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Pandemic-related experiences, mental health symptoms, substance use, and relationship conflict among older adolescents and young adults from Manitoba, Canada

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ABSTRACT

There is growing awareness of the negative impact of the COVID-19 pandemic on young people. The purpose of this study was to examine older adolescents' and young adults' pandemic-related experiences, including financial difficulties, emotional support, social connections, mental health symptoms, substance use, and relationship conflict. Data from the Well-being and Experiences Study (The WE Study) were gathered from November to December 2020 in Manitoba, Canada, among a community sample ($n = 664$; ages 16–21 years). Over half of the sample self-reported increased stress/anxiety (57.6%) and depression (54.2%) attributed to the pandemic. Increased alcohol consumption was reported by 18.2% of alcohol-users. Among cannabis-users, 35.1% reported increased use. Conflict with parents, siblings, and an intimate partner increased for 19.9%, 15.2%, and 24.0% of respondents, respectively. Females reported greater financial burden, mental health burden, and conflict with parents than males. Young adults reported greater financial and mental health burden than older adolescents. Higher household income was protective of some experiences. The current study adds to growing evidence that young people were adversely impacted by the COVID-19 pandemic. Increased access to virtual support resources is needed and should continue following the pandemic. Evidence-based interventions may need to be tailored to females and young adults.

1. Introduction

The mental health impact of the COVID-19 pandemic in young populations is a growing concern with experts calling attention to a parallel mental health pandemic (El-Gabalawy and Sommer, 2021a; Idele and Banati, 2021; Vigo et al., 2020). Necessary public health measures in place to slow transmission of the virus, protect individuals from becoming ill, and prevent the health care system from becoming overwhelmed, have also disrupted aspects of daily life (e.g., socialization, education, employment) that are fundamental for health and wellbeing, particularly in adolescence and emerging adulthood (Steinberg and Sheffield Morris, 2001; Wood et al., 2018). In Manitoba, Canada, public health measures implemented to contain the initial outbreak included restrictions on public gatherings, social/physical

distancing, closures of non-essential businesses, restrictions on recreational activities, and school closures (Government of Manitoba, 2020a). During the months of May to July 2020, many public health restrictions were lifted as infections rates decreased throughout the province. In the fall of 2020, there was a resurgence of COVID-19 cases (hereafter referred to as the second wave). In November 2020, public health measures were once again implemented, including strict social gathering limits, mask mandates, and closures of non-essential services (Government of Manitoba, 2020b).

During adolescence, attachment shifts from parents to peers as adolescents gain independence and sense of self (Steinberg and Sheffield Morris, 2001). Peer relationships, romantic or intimate relationships, and socialization outside immediate family become integral components of this process leading to identity formation in later adolescence and

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early adulthood (Steinberg and Sheffield Morris, 2001; Wood et al., 2018). This life stage is also marked by heightened emotionality, interpersonal challenges, family conflict, and risk-taking behavior (Bailen et al., 2019; Steinberg, 2010; Steinberg and Sheffield Morris, 2001). Risk for the onset of internalizing mental health disorders, such as depression and anxiety (Rapee et al., 2019), as well as substance use, including alcohol and cannabis (Vega et al., 2002), is heightened during these formative years. As adolescents transition into early adulthood and assume greater responsibilities and obligations, it is common to experience additional stressors such as financial strain related to the insecurity of the labor market and economy, which can further contribute to poor health (Huang et al., 2021; Institute of Medicine and National Research Council, 2014; Wood et al., 2018). Indeed, under the current context of the pandemic, young workers have experienced the largest declines in employment (Gould and Kassa, 2020; Statistics Canada, 2020). Without urgent efforts to support adolescents and young adults while adhering to necessary restrictions, the impact of the COVID-19 pandemic is anticipated to have serious long-term consequences (El-Gabalawy and Sommer, 2021a; Idele and Banati, 2021; Vigo et al., 2020).

To date, the information on adolescents' and young adults' experiences of the COVID-19 pandemic is limited. This includes information such as knowledge, practices, and experiences of financial hardship, as well as experiences of how the pandemic has affected adolescents' and young adults' perceptions of emotional support, social connections, and the impact on mental health, substance use, and interpersonal conflict. In particular, there is a considerable lack of knowledge on more recent experiences of the pandemic during and following the second wave. Much of the literature thus far is limited to studies conducted in the early stages of the pandemic, primarily from March to May 2020. Ongoing monitoring of at-risk groups' experiences during the COVID-19 pandemic will be important for informing strategies that can be implemented both during compliance with public health orders and following the easing of restrictions to prevent or reduce negative health consequences associated with the pandemic.

Emerging evidence has indicated that the mental health burden related to the COVID-19 pandemic may be substantial. In a nationally-representative sample of Canadian adults (18 years and older), self-reported levels of anxiety and depression increased considerably since before the outbreak (Dozois, 2020). Other studies have reported that the mental health burden during the early months of the pandemic was greater in younger ages (El-Gabalawy and Sommer, 2021b; Klaiber et al., 2021). Specifically, in a study of Canadians aged 15 years and older, El-Gabalawy and Sommer (2021b) found that those aged 15 to 34 years had a higher prevalence of clinically-significant anxiety symptoms compared to older adults. Similarly, in a study using adult samples from Canada and the United States, Klaiber et al. (2021) found that younger compared to older adults reported lower positive affect and higher negative affect. In a global systematic review restricted to adolescents aged 13 to 17 years, several studies observed increases in anxiety and depression related to the pandemic (Jones et al., 2021). Longitudinal studies with data collected prior to and shortly after the initial outbreak have reported mixed findings (Chen et al., 2021; Hawes et al., 2021a; Magson et al., 2021). For example, a study conducted among a longitudinal cohort of adolescents from Ontario and Québec, Canada (mean age of 14.1 years in 2018), concluded that the initial COVID-19 lockdown was not associated with elevated depression and anxiety symptoms (Belanger et al., 2021). Conversely, in a sample of adolescents and young adults (aged 12 to 22 years) from Long Island, New York, Hawes et al. (2021a) found that symptoms of anxiety and depression increased in the period of end-of-March to mid-May as compared to pre-COVID-19 assessments. Continuing their study into mid-July 2020, it was subsequently found that depression and anxiety symptoms declined following this initial rise (Hawes et al., 2021b). Yet, it is unclear how the pandemic has continued to affect mental health during and following the second wave.

Feelings of loneliness and/or social isolation have been shown to be associated with mental health problems in young ages in more general circumstances and, in the context of past pandemics (e.g., severe acute respiratory syndrome), enforced isolation and/or quarantine have shown associations with post-traumatic stress symptoms (Loades et al., 2020). Among adults in the COVID-19 context, specifically, an association between loneliness and increased depressive symptoms has been observed (Groarke et al., 2021) and loneliness has been reported to be highest among younger (aged 18 to 29 years) compared to older adults (John et al., 2021; Wickens et al., 2021). Given the impact of loneliness/isolation on mental health problems, it is important to understand the degree to which young people feel emotionally supported and able to maintain social connections even if practicing social/physical distancing during the COVID-19 pandemic. Studies with adult samples have demonstrated a protective effect of perceived social support on symptoms of depression (Sommerlad et al., 2021; Sun et al., 2020). Few studies have examined adolescents' and young adults' perceptions of emotional support and social connections during the COVID-19 pandemic. For example, in a mixed methods study from the United States, adolescents identified that a particularly challenging aspect of COVID-19 was feeling disconnected and lacking support from friends, romantic partners, and/or extended or distant family members despite connecting with one another electronically (Rogers et al., 2021). In a qualitative study, young adults (aged 18–24) living in the United Kingdom during the pandemic similarly identified the difficulty in maintaining social connections even while interacting electronically (Dedryver and Knai, 2021).

In addition to increased mental health concerns, increased alcohol and cannabis use has been self-reported for approximately 30% of Canadian adults (age 18 and older) during the initial outbreak, while remaining unchanged for approximately 50% of adults (Dozois, 2020). During the second wave, the self-reported increase in alcohol and cannabis use among Canadian adults was estimated at 16% and 5%, respectively (Varin et al., 2021). Among adolescents and young adults, specifically, there is limited and conflicting information on substance use during the pandemic. In a sample of Canadians, alcohol consumption increased for 18.7% and cannabis consumption increased for 11.6% of those aged 15 to 34 years early in the pandemic (El-Gabalawy and Sommer, 2021b). During the second wave, 14% of young adults aged 18 to 24 years reported increased alcohol consumption and 12% reported increased cannabis consumption (Varin et al., 2021). In a sample of adolescents aged 14 to 18 years, the frequency of alcohol and cannabis use increased early in the pandemic (Dumas et al., 2020). However, in a study with adolescents and young adults ranging in age from 14 to 28 years, substance use declined in both community and clinical samples (Hawke et al., 2020).

As mentioned above, interpersonal conflict is common during adolescence (Steinberg and Sheffield Morris, 2001). It is possible that such conflict may be occurring more often during, and may be exacerbated by, the pandemic. Yet, little is currently known about adolescents' and young adults' experiences of conflict with parents, siblings, and partners in an intimate relationship in the COVID-19 context (Magson et al., 2021). Magson et al. (2021) observed that approximately 25% of adolescents (aged 13 to 16 years) reported increased conflict with parents and approximately 50% reported increased conflict with siblings. Conversely, in another longitudinal study, adolescents (aged 14 to 17 years) reported experiencing declines in conflict with parents in the initial months following the outbreak (Rogers et al., 2021).

Addressing substantial gaps in our understanding of the COVID-19 pandemic-related impact on young people, the objectives of this study of older adolescents and young adults (aged 16 to 21 years) were: 1) to descriptively examine their self-reported knowledge of COVID-19, social/physical distancing experiences, COVID-19 testing history, levels of financial hardship experienced during the COVID-19 pandemic, and perceived levels of emotional support and social connections during the COVID-19 pandemic; 2) to examine self-reported levels of, and changes

in, feelings of stress or anxiety and depression, and changes in consumption of alcohol and cannabis due to the COVID-19 pandemic; 3) to examine self-reported changes in conflict with parents, siblings, and intimate partners due to COVID-19 pandemic; and 4) to determine if differences exist in the aforementioned experiences based on respondent sex, age group, or household income after adjusting for sociodemographic characteristics and pre-pandemic self-rated mental health.

2. Methods

2.1. Data and sample

Data were primarily from Wave 3 of the Well-being and Experiences (WE) Study, a longitudinal and intergenerational community survey based in Winnipeg, Manitoba, Canada. At Wave 1, adolescents aged 14 to 17 years and a parent/caregiver each completed a separate baseline questionnaire in person at a research facility. Adolescents were subsequently re-contacted by phone or email for participation in additional waves of data collection. Data were collected with online questionnaires completed by phone, tablet, or computer. Due to the electronic survey administration, participants were no longer required to reside in Manitoba. Participants that had previously completed Wave 1 (2017–18; $N = 1002$) and Wave 2 (2019; $n = 748$) were invited to participate in Wave 3 from November to December 2020. A total of 664 older adolescents and young adults aged 16 to 21 years completed the online questionnaire. Parents and adolescents residing in Winnipeg and surrounding rural areas were initially recruited with random digit dialing (21%), referrals (40.6%), and community advertisements (38.4%); no differences in recruitment method were observed at baseline for sex, age, ethnicity, and several adverse childhood experiences (Afifi et al., 2020b). The distributions of these key variables were reexamined at Wave 3, differing only for age with fewer younger participants in the group that was recruited with random digit dialing compared to that with convenience sampling. The baseline sample of adolescents was confirmed to closely resemble the population from which it was drawn based on the Forward Sortation Area of postal codes, sex, household income, and ethnicity (Afifi et al., 2020a). Informed consent was provided by all participants. Ethics approval was granted by the University of Manitoba Health Research Ethics Board.

2.2. Measures

COVID-19 experiences were assessed with items developed for this questionnaire and were all self-reported based on the respondent's perceptions. The items were: (a) "How much do you know about COVID-19?", (b) "Have you practiced social/physical distancing or self-isolation because of the COVID-19 pandemic?", (c) "Have you been tested for COVID-19?", (d) "Have you or your family experienced financial difficulties because of the COVID-19 pandemic?", (e) "Have you or your family received any of the Government of Canada's COVID-19 financial assistance benefits (e.g., Canadian Emergency Response Benefit [CERB])?", (f) "Have you felt emotionally supported during the COVID-19 pandemic?", (g) "Have you felt like you are able to maintain your social connections even if social/physical distancing during the COVID-19 pandemic?", (h) "Have you felt stressed or anxious because of the COVID-19 pandemic?", (i) "Has your daily stress or anxiety changed due to the COVID-19 pandemic?", (j) "Have you felt down or depressed because of the COVID-19 pandemic?", (k) "Have your down or depressed feelings changed due to the COVID-19 pandemic?", (l) "Has your consumption of alcohol changed due to the COVID-19 pandemic?", (m) "Has your consumption of cannabis changed due to the COVID-19 pandemic?", (n) "Has conflict with your parents changed due to the COVID-19 pandemic?", (o) "Has conflict with your siblings changed due to the COVID-19 pandemic?", and (p) "Has conflict with a partner in an intimate relationship changed due to the COVID-19 pandemic?". The response categories for each item are provided in Table 1. In some cases,

categories were combined due to small cell sizes, and where applicable the response options "quite a bit" and "a lot" were similar and combined for brevity.

Sociodemographic characteristics included male and female sex collected at Wave 1, current age at Wave 3, and household income collected at Wave 1 from the parent respondent. Two age groups were formed: older adolescents aged 16 and 17 years and young adults aged 18 to 21 years. Household income was dichotomized with a cut-point of \$100,000, selected as an approximation of the median household income in this sample to evenly distribute the sample in each group. The covariate self-rated mental health was assessed at Wave 1 prior to the COVID-19 pandemic asking: "In general, how would you rate your mental health?" Response options were dichotomized as "fair" or "poor" versus "good," "very good," or "excellent."

2.3. Data analysis

The distribution of each COVID-19 item was computed in the entire sample and stratified by sex, age group, and household income group. Differences between male and female sex, older adolescents and young adults, and lower and higher household income were tested with logistic regression analysis adjusting for sociodemographic characteristics in model 1 and then sociodemographic characteristics and pre-pandemic self-rated mental health in model 2.

3. Results

Table 1 shows the distribution of self-reported COVID-19 knowledge, social/physical distancing, COVID-19 testing history, financial hardship, emotional support, social connections, levels of, and changes in, feelings of stress/anxiety and depression, changes in alcohol and cannabis use, and changes in relationship conflict with parents, siblings, and an intimate partner in the total sample and by sociodemographic characteristics. Feeling emotionally supported only "a little" or "not at all" during the pandemic was reported by 27.6% of the sample, and being able to maintain social connections only "a little" or "not at all" was reported by 29.5% of the sample. Nearly half of the sample (47.3%) reported feeling stressed or anxious "quite a bit/a lot" because of the pandemic, with 57.6% reporting an increase in daily stress/anxiety. Feeling down or depressed "quite a bit/a lot" was reported in 36.2% of the sample, and 54.2% reported an increase in down/depressed feelings due to the pandemic. One-third (33.4%) of the sample reported not drinking alcohol and over half (57.8%) reported not using cannabis, which differed by age group: young adults were more likely to report using alcohol (odds ratio [OR] = 4.08, 95% confidence interval [CI] = 2.88–5.79) and cannabis (OR = 2.18, 95% CI = 1.56–3.04) than older adolescents. Among those who reported using alcohol, 18.2% reported increased use due to the pandemic. Among those who reported using cannabis, 35.1% reported increased use. In the entire sample, 19.9% reported increased conflict with parents, 15.2% of respondents with siblings reported increased sibling conflict, and 24.0% of respondents in an intimate relationship reported increased conflict with their partner.

Table 2 presents the associations between COVID-19 pandemic experiences and sex, age group, and household income. No differences in sex, age group, or household income were observed for COVID-19 knowledge and social/physical distancing. After adjusting for sociodemographic characteristics and pre-pandemic self-rated mental health, young adults were more likely than older adolescents to report "a little" financial difficulties (adjusted OR [AOR] = 1.57, 95% CI = 1.04–2.39), and those with a higher household income were less likely than those with a lower income (AOR range: 0.14–0.54) to report financial difficulties. Additionally, females were more likely than males (AOR = 1.71, 95% CI = 1.17–2.50), and young adults were more likely than older adolescents (OR = 3.02, 95% CI = 2.07–4.40), to report receiving financial assistance. Self-reported emotional support differed only by household income: respondents with a higher compared to lower

Table 1

Prevalence of pandemic-related experiences, mental health symptoms, substance use, and relationship conflict in the total sample and by sex, age group, and household income.

| | Total sample | Sex | | Age Group | | Household Income | |
|--|--------------|------------|--------------|---------------------------|----------------------|------------------|-------------|
| | % | Males % | Females % | Older Adolescents % | Young Adults % | Lower % | Higher % |
| COVID-19 knowledge | | | | | | | |
| A lot | 50.1 | 47.1 | 52.7 | 47.5 | 51.8 | 48.5 | 51.9 |
| Some | 43.5 | 46.1 | 41.2 | 44.0 | 43.2 | 44.0 | 42.6 |
| Nothing/A little | 6.4 | 6.8 | 6.2 | 8.5 | 5.1 | 7.5 | 5.5 |
| Social/physical distancing or self-isolation | | | | | | | |
| Quite a bit/A lot | 88.8 | 86.4 | 90.8 | 87.6 | 89.6 | 88.0 | 89.0 |
| Some | 6.9 | 8.2 | 5.9 | 6.6 | 7.1 | 8.1 | 5.8 |
| Not at all/A little | 4.3 | 5.5 | 3.4 | 5.8 | 3.3 | 3.9 | 5.1 |
| COVID-19 testing | | | | | | | |
| No | 74.9 | 79.9 | 70.9 | 79.0 | 72.3 | 76.7 | 74.9 |
| Yes | 25.1 | 20.1 | 29.1 | 21.0 | 27.7 | 23.3 | 25.1 |
| Financial difficulties (self or family) | | | | | | | |
| Not at all | 45.4 | 52.9 | 39.4 | 51.7 | 41.2 | 35.5 | 56.2 |
| A little | 25.0 | 21.7 | 27.7 | 20.9 | 27.7 | 26.5 | 23.6 |
| Some | 13.8 | 11.3 | 15.6 | 12.0 | 15.0 | 16.9 | 11.0 |
| Quite a bit/A lot | 10.6 | 8.9 | 12.0 | 7.3 | 12.7 | 16.0 | 4.1 |
| Do not know | 5.2 | 5.2 | 5.3 | 8.1 | 3.3 | 5.1 | 5.1 |
| Received Government of Canada financial assistance (self or family) | | | | | | | |
| No | 34.4 | 39.7 | 30.1 | 43.4 | 28.6 | 31.9 | 37.5 |
| Yes | 52.0 | 44.1 | 58.6 | 33.2 | 64.3 | 53.5 | 49.8 |
| Do not know | 13.6 | 16.2 | 11.3 | 23.4 | 7.1 | 14.6 | 12.7 |
| Emotionally supported | | | | | | | |
| Quite a bit/A lot | 48.0 | 52.0 | 45.0 | 48.2 | 47.9 | 44.9 | 52.3 |
| Some | 24.4 | 21.4 | 27.1 | 22.5 | 25.7 | 22.5 | 25.4 |
| A little | 19.0 | 17.4 | 20.2 | 19.3 | 18.9 | 21.8 | 16.0 |
| Not at all | 8.6 | 9.3 | 7.8 | 10.0 | 7.6 | 10.8 | 6.3 |
| Maintained social connections | | | | | | | |
| Quite a bit/A lot | 40.9 | 42.4 | 39.8 | 45.5 | 38.0 | 39.6 | 42.8 |
| Some | 29.6 | 29.2 | 30.2 | 28.2 | 30.5 | 28.1 | 31.0 |
| A little | 21.1 | 20.1 | 21.8 | 20.4 | 21.5 | 23.8 | 17.9 |
| Not at all | 8.4 | 8.3 | 8.2 | 5.9 | 10.0 | 8.5 | 8.3 |
| Feelings of stress/anxiety | | | | | | | |
| Not at all | 8.9 | 16.5 | 2.8 | 11.6 | 7.1 | 10.0 | 8.2 |
| A little | 22.0 | 26.5 | 18.2 | 23.3 | 21.1 | 23.6 | 20.6 |
| Somewhat | 21.8 | 22.0 | 21.9 | 21.7 | 21.9 | 19.9 | 23.6 |
| Quite a bit/A lot | 47.3 | 35.1 | 57.1 | 43.4 | 49.9 | 46.5 | 47.6 |
| Changes in feelings of stress/anxiety | | | | | | | |
| Remained the same | 30.2 | 38.1 | 23.9 | 33.1 | 28.3 | 29.0 | 32.1 |
| Increased | 57.6 | 47.8 | 65.6 | 53.3 | 60.5 | 58.9 | 55.2 |
| Decreased | 5.9 | 6.2 | 5.6 | 7.4 | 4.9 | 5.1 | 6.9 |
| Do not know | 6.3 | 7.9 | 4.8 | 6.2 | 6.4 | 7.0 | 5.9 |
| Feeling down/depressed | | | | | | | |
| Not at all | 14.9 | 23.7 | 7.9 | 18.8 | 12.4 | 16.6 | 13.5 |
| A little | 30.0 | 35.2 | 26.1 | 27.8 | 31.4 | 27.4 | 32.1 |
| Somewhat | 18.8 | 18.5 | 19.0 | 18.4 | 19.1 | 20.0 | 18.3 |
| Quite a bit/A lot | 36.2 | 22.7 | 47.0 | 34.9 | 37.1 | 36.0 | 36.2 |
| Changes in feeling down/depressed | | | | | | | |
| Remained the same | 31.8 | 37.2 | 27.5 | 32.6 | 31.4 | 33.5 | 30.6 |
| Increased | 54.2 | 46.3 | 60.4 | 51.0 | 56.3 | 51.8 | 55.9 |
| Decreased | 3.9 | 4.6 | 3.4 | 4.7 | 3.3 | 4.3 | 3.8 |
| Do not know | 10.1 | 11.9 | 8.7 | 11.8 | 9.0 | 10.4 | 9.7 |
| Changes in alcohol consumption (n = 423) | | | | | | | |
| Remained the same | 50.4 | 51.4 | 49.6 | 50.8 | 50.2 | 54.2 | 45.1 |
| Increased | 18.2 | 22.7 | 15.0 | 19.2 | 17.8 | 18.7 | 18.6 |
| Decreased | 31.4 | 26.0 | 35.4 | 30.0 | 32.0 | 27.1 | 36.3 |
| Changes in cannabis consumption (n = 268) | | | | | | | |
| Remained the same | 44.0 | 44.4 | 44.0 | 44.3 | 43.9 | 48.9 | 38.3 |
| Increased | 35.1 | 34.3 | 35.9 | 32.9 | 36.0 | 33.1 | 37.5 |
| Decreased | 20.9 | 21.3 | 20.1 | 22.8 | 20.1 | 18.0 | 24.2 |
| Changes in conflict with parents | | | | | | | |
| Remained the same | 61.1 | 64.0 | 58.6 | 58.2 | 62.9 | 61.9 | 60.4 |
| Increased | 19.9 | 14.4 | 24.1 | 21.7 | 18.7 | 22.0 | 18.0 |
| Decreased | 8.7 | 9.4 | 8.3 | 6.0 | 10.5 | 5.9 | 12.2 |
| Do not know | 10.3 | 12.2 | 8.9 | 14.1 | 7.9 | 10.2 | 9.4 |
| Changes in conflict with siblings (n = 592) | | | | | | | |
| Remained the same | 63.9 | 64.5 | 64.0 | 61.3 | 65.5 | 62.2 | 64.7 |
| Increased | 15.2 | 16.8 | 13.5 | 18.7 | 13.0 | 15.5 | 14.9 |
| Decreased | 14.2 | 12.5 | 15.3 | 10.0 | 16.9 | 15.1 | 14.2 |
| Do not know | 6.8 | 6.3 | 7.2 | 10.0 | 4.7 | 7.2 | 6.2 |
| Changes in conflict with intimate partner (n = 288) | | | | | | | |

(continued on next page)

Table 1 (continued)

| | Total sample % | Sex | | Age Group | | Household Income | |
|-------------------|-------------------|------------|--------------|---------------------------|----------------------|------------------|-------------|
| | | Males % | Females % | Older Adolescents % | Young Adults % | Lower % | Higher % |
| Remained the same | 56.6 | 59.5 | 54.7 | 51.5 | 59.3 | 59.2 | 54.8 |
| Increased | 24.0 | 19.8 | 26.5 | 23.2 | 24.3 | 20.4 | 27.8 |
| Decreased | 10.4 | 6.9 | 12.9 | 9.1 | 11.1 | 12.5 | 8.7 |
| Do not know | 9.0 | 13.8 | 5.9 | 16.2 | 5.3 | 7.9 | 8.7 |

Table 2

Associations between COVID-19 pandemic experiences and sex, age group, and household income.

| | Sex, Female versus Male | | Age Group, Young Adults versus Older Adolescents | | Household Income, Higher versus Lower | |
|--|-------------------------|---------------------|--|----------------------|---------------------------------------|----------------------|
| | AOR-1 (95% CI) | AOR-2 (95% CI) | AOR-1 (95% CI) | AOR-2 (95% CI) | AOR-1 (95% CI) | AOR-2 (95% CI) |
| COVID-19 knowledge | | | | | | |
| A lot, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Some | 0.81 (0.58–1.12) | 0.77 (0.55–1.09) | 0.92 (0.66–1.28) | 0.95 (0.67–1.34) | 0.89 (0.64–1.24) | 0.93 (0.67–1.30) |
| Nothing/A little | 0.81 (0.42–1.57) | 0.81 (0.41–1.61) | 0.58 (0.30–1.12) | 0.55 (0.28–1.06) | 0.67 (0.34–1.31) | 0.63 (0.32–1.24) |
| Social/physical distancing or self-isolation | | | | | | |
| Quite a bit/A lot, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Some | 0.72 (0.39–1.34) | 0.63 (0.33–1.22) | 1.15 (0.61–2.18) | 1.12 (0.58–2.18) | 0.71 (0.38–1.32) | 0.71 (0.37–1.36) |
| Not at all/A little | 0.62 (0.29–1.34) | 0.67 (0.29–1.52) | 0.58 (0.27–1.24) | 0.56 (0.25–1.24) | 1.28 (0.60–2.74) | 1.08 (0.49–2.39) |
| COVID-19 testing | | | | | | |
| No, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Yes | 1.60 (1.09–2.34) * | 1.59 (1.07–2.36) * | 1.42 (0.96–2.10) | 1.40 (0.94–2.07) | 1.10 (0.76–1.59) | 1.11 (0.76–1.61) |
| Financial difficulties (self or family) | | | | | | |
| Not at all, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| A little | 1.66 (1.11–2.49) * | 1.48 (0.98–2.24) | 1.59 (1.05–2.41) * | 1.57 (1.04–2.39) * | 0.55 (0.37–0.81) ** | 0.54 (0.36–0.81) ** |
| Some | 1.89 (1.15–3.12) * | 1.61 (0.95–2.74) | 1.59 (0.95–2.65) | 1.62 (0.95–2.74) | 0.41 (0.25–0.68) *** | 0.38 (0.22–0.63) *** |
| Quite a bit/A lot | 1.76 (1.00–3.12) | 1.48 (0.80–2.75) | 1.94 (1.06–3.54) * | 1.68 (0.90–3.12) | 0.16 (0.08–0.31) *** | 0.14 (0.07–0.29) *** |
| Do not know | 1.32 (0.63–2.77) | 1.17 (0.54–2.55) | 0.42 (0.20–0.91) * | 0.43 (0.20–0.93) * | 0.63 (0.30–1.32) | 0.63 (0.30–1.34) |
| Received Government of Canada financial assistance (self or family) | | | | | | |
| No, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Yes | 1.73 (1.21–2.48) ** | 1.71 (1.17–2.50) ** | 2.95 (2.03–4.28) *** | 3.02 (2.07–4.40) *** | 0.83 (0.58–1.19) | 0.84 (0.58–1.21) |
| Do not know | 0.96 (0.58–1.61) | 0.91 (0.53–1.57) | 0.44 (0.26–0.75) ** | 0.42 (0.24–0.74) ** | 0.75 (0.45–1.26) | 0.79 (0.47–1.34) |
| Emotionally supported | | | | | | |
| Quite a bit/A lot, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Some | 1.37 (0.91–2.05) | 1.36 (0.89–2.08) | 1.12 (0.74–1.70) | 1.11 (0.73–1.70) | 0.98 (0.65–1.46) | 0.94 (0.63–1.41) |
| A little | 1.27 (0.82–1.97) | 1.08 (0.68–1.72) | 0.89 (0.57–1.39) | 0.84 (0.53–1.32) | 0.61 (0.39–0.95) * | 0.63 (0.40–0.98) * |
| Not at all | 0.89 (0.49–1.62) | 0.57 (0.30–1.11) | 0.71 (0.39–1.29) | 0.66 (0.35–1.25) | 0.50 (0.27–0.94) * | 0.51 (0.26–0.97) * |
| Maintained social connections | | | | | | |
| Quite a bit/A lot, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Some | 1.14 (0.77–1.67) | 1.18 (0.79–1.75) | 1.35 (0.92–2.00) | 1.36 (0.92–2.02) | 1.03 (0.70–1.50) | 1.06 (0.72–1.56) |
| A little | 1.10 (0.72–1.69) | 0.99 (0.63–1.56) | 1.24 (0.80–1.92) | 1.34 (0.85–2.10) | 0.71 (0.46–1.09) | 0.74 (0.47–1.14) |
| Not at all | 0.96 (0.52–1.76) | 0.77 (0.41–1.48) | 2.10 (1.08–4.08) * | 2.18 (1.09–4.32) * | 0.86 (0.47–1.58) | 0.87 (0.47–1.62) |

Notes: AOR-1 = odds ratio adjusted for sociodemographic characteristics; AOR-2 = odds ratio adjusted for sociodemographic characteristic and pre-pandemic self-rated mental health; CI = confidence interval; ref = reference group.

* $p < .05$; ** $p < .01$; *** $p < .001$.

household income had lower odds of feeling emotionally supported “a little” (AOR = 0.63, 95% CI = 0.40–0.98) or “not at all” (AOR = 0.51, 95% CI = 0.26–0.97) compared to “quite a bit/a lot” after adjusting for sociodemographic characteristics and pre-pandemic self-rated mental health. Self-reports of being able to maintain social connections differed only by age group, with young adults compared to older adolescents more likely to report “not at all” (AOR = 2.18, 95% CI = 1.09–4.32) compared to “quite a bit/a lot”.

Table 3 displays the associations between pandemic-related mental health symptoms, substance use, and sex, age group, and household income. After adjusting for sociodemographic characteristics and pre-pandemic self-rated mental health, females were more likely than males to report feelings of stress/anxiety (AOR range: 3.82–7.83) and depression (AOR range: 2.25–5.38), as well as increased feelings of stress/anxiety (AOR = 1.90, 95% CI = 1.31–2.77) and depression (AOR = 1.73, 95% CI = 1.19–2.52) due to the pandemic. Young adults were more likely than older adolescents to report feeling “a little” down/depressed (AOR = 1.81, 95% CI = 1.08–3.02) compared to not reporting these feelings at all. Respondents with a higher compared to lower household income had greater odds of reporting decreased alcohol

consumption (AOR = 1.68; 95% CI = 1.06–2.64). No differences in cannabis use were observed by sociodemographic characteristics.

Table 4 presents the associations between pandemic-related relationship conflict and sex, age group, and household income. Females compared to males had greater odds of increased conflict with parents (AOR = 1.62, 95% CI = 1.02–2.56) and respondents with a higher compared to lower household income were more likely to report decreased conflict with parents (AOR = 2.05, 95% CI = 1.12–3.74) after adjusting for sociodemographic characteristics and pre-pandemic self-rated mental health. For all types of relationship conflict, young adults were less likely than older adolescents to report being uncertain about changes in conflict (AOR range: 0.22–0.41), and females compared to males had lower odds of being uncertain of changes in conflict with an intimate partner (AOR = 0.32, 95% CI = 0.11–0.90) in the adjusted models.

4. Discussion

The current study makes several important contributions to our understanding of older adolescents’ and young adults’ experiences during

Table 3
Associations between pandemic-related mental health symptoms, substance use, and sex, age group, and household income.

| | Sex, Female versus Male | | Age Group, Young Adults versus Older Adolescents | | Household Income, Higher versus Lower | |
|--|-------------------------|-----------------------|--|--------------------|---------------------------------------|--------------------|
| | AOR-1 (95% CI) | AOR-2 (95% CI) | AOR-1 (95% CI) | AOR-2 (95% CI) | AOR-1 (95% CI) | AOR-2 (95% CI) |
| Feelings of stress/anxiety | | | | | | |
| Not at all, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| A little | 3.95 (1.85–8.47) *** | 3.82 (1.76–8.31) ** | 1.43 (0.76–2.69) | 1.56 (0.82–2.94) | 1.12 (0.59–2.11) | 1.20 (0.63–2.28) |
| Somewhat | 5.50 (2.56–11.81) *** | 5.44 (2.50–11.85) *** | 1.52 (0.81–2.88) | 1.67 (0.87–3.18) | 1.52 (0.80–2.87) | 1.62 (0.85–3.10) |
| Quite a bit/A lot | 9.00 (4.36–18.61) *** | 7.83 (3.74–16.41) *** | 1.63 (0.90–2.95) | 1.57 (0.86–2.87) | 1.33 (0.73–2.42) | 1.42 (0.77–2.61) |
| Changes in feelings of stress/anxiety | | | | | | |
| Remained the same, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Increased | 2.06 (1.44–2.95) *** | 1.90 (1.31–2.77) ** | 1.19 (0.83–1.72) | 1.16 (0.80–1.68) | 0.85 (0.60–1.22) | 0.84 (0.59–1.21) |
| Decreased | 1.56 (0.77–3.17) | 1.51 (0.73–3.14) | 0.76 (0.37–1.54) | 0.75 (0.37–1.52) | 1.21 (0.60–2.47) | 1.19 (0.59–2.41) |
| Do not know | 1.00 (0.50–2.01) | 0.95 (0.46–1.96) | 1.05 (0.52–2.12) | 1.09 (0.53–2.23) | 0.80 (0.40–1.60) | 0.82 (0.41–1.66) |
| Feeling down/depressed | | | | | | |
| Not at all, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| A little | 2.14 (1.25–3.66) ** | 2.25 (1.30–3.90) ** | 1.79 (1.07–2.99) * | 1.81 (1.08–3.02) * | 1.49 (0.89–2.48) | 1.48 (0.89–2.47) |
| Somewhat | 3.00 (1.68–5.35) *** | 2.86 (1.56–5.22) ** | 1.50 (0.86–2.62) | 1.63 (0.92–2.89) | 1.18 (0.68–2.06) | 1.33 (0.76–2.36) |
| Quite a bit/A lot | 5.86 (3.43–10.01) *** | 5.38 (3.10–9.33) *** | 1.49 (0.90–2.49) | 1.39 (0.83–2.33) | 1.29 (0.78–2.15) | 1.28 (0.77–2.15) |
| Changes in feeling down/depressed | | | | | | |
| Remained the same, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Increased | 1.68 (1.17–2.40) ** | 1.73 (1.19–2.52) ** | 1.12 (0.78–1.62) | 1.09 (0.75–1.58) | 1.19 (0.83–1.70) | 1.22 (0.85–1.76) |
| Decreased | 1.01 (0.44–2.33) | 1.16 (0.49–2.73) | 0.74 (0.32–1.71) | 0.74 (0.32–1.72) | 0.96 (0.42–2.23) | 0.96 (0.42–2.23) |
| Do not know | 0.96 (0.54–1.71) | 1.04 (0.57–1.88) | 0.78 (0.44–1.39) | 0.84 (0.47–1.51) | 1.01 (0.57–1.80) | 1.08 (0.60–1.93) |
| Changes in alcohol consumption (n = 423) | | | | | | |
| Remained the same, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Increased | 0.70 (0.41–1.18) | 0.57 (0.33–1.00) | 0.94 (0.52–1.67) | 0.87 (0.48–1.57) | 1.17 (0.69–2.00) | 1.17 (0.68–2.01) |
| Decreased | 1.45 (0.92–2.30) | 1.41 (0.87–2.26) | 1.05 (0.64–1.73) | 1.08 (0.65–1.79) | 1.64 (1.04–2.56) * | 1.68 (1.06–2.64) * |
| Changes in cannabis consumption (n = 268) | | | | | | |
| Remained the same, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Increased | 1.01 (0.57–1.78) | 0.65 (0.35–1.21) | 1.14 (0.62–2.10) | 1.07 (0.56–2.02) | 1.46 (0.83–2.54) | 1.44 (0.81–2.58) |
| Decreased | 0.92 (0.47–1.79) | 0.76 (0.38–1.54) | 0.99 (0.49–2.02) | 1.08 (0.52–2.25) | 1.78 (0.92–3.45) | 1.86 (0.95–3.64) |

Notes: AOR-1 = odds ratio adjusted for sociodemographic characteristics; AOR-2 = odds ratio adjusted for sociodemographic characteristic and pre-pandemic self-rated mental health; CI = confidence interval; ref = reference group.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4
Associations between pandemic-related relationship conflict and sex, age group, and household income.

| | Sex, Female versus Male | | Age Group, Young Adults versus Older Adolescents | | Household Income, Higher versus Lower | |
|--|-------------------------|--------------------|--|---------------------|---------------------------------------|--------------------|
| | AOR-1 (95% CI) | AOR-2 (95% CI) | AOR-1 (95% CI) | AOR-2 (95% CI) | AOR-1 (95% CI) | AOR-2 (95% CI) |
| Changes in conflict with parents | | | | | | |
| Remained the same, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Increased | 1.88 (1.22–2.91) ** | 1.62 (1.02–2.56) * | 0.70 (0.46–1.07) | 0.69 (0.45–1.07) | 0.81 (0.53–1.23) | 0.81 (0.52–1.25) |
| Decreased | 0.97 (0.54–1.74) | 1.00 (0.55–1.84) | 1.68 (0.87–3.21) | 1.63 (0.84–3.13) | 2.14 (1.18–3.90) * | 2.05 (1.12–3.74) * |
| Do not know | 0.74 (0.42–1.30) | 0.73 (0.41–1.30) | 0.41 (0.23–0.72) ** | 0.41 (0.23–0.73) ** | 0.90 (0.51–1.57) | 0.90 (0.51–1.58) |
| Changes in conflict with siblings (n = 592) | | | | | | |
| Remained the same, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Increased | 0.76 (0.47–1.23) | 0.71 (0.43–1.19) | 0.62 (0.38–0.99) * | 0.63 (0.39–1.04) | 0.91 (0.56–1.47) | 0.99 (0.61–1.61) |
| Decreased | 1.19 (0.73–1.94) | 1.17 (0.70–1.95) | 1.47 (0.87–2.50) | 1.42 (0.83–2.41) | 0.93 (0.58–1.51) | 0.90 (0.56–1.47) |
| Do not know | 1.13 (0.57–2.24) | 1.18 (0.58–2.39) | 0.37 (0.19–0.74) ** | 0.37 (0.19–0.74) ** | 0.80 (0.41–1.58) | 0.79 (0.40–1.55) |
| Changes in conflict with intimate partner (n = 288) | | | | | | |
| Remained the same, ref | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Increased | 1.48 (0.81–2.72) | 1.20 (0.63–2.31) | 0.92 (0.49–1.72) | 0.93 (0.50–1.76) | 1.53 (0.86–2.74) | 1.55 (0.86–2.80) |
| Decreased | 2.00 (0.84–4.78) | 1.92 (0.77–4.79) | 0.99 (0.42–2.33) | 1.02 (0.43–2.40) | 0.77 (0.34–1.74) | 0.77 (0.34–1.74) |
| Do not know | 0.37 (0.14–0.96) * | 0.32 (0.11–0.90) * | 0.21 (0.08–0.56) ** | 0.22 (0.08–0.57) ** | 1.09 (0.44–2.69) | 1.09 (0.44–2.70) |

Notes: AOR-1 = odds ratio adjusted for sociodemographic characteristics; AOR-2 = odds ratio adjusted for sociodemographic characteristic and pre-pandemic self-rated mental health; CI = confidence interval; ref = reference group.

* $p < .05$; ** $p < .01$; *** $p < .001$.

the COVID-19 pandemic. First, a large proportion of respondents self-reported increases in their feelings of stress/anxiety (57.6%) and depression (54.2%), alcohol use (18.2%), cannabis use (35.1%), and interpersonal conflict due to the pandemic (i.e., parents 19.9%, siblings 15.2%, and intimate relationships 24.0%). Second, sex differences were noted related to self-reported financial hardship, levels of and changes in feelings of stress/anxiety and depression, and conflict with parents. However, no sex differences were found for increases in substance use. Third, age group differences were found for self-reported financial hardship, social connections, and levels of feeling down/depressed. Fourth, a higher household income of \$100,000 or greater was protective of some COVID-19 experiences including self-reported financial difficulties, a lack of emotional support, alcohol consumption, and conflict with parents.

The degree to which older adolescents and young adults in this sample reported feelings of stress or anxiety (47.3%) and depression (36.2%) quite a bit or a lot because of the COVID-19 pandemic is much higher than findings from a nationally-representative study of Canadian adults, in which 20% self-reported high levels of anxiety and 10% self-reported high levels of depression (Dozois, 2020). Yet in another study, 36% of Canadian adolescents and young adults ages 15 to 34 years reported clinically-significant anxiety symptoms (moderate and severe levels); symptoms of depression were not examined (El-Gabalawy and Sommer, 2021b). However, in that study, anxiety was assessed with the 7-item Generalized Anxiety Disorder Scale (GAD-7), which is a validated measure of anxiety symptoms over the past two weeks, but is not specific to stress and anxiety experienced because of the COVID-19 pandemic (Spitzer et al., 2006). Thus, our findings of the mental health burden on older adolescents and young adults may not be directly comparable to other samples, but nonetheless, provide important information regarding the self-reported impact directly related to COVID-19. Furthermore, both of these studies were conducted soon after the COVID-19 outbreak; it is possible that the mental health burden may have increased following the resurgence of cases during the second wave. Specifically, respondents in our study completed the survey during the months when the province of Manitoba enacted critical-level ("Code Red") disease containment restrictions (Government of Manitoba, 2020b). In line with the extant COVID-19 research (Hawes et al., 2021a; Magson et al., 2021) and the well-established research preceding the pandemic (Martel, 2013), we found that females disproportionately reported greater feelings of stress/anxiety and depression than males. This finding persisted after adjustment for self-rated mental health reported prior to the pandemic and sociodemographic characteristics. Additionally, we found that young adults aged 18 to 21 years were more likely than older adolescents aged 16 and 17 years to report feeling down/depressed. This finding has not been reported previously due to a lack of COVID-19 studies comparing these age groups. Yet, the emerging adulthood years are characterized by numerous dynamic and complex changes during the transition to independence that can increase stress and risk for psychiatric symptomatology (Wood et al., 2018). The age differences observed in reported down/depressed feelings could be due to added stressors (e.g., financial strain, job instability, lack of supports) experienced by young adults that may be exacerbated during the pandemic (Zheng et al., 2021).

Notably, there were some important sex and age differences observed in reported financial difficulties because of the pandemic. With reduced hours and unemployment during the pandemic largely impacting young workers (Gould and Kassa, 2020; Statistics Canada, 2020), it is unsurprising that young adults in our study reported greater financial burden compared to older adolescents who may have fewer financial obligations and potentially greater reliance on family resources (Wood et al., 2018). It was also observed in our study that female respondents reported greater financial difficulties (AOR-1) and reported receiving more financial assistance (AOR-1 and AOR-2) than males. In Canada, women have been disproportionately impacted by disruptions to the labor market due to the pandemic, particularly in younger ages

ranging from 15 to 24 years (Scott, 2021; Statistics Canada, 2020). This gendered impact of COVID-19 on unemployment has occurred globally, in part related to women predominantly working in the service sector, including childcare, retail, hospitality, and tourism (Zarrilli and Luomaranta, 2021).

The large proportion of older adolescents and young adults in our sample reporting little or no emotional support (27.6%) and social connections (29.5%) highlights target areas for providing supports during the pandemic. Young adults in our study were more likely than older adolescents to report being unable to maintain social connections during the pandemic. This may be explained by decreased social supports common in young adulthood coinciding with major life events such as leaving secondary school and moving out of the family home (Wood et al., 2018), which may be intensified in the context of the pandemic due to further disruptions to socialization such as stay-at-home orders, reduced work hours or unemployment, online post-secondary education, and closure of recreational facilities. Sex differences were not observed in reports of being able to maintain social connections. Furthermore, sex and age differences were not observed in respondents' self-reports of feeling emotionally supported during the COVID-19 pandemic. However, a protective effect was found with higher household income having reduced odds of not feeling emotionally supported during the pandemic. This is consistent with a recent COVID-19 study finding that higher income was associated with greater socio-emotional support seeking among young adults aged 24 to 35 years (Volk et al., 2021).

The percentage of older adolescents and young adults in our sample reporting increased cannabis use (35.1%) and alcohol consumption (18.2%) due to the pandemic is alarming. Compared to self-reported substance use among Canadian adults (18 years and older) during the second wave of the pandemic, our study reported larger increases in both alcohol (16%) and cannabis (5%) use (Varin et al., 2021). However, the increase in alcohol use was comparable to that reported in a sample of Canadian adolescents and adults ages 15 to 34 years (18.7%), but the increase in cannabis use was much greater (11.6%) (El-Gabalawy and Sommer, 2021b). More recent data among young adults aged 18 to 24 estimated the increase in alcohol and cannabis use to be 14% and 12%, respectively (Varin et al., 2021). Although not assessed in the present study, it is possible that those who reported increased alcohol and/or cannabis use may have done so due to greater time availability and boredom, or as a maladaptive strategy for coping with stress (Jackson et al., 2021; Wills and Shiffman, 1985). It is also important to acknowledge, however, that 31.4% of respondents reported decreased alcohol consumption and 20.9% reported decreased cannabis consumption due to the pandemic. Although it is not possible to determine with these data, this finding may reflect reduced socialization and/or access during the pandemic (Jackson et al., 2021). Furthermore, young adults in our study were more likely than older adolescents to report using alcohol and/or cannabis, corresponding with the legal age for use of these substances in Manitoba (alcohol: 18 years and older; cannabis: 19 years and older). However, among respondents that reported using these substances, no differences in self-reported changes in consumption were detected by age group. Sex differences were not detected either, but respondents with a higher household income had a greater likelihood of decreased alcohol use. One possible explanation might be that individuals from higher income households may have greater access to support resources that could help to prevent or reduce maladaptive health behaviours such as alcohol use.

Conflict was self-reported to have increased for 19.9% with parents, 15.2% with siblings, and 24% with partners. Currently the evidence on interpersonal conflict is limited with conflicting findings. In addition, we are unaware of any studies reporting on conflict with partners in an intimate relationship in younger age groups. The percentage of increased conflict with parents is similar to that reported by Magson and colleagues in a younger sample of adolescents aged 13 to 16 years (about 25%) (Magson et al., 2021), but differs with another study conducted

among adolescents aged 14 to 17 years, in which few respondents reported increased conflict with parents (Rogers et al., 2021). Differences in interpersonal conflict were not observed between older adolescents and young adults in the current study. However, females compared to males had greater odds of increased parent conflict and respondents with a higher household income had greater odds of decreased parent conflict. The latter in line with recent work (Rogers et al., 2021).

Findings from this study should be interpreted in context of its limitations. The data were collected from a community sample. Although several characteristics of the sample were determined to be comparable to the adolescent population from which it was drawn at Wave 1 of the WE Study, the sample may not be representative or generalizable to all older adolescents and young adults aged 16 to 21 years. Additionally, COVID-19 experiences were assessed with self-report measures and may be prone to response bias including recall and social desirability. COVID-19 experiences were also not assessed using standardized tools, but this was done so in an effort to assess perceptions of stress/anxiety, depression, substance use, and interpersonal conflict due to the pandemic. In order to conduct timely assessments, it was not possible to develop a standardized COVID-19 instrument prior to data collection. Finally, the extent to which adolescents and young adults adhered to pandemic restrictions could have also influenced how pandemic-related outcomes were perceived and experienced. However, we were unable to assess the level of adherence to public health restrictions with these data.

This study has important public health implications to address needs of this age group during and following the COVID-19 pandemic. Overall, the findings indicate that older adolescents and young adults may benefit from greater access to resources to manage stress, anxiety, depression, and substance use, as well as resources that provide emotional support and facilitate maintaining positive relationships and social connections. At this time, the best strategy may be to provide immediate access to virtual care and online evidence-based interventions specifically for this age group that continues following the pandemic. Since some differences by sex and age group were noted, consideration of these differences could be incorporated into intervention strategies. Prevention strategies should include public health education campaigns that aim to raise awareness about the risks of increased substance use, mental health concerns, and interpersonal conflict, with guidance on how to receive support. Additional pandemic-relief resources should be directed specifically towards families and young adults. Furthermore, ongoing efforts to evaluate the health and wellbeing of young populations, including older adolescents and young adults, should be prioritized.

CRedit authorship contribution statement

Samantha Salmon: Visualization, Data curation, Investigation, Formal analysis, Writing – original draft, Writing – review & editing. **Tamara L. Taillieu:** Visualization, Data curation, Investigation, Formal analysis, Writing – review & editing. **Janique Fortier:** Visualization, Data curation, Investigation, Formal analysis, Writing – review & editing. **Ashley Stewart-Tufescu:** Visualization, Data curation, Investigation, Writing – review & editing. **Tracie O. Afifi:** Visualization, Data curation, Investigation, Writing – review & editing.

Declaration of Competing Interest

No authors have any conflicts of interest to report.

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