hours you are working for pay been affected by the COVID-19 pandemic?

Increased a lot

Increased somewhat

No change

Decreased somewhat

Decreased a lot

8. How worried are you that you or someone close to you (close relative or friend) will get ill from COVID-19?

Very worried

Somewhat worried

Not very worried

Not at all worried

The next few questions are about how you have been feeling lately.

Over the __PAST 2 WEEKS__, how often have you been bothered by the following problem?

9. Feeling nervous, anxious or on edge

Not at all

Several days

Over half the days

Nearly every day

10. Not being able to stop or control worrying

Not at all

Several days

Over half the days

Nearly every day

11. Worrying too much about different things

Not at all

Several days

Over half the days

Nearly every day

12. Trouble relaxing

Not at all

Several days

Over half the days

Nearly every day

13. Being so restless that it's hard to sit still

Not at all

Over half the days
Nearly every day

14. Becoming easily annoyed or irritable
    Not at all
    Several days
    Over half the days
    Nearly every day

15. Feeling afraid as if something awful might happen
    Not at all
    Several days
    Over half the days
    Nearly every day

The next few questions are about alcohol and cannabis.

16. During the <u>PAST 7 DAYS</u>, on how many days did you drink ALCOHOL?
    __Number of days
    I do not drink alcohol
    Prefer not to answer

WAVE 1 ONLY {Note: If response is 0 days or "I do not drink alcohol', other alcohol questions (Q17-18) ARE SKIPPED}

WAVE 2 ONWARDS: ONLY SKIP Q17

17. On how many of the <u>PAST 7 DAYS</u> did you drink [4 (if woman) or 5 (if man) or 5 (if other gender)] or more drinks on one occasion? A drink means a 341 ml or 12 oz. bottle of beer or cider/cooler (5% alcohol content), a 142 ml or 5 oz. glass of wine (12% alcohol content), or a straight or mixed drink with 43 ml or 1.5 oz. of liquor (40% alcohol content – e.g., rye, gin, rum).
    __Number of days
    Prefer not to answer

WAVE 2 ONWARDS: ASK ALL Q18

18. In the <u>PAST 7 DAYS</u>, did you drink more ALCOHOL, about the same, or less alcohol overall than you did before the COVID-18 pandemic started?
    Drink more alcohol
    Drink slightly more alcohol
    No change
    Drink slightly less alcohol
    Drink much less alcohol
    Prefer not to answer

19. During the <u>PAST 7 DAYS</u>, on how many days did you use CANNABIS (also known as marijuana, hash, "pot")?
    __Number of days
    I do not use cannabis
    Prefer not to answer

WAVE 1 ONLY {Note: If response is 0 days or "I do not use cannabis", the next cannabis question (Q20) is SKIPPED}

WAVE 2 ONWARDS ASK ALL Q20

20. In the <u>PAST 7 DAYS</u>, did you use CANNABIS more often, about the same, or less often overall than you did before the COVID-19 pandemic started?
    Much more
    Slightly more
    No change
    Much less
    Slightly less
    Prefer not to answer

Now, we would like to ask you some questions about how you have been feeling over the past 7 days.

21. In the <u>PAST 7 DAYS</u>, how often have you felt depressed?
    Rarely or none of the time (less than 1 day)
    Some or a little of the time (1-2 days)
    Occasionally or a moderate amount of the time (3-4 days)
    Most or all of the time (5-7 days)

22. In the <u>PAST 7 DAYS</u>, how often have you felt lonely?
> Rarely or none of the time (less than 1 day)
> Some or a little of the time (1-2 days)
> Occasionally or a moderate amount of the time (3-4 days)
> Most or all of the time (5-7 days)

23. In the <u>PAST 7 DAYS</u>, how often have you felt hopeful about the future?
> Rarely or none of the time (less than 1 day)
> Some or a little of the time (1-2 days)
> Occasionally or a moderate amount of the time (3-4 days)
> Most or all of the time (5-7 days)

The next few questions are about yourself and your household.

24. Including yourself, how many people are currently living in your household?
> __Enter number
> Prefer not to answer

25. How many children in each of the following categories live in your household?
> Under 6 years old: __ Enter number
> 6-12 years old: __ Enter number
> 13-17 years old: __ Enter number

26. What is the highest level of education you have completed?
> Did not graduate from high school
> Completed high school
> Some post-high school education (college, technical, university, etc.)
> College diploma / degree
> University diploma / degree
> Prefer not to answer

27. What is your current marital status?
> Married
> Living with a partner
> Widowed
> Divorced
> Separated
> Never married
> Prefer not to answer

28. Which of the following best describes your racial or ethnic group? (Check <u>one</u> only)
> Asian – East (e.g., Chinese, Japanese, Korean)
> Asian – South (e.g., Indian, Pakistani, Sri Lankan)
> Asian – South East (e.g., Malaysian, Filipino, Vietnamese)
> Black (Africa, Caribbean, North American)
> Indigenous (First Nations, Inuit, Métis)
> Latin American (e.g., Argentinean, Chilean, Salvadoran)
> Middle Eastern (e.g., Egyptian, Iranian, Lebanese)
> White (European, North American)
> Mixed heritage (e.g. Black – North American & White – North American)
> Other
> Not sure
> Prefer not to answer

29. What is the total household income you and other members of your household received in the year ending December 31st, 2019 before taxes? Please include FROM ALL SOURCES such as savings, pensions, rent, and unemployment insurance as well as wages.
> Less than $20,000
> $20,000 - $39,999
> $40,000 - $59,999
> $60,000 - $79,999
> $80,000 - $99,999
> $100,000 - $119,999
> $120,000 - $139,999
> $140,000 or more

Prefer not to answer
30. Do you consider yourself to be living in a…
Urban area
Suburban area
Rural area

Thank you for your time.

Appendix B

Table 1

Dependent Variable Correlations

	Negative Affect	Anxiety	COVID Worry	COVID Finances
Negative Affect	1	0.67	0.23	0.35
Anxiety	0.67	1	0.35	0.41
COVID Worry	0.23	0.35	1	0.43
COVID Finances	0.35	0.41	0.43	1
Mean	6.06	12.63	2.91	2.66
SD	2.15	5.61	0.8	0.91
Skew	0.63	1.04	0.43	0.23
Kurtosis	-0.09	0.33	-0.2	-0.74

Note. Correlations between all dependent variables entered.

Table 2

Significant Multivariate Tests

	Lambda	F	Hypothesis df	Error df	(*p*)
Wave	0.99	11.55	4	6603	< .001
Income	0.95	29.79	12	17470	< .001
Sex	0.99	22.99	4	6603	< .001
Age	0.92	67.98	8	13206	< .001
Wave x Age	0.99	2.33	8	13206	.017
Income x Age	0.99	1.83	24	23036	.008

Note. Results of MANOVA.

Table 3

Significant ANOVAs by Wave, Income, Gender, and Age

Independent Variable	Dependent Variable	F	(p)	Partial eta squared
Wave	COVID Finances	37.56	< .001	0.006
Income	Negative Affect	72.63	< .001	0.032
	Anxiety	24.2	< .001	0.011
	COVID Worry	4.84	.002	0.002
	COVID Finances	73.59	< .001	0.032
Gender	Negative Affect	32.63	< .001	0.005
	Anxiety	60.81	< .001	0.009
Age	Negative Affect	158.35	< .001	0.046
	Anxiety	201.54	< .001	0.058
	COVID Worry	4.28	.014	0.001
	COVID Finances	98.71	< .001	0.029
Wave x Age	COVID Worry	5.83	.003	0.002
Income x Age	Negative Affect	2.37	.027	0.002
	Anxiety	2.48	.021	0.002
	COVID Worry	2.61	.016	0.002
	COVID Finances	3.73	.001	0.003

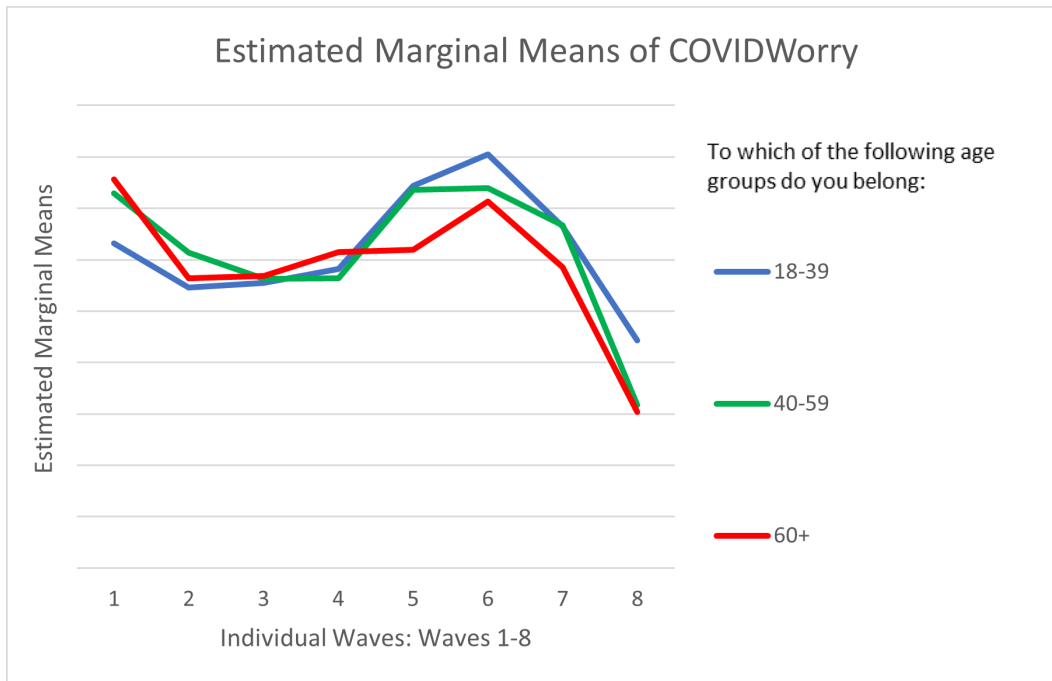*Note.* Significant ANOVAs following the MANOVA.

Appendix B

Figure 1

Age x Wave Interaction: COVID Worry–Early Waves vs. Later Waves
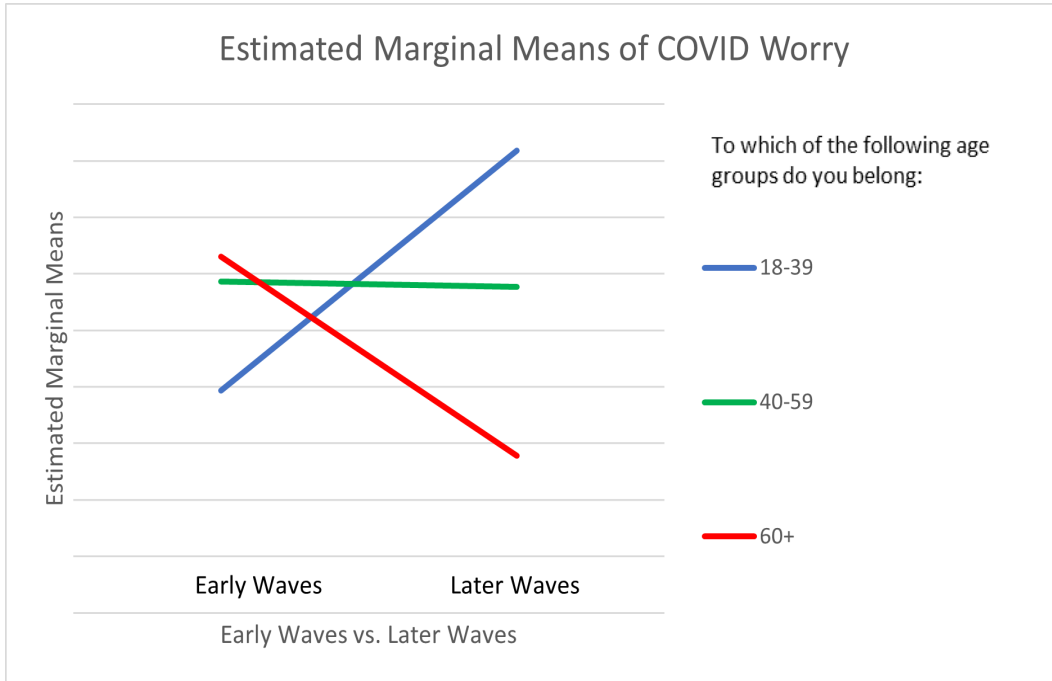
Note. Interaction between age group and early vs. later waves in COVID worry differences.
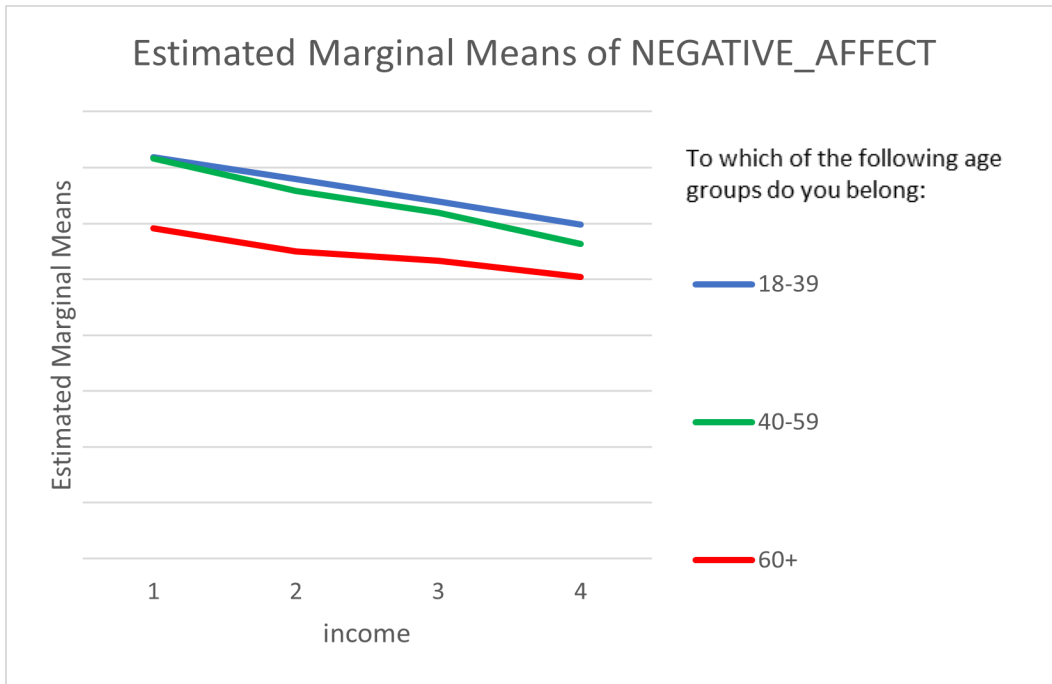
Figure 2

Age x Wave Interaction: COVID Worry–Each Individual Wave (Waves 1-8)

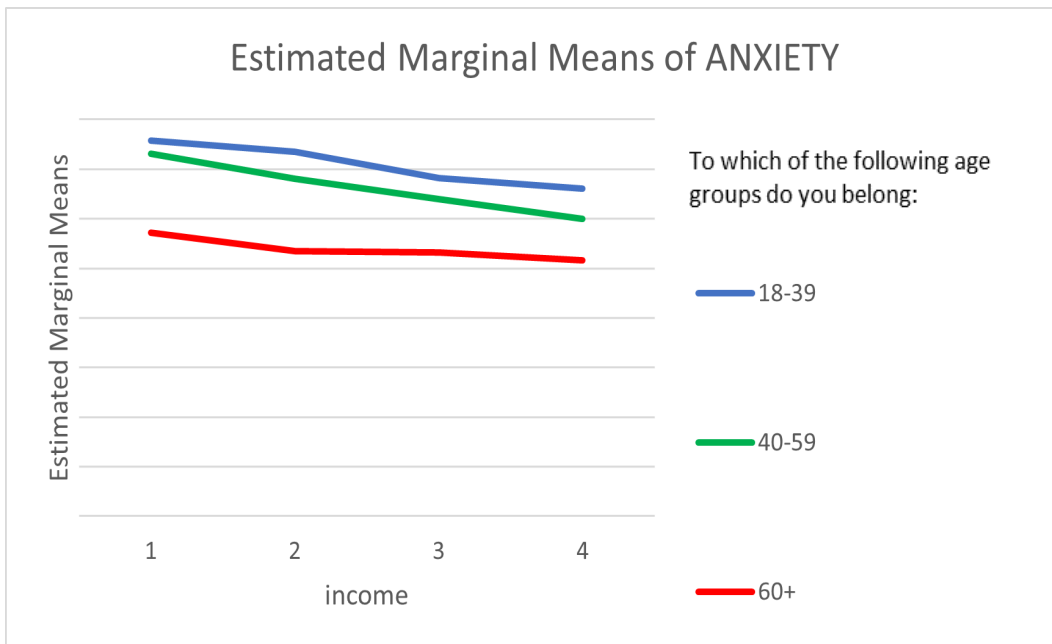*Note.* Interaction between age group and wave in differences in COVID worry differences.

Figure 3
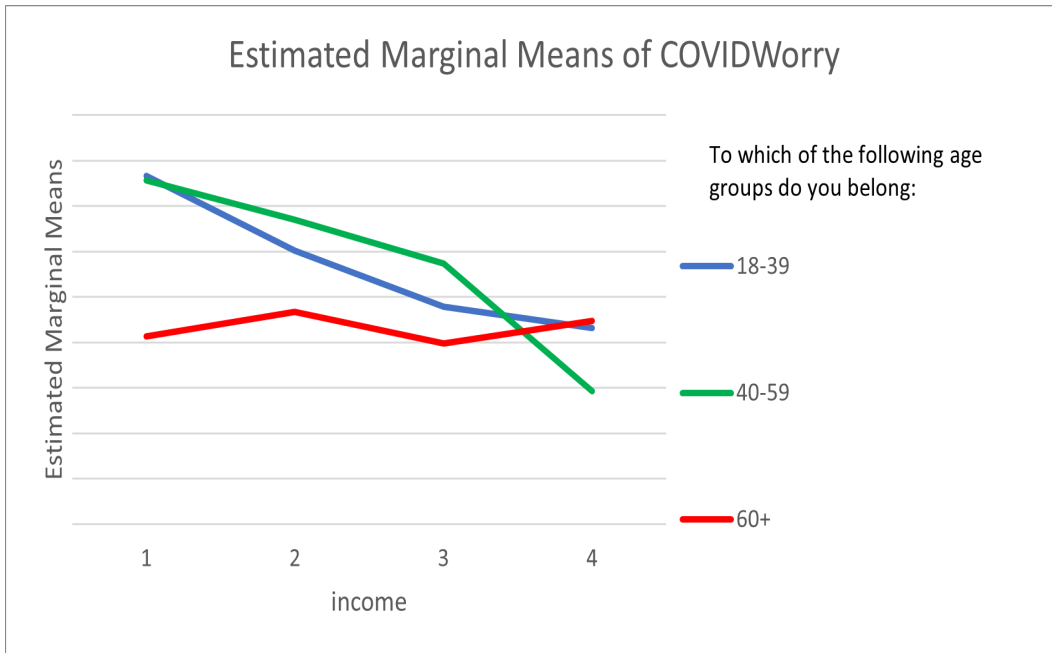*Mean Negative Affect Scores by Age and Income*

Note. Interaction between age group and income level in differences in negative affect.
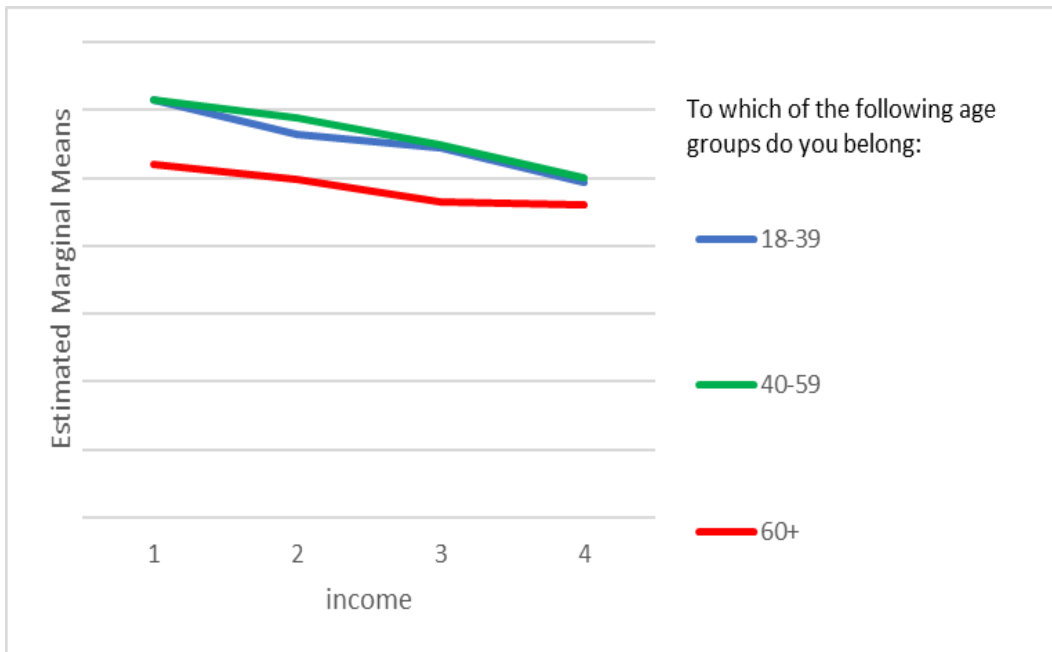
Figure 4
Mean Anxiety Scores by Age and Income

Note. Interaction between age group and income level in differences in anxiety.

Figure 5
Mean COVID Worry Scores by Age and Income

Note. Interaction between age group and income level in differences in COVID worry.

Figure 6
Mean COVID Financial Worry by Age and Income

Note. Interaction between age group and income level in differences in COVID financial worry.