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# Gender, employment, and continuous pandemic as predictors of alcohol and drug consumption during the COVID-19

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## ARTICLE INFO

### Keywords:

Continuous COVID-19  
Substance use  
Employment  
Cannabis  
Alcohol  
Israel

## ABSTRACT

**Aims:** This study aims to assess the impacts of the continuous pandemic state, gender and employment status on changes in substance use during the COVID-19 outbreak.

**Methods:** A sample of 828 Israelis participated in an online survey and answered questions on demographic characteristics, ranking their substance consumption, and perceived increase in alcohol/drug consumption. The age range was 18–65 (*Mean* = 30.10, *S.D.* = 11.99), and the majority (72.9 %) were female. We gathered the data in two waves: 1) during and following the early first lockdown; 2) following the second lockdown.

**Results:** Men reported higher beer, hard liquor, and illegal drug consumption than women. Continuous COVID-19 was associated with higher consumption of all alcohol, and cannabis, and higher perceived increases in substance consumption than short-term COVID-19. Significant interactions were found between gender and employment regarding all-drug consumption measurements and interactions between gender, employment, and pandemic duration (short/continuous) were found regarding cannabis consumption.

**Conclusions:** The discussion addresses the results in the context of continuous COVID-19 and traditional gender roles. Policymakers should develop prevention and harm reduction interventions for substance use and abuse, focusing on unemployed men as an at-risk group.

## 1. Introduction

The many ramifications stemming from the COVID-19 pandemic, which started in December 2019, qualify it as a mass trauma event (Gonçalves et al., 2020). The effects of COVID-19 are not limited to health related and physical damages, and include physical, economic, social and psychological stressors (Cohen-Louck and Levy, 2021; Levy and Cohen-Louck, 2021). These stressors may lead to higher substance consumption and self-medication (Aviad-Wilchek et al., 2017; Keyes et al., 2011). The few empirical examinations of substance use during COVID-19 in general populations indicate that the COVID-19 pandemic is associated with increased alcohol and drug consumption (Lechner et al., 2020; Neill et al., 2020; Sun et al., 2020). In Israel, the demand for detoxification center admissions and addiction treatment services has grown (Rosca et al., 2020), while students (Yehudai et al., 2020) and individuals recovering from substance-use disorders (Bonny-Noach and Gold, 2020) reported COVID-19-related cravings and substance use increases. This study aims to identify associations between substance consumption, gender, unemployment and pandemic duration.

### 1.1. Gender and employment

Typically, men's substance consumption is higher than women's (e.g., Bonny-Noach and Shechory-Bitton, 2020; Cabanillas-Rojas, 2020). These gender differences may be related to different cultural expectations and reflect traditional gender roles that associate drug use with traditional masculine values such as risk-taking (Bonny-Noach and Shechory-Bitton, 2020; Cabanillas-Rojas, 2020). However, during the COVID-19 pandemic, Neill et al. (2020) report that women experienced increased drinking during the early outbreak more than men, while Rodriguez et al. (2020) indicate the reverse. Considering that Israeli society is characterized by traditional gender values, due both to strong religious beliefs and military dominance (Mandel and Birgier, 2016; Sasson-Levy, 2011; Yaish et al., 2021), we hypothesize that:

**H1.** Substance consumption varies by gender: Men will report higher substance consumption levels than women.

In addition to physical and mental difficulties, COVID-19 pandemic also have caused financial difficulties, such as increased unemployment

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rates (Béland et al., 2020). Employment is more than just a livelihood; it also provides individuals with a sense of confidence, control, and self-respect (Holmes et al., 2020; Kuang et al., 2020; Mimoun et al., 2020). Thus, unemployment has potentially adverse mental and behavioral effects. High unemployment rates from COVID-19 lockdowns (Estrada, 2020) has translated into financial distress, higher anxiety, depression, lower functional levels (Kazmi et al., 2020; Levy and Cohen-Louck, 2021; Mimoun et al., 2020) and decreased mental well-being (Holmes et al., 2020; Kuang et al., 2020). Since psychological stress due to unemployment may increase substance consumption (Hughes and Kumari, 2017), we hypothesize that:

**H2.** Substance consumption varies by employment during the COVID-19 pandemic: Unemployment is associated with higher substance consumption levels than employment.

Studies have examined the combined effects of unemployment and gender on mental health, but there is no clear conclusion on their interrelationship. Several studies suggested that married women and men find unemployment equally stressful (Basbug and Sharone, 2017; Kulik, 2000). Whereas, according to Lane (2011), men are currently more comfortable to depend on their partner's income. Others claim that men are still more negatively affected by unemployment than women (Paul and Moser, 2009). Men's higher distress following unemployment can be attributed to adherence to traditional gender roles (Artazcoz et al., 2004; Hughes and Kumari, 2017; López Gómez et al., 2017), which influence inter alia coping with unemployment (Thompson and Dahling, 2010). Traditional gender roles emphasize men's role as financial providers and women's social and emotional support roles. Therefore, unemployed women still comply with traditional feminine norms, whereas unemployment contradicts men's traditional perceptions and possibly threatens their masculinity (Forret et al., 2010; Paul and Moser, 2009). Thus, unemployment may be more stressful for men who may feel a higher need to cope via substance consumption. Therefore, we hypothesize that:

**H3.** A significant interaction exists between gender and employment regarding substance consumption during the COVID-19 outbreak: Unemployment will affect men's substance consumption more than women's consumption.

### 1.2. COVID-19 duration and substance use

After more than a year since the COVID-19 outbreak, its persistence raises questions about the effects of continuous COVID-19 and its impact on substance use. Prolonged pandemics can expose people to constant health-related anxiety (Tull et al., 2020) as well as fears of viral contagion (Cohen-Louck and Levy, 2021). The effects of continuous COVID-19 have yet to be studied. Continuous exposure to stress or trauma results in more posttraumatic distress symptoms than single events or short-duration traumatic exposure (Goral et al., 2017; Pat-Horenczyk et al., 2007). Furthermore, chronic exposure to traumatic events leads to increased alcohol (Clark and Foy, 2000; Kaysen et al., 2007; Simpson, 2003) and psychoactive substance use (McFarlane, 1998) to cope with the effects of chronic stressors. Therefore, we hypothesize that:

**H4.** Substance consumption varies by the duration of COVID-19: Continuous COVID-19 is associated with higher substance consumption levels than short-term COVID-19.

Moreover, we suggest that continuous COVID-19 and related lockdowns prolong unemployment and creates new unemployment (Estrada, 2020). Since employment is more critical to men's mental health (Paul and Moser, 2009), and men have a higher tendency for substance use and self-medication (Bonny-Noach and Shechory-Bitton, 2020; Rodriguez et al., 2020), we suggest that continuous COVID-19 will have harsher effects on men than women. Thus, we hypothesize

that:

**H5.** There is a significant interaction between gender and continuous COVID-19 regarding substance consumption: Continuous COVID-19 will affect men's substance consumption more than women's consumption.

### 1.3. The current research

The present research aims to identify patterns of association between substance use during the COVID-19 pandemic and gender, employment status, and the pandemic duration. This study is significant because it focuses on COVID-19-related substance use in the general population instead of distinct groups such as individuals struggling with addiction (e.g., Bonny-Noach and Gold, 2020; Rosca et al., 2020; Yehudai et al., 2020). It is also unique since most COVID-19 research was conducted during the early outbreak stages, whereas this study compares the early stage to the later. Therefore, this study can identify the effects of prolonged pandemics on substance use. Finally, by exploring employment and gender effects on substance use, this research may facilitate further understanding of gender-related differences and identify at-risk groups. Such information may be useful to practitioners and policymakers responsible for public mental health and substance abuse prevention.

## 2. Methods

### 2.1. Participants

This study was conducted during the COVID-19 pandemic and included a snowball sample of 828 Israeli citizens. Data was gathered in two waves. The first wave ( $n = 477$ ) was during and following the first lockdown (1.4.2020–18.5.2020), and the second wave ( $n = 351$ ) was following the second lockdown (26.10.2020–17.11.2020). The age range was 18–65 ( $Mean = 30.10$ ,  $S.D. = 11.99$ ), with the majority being female (72.9 %), single (66.8 %), and secular (51.6 %), academically educated (74 %), and Israeli born (87.7 %). The majority were unemployed (52.8 %), and over two-thirds defined their economic status as low (69.6 %).

### 2.2. Data collection

The study is based on self-reports through an online survey. Our university's ethics committee provided ethical approval. The questionnaire stated that participation was anonymous and confidential, that participants did not have to answer any question that made them uncomfortable, could stop answering at any point, and that their answers only serve for research purposes. All participants gave their informed consent to participate in this study. We shared the survey's link via Facebook and WhatsApp. The postings were written in Hebrew and invited Israeli citizens to participate in a study on responses to COVID-19 pandemic. Interested individuals were directed to an online questionnaire where they were provided with information about the nature of the study and their rights as research participants. To identify participants who filled out the survey carelessly, we included two screening questions in which the participants had to give a specific response. The participants who failed (12) the screening questions were excluded from the data.

### 2.3. Measures

#### 2.3.1. Demographic characteristics

The respondents were asked about their age, gender, family status, religiosity, education, employment, and economic status.

#### 2.3.2. COVID-19 duration - continuous COVID-19 vs. short-term COVID-19

We based our operative definition of COVID-19 duration on the date

of participation. Individuals who participated in this study during and shortly after the first lockdown were defined as experiencing short-term COVID-19, whereas individuals who participated during and shortly after the second lockdown were defined as experiencing long-term, continuous COVID-19. In Israel, during the lockdowns, people were allowed to leave their homes only for essential needs (e.g., supplies and medicine). Most workplaces, kindergartens, schools, public parks, restaurants, and shopping malls were shut down.

2.3.3. Substances use (alcohol & drugs)

To examine substance consumption, we adapted a questionnaire from the Israel Anti-Drug Authority’s 2017 National Epidemiological Survey (Ezrachi and Harel-Fisch, 2017). The participants ranked how many times they used the following substances: wine (excluding religious rituals and practices), beer, hard liquor/spirits, cannabis, and other illegal substances (e.g., MDMA, cocaine, LSD). Participants ranked their substance consumption in the last 30 days on the following scale: 0 (never); 1 (1–2 times); 2 (3–5 times); 3 (6–9 times); 4 (10–19 times), 5 (20–29), 6 (30+ times). The participants also ranked on the same scale, the frequency of their binge drinking (heavy episodic use of alcohol consisting of consuming five or more alcoholic beverages in a few-hour span) during the last 30 days before the survey.

2.3.4. Increases in substance consumption

We assessed the general perceived increase in substance consumption via two questions, one regarding alcohol and the other regarding drugs (including cannabis). The question was “To which degree has your alcohol/drug (including cannabis) consumption increased since the COVID-19 outbreak in Israel?” The answers were on the scale from “0” (did not increase) to “5” (greatly increased).

2.4. Data analysis

Analyses were carried out using SPSS25. We used chi-square tests to compare between first and second wave samples by demographic variables, repeated-measures ANOVA to explore differences in consumption by substance type, and t-tests, Pearson correlations and ANOVAs to examine the differences in consumption by demographic variables. ANCOVA (controlling for family status) was used to explore the effects of gender, employment, and COVID-19 duration.

3. Results

3.1. Descriptive statistics

The comparison between short-term and continuous COVID-19 samples (Table 1) indicate no differences in gender, religiosity, and employment distributions. However, there is a significant association between type of sample and family status, educational level, and economic status. The frequency of single and academically educated respondents in the short-term sample was higher than in the continuous COVID-19 sample. In the continuous COVID-19 sample, there were significantly more respondents who defined their economic status as low. Additionally, there was a significant difference in age by samples type ( $t(799.98) = 5.87, p < .001$ ): continuous COVID-19 sample participants ( $Mean = 27.36, S.D. = 10.88$ ) were younger than short-term COVID-19 participants ( $Mean = 32.12, S.D. = 12.36$ ).

Considering the above findings, we conducted one-way ANOVAs to examine differences in substance use by family status, education, and economic status. The results (Table S1, Supplemental Materials) indicate significant differences by family status in all substance use measures, except for beer and illegal drug consumption. Scheffe analyses indicated that the significant difference was between single and all others (married/divorced/widowed respondents). Therefore, we recoded family status: 0 = single, 1 = all others and used it to control for family status within the ANCOVA.

**Table 1**  
Socio-demographic Characteristics in Total Sample and by Duration of COVID-19 (N = 828).

Demographic Characteristics	Duration of COVID-19		General Sample	$\chi^2$	df	Cramer's $v$
	First wave/ Short-term (n = 477)	Second wave/ Continuous (n = 351)				
<b>Gender</b>						
Female	73.6 %	72.1 %	72.9 %	.23	1	.02
Male	26.4 %	27.9 %	27.1 %			
<b>Total</b>	100 %	100 %	100 %			
<b>Family Status</b>						
Single	59.9 %	76.1 %	66.8 %	24.75 ***	2	.17
Married	36.7 %	20.7 %	29.9 %			
Divorced	3.4 %	3.2 %	3.3 %			
<b>Total</b>	100 %	100 %	100 %			
<b>Religiosity</b>						
Secular	56.8 %	49.4 %	51.6 %	4.13	2	.09
Traditional	19.2 %	27.7 %	25.2 %			
Religious	24.0 %	22.9 %	23.2 %			
<b>Total</b>	100 %	100 %	100 %			
<b>Educational Level</b>						
High school	20.5 %	33.3 %	26 %	17.20 ***	1	.14
Academic	79.5 %	66.7 %	74 %			
<b>Total</b>	100 %	100 %	100 %			
<b>Employment</b>						
Unemployed	53.5 %	51.9 %	52.8 %	0.21	1	.02
Employed	46.5 %	48.1 %	47.2 %			
<b>Total</b>	100 %	100 %	100 %			
<b>Economic Status</b>						
Low	54.8 %	75.8 %	69.6 %	24.79 ***	2	.22
Average	19.9 %	14.0 %	15.7 %			
High	25.3 %	10.3 %	14.7 %			
<b>Total</b>	100 %	100 %	100 %			

\*\*\*  $p < .001$ .

The differences in substance use by economic status and education were statistically nonsignificant. There was a significant negative and weak correlation between age and consumption of beer ( $r(828) = -.10, p = .01$ ), hard liquor ( $r(828) = -.09, p = .01$ ), cannabis ( $r(828) = -.16, p = .00$ ), and binge drinking ( $r(828) = -.19, p = .00$ ). There was no significant correlation between age and consumption of wine ( $r(828) = -.03, p = .35$ ) and illegal drugs ( $r(828) = -.03, p = .33$ ). Since there was a significant positive and relatively strong correlation between age and family status ( $r(828) = .36, p = .00$ ), we controlled only for family status.

3.2. Alcohol consumption

The repeated measures ANOVA indicated a significant difference in alcohol consumption in the last 30 days by substance type ( $F(2, 826) = 52.06, \eta^2 = .11, p = .00$ ). The highest consumption level was of wine ( $Mean = 1.98, S.D. = 1.26$ ), followed by beer ( $Mean = 1.77, S.D. = 1.20$ ), and then hard liquor ( $Mean = 1.54, S.D. = 0.97$ ). The mean binge drinking level in the last 30 days was 0.24 ( $S.D. = 0.69, Range = 0–4$ ), and the mean level of perceived increases in alcohol consumption due to COVID-19 was .61 ( $S.D. = 1.23, Range = 0–5$ ).

The ANCOVA results (controlling for family status) show (Table 2) significant gender differences in beer and hard liquor consumption, with men reporting higher frequencies of drinking than women. However, there were no significant gender differences in wine consumption, binge drinking, and perceived increase in alcohol consumption due to COVID-19. Also, there was no significant main effect of employment on alcohol consumption. There were, however, significant differences in alcohol consumption according to the COVID-19 duration. Participants who experienced continuous COVID-19 reported higher consumption of all alcohol than those who experienced short-term COVID-19. Furthermore,

**Table 2**  
Differences in Alcohol Consumption by Gender, Employment, and COVID-19 Duration.

	Alcohol Consumption in Last 30 Days				Increase in Consumption of Alcohol Due to COVID-19 Mean (S.E.)
	Wine Mean (S.E.)	Beer Mean (S.E.)	Hard liquor Mean (S.E.)	Binge Drinking Mean (S.E.)	
<b>Gender</b>					
Female	1.98 (.05)	1.61 (.05)	1.44 (.04)	.17 (.04)	.63 (.05)
Male	2.08 (.09)	2.28 (.08)	1.85 (.07)	.35 (.04)	.68 (.09)
<b>F</b>	0.92	50.34***	27.43***	1.41	0.33
<b>df</b>	1, 807	1, 807	1, 807	1, 807	1, 807
<b>η<sup>2</sup></b>	.00	.06	.03	.00	.00
<b>Employment</b>					
Unemployed	2.08 (.08)	1.98 (.07)	1.71 (.06)	.28 (.04)	.67 (.07)
Employed	1.97 (.07)	1.92 (.06)	1.58 (.05)	.24 (.04)	.64 (.07)
<b>F</b>	1.07	0.35	2.62	0.78	0.11
<b>df</b>	1, 807	1, 807	1, 807	1, 807	1, 807
<b>η<sup>2</sup></b>	.004	.00	.00	.00	.00
<b>Duration of COVID-19</b>					
Short-term	1.90 (.07)	1.78 (.06)	1.53 (.05)	.17 (.04)	0.40 (.07)
Continuous	2.16 (.08)	2.11 (.07)	1.76 (.06)	.35 (.04)	0.91 (.07)
<b>F</b>	6.12*	11.46**	8.33**	9.50**	27.25***
<b>df</b>	1, 807	1, 807	1, 807	1, 807	1, 807
<b>η<sup>2</sup></b>	.01	.01	.01	.01	.03

S.E. - Standard Error.

- \*  $p < .05$ .
- \*\*  $p < .01$ .
- \*\*\*  $p < .001$ .

following continuous COVID-19, participants reported higher binge drinking frequencies and a perceived increase in alcohol consumption.

The only significant interaction regarding alcohol consumption was between employment and the COVID-19 duration regarding beer consumption ( $F(1, 807) = 4.18, \eta^2 = .01, p = .04$ ). There was no significant difference by COVID-19 duration among unemployed ( $F(1, 807) = 0.81, \eta^2 = .00, p = .37$ ), but there was a significant difference by COVID-19 duration among employed participants ( $F(1, 807) = 16.70, \eta^2 = .02, p = .00$ ). The employed participants who experienced continuous COVID-19 reported higher levels of beer consumption ( $Mean = 2.18, S.D. = .10$ ) than the employed participants who experienced only short-term COVID-19 ( $Mean = 1.67, S.D. = .08$ ). The interaction between gender and employment ( $F(1, 807) = .004, \eta^2 = .00, p = .95$ ) and between gender and COVID-19 duration in beer consumption were statistically nonsignificant ( $F(1, 807) = .71, \eta^2 = .00, p = .40$ ).

### 3.3. Drug consumption

Repeated measures ANOVA indicated a significant difference in drug consumption in the last 30 days by substance type ( $F(2, 827) = 95.25, \eta^2 = .10, p = .00$ ). The consumption level was higher for cannabis ( $Mean = 1.46, S.D. = 1.33$ ) than for illegal drugs ( $Mean = 1.02, S.D. = 0.24$ ). The mean level of perceived increases in drug consumption due to COVID-19 was .35 ( $S.D. = 1.06, Range=0-5$ ). The ANCOVA (controlling for family status) results (Table 3) indicate a significant gender effect on cannabis, illegal drugs consumption and the perceived increase in drug consumption due to COVID-19. Men reported higher consumption levels of cannabis and illegal drugs and a more significant perceived increase in drug consumption than women.

Employment also had a significant main effect on all aspects of drug

**Table 3**  
Differences in Drug Consumption by Gender, Employment, and COVID-19 Duration.

	Drug Consumption in Last 30 Days		Increase in Consumption of Drugs Due to COVID-19 Mean (S.E.)
	Cannabis Mean (S.E.)	Illegal drugs Mean (S.E.)	
<b>Gender</b>			
Female	1.43 (.05)	1.01 (.01)	.32 (.04)
Male	1.65 (.09)	1.06 (.02)	.53 (.07)
<b>F</b>	4.20*	7.35**	6.52*
<b>df</b>	1, 807	1, 820	1, 807
<b>η<sup>2</sup></b>	.01	.01	.01
<b>Employment</b>			
Unemployed	1.76 (.08)	1.06 (.01)	.59 (.06)
Employed	1.31 (.07)	1.01 (.01)	.26 (.06)
<b>F</b>	18.32***	7.61**	16.16***
<b>df</b>	1, 807	1, 820	1, 807
<b>η<sup>2</sup></b>	.02	.01	.02
<b>Duration of COVID-19</b>			
Shot-term	1.36 (.07)	1.02 (.01)	0.19 (.06)
Continuous	1.72 (.07)	1.05 (.01)	0.66 (.06)
<b>F</b>	11.84***	3.30	30.96***
<b>df</b>	1, 807	1, 820	1, 807
<b>η<sup>2</sup></b>	.01	.00	.04

S.E. - Standard Error.

- \*  $p < .05$ .
- \*\*  $p < .01$ .
- \*\*\*  $p < .001$ .

consumption. Unemployed participants reported higher levels of cannabis and illegal drug consumption and a more significant perceived increase in drug consumption due to COVID-19 than employed participants. The COVID-19 duration significantly affected cannabis consumption and the perceived increase in drug consumption, but had no significant effect on illegal drug consumption. Participants who experienced continuous COVID-19 reported significantly higher levels of cannabis consumption and more significant perceived increases in drug consumption than participants who experienced only short-term COVID-19.

Additionally, there was a significant interaction between gender and COVID-19 duration regarding illegal drugs ( $F(1, 820) = 6.52, \eta^2 = .01, p = .01$ ) and the perception of increased drug consumption due to COVID-19 ( $F(1, 807) = 4.75, \eta^2 = .01, p = .03$ ). Among the participants who experienced short-term COVID-19, the gender differences in consumption of illegal drugs ( $F(1, 820) = .01, \eta^2 = .00, p = .91$ ) and in perceived increase of drug consumption ( $F(1, 807) = .14, \eta^2 = .00, p = .72$ ) were insignificant. Whereas, among the participants who experienced continuous COVID-19, the gender differences in consumption of illegal drugs ( $F(1, 820) = 12.42, \eta^2 = .02, p = .00$ ) and in perceived increase in drug consumption ( $F(1, 807) = 10.52, \eta^2 = .01, p = .00$ ) were statistically significant. Men reported higher consumption of illegal drugs and perceived a higher increase in their drug consumption than did women (Fig. 1). There were no significant interactions between gender and COVID-19 duration for cannabis ( $F(1, 807) = 2.24, \eta^2 = .00, p = .14$ ).

Moreover, there was a significant interaction between gender and employment regarding consumption of cannabis ( $F(1, 807) = 9.61, \eta^2 = .01, p = .00$ ), illegal drug consumption ( $F(1, 807) = 8.29, \eta^2 = .01, p = .004$ ) and perceived increase in drug consumption ( $F(1, 806) = 5.10, \eta^2 = .01, p = .03$ ). Fig. 2 shows that employed and unemployed women did not differ significantly in cannabis and illegal drug consumption and in their perceived increase in drug consumption. Compared to employed men, unemployed men reported significantly higher cannabis and illegal drug consumption levels and a perceived drug consumption increase.

There were no significant interactions between employment and COVID-19 duration regarding cannabis consumption ( $F(1, 807) = 3.91,$

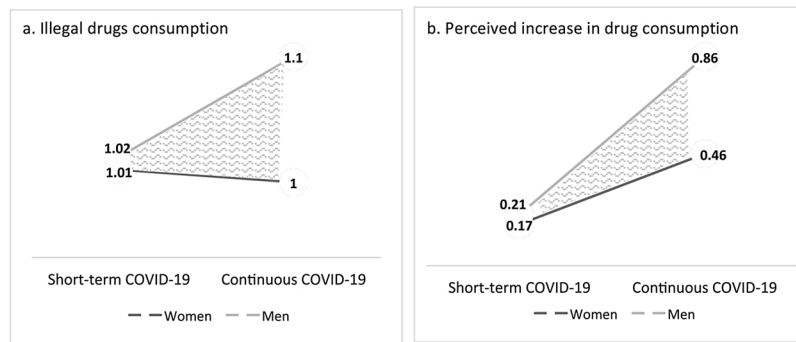


Fig. 1. Interaction between gender and COVID-19 duration regarding: a. illegal drugs consumption and b. perceived increase in drug consumption due to COVID-19.

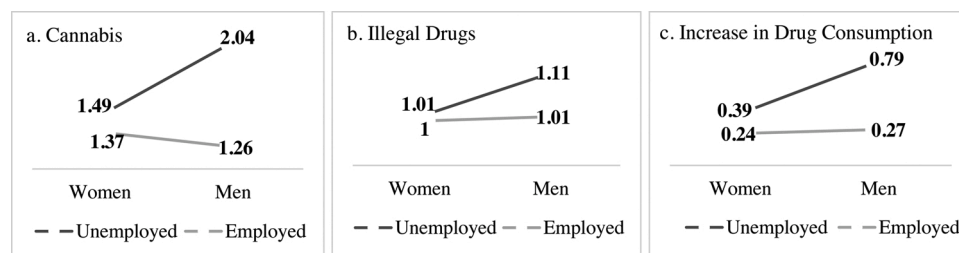


Fig. 2. Interaction between gender and employment regarding: a. consumption of cannabis; b. consumption of illegal drugs; c. perceived increase in drug consumption due to COVID-19.

$\eta^2 = .01, p = .05$ ) and perceived increase in drug consumption ( $F(1, 806) = 3.45, \eta^2 = .004, p = .06$ ). But, there was a significant interaction between employment and COVID-19 duration ( $F(1, 820) = 6.35, \eta^2 = .01, p = .01$ ) regarding illegal drugs consumption. Among unemployed participants, there was a significant difference by COVID-19 duration ( $F(1, 820) = 8.41, \eta^2 = .01, p = .01$ ): the participants who experienced short-term COVID-19 reported lesser levels of illegal drug consumption ( $Mean = 1.02, S.E. = .02$ ) than those who experience continuous COVID-19 ( $Mean = 1.10, S.E. = .02$ ). Whereas, among employed participants, there were no significant differences by COVID-19 duration ( $F(1, 820) = 0.28, \eta^2 = .00, p = .60$ ).

Also, there was a significant interaction between gender, employment, and COVID-19 duration regarding all drug consumption measures (Fig. 3): cannabis consumption ( $F(1, 807) = 6.42, \eta^2 = .01, p = .01$ ); illegal drugs consumption ( $F(1, 807) = 6.58, \eta^2 = .01, p = .01$ ); and perceived increase in drug consumption ( $F(1, 807) = 4.10, \eta^2 = .01, p = .04$ ). There were no significant differences between employed and unemployed women in cannabis consumption (Fig. 3.(1).a), both in short-term ( $F(1, 820) = 0.70, \eta^2 = .00, p = .40$ ) and continuous COVID-19 ( $F(1, 820) = 0.16, \eta^2 = .00, p = .69$ ). Conversely, there was a significant difference in cannabis consumption between employed and unemployed men both in cases of short-term ( $F(1, 820) = 9.83, \eta^2 = .01, p = .00$ ) and continuous COVID-19 ( $F(1, 820) = 10.58, \eta^2 = .01, p = .00$ ). Unemployed men consumed more cannabis than employed men. This difference was more salient for men who experienced continuous COVID-19 (Fig. 3.(1).b).

As Fig. 3.(2).a shows, there were no significant differences in illegal drug consumption between employed and unemployed women in the short-term ( $F(1, 807) = 0.07, \eta^2 = .00, p = .79$ ) and continuous COVID-19 ( $F(1, 807) = .00, \eta^2 = .01, p = .99$ ) and between employed and unemployed men ( $F(1, 807) = 0.06, \eta^2 = .00, p = .81$ ; Fig. 3.(2).b). However, for continuous COVID-19, unemployed men reported significantly higher levels of illegal drug consumption than employed men ( $F(1, 807) = 16.87, \eta^2 = .02, p = .00$ ; Fig. 3.(2).b). The same pattern was seen in the gender\*employment\* COVID-19-duration interaction regarding participant perceptions about their increased drug consumption due to COVID-19. As Fig. 3.(3).a shows, there were no significant

differences in perceived increases in drug consumption between employed and unemployed women in short-term ( $F(1, 807) = 1.99, \eta^2 = .00, p = .16$ ) and continuous COVID-19 ( $F(1, 807) = .103, \eta^2 = .01, p = .31$ ). There were also no significant differences in perceived increases in drug consumption in short-term COVID-19 between employed and unemployed men ( $F(1, 807) = 1.06, \eta^2 = .00, p = .30$ ; Fig. 3.(3).b). However, for continuous COVID-19, unemployed men reported significantly higher perceived increases in drug consumption than employed men ( $F(1, 807) = 15.87, \eta^2 = .02, p = .00$ ; Fig. 3.(3).b).

#### 4. Discussion

We focused on identifying the impact of COVID-19 on alcohol and drug use. As hypothesized, continuous COVID-19 translated into higher alcohol and cannabis consumption levels than its short-term counterpart, with the notable exception of illegal drugs. Therefore, our findings indicate that prolonged COVID-19 exposure may increase psychoactive substance consumption. This pattern disagrees with Cohen-Locuk and Levy's (2020) claim that chronic threats (e.g., chronic terrorism) are more controllable and allow more effective coping. The discrepancy between our findings and Cohen-Locuk and Levy's claim (2020) may be related to the difference in duration of terrorism and COVID-19. The exposure to terrorism has spanned decades, whereas COVID-19 is roughly one and a half years old, and the process of habituation has not started yet. Alternatively, the increase in alcohol and cannabis consumption does not have to be associated with continuous stress and anxiety. The increase in consumption may be related to the free time at home that the lockdowns facilitated. Hence, COVID-19 seems likely to affect our lives for some time; future studies should explore its prolonged, chronic effects.

The gender difference in substance consumption manifested only regarding beer, hard liquor, cannabis and illegal drugs, with men reporting higher consumption. Men also reported higher perceived increase in drug usage levels due to COVID-19 than women did. Contrary to the pattern that emerges in pre-COVID-19 studies (e.g., Bonny-Noach and Shechory-Bitton, 2020; Korn and Bonny-Noach, 2018), there were no gender differences regarding wine consumption and perceptions of

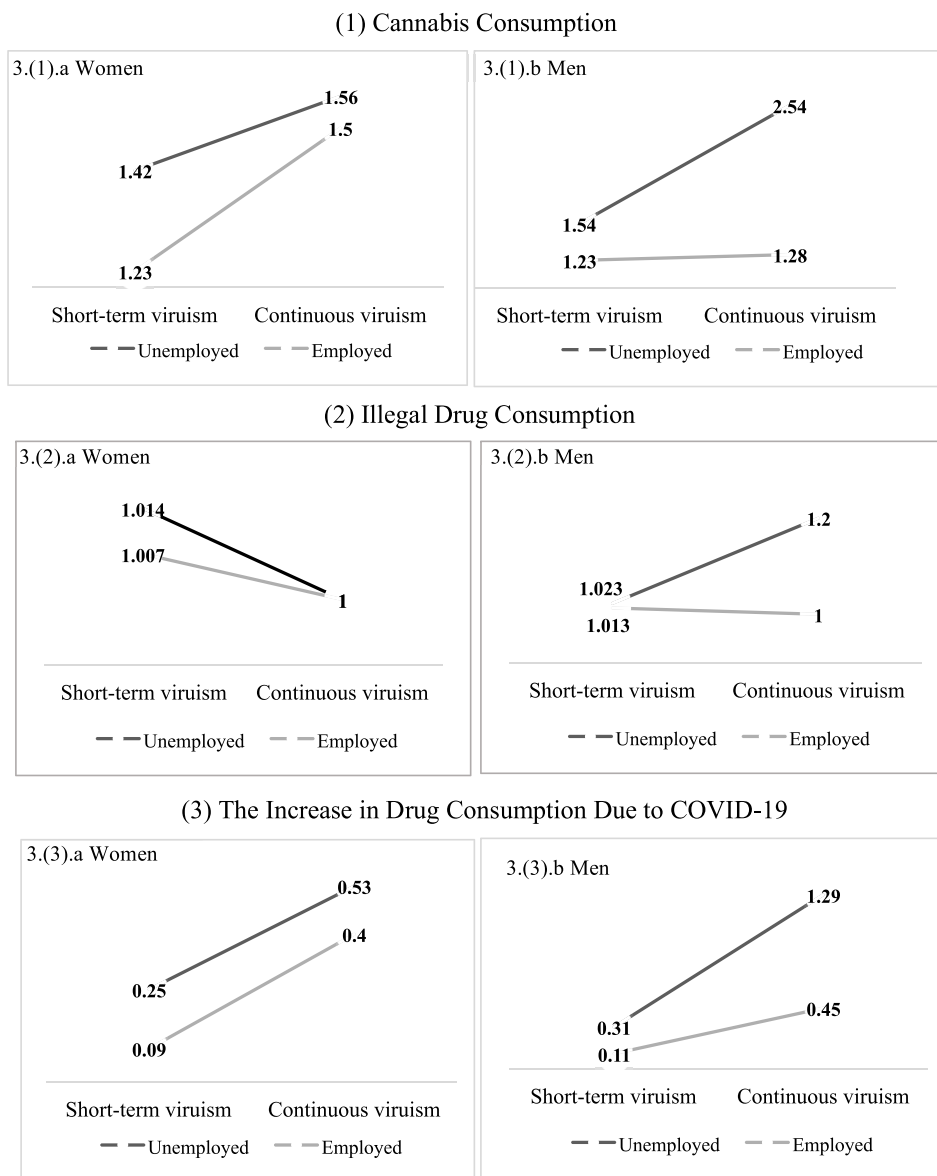


Fig. 3. Interaction between gender, employment and COVID-19 duration (Short-term vs. Continuous) regarding each measurement of drug consumption.

alcohol consumption increases. These results indicate that gender differences are more salient regarding stronger substances (e.g., illegal drugs) than light substances (e.g., wine). This pattern corresponds with the notion that men have higher risk-taking tendencies than women (Cappitelli and Van Volkom, 2020).

Additionally, there was a significant interaction between gender and COVID-19 duration regarding illegal drugs consumption and the perceived increase in drug consumption due to COVID-19. Men and women who experienced short-term COVID-19 did not differ significantly in their levels of illegal drugs consumption and in how they perceived their COVID-19-related drug-use increase. Whereas, among the continuous COVID-19 participants, men reported significantly higher illegal drugs consumption and higher perceived increases in drug consumption than women. These findings may suggest that even with the social changes and transformations in gender roles, men still need to be more active outside their homes and tend to find more meaning in outdoor activities than women (Duckham et al., 2013), who are more family- and home-focused (Artazcoz et al., 2004; Hughes and Kumari, 2017). Therefore, it may be that the characteristics of continuous COVID-19 such as repeated lockdowns, constant social distancing, ongoing workplace shutdowns, may affect men more substantially than

women and manifest in higher levels of drug consumption.

According to our findings, differences between employed and unemployed participants manifested only regarding drug consumption and not alcohol. Unemployed participants reported significantly higher cannabis and illegal drug consumption and much higher perceived increases in drug consumption than employed participants. This pattern is intriguing because alcohol is more accessible than drugs, and drugs are illegal and less socially accepted in Israel (Korn and Bonny-Noach, 2014). Since alcohol is the most popular psychoactive substance (Center for Behavioral Health Statistics and Quality (CBHSQ), 2015), and alcohol consumption is part of the mainstream Israeli culture (Ezrahi et al., 2005), it seems reasonable that both employed and unemployed people consume alcohol in similar frequencies. Conversely, the significantly higher use of drugs among unemployed participants may be related to the higher risk of distress and loneliness that characterize unemployed individuals (Mamun et al., 2020). Also, the higher level of drug consumption among unemployed participants in this study may be a manifestation of a higher risk-taking behavior (i.e., drug use) because they had less to lose than those employed or not having to function properly as the employed participants had to.

The additional finding of significant interactions between gender,

employment, and COVID-19 duration regarding drug consumption further supports the suggestion that compared to women, men's substance consumption is more related to the economic influences of the COVID-19. This vulnerability is more salient among unemployed men, and men who experienced continuous COVID-19. These findings disagree with the suggestion that men are more comfortable with unemployment due to gender role perception changes (Lane, 2011). It appears that despite cultural progress, men still perceive their value through their ability to earn income and support their families (Paul and Moser, 2009). Such patterns suggest the significance of traditional gender-role norms and perception (Hughes and Kumari, 2017; López Gómez et al., 2017). Thus, the social norms customary in post-industrial societies, such as Israel, still direct men and women to preserve their gendered identities through traditional gender roles. Such norms lead women to expand their household chores and men to expand their workloads (Chung and van der Lippe, 2020; Yaish et al., 2021), even during the recent COVID-19 pandemic (Yaish et al., 2021).

#### 4.1. Limitations and future research

This study is not without limitations. Firstly, our sample is not representative, and the sampling was not random. The majority of the participants were female, educated, Jewish, secular, and single. These sample characteristics may have affected the general findings, and therefore, the external validity is relatively limited. Future COVID-19 studies should examine our findings using random and representative sampling techniques. Additionally, future studies should explore whether the types of job held by men and women may affect their substance consumption in general and specifically in times of viral pandemics. Moreover, we collected data from two different samples: an early pandemic stage sample and a later, continuous stage sample. It would be interesting to explore the effects of continuous trauma or continuous pandemic in a longitudinal study.

Secondly, substance use is a sensitive subject. Drug use is illegal in Israel, and our data was based on self-reports, which raises concerns regarding the impact of fear of reporting actual consumption levels. However, the participants were assured anonymity. Finally, future studies should consider examining interrelations between substance use, gender, unemployment, and continuous mass trauma or continuous COVID-19 in other cultural contexts or within a cross-cultural framework.

#### 4.2. Conclusions

This research found that continuous COVID-19 is associated with increased substance consumption. We also found an interrelationship between gender, employment, and COVID-19 duration regarding substance consumption. The differences between unemployed and employed men imply that traditional gender role perceptions may be associated with increased vulnerability to the economic difficulties caused by COVID-19. Furthermore, these findings suggest that the role of a provider is still more significant for men than for women. Clinically, our findings suggest that unemployed men are at higher risk for substance use. Thus, employment is a critical variable that may serve as a protective factor in the COVID-19 pandemic or viral pandemics in general. Therefore, policymakers and practitioners should consider creating prevention and treatment programs for substance use and abuse, targeting at-risk groups such as unemployed individuals, especially men. Employment should therefore be a central issue on any government's pandemic-related crisis agenda.

#### Authors contribution

**Inna Levy:** Research development, data collection, methodology development, statistical analysis, writing the manuscript.

**Keren Cohen-Louck:** Research development, data collection,

methodology development, writing the manuscript.

**Hagit Bonny-Noach:** Research development, data collection, methodology development, writing the manuscript.

#### Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

#### Data accessibility statement

The data that support the findings of this study are available from Inna Levy (via E-mail: [inna.levy1@gmail.com](mailto:inna.levy1@gmail.com)) upon reasonable request.

#### Declaration of Competing Interest

The authors report no declarations of interest.

#### Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.drugalcdep.2021.109029>.

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