Alcohol use and mental health during COVID-19 lockdown: A cross-sectional study in a sample of UK adults

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Abstract

Background: The aim was to examine the correlates of increased alcohol consumption during the COVID-19 pandemic-related restrictions that were implemented in a sample of UK adults.

Methods: This paper presents analyses of data from a cross-sectional study. Adults aged 18 years and over, residing in the UK and self-isolating from others outside their own household were eligible to participate. Participants reported increase or no increase in their level of alcohol consumption from before to during lockdown, as well as symptoms of anxiety, depression and mental wellbeing. Socio-demographic characteristics were compared between adults with and without reported increased alcohol consumption. The associations between reported increased alcohol consumption and mental health outcomes were investigated using logistic and linear regression analyses.

Results: 691 adults (61.1% women; 48.8% aged 35-64 years) were included in the analysis. Of these, 17% reported increased alcohol consumption after lockdown. A higher proportion of 18-34-year olds reported increased alcohol consumption compared to older groups. The prevalence of poor overall mental health was significantly higher in individuals with increased alcohol consumption (vs. no increase) (45.4% versus 32.7%; p-value=0.01). There was a significant association between increased alcohol consumption and poor overall mental health (OR=1.64; 95% CI=1.01, 2.66), depressive symptoms (unstandardized beta=2.93; 95% CI=0.91, 4.95) and mental wellbeing (unstandardized beta=-1.38; 95% CI=-2.38, -0.39).

Conclusions: More than one in six UK adults increased their alcohol consumption during lockdown and a higher proportion of these were younger adults. Increased alcohol consumption was independently associated with poor overall mental health, increased depressive symptoms and lower mental wellbeing. These findings highlight the importance of planning targeted support as we emerge from lockdown and plan for potential second and subsequent waves.

Key words: Alcohol; COVID-19; Lockdown; Social Distancing; Correlates

1. Introduction

Since the emergence of COVID-19 as a global pandemic in March 2020, governments across the globe have instigated public health restrictions on the movement of people to prevent the spread of transmission. These restrictions have included legislation or guidance to stay at home, which has been referred to as 'lockdown'. In the UK from 23rd March 2020, all but essential workers were ordered to stay at home and self-isolate from people outside their household. As there are yet no vaccines, with limited therapeutic options, the goal was to reduce transmission by limiting social contact and physical distancing.

In addition to reducing the spread of COVID-19, the social distancing measures have also had unintended consequences in society. The impact of the COVID-19 social distancing on alcohol consumption has been highlighted. In an editorial in the British Medical Journal, Finlay and Gilmore noted that supermarket sales of alcohol rose by 67% in the United Kingdom (UK), a higher percentage increase than overall supermarket sales (Finlay and Gilmore, 2020). They noted that the potential impact from increased alcohol harm may be felt for a generation. Alcohol harm costs the National Health Service (NHS) in excess of £3.5bn and the wider economy at least £21bn per annum (Home Office, 2012). Currently however, it is uncertain what impact the COVID-19 pandemic will have on alcohol consumption in the UK, though they are likely mediated by psychosocial factors such as social isolation, grief and anxiety (Dubey et al., 2020) as well as job insecurity. Indeed, increases in alcohol consumption have been identified during previous global events, such as during recessions, perhaps to seek relief from unpleasant emotions, stress, anxiety or depression (Chodkiewicz et al., 2020).

Emergent data from various other countries during the COVID-19 pandemic have demonstrated an increase in alcohol use during this time, including the USA (Rodriguez et al., 2020), Australia (Stanton et al., 2020), Germany (Anne et al., 2020) and Poland (Chodkiewicz et al., 2020). These studies have further shown that between one fifth and one quarter of adults have increased the amount of alcohol they usually consume, and that increased alcohol consumption was related to psychological distress and perceived threat associated with COVID-19 (Rodriguez et al., 2020).

However, there is less research on the correlates of changes in alcohol consumption. In a study of 5,158 Australian adults, increased drinking during the pandemic was more common in those who were heavier drinkers before the pandemic, middle aged, had an average or higher income, had lost their job, were eating more, had experienced changes to sleep and reported stress and depression (Neill et al., 2020). Identifying the correlates of increased alcohol consumption resulting from the COVID-19 pandemic lockdown will help to target public health interventions towards ameliorating this, now that restrictions associated with the initial restriction of movement are easing. Furthermore, this can lead to the identification of those who may require further targeted intervention should restrictions be put in place again (or for future global events of this nature).

Therefore, the aim of this paper is to identify correlates of increased alcohol consumption following COVID-19 social distancing restrictions, using cross-sectional data in a sample of UK adults.

2. Methods

This paper presents preplanned interim analysis of data from a cross-sectional epidemiological study, administered through an online survey. The study was launched on 17th March 2020, 17 days after the first case of COVID-19 was diagnosed in the UK. UK residents aged 18 years and over were recruited through social media, national media and existing researcher networks. The study was approved by the Anglia Ruskin University Research Ethics Committee (16th March 2020).

Participants were asked if they were 18 years or over, if they lived in the UK and if they were self-isolating. If the participant responded affirmatively to all questions they were asked to provide consent to participate and then directed to a data encrypted website that hosted a survey containing questions about mental-health and health behaviours.

This study analyses data collected up until 1st June 2020.

2.1. Exposure Variable

Participants were asked to identify if they were consuming less alcohol than previously, more alcohol than previously or if they were drinking about the same. Participants who had not increased their alcohol consumption (remained same or decreased) were grouped together for the analyses.

2.2. Outcome Variable

Mental health was measured using the 21-item Becks Anxiety Inventory (BAI) (Beck et al., 1988) and Becks Depression Inventory (BDI) (Beck et al., 1961). Higher BAI and BDI scores indicate more severe anxiety and depressive symptoms, respectively. The short Warwick-Edinburgh Mental Well-being Scale was used to measure mental well-being (Fat et al., 2017; Stewart-Brown et al., 2009). As mental health is a multi-component construct, we created a mental health score to capture a wider range of aspects of mental health in individuals than usually is examined. Poor mental health was defined as the presence of at least one of the following three criteria: moderate-to-severe anxiety symptoms (BAI score ≥16), moderate-to severe depressive symptoms (BDI score ≥20) (Carney et al., 2011) or poor mental wellbeing (SWEMWBS score ≤15.8) (Warwick Medical School, 2020). Therefore, BAI, BDI and SWEMWBS scores were used as continuous variables when studied separately and as dichotomous variables when studying overall poor mental health.

2.3. Covariates

Demographic data was collected, including sex, age (18-34 years, 35-64 years, and 65 years and over), marital status (single/separated/divorced/widowed or married/in a domestic partnership), employment status, annual household income (<£15,000, £15,000-<£25,000, £25,000-<£40,000, £40,000<£60,000, ≥£60,000) and the region of the UK they resided in (England, Northern Ireland or Scotland/Wales).

Health status was defined as the number of chronic physical conditions. Chronic physical diseases included obesity, hypertension, myocardial infarction, angina pectoris and other coronary diseases, other cardiac diseases, varicose veins of lower extremities, osteoarthritis, chronic neck pain, chronic low back pain, chronic allergy (excluding allergic asthma), asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease (COPD), type 1 diabetes, type 2 diabetes, diabetic retinopathy, cataract, peptic ulcer disease, urinary incontinence or urine control problems, hypercholesterolemia, chronic skin disease, chronic constipation, liver cirrhosis and other hepatic disorders, stroke, chronic migraine and other headaches, hemorrhoids, cancer, osteoporosis, thyroid disease, renal disease, and injury.

Participants also reported if they had experienced any of the physical symptoms of COVID-19 and the number of days they had been self-isolating for.

2.4. Statistical analysis

Sample characteristics were compared between adults with and without increased alcohol consumption using chi-squared tests for categorical variables and t-tests for continuous variables. In addition, BAI, BDI and SWEMWBS scores were compared between the two different alcohol consumption groups using t-tests. Effect sizes were estimated using phi coefficient for categorical variables with two levels, Cramer's V for categorical variables with more than two levels, and Cohen's d for continuous variables. Furthermore, Pearson's correlation coefficients were used to estimate the correlation between BAI, BDI and SWEMWBS scores. Finally, the associations between increased alcohol consumption (independent variable) and mental health outcomes (dependent variables) were studied in regression analyses. Poor overall mental health (dichotomous variable) was included in a logistic regression model, while anxiety symptoms, depressive symptoms and mental well-being (continuous variables) were included in linear regression models. Regression models were adjusted for sex, age, marital status, employment status, annual household income, region, the number of chronic physical conditions, the number of days of self-isolation, and any physical symptom experienced during self-isolation. Results from the logistic and linear regression analyses are presented as an odd ratio (OR) and unstandardized beta coefficients with 95% confidence intervals (CIs), respectively. The level of statistical significance was set at $p < 0.05$. The statistical analysis was performed with R 3.5.2 (R Core Team, 2018).

3. Results

This study included 691 adults (61.1% women; 48.8% aged 35-64 years; **Table 1**). Overall, 17% of participants had increased their self-reported alcohol consumption. Sample characteristics were similar between participants with and without increased alcohol consumption except for age. The proportion of people aged 18-34 years was higher in the increased than in the no increased alcohol consumption group (50.4% versus 29.4%; p-value<0.001). The prevalence of poor overall mental health was significantly higher in individuals with than in those without increased alcohol consumption (45.4% versus 32.7%; p-value=0.01), while anxiety and depressive symptoms were more severe and mental well-being poorer in those that increased their alcohol consumption compared to those that did not (**Figure 1**). Furthermore, there was a moderate-to-strong correlation between anxiety symptoms, depressive symptoms and mental well-being (BAI and BDI scores: 0.72; BAI and SWEMWBS scores: -0.56; and BDI and SWEMWBS scores: -0.71).

Table 1. Sample characteristics (overall and by alcohol consumption status)

Characteristics	Category	Overall (N=691)	Increased alcohol consumption		Effect size[a]	p-value[b]
			No (N=572)	Yes (N=119)		
Sex	Male	38.9%	39.4%	36.5%	0.02	0.64
	Female	61.1%	60.6%	63.5%		
Age	18-34 years	33.0%	29.4%	50.4%	0.21	<0.001
	35-64 years	48.8%	49.5%	45.4%		
	≥65 years	18.2%	21.2%	4.2%		
Marital status	Single/separated/divorced/widowed	44.3%	43.7%	47.5%	0.03	0.52
	Married/in a domestic partnership	55.7%	56.3%	52.5%		
Employment	No	39.8%	41.1%	33.6%	0.06	0.16
	Yes	60.2%	58.9%	66.4%		
	<£15,000	12.7%	13.1%	11.0%	0.08	0.36

Annual income	£15,000-<£25,000	17.2%	18.0%	13.6%		
	£25,000-<£40,000	22.3%	22.9%	19.5%		
	£40,000-<£60,000	21.9%	21.5%	23.7%		
	≥£60,000	25.8%	24.5%	32.2%		
Region	England	80.1%	78.8%	86.4%	0.07	0.17
	Northern Ireland	16.1%	17.1%	11.0%		
	Scotland/Wales	3.8%	4.0%	2.5%		
Number of chronic physical conditions	Mean (standard deviation)	1.62 (1.97)	1.68 (2.02)	1.34 (1.67)	0.17	0.05
Number of days of self-isolation	Mean (standard deviation)	8.77 (4.77)	8.77 (4.46)	8.77 (6.13)	0.00	0.99
Any physical symptom experienced during self-isolation	No	75.0%	74.2%	79.3%	0.04	0.31
	Yes	25.0%	25.8%	20.7%		

Alcohol consumption was a categorical variable with two levels (no increased and increased alcohol consumption).
[a]Effect size was calculated using phi coefficient for categorical variables with two levels, Cramer's V for categorical variables with more than two levels, and Cohen's d for continuous variables.
[b]p-values were based on chi-squared tests for categorical variables and t-tests for continuous variables.

Figure 1. Anxiety symptoms, depressive symptoms and mental well-being in the overall population and by alcohol consumption status (increase versus no increase).
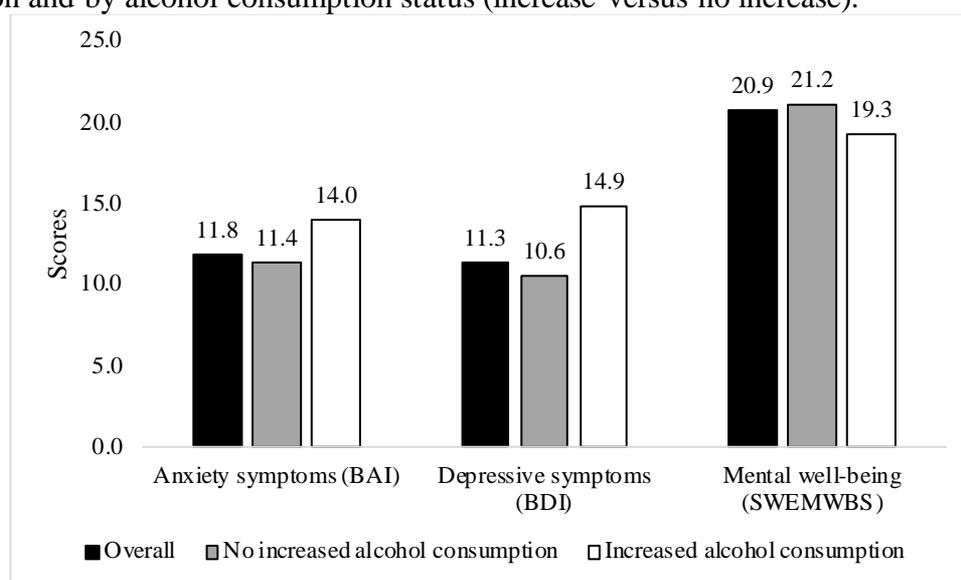
Abbreviations: BAI Beck Anxiety Inventory; BDI Beck Depression Inventory; and SWEMWBS Short Warwick Edinburgh Mental Well-being Scale. Higher BAI and BDI scores indicate more severe anxiety and depressive symptoms, respectively, while lower SWEMWBS scores correspond to poorer mental well-being. BAI and BDI scores were significantly higher and SWEMWBS scores lower in adults with an increased alcohol consumption than in those without an increased alcohol consumption.

The results of the adjusted regression analyses are displayed in **Table 2**. There was a positive and significant association between increased alcohol consumption and poor overall mental health (OR=1.64; 95% CI=1.01, 2.66). Similar findings were obtained for depressive symptoms and mental well-being but not anxiety symptoms. Regression models were adjusted for sex, age, marital status, employment status, annual household income, region, the number of chronic physical conditions, the number of days of self-isolation, and any physical symptom experienced during self-isolation.

Table 2. Associations between increased alcohol consumption (independent variable) and mental health outcomes (dependent variables) in UK self-isolated adults during the SARS-CoV-2 pandemic in 2020

	Poor overall mental health			Anxiety symptoms (BAI)			Depressive symptoms (BDI)			Mental well-being (SWEMWBS)		
	OR	95% CI	p-value	Unstandardized beta	95% CI	p-value	Unstandardized beta	95% CI	p-value	Unstandardized beta	95% CI	p-value
Increase in alcohol consumption	1.64	[1.01, 2.66]	0.044	1.51	[-0.71, 3.74]	0.18	2.93	[0.91, 4.95]	0.005	-1.38	[-2.38, -0.39]	0.006

Abbreviations: BAI Beck Anxiety Inventory; BDI Beck Depression Inventory; CI confidence interval; OR odds ratio; and SWEMWBS Short Warwick Edinburgh Mental Well-being Scale.

The associations between increased alcohol consumption (independent dichotomous variable) and mental health outcomes (dependent variables) were studied using regression models adjusted for sex, age, marital status, employment status, annual household income, region, the number of chronic physical conditions, the number of days of self-isolation, and any physical symptom experienced during self-isolation. Poor overall mental health (dichotomous variable) was included in a logistic regression model, while anxiety symptoms, depressive symptoms and mental well-being (continuous variables) were included in linear regression models.

4. Discussion

In this sample of UK adults, more than one in six individuals had increased their alcohol consumption during the COVID-19 lockdown period. This was particularly apparent among younger adults, such that 50.4% of people who had increased their alcohol consumption were aged 18-34 years. Furthermore, increased alcohol consumption was independently associated with poor overall mental health, increased depressive symptoms, and lower mental wellbeing, but not with anxiety symptoms.

Similar findings have been reported from other countries. A study of 1,491 Australian adults demonstrated that a similar proportion (26.6%) increased their alcohol consumption, and this was associated with depression, anxiety and stroke (Stanton et al., 2020). However, where other studies have found an association between alcohol consumption and anxiety the present study did not. It is not clear why the present study did not find an association between alcohol consumption and anxiety and further research of a qualitative nature is now needed to shed light on this. In a study of German adults, of the 2,102 participants that responded to a survey, 34.7% reported drinking more or much more alcohol since the beginning of the lockdown (Anne et al., 2020). In the present study, self-isolation lasted on average nine days, and the proportion of people increasing their alcohol consumption may have been even larger if the survey had been conducted at a later stage of the lockdown. Together, these studies likely demonstrate that the increase in supermarket alcohol sales seen in many countries may not be reflective of a displacement of drinking habits from social or publicly licenced settings to the home, but reflect an increase in alcohol consumption. However, this hypothesis remains untested and research of a qualitative nature is required to shed further light on this point.

Increased alcohol consumption is commonly observed after a crisis (De Goeij et al., 2015). There are a number of reasons that alcohol consumption might increase during the COVID-19 pandemic. These include boredom and disruption to routines caused by the lockdown, or the threat of the disease or changes to life circumstances, and associated distress. A study of 754 adults from the USA demonstrated that psychological distress caused by the COVID-19 pandemic was associated with increased alcohol consumption, whereas perceived threat from

the virus itself was not associated with increased alcohol consumption (Rodriguez et al., 2020). Interestingly that same study demonstrated that gender moderated this relationship, suggesting a more pronounced effect on women, effect that we did not observe in our data. Other reasons people drink during a crisis include the inhibiting effect of alcohol on the nervous system, offering temporary relief from emotions, anxiety or depression associated with lockdown (Abrahao et al., 2017). A separate study from the USA further showed that perceived social support was associated with lower alcohol consumption (Lechner et al., 2020), which at least partly suggests the need to promote maintained social support during any future lockdowns, should subsequent waves of COVID-19 materialize.

The findings of this study and those from other countries highlight the importance of planning for targeted support as we emerge from lockdown and plan for potential second and subsequent waves. They indicate the importance of addressing the mental health impacts of COVID-19 lockdown, which may have far reaching consequences for society. The effect of the approaches taken by different countries is yet to be determined. For example, South Africa implemented an alcohol sales ban during lockdown (Matzopoulos et al., 2020), which is one of the more direct measures taken to limit the impact of alcohol consumption on both transmission and also health service demand. There will also be a need to continue to address myths about COVID-19 as they emerge. In some countries, there was a myth propagated that drinking alcohol was protective against COVID-19 (Chick, 2020), providing one clear example of how misinformation can perpetuate wider societal problems during a global health pandemic.

It is also important to note that increased alcohol consumption was significantly more frequent in participants aged 18-34 years (50.4%) than in those aged 35-64 (45.4%) and $\geq$65 years (4.2%). Therefore, it may be that COVID-19 social distancing measures are disproportionally affecting younger adults in relation to increased alcohol consumption. It is plausible that social distancing measures may have limited impact on those greater than 65 years in the UK, since by this age both females and males will receive a state pension and thus likely retired with some financial security (Batchelor, 2017). Owing to COVID 19 social distancing younger adults may had been furloughed and thus concerned about their financial security and future per se, increasing their alcohol intake in the attempt to mitigate depressive symptoms. However, these hypotheses are untested and further research of a qualitative nature is now required.

Findings from the present study must be interpreted in light of its limitations. Self-reported changes in alcohol consumption may introduce self-reporting bias into the findings with participants intentionally or unintentionally underestimating their consumption. Additionally, we did not quantify the change in alcohol consumption, so it is not possible to determine if the reported changes were clinically significant. As with all online surveys, self-selection bias cannot be ruled out. Furthermore, as this survey was administered very early into the lockdown period, it was not possible to establish whether the effects on drinking habits are sustained over time or persist following the easing of restrictions – which is an important area for future research. Moreover, some of the associations analysed in this study may be statistically but not clinically significant, and more research using diagnostic data are warranted to corroborate the present results. Besides, changes in employment status is a likely key factor that influences changes in alcohol consumption during this unique period, however, such data was not collected in the present study. Finally, the present data is cross-sectional in nature thus it is not known whether an increase in alcohol consumption resulted in a decline in mental health or if a decline in mental health resulted in an increase in alcohol consumption. Future research of a longitudinal nature is now needed.

5. Conclusion

In conclusion, in this sample of UK adults, increased alcohol consumption associated with COVID-19 lockdown was associated with poorer mental health, depressive symptoms and lower mental wellbeing. A high proportion of young people reported increased alcohol consumption. However, given our knowledge of the impacts of other international crises on alcohol consumption, policy makers need to start planning targeted support to address the impact of COVID-19 lockdown on alcohol consumption and strategies to prevent increased alcohol consumption in future lockdowns should a second and subsequent wave of COVID-19 emerge.

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