

Original quantitative research

Heavy episodic drinking and self-reported increased alcohol use during the COVID-19 pandemic: a spotlight on frontline and essential workers in Canada

Melanie Varin, MSc (1); Jeyasakthi Venugopal, MPH (1); Le Li, MMath (1); Kate Hill MacEachern, PhD (2); Murray Weeks, PhD (1); Melissa M. Baker, PhD (3); Anne-Marie Lowe, MSc (1)

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Abstract

Introduction: There is evidence that some frontline and essential workers have increased their alcohol use during the COVID-19 pandemic; however, this has not been examined in Canada.

Methods: Using the Survey on COVID-19 and Mental Health 2020, weighted prevalence and 95% confidence intervals of self-reported increased alcohol consumption and heavy episodic drinking were calculated for each of the population groups: frontline workers, essential workers, and nonfrontline or essential workers (NFEW). Logistic regression was used to examine the associations between social determinants of health, mental health and alcohol use for each group.

Results: The prevalence of increased alcohol consumption and past-month heavy episodic drinking did not differ across frontline workers, essential workers and NFEW. For the three groups, nonracialized group members had significantly higher odds for both outcomes. Screening positive for either generalized anxiety disorder or mood disorder was significantly associated with increased alcohol consumption across the three groups. For frontline and essential workers, females had significantly lower odds of heavy episodic drinking compared to males. For essential workers only, living in a rural area was significantly associated with lower odds of increased alcohol use, and screening positive for posttraumatic stress disorder was significantly associated with increased odds of heavy episodic drinking. For frontline workers only, living in a rural area was significantly associated with lower odds of heavy episodic drinking.

Conclusion: While frontline and essential workers were not more likely to report increased alcohol consumption and heavy episodic drinking compared to NFEW, there were some differences in factors associated with alcohol use. Such findings demonstrate the benefit of examining each group separately to provide information for targeted prevention strategies.

Highlights

- There were no significant differences between frontline workers, essential workers and nonfrontline or essential workers for self-reported increased alcohol consumption and past-month heavy episodic drinking.
- Gender and living area were significantly associated with increased alcohol use and/or heavy episodic drinking only for frontline and essential workers.
- Screening positive for either generalized anxiety disorder or major depressive disorder was significantly associated with increased alcohol consumption across the three groups, which supports the association between mental health and alcohol use during COVID-19 across the Canadian population.

Introduction

The outbreak of coronavirus disease 2019 (COVID-19) was declared a global pandemic on 11 March 2020.¹ Frontline and essential workers are individuals whose occupation has the potential to put them

in direct contact with people with COVID-19 or whose occupation is necessary for preserving society during a pandemic (e.g. first responders, health care workers, employees working in a service industry). Throughout the course of the COVID-19 pandemic, frontline and essential workers

have faced increased pressure to deliver services and goods, such as health care, food and facilities management. The public-facing nature of their work may have increased their risk of exposure to COVID-19, which in turn may have increased risk of infection. These conditions, coupled with amplified work stress and fear of spreading the virus, may have increased the psychosocial burden among this population and may have impacted mental health and substance use.^{2,3}

Author references:

1. Public Health Agency of Canada, Ottawa, Ontario, Canada
2. Atlas Institute for Veterans and Families, Ottawa, Ontario, Canada
3. Helen Keller International, Nairobi, Kenya

Correspondence: Mélanie Varin, Public Health Agency of Canada, 785 Carling Ave, Ottawa ON K1S 5H4; Email: melanie.varin@phac-aspc.gc.ca

Health care is one of the few occupational sectors in which researchers have previously explored the impact of pandemics and epidemics on mental health and alcohol use. Evidence from three rapid reviews suggests that the mental health of health care professionals can be negatively impacted during a pandemic or epidemic, as was reported during the Severe Acute Respiratory Syndrome (SARS) epidemic in 2003, the influenza A (H1N1) pandemic in 2009 and the Middle East Respiratory Syndrome (MERS) epidemic in 2012.^{4,6} The pandemic- and epidemic-related impacts observed in these studies include alcohol misuse,⁴ depression,^{4,6} symptoms of burnout^{4,5} and reduced psychological well-being.⁵

Emerging evidence during the COVID-19 pandemic corroborates these findings. In a study of 544 health care personnel in Indonesia, researchers found higher odds of moderate to severe symptoms of depression (adjusted odds ratio [aOR] = 5.82, 95% confidence interval [CI]: 2.18–15.56) and burnout (aOR = 3.78, 95% CI: 1.99–7.16) among those who were at higher risk of being directly exposed to COVID-19 compared to those who were at lower risk.⁷ In a sample of 1257 health care workers in China, being a frontline worker and directly treating COVID-19 patients was associated with increased odds of depression (OR = 1.52, 95% CI: 1.11–2.09) and severe symptoms of generalized anxiety disorder (aOR = 1.57, 95% CI: 1.22–2.02) compared to working in second-line positions.⁸

Finally, data from a crowdsourced survey conducted by Statistics Canada between November and December 2020 demonstrated that 70% of health care workers reported worse mental health during the COVID-19 pandemic.^{9,10} Given that anxiety and mood disorders are risk factors for alcohol consumption,¹¹ and given the potential for excessive consumption to lead to chronic conditions and mortality,¹² assessing alcohol use behaviours in these occupational groups is important.

Preliminary research suggests that the COVID-19 pandemic has also impacted alcohol consumption among some frontline and essential workers. A US study of 571 frontline workers (98 hospital staff, 401 firefighters, 72 law enforcement) found 31% had an increased risk for alcohol use disorder during the COVID-19 pandemic.¹³ Furthermore, the study found

that frontline workers who had direct contact with patients had more than twice the odds of increased risk for alcohol use disorder (OR = 2.18, 95% CI: 1.35–3.52) than those who did not have direct patient contact.¹³ A cross-sectional study in the US found a high prevalence of alcohol use disorder (42.8%) among the 1092 health care workers from 25 medical centres.¹⁴ In both of these US studies, alcohol use disorder was quantified using the Alcohol Use Disorders Identification Test Consumption Questions (AUDIT-C) measure.^{13,14} In a cross-sectional study of 1346 participants in the UK, essential workers reported an increase in weekly alcohol consumption and drinking severity in May 2020 (i.e., during quarantine) compared to November 2019 (pre-quarantine).¹⁵ These international findings provide important preliminary evidence on alcohol use among frontline and essential workers during the COVID-19 pandemic.

While there are currently no nationally representative data on alcohol use among frontline and essential workers during the COVID-19 pandemic, increases in alcohol consumption and heavy episodic drinking have been documented among Canadians during this time, with some groups seemingly affected more than others.^{16–22} Indeed, females, parents/legal guardians and individuals who screened positive for generalized anxiety disorder (GAD), major depressive disorder (MDD) or posttraumatic stress disorder (PTSD) had a significantly higher prevalence of self-reported increased alcohol use since the onset of the pandemic.^{16,17,22} Given these differential impacts across certain social and mental determinants of health, it is crucial to examine these determinants when assessing alcohol use among frontline and essential workers.

Overall, international evidence demonstrates that frontline and essential workers may have increased risk for alcohol use disorder^{13–15} during the COVID-19 pandemic; however, no studies have examined this in the Canadian context. The objectives of this study were three-fold:

- (1) estimate the prevalence of self-reported increased alcohol consumption and past-month heavy episodic drinking among (i) frontline workers, (ii) essential workers and (iii) non-frontline or essential workers (NFEW);

- (2) determine whether there are any significant differences between groups; and

- (3) identify group-specific associations between social determinants of health, mental health variables and alcohol (increased alcohol use and heavy episodic drinking).

Methods

Study design and population

This study used data from the Survey on COVID-19 and Mental Health (SCMH), which is a nationally representative, cross-sectional survey led by Statistics Canada and the Public Health Agency of Canada (PHAC). This survey was administered to 30 000 dwellings from 11 September to 4 December 2020. A total of 14 689 individuals aged 18 years and older completed the survey, representing a response rate of 53.3%. Of this sample, 84% agreed to share their data with PHAC, resulting in a sample size of 12 344. Survey coverage did not include individuals living on reserves or other Indigenous settlements, full-time members of the Canadian Armed Forces, and individuals in institutions. These exclusions are estimated to be less than 2% of the population. Further details about the SCMH design and sampling frame can be found on Statistic Canada's website.²³

The study population included workers aged 19 to 64 years who (1) identified as a frontline worker, (2) identified as an essential worker but not a frontline worker and (3) did not identify as either an essential or a frontline worker.

Respondents who answered “Yes” to the following question were classified as frontline workers: “Were you considered a ‘frontline’ worker? A frontline worker is defined as an individual who has the potential to come in direct contact with COVID-19 by assisting those who have been diagnosed with the virus. For example, police officers, firefighters, paramedics, nurses or doctors.”

Respondents who answered “Yes” to the following question were classified as essential workers: “Was your job determined to be ‘essential’? An essential worker is defined as an individual who works in a service, a facility or in an

activity that is necessary to preserving life, health, public safety and basic societal functions of Canadians. For example, employees working in transportation (public transit, gas stations, etc.), financial institutions, health care or as first responders (police, firefighters, paramedics, etc.), pharmacies, childcare, food supply (grocery stores, truck drivers, etc.).”

The NFEW population comprised individuals who responded “No” to both of the above questions. Almost all (94%) individuals who self-identified as a frontline worker also self-identified as an essential worker. This suggested that frontline workers were a subset of essential workers. Accordingly, three mutually exclusive groups were created: (1) frontline workers ($n = 880$), (2) essential workers (not including frontline workers; $n = 2288$) and (3) NFEW ($n = 5301$).

Questions on frontline and essential worker status were not asked for respondents over 75 years of age. As there were large discrepancies in the proportion of frontline and essential workers (around 4%) between the ages of 65 to 75 compared to the nonfrontline or essential worker group (22%), analyses were restricted to individuals aged 19 to 64. This age restriction also takes into consideration the healthy worker bias. This restriction did not result in meaningful changes to the findings.

Outcomes

This study examined two primary outcomes: (1) increased alcohol consumption and (2) past-month heavy episodic drinking. Respondents were asked, “How has your alcohol consumption changed since before the COVID-19 pandemic?” Response options were “Increased,” “Decreased” and “No change.” The first outcome was dichotomized into (1) increased versus (2) decreased or no change.

For the second outcome, respondents were asked, “During the past 30 days, how often have you had four/five [four for females; five for males] or more drinks on one occasion?” Respondents were considered to have past-month heavy episodic drinking if they chose the options “Daily or almost daily,” “2 to 5 times a week,” “Once a week,” “2 to 3 times in the past 30 days,” or “Once in the past 30 days.” Individuals who chose the option “Not in the past 30 days” or who had not had an

alcoholic beverage in the last month were defined as not having engaged in past-month heavy episodic drinking. Heavy episodic drinking is an example of a behaviour that exceeds Canada’s Low-Risk Alcohol Drinking Guidelines²⁴ and can lead to harms.

Individuals who responded “Don’t know” or who did not answer the questions for alcohol consumption ($n = 17$, 0.002%) and past-month heavy episodic drinking ($n = 24$, 0.003%) were considered to be missing data and were excluded from the analysis.

Social determinants of health

The social determinants of health examined were education (less than high school, high school graduate, postsecondary graduate); age group (19–24, 25–44, and 45–64 years); total household income (divided into quintiles); being a parent or legal guardian of a child or children under the age of 18 years (yes, no; hereafter referred to as “parent/legal guardian”); living area (urban, rural); self-identifying as part of a racialized group (yes, no; hereafter referred to as “racialized populations or individuals”); and gender (male, female).

Living area identified whether the respondent lived in a population centre (urban area) or a rural area within or outside of a census metropolitan area or census agglomeration. Population centres have a population concentration of 1000 or more and a population density of 400 or more per square kilometre based on 2016 Census population counts.

Racialized group membership was measured by asking respondents to identify the population group or groups to which they belong. Data from respondents who did not provide a response to this question were considered missing.

Respondents were asked “What is your gender? Gender refers to current gender, which may be different from sex assigned at birth and may be different from what is indicated on legal documents. Is it: Male, Female, or please specify your gender.” Although the question asks for gender, the language used in the response options is consistent with biological sex (male, female) as opposed to gender (man, woman). As this was a secondary data

analysis limited by the survey question and responses, we chose to report on gender using the answer choices that were provided (male, female) to the people surveyed, as the most rigorous and ethical approach. For respondents who answered “Don’t know” or did not give an answer, the data were deemed to be missing.

Mental health variables

The generalized anxiety disorder (GAD) scale, GAD-7, is a validated, seven-item scale that assesses how often an individual has been affected by seven symptoms of anxiety in the past two weeks.²⁵ Examples of symptoms include not being able to stop or control worrying, trouble relaxing, feeling nervous, etc. Respondents who had a score of 10 or more (out of 21) were considered to have moderate to severe symptoms of GAD.²⁵

The Patient Health Questionnaire (PHQ-9) is a validated, nine-item scale that assesses how often an individual has been affected by symptoms of major depressive disorder (MDD) in the past two weeks.²⁶ Examples of symptoms include feeling tired or having little energy, trouble concentrating, having little interest or pleasure in doing things, etc. Respondents who had a score of 10 or more (out of 27) were considered to have moderate to severe symptoms of MDD.²⁶ Both the GAD-7 and the PHQ-9 asked about symptoms in the two weeks prior to completing the survey. Throughout the rest of the article, we refer to these variables as screening positive for GAD or MDD.

The 20-item PTSD Checklist for DSM-5 (PCL-5) assesses posttraumatic stress symptoms in the past month, such as repeated, disturbing or unwanted memories; avoiding external reminders; and being hyper alert or on guard. Respondents with a score of 33 or more (out of 80) were considered to meet the cut-point for probable PTSD.²⁷ It should be noted that the event causing the PTSD is not specified and could include PTSD due to COVID-19 or other events that occurred in the respondent’s lifetime.

Statistical analyses

A descriptive analysis to examine the characteristics of the overall survey population by calculating weighted proportions and 95% confidence intervals (CIs) for each of the three self-identified groups

was conducted. We fitted two adjusted logistic regression models to examine the associations between (1) population group and self-reported increased alcohol consumption, and (2) population group and past-month heavy episodic drinking.

To examine the associations between (1) social determinants of health, mental health and increased alcohol consumption; and (2) social determinants of health, mental health and past-month heavy episodic drinking within each group, the adjusted logistic regression models were stratified by frontline workers, essential workers and NFEW. In total, six stratified adjusted logistic regression models were conducted.

Each model was adjusted for the following: gender, age group, self-reported household income quintile, education level, parent/legal guardian status, living area, racialized group membership, screening positive for GAD, screening positive for MDD and screening positive for PTSD. Odds ratios with 95% CIs that do not include 1.00 were interpreted as statistically significant. Survey sampling weights were provided by Statistics Canada to generate nationally representative estimates. Variance for prevalence estimates was estimated using the bootstrap method and SAS Enterprise Guide version 7.1 (SAS Institute Inc., Cary, NC, US) was used for statistical analyses.

Results

Prevalence estimates for the social determinants for the survey population and for the three groups are presented in Table 1. There were more females in the frontline worker (61.3%) and NFEW (50.9%) groups, while there were fewer in the essential worker group (45.1%). Age was similarly distributed across all three groups. There was a higher prevalence of NFEW in the lowest income quintile (25.1%) compared to frontline (15.7%) and essential workers (18.5%). For all three groups, most individuals were postsecondary graduates, were not a parent/legal guardian, lived in an urban area, did not identify as being a racialized group member and did not screen positive for GAD, MDD or PTSD. Frontline workers had the highest prevalence of screening positive for GAD (17.9%), MDD (20.7%) and PTSD (9.7%), while essential workers had the lowest prevalence (10.6%, 12.6% and 6.2%, respectively). After adjusting for confounders,

there were no significant between-group differences for increased alcohol consumption or heavy episodic drinking (Table 2).

Increased alcohol consumption by occupational groups

For all three groups, nonracialized individuals (aOR = 5.94 frontline; aOR = 2.86 essential; aOR = 2.32 NFEW) were significantly more likely to report increased alcohol consumption. For frontline workers and NFEW, those who screened positive for MDD (aOR = 3.90 frontline; aOR = 2.17 NFEW) had significantly higher odds of increased alcohol consumption. For essential workers and NFEW, individuals within the highest income quintile (aOR = 2.61 essential; aOR = 2.69 NFEW) and parents/legal guardians (aOR = 1.51 essential; aOR = 1.41 NFEW) were significantly more likely to report increased alcohol consumption. Essential workers living in a rural area (aOR = 0.53) had lower odds of increased alcohol consumption, while those who screened positive for GAD (aOR = 2.27) had higher odds of increased alcohol consumption. For NFEW, individuals in the fourth income quintile (aOR = 1.86) and postsecondary graduates (aOR = 3.99) had higher odds of increased alcohol consumption (Table 3).

Heavy episodic drinking by occupational groups

For all three groups, nonracialized group members (aOR = 3.85 frontline; aOR = 3.26 essential; aOR = 3.10 NFEW) were significantly more likely to report past-month heavy episodic drinking. For frontline (aOR = 0.41) and essential (aOR = 0.75) workers, females were significantly less likely to report heavy episodic drinking. For essential workers and NFEW, individuals aged 25 to 44 (aOR = 1.62 essential; aOR = 1.40 NFEW) were significantly more likely to report heavy episodic drinking compared to individuals aged 45 to 64. For NFEW, individuals in the three highest income quintiles (aOR between 1.45 and 1.56), high school graduates (aOR = 2.16), postsecondary graduates (aOR = 1.65), and those who screened positive for MDD (aOR = 1.46) were significantly more likely to report heavy episodic drinking. Frontline workers who lived in a rural area had significantly lower odds of heavy episodic drinking (aOR = 0.47). Essential workers who screened positive for PTSD were over two times more likely to report

heavy episodic drinking (aOR = 2.15; Table 4).

Discussion

The stress and uncertainty generated by the COVID-19 pandemic, including wider social and economic impacts, have impacted the substance use patterns of many Canadians.¹⁰ National data show that some Canadians have reported an increase in their consumption of alcohol since the beginning of COVID-19.¹⁶⁻²² Yet, there are currently no national estimates specifically for frontline and essential workers—two occupational groups impacted in this unprecedented time. This study aimed to address this gap.

From September to December 2020, we did not find significant differences in the prevalence and likelihood of increased alcohol consumption and heavy episodic drinking among frontline and essential workers compared to NFEW. While these findings are not consistent with some of the other cross-sectional studies in the US and the UK,¹³⁻¹⁵ alcohol use was measured differently in this study, which may explain these discrepancies. This analysis suggests that factors other than occupation may have played a role in increased alcohol use and heavy episodic drinking during the COVID-19 pandemic in Canada. Nevertheless, the stratified regression models identified some interesting similarities and differences across the three groups.

A few differences in factors associated with increased alcohol use and heavy episodic drinking across groups were identified in this study. First, female frontline and essential workers had lower odds of heavy episodic drinking compared to males, whereas this was not seen for NFEW. No comparable results could be found in the current literature; however, findings from a global rapid review indicated that male health care workers had a higher risk of depression than female health care workers,²⁸ which could be an underlying condition leading to alcohol use beyond low-risk guidelines.

Second, living in a rural area was significantly associated with lower odds of heavy episodic drinking for frontline workers and lower odds of increased alcohol use for essential workers. There was no significant relationship between living area and the two outcomes for NFEW.

TABLE 1
Prevalence estimates of the overall sample, frontline workers, essential workers and nonfrontline or essential workers disaggregated by social determinants of health, mental health variables and alcohol outcomes

Social determinants of health	Total population % (95% CI)	Frontline workers % (95% CI)	Essential workers (excluding frontline workers) % (95% CI)	Nonfrontline or essential workers % (95% CI)
Total unweighted	8797	880	2288	5301
Total weighted	23 078 096	1 872 014	5 893 453	14 408 423
Gender	(n = 8774)	(n = 878)	(n = 2283)	(n = 5287)
Male	49.9 (49.6–50.2)	38.7 (33.6–43.8)	54.9 (52.3–57.6)	49.1 (47.8–50.3)
Female	50.1 (49.8–50.4)	61.3 (56.2–66.4)	45.1 (42.4–47.7)	50.9 (49.7–52.2)
Age group (y)	(n = 8797)	(n = 880)	(n = 2288)	(n = 5301)
19–24	10.8 (9.7–11.9)	8.9 (4.5–13.2)	8.7 (6.4–11.0)	12.0 (10.4–13.6)
25–44	46.4 (45.3–47.5)	47.8 (42.6–53.0)	47.5 (44.6–50.4)	45.4 (43.6–47.2)
45–64	42.8 (42.6–43.0)	43.3 (38.4–48.2)	43.8 (41.2–46.4)	42.6 (41.4–43.9)
Self-reported household income quintile	(n = 8114)	(n = 812)	(n = 2110)	(n = 4877)
Q1	22.7 (21.4–24.1)	15.7 (11.7–19.6)	18.5 (16.2–20.7)	25.1 (23.3–26.9)
Q2	20.0 (18.7–21.4)	23.0 (18.0–27.9)	20.9 (18.3–23.5)	19.2 (17.5–20.9)
Q3	19.0 (17.6–20.3)	18.4 (14.4–22.5)	21.0 (18.3–23.7)	18.1 (16.4–19.8)
Q4	20.4 (19.0–21.7)	21.0 (16.9–25.0)	21.3 (18.5–24.0)	20.2 (18.5–22.0)
Q5	17.9 (16.6–19.2)	22.0 (17.3–26.6)	18.4 (15.8–21.0)	17.4 (15.8–19.0)
Education level	(n = 8783)	(n = 878)	(n = 2286)	(n = 5293)
Less than high school	4.8 (4.0–5.5)	1.0 (0.3–1.7)	3.8 (2.6–5.0)	5.5 (4.5–6.4)
High school graduate	21.5 (20.0–22.9)	11.9 (7.7–16.0)	23.0 (20.2–25.7)	22.3 (20.4–24.3)
Postsecondary graduate	73.8 (72.3–75.2)	87.1 (82.9–91.3)	73.2 (70.3–76.1)	72.2 (70.2–74.2)
Parent/legal guardian	(n = 8783)	(n = 880)	(n = 2282)	(n = 5293)
Yes	35.6 (34.4–36.8)	42.0 (36.8–47.2)	39.7 (36.8–42.6)	32.9 (31.2–34.6)
No	64.4 (63.2–65.6)	58.0 (52.8–63.2)	60.3 (57.4–63.2)	67.1 (65.4–68.8)
Living area	(n = 8720)	(n = 871)	(n = 2269)	(n = 5256)
Urban	83.3 (82.3–84.2)	83.6 (80.0–87.2)	81.6 (79.4–83.9)	84.0 (82.7–85.3)
Rural	16.7 (15.8–17.7)	16.4 (12.8–20.0)	18.4 (16.1–20.6)	16.0 (14.7–17.3)
Racialized group member	(n = 8723)	(n = 872)	(n = 2268)	(n = 5262)
Yes	28.5 (27.1–29.9)	30.9 (25.5–36.2)	24.8 (21.8–27.9)	29.9 (28.0–31.8)
No	71.5 (70.1–72.9)	69.1 (63.8–74.5)	75.2 (72.1–78.2)	70.1 (68.2–72.0)
Screened positive for GAD	(n = 8661)	(n = 863)	(n = 2259)	(n = 5218)
Yes	14.5 (13.3–15.6)	17.9 (13.5–22.2)	10.6 (8.6–12.6)	15.5 (14.1–17.0)
No	85.5 (84.4–86.7)	82.1 (77.8–86.5)	89.4 (87.4–91.4)	84.5 (83.0–85.9)
Screened positive for MDD	(n = 8610)	(n = 865)	(n = 2235)	(n = 5193)
Yes	17.2 (16.0–18.4)	20.7 (16.3–25.2)	12.6 (10.3–14.9)	18.6 (17.0–20.2)
No	82.8 (81.6–84.0)	79.3 (74.8–83.7)	87.4 (85.1–89.7)	81.4 (79.8–83.0)
Screened positive for PTSD	(n = 8448)	(n = 839)	(n = 2210)	(n = 5080)
Yes	7.2 (6.4–8.1)	9.7 (6.0–13.3)	6.2 (4.6–7.9)	7.4 (6.4–8.4)
No	92.8 (91.9–93.6)	90.3 (86.7–94.0)	93.8 (92.1–95.4)	92.6 (91.6–93.6)
Self-reported change in alcohol consumption	(n = 8780)	(n = 878)	(n = 2285)	(n = 5291)
Increased	18.2 (17.0–19.4)	18.4 (14.4–22.3)	18.9 (16.3–21.4)	18.0 (16.5–19.4)
Decreased	11.1 (10.0–12.1)	13.1 (9.0–17.2)	9.6 (7.6–11.5)	11.3 (10.0–12.7)
No change	70.7 (69.2–72.1)	68.6 (63.5–73.6)	71.6 (68.5–74.6)	70.7 (68.8–72.5)
Past-month heavy episodic drinking	(n = 8773)	(n = 879)	(n = 2284)	(n = 5284)
At least once	31.6 (30.1–33.1)	29.5 (24.8–34.2)	34.0 (31.0–37.0)	30.5 (28.6–32.4)
No	68.4 (66.9–69.9)	70.5 (65.8–75.2)	66.0 (63.0–69.0)	69.5 (67.6–71.4)

Data source: Survey on COVID-19 and Mental Health 2020.

Abbreviations: CI, confidence interval; GAD, generalized anxiety disorder; MDD, major depressive disorder; PTSD, posttraumatic stress disorder; Q, quintile; y, years.

Notes: Totals do not always equal 100% due to rounding. The sample sizes of frontline workers, essential workers and nonfrontline essential workers (n = 8469) do not add up to the sample size for the total population (n = 8797). The total population includes all respondents aged 19 to 64, whereas frontline workers, essential workers and nonfrontline or essential workers included respondents aged 19 to 64 who worked in the last week and who answered the questions about frontline and essential workers. Total sample size (n) is unweighted.

TABLE 2
Adjusted odds ratios for increased alcohol consumption and heavy episodic drinking

	Increased alcohol consumption aOR (95% CI)	Heavy episodic drinking aOR (95% CI)
Frontline workers	0.86 (0.63–1.17)	0.92 (0.70–1.20)
Essential workers (excluding frontline workers)	1.04 (0.84–1.30)	1.07 (0.90–1.28)
Nonfrontline or essential workers	Ref	Ref

Data source: Survey on COVID-19 and Mental Health 2020.

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; GAD, generalized anxiety disorder; MDD, major depressive disorder; PTSD, posttraumatic stress disorder; Ref, reference group.

Note: The two logistic regression models were adjusted for these social determinants of health: occupational group, gender, age group, income quintile, parent/legal guardian, education level, living area, racialized group member, screened positive for GAD, screened positive for MDD, screened positive for PTSD.

TABLE 3
Adjusted odds ratios of self-reported increased alcohol use during the COVID-19 pandemic by occupational group

	Frontline workers aOR (95%CI)	Essential workers (excluding frontline workers) aOR (95%CI)	Nonfrontline or essential workers aOR (95%CI)
Gender			
Male	Ref	Ref	Ref
Female	0.75 (0.40–1.41)	1.04 (0.73–1.48)	1.04 (0.81–1.32)
Age group (y)			
19–24	0.50 (0.09–2.96)	1.81 (0.67–4.92)	1.11 (0.61–1.99)
25–44	1.04 (0.53–2.04)	1.37 (0.96–1.95)	1.03 (0.80–1.31)
45–64	Ref	Ref	Ref
Self-reported household income quintile			
Q1	Ref	Ref	Ref
Q2	1.26 (0.16–9.66)	1.10 (0.59–2.04)	1.18 (0.79–1.75)
Q3	0.83 (0.11–6.46)	1.57 (0.81–3.03)	1.33 (0.89–1.99)
Q4	3.45 (0.53–22.48)	1.44 (0.75–2.74)	1.86* (1.24–2.77)
Q5	3.72 (0.58–23.79)	2.61* (1.39–4.91)	2.69* (1.85–3.90)
Parent/legal guardian			
Yes	1.46 (0.72–2.96)	1.51* (1.04–2.18)	1.41* (1.09–1.82)
No	Ref	Ref	Ref
Education level			
Less than high school	Ref	Ref	Ref
High school graduate	0.43 (0.05–3.50)	0.65 (0.21–2.02)	2.09 (0.88–4.96)
Postsecondary graduate	0.34 (0.05–2.31)	0.65 (0.22–1.90)	3.99* (1.70–9.34)
Living area			
Urban	Ref	Ref	Ref
Rural	0.61 (0.29–1.29)	0.53* (0.34–0.82)	0.89 (0.64–1.23)
Racialized group member			
Yes	Ref	Ref	Ref
No	5.94* (1.38–25.53)	2.86* (1.54–5.30)	2.32* (1.62–3.33)
Screened positive for GAD			
Yes	1.41 (0.38–5.16)	2.27* (1.18–4.38)	1.41 (0.97–2.06)
No	Ref	Ref	Ref
Screened positive for MDD			
Yes	3.90* (1.54–9.90)	1.87 (0.98–3.58)	2.17* (1.55–3.04)
No	Ref	Ref	Ref
Screened positive for PTSD			
Yes	0.85 (0.18–4.05)	0.83 (0.38–1.81)	1.12 (0.74–1.69)
No	Ref	Ref	Ref

Data source: Survey on COVID-19 and Mental Health 2020.

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; GAD, generalized anxiety disorder; MDD, major depressive disorder; PTSD, posttraumatic stress disorder; Q, quintile; Ref, reference group; y, years.

* Statistically significant association based on nonoverlapping confidence intervals.

Urban centres have had greater numbers of COVID-19 cases and strict lockdowns, and have had to manage COVID-19 cases with more severe outcomes compared to rural areas.²⁹ Frontline and essential workers in urban areas may have experienced heightened COVID-19-related job stress, and may subsequently be attempting to cope with this stress by engaging in heavy episodic drinking or increasing their alcohol consumption.

Third, essential workers were the only group with a significant association between PTSD and heavy episodic drinking. These patterns are partially supported by an Australian study that found higher levels of anxiety, stress and dissatisfaction among essential workers compared to frontline workers and the rest of the study population.³⁰ The authors speculated that this could have been due to inadequate training, inadequate protection and limited job stability among other essential workers compared to frontline workers.³⁰

Overall, increased resources and targeted public health prevention strategies for male frontline and essential workers, frontline and essential workers living in urban areas, and essential workers with symptoms of PTSD may be warranted.

There were also common social determinants associated with increased alcohol consumption across frontline workers, essential workers and NFEW. Individuals who did not identify as racialized group members had significantly higher odds of increased alcohol consumption and heavy episodic drinking. This finding is consistent with findings from other studies depicting similar patterns.^{16,31} Screening positive for MDD was significantly associated with increased alcohol consumption for frontline workers and NFEW. Furthermore, screening positive for GAD was significantly associated with increased alcohol consumption for essential workers. The relationship and comorbidity between anxiety, depression and alcohol use is documented across the literature,^{32–34} and specifically during the COVID-19 pandemic.^{16,18,19,35,36} Findings from this study and others in the literature^{16,18,19,35,36} suggest that mental health is a significant risk factor for alcohol use across the Canadian population and not just among certain occupational groups. It is critical to continue promoting mental health, well-being

TABLE 4
Adjusted odds ratios of self-reported, past-month, heavy episodic drinking by occupational group

	Frontline workers aOR (95% CI)	Essential workers (excluding frontline workers) aOR (95% CI)	Nonfrontline or essential workers aOR (95% CI)
Gender			
Male	Ref	Ref	Ref
Female	0.41* (0.24–0.71)	0.75* (0.56–0.99)	0.88 (0.73–1.07)
Age group (y)			
19–24	0.78 (0.14–4.35)	0.91 (0.42–1.96)	1.15 (0.73–1.81)
25–44	1.61 (0.93–2.80)	1.62* (1.19–2.21)	1.40* (1.14–1.73)
45–64	Ref	Ref	Ref
Self-reported household income quintile			
Q1	Ref	Ref	Ref
Q2	1.12 (0.36–3.44)	0.95 (0.61–1.48)	1.19 (0.89–1.59)
Q3	1.94 (0.61–6.11)	1.16 (0.72–1.88)	1.45* (1.07–1.96)
Q4	2.37 (0.87–6.50)	1.24 (0.77–2.01)	1.56* (1.14–2.14)
Q5	1.81 (0.62–5.25)	1.20 (0.75–1.91)	1.54* (1.15–2.07)
Parent/legal guardian			
Yes	0.77 (0.43–1.41)	1.07 (0.77–1.48)	0.90 (0.73–1.11)
No	Ref	Ref	Ref
Education level			
Less than high school	Ref	Ref	Ref
High school graduate	1.55 (0.26–9.13)	1.01 (0.46–2.21)	2.16* (1.33–3.51)
Postsecondary graduate	1.06 (0.20–5.58)	1.05 (0.49–2.24)	1.65* (1.04–2.62)
Living area			
Urban	Ref	Ref	Ref
Rural	0.47* (0.24–0.93)	1.14 (0.80–1.61)	1.04 (0.83–1.30)
Racialized group member			
Yes	Ref	Ref	Ref
No	3.85* (1.70–8.73)	3.26* (2.05–5.19)	3.10* (2.30–4.18)
Screened positive for GAD			
Yes	1.02 (0.36–2.87)	1.26 (0.71–2.23)	1.02 (0.72–1.42)
No	Ref	Ref	Ref
Screened positive for MDD			
Yes	2.32 (0.95–5.70)	1.02 (0.57–1.83)	1.46* (1.07–1.99)
No	Ref	Ref	Ref
Screened positive for PTSD			
Yes	1.49 (0.39–5.73)	2.15* (1.07–4.33)	0.94 (0.63–1.39)
No	Ref	Ref	Ref

Data source: Survey on COVID-19 and Mental Health 2020.

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; GAD, generalized anxiety disorder; MDD, major depressive disorder; PTSD, posttraumatic stress disorder; Q, quintile; Ref, reference group; y, years.

* Statistically significant association based on nonoverlapping confidence intervals.

and access to services and resources at a population level.

Strengths and limitations

A key strength of this study is that it fills a gap in the literature on alcohol use and episodic drinking among frontline and essential workers in Canada during COVID-19. Another strength is the use of a large and nationally representative sample.

While the present findings contribute to an emerging evidence base, there are limitations to highlight. First, as this was a

national survey not specifically focussed on frontline and essential workers, data on specific occupational concerns (such as shortage of personal protective equipment, unmet needs, limited resources and fear of contracting or transmitting the disease) were not collected. Future research could expand on these findings to examine occupation-specific factors that may have impacted alcohol use during the pandemic.

Second, as the data was cross-sectional, causation cannot be inferred based on findings.

Third, we were unable to adjust for the drinking frequency (number of alcoholic beverages consumed weekly) before the COVID-19 pandemic. Individuals who reported increasing their alcohol consumption by one or two drinks per week are likely different from those who reported increasing their alcohol consumption by five or more drinks. The analysis did not achieve that level of granularity.

Fourth, it is important to note that this survey was initiated, developed and deployed in the field in unprecedented

circumstances. The language for the “gender” question response options is consistent with biological sex (male and female vs. man and woman). However, the question specifically asked about gender. Using the answer choices that were provided to the people surveyed was the most rigorous way to report on this variable.

Fifth, information collected through the SCMh was self-reported, and answers were subject to recall and social desirability biases.

Conclusion

Frontline and essential workers were not more likely to report increased alcohol consumption and heavy episodic drinking during the COVID-19 pandemic compared to NFEW. However, there were noteworthy differences regarding factors associated with increased alcohol use and heavy episodic drinking across the three groups. This fact highlights the benefit of examining each occupational group separately, as it could provide guidance for targeted public health prevention strategies. Moreover, individuals who screened positive for either GAD or MDD had significantly higher odds of increased alcohol consumption across all three groups. These findings indicate a possible link between mental health and alcohol use during the COVID-19 pandemic that is widespread across the Canadian population. This is especially concerning as longer-term impacts of the COVID-19 pandemic on the mental health of Canadians and related harms remain unknown.¹⁰ These findings signal an opportunity to mitigate the negative effects of alcohol consumption through greater provision of and access to mental health supports among the general population.

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Conflicts of interest

The authors have no conflicts of interest to disclose.

Authors' contributions and statement

MV—conceptualization, formal analysis, methodology, project administration, visualization, writing—original draft, writing—review and editing. JV, LL—conceptualization, methodology, validation, writing—review and editing. KHM, MW and MMB—conceptualization, methodology, writing—review and editing. AML—conceptualization, methodology, project administration, supervision and writing—review and editing.

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