Effects of the COVID-19 pandemic and lockdown on alcohol use disorders and complications

Pratima Murthy* and Venkata Lakshmi Narasimha

Purpose of review
To understand the effect of COVID-19 pandemic and lockdown on persons with alcohol use disorders.

Recent findings
From a total of 455 titles on COVID-19 and alcohol, 227 abstracts were screened, and 95 articles were reviewed (on November 25th, 2020). The immediate effect was an increase in alcohol related emergencies including alcohol withdrawal, related suicides, and methanol toxicity. Although there are mixed findings with respect to changes in the quantity of drinking, there are reports of binge/heavy drinking during the lockdown as well as relapse postlockdown. Psychological, social, biological, economic and policy-related factors appear to influence the changes in drinking. Although preliminary data suggest no change in alcohol use among persons with comorbid mental illness, findings in this population are presently limited. Among patients with alcohol related liver disease, outcomes appear worse and caution is warranted with the use of medications. Alcohol also appears to increases the risk of COVID-19 infection and complicates its course. Although some nations banned alcohol sales completely during lockdown, others declared it as an essential commodity, resulting in different problems across countries. Alcohol use has added to the burden of the problem particularly among vulnerable groups like the adolescents, elderly, patients with cancer, as well as health professionals. Services for patients with alcohol use disorders have been affected.

Summary
The COVID-19 pandemic has had considerable impact on alcohol use, with an increase in alcohol related emergencies, changes in alcohol use patterns, increased risk of contracting COVID-19, effect on alcohol policies and sales, and an effect on vulnerable groups. It is essential to understand and respond to the current situation, intervene early, and prevent further repercussions of the pandemic.

Keywords
alcohol, alcohol policy, COVID-19, drinking, lockdown

INTRODUCTION
The SARS outbreak in 2003 led to an increase in alcohol use disorders [1]. The COVID-19 pandemic has also seen serious repercussions for vulnerable groups with substance use disorders (SUD), including alcohol [2]. The pandemic has resulted in changes in patterns of drinking, an increase in alcohol withdrawal, disruption in access to care, and increase in illicit alcohol availability [3]. It has also resulted in the disruption of a range of services, including emergency, treatment, and relapse prevention and liaison services for this population [4,5*].

Although the long-term impacts of this pandemic are unknown, predictions have suggested a reduction in alcohol consumption as an immediate effect, but an increase in consumption in the medium and long-term [6]. This raises the need to appropriately address SUD problems contextually in different phases of the pandemic [7]. Special

Correspondence to Pratima Murthy, MD, DPM, FRCP (Glasgow), Professor and Head of the Department of Psychiatry, National Institute of Mental Health and Neurosciences (NIMHANS), Bengaluru 560029, India. Tel: +91 9844094482; e-mail: pratimamurthy@gmail.com

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The COVID-19 pandemic resulted in increase in alcohol related emergencies and changes in alcohol use patterns.

Among patients with alcohol related liver disease, outcomes appear worse and caution is warranted with respect to the use of medications.

Alcohol use increases the risk of contracting COVID-19.

Alcohol policies and sales during pandemic have varied across countries.

Alcohol use has added an additional burden in vulnerable populations.

The purpose of this review is to understand the acute effects on persons with AUD during the COVID-19 virus outbreak. It focuses on 1. Alcohol related emergencies 2. Changes in alcohol use patterns 3. Alcohol use and co-morbid mental health problems 4. Effect on co-morbid medical illness 5. Alcohol and risk for COVID-19 infection 6. Effect on addiction treatment services 7. Effect on alcohol policy, sales, and on-line trends 8. Special populations

A total of 455 titles were obtained using a PUBMED search (keywords related to COVID-19 and alcohol), among which 227 abstracts were screened, and 95 articles reviewed (on 25th November 2020).

Immediately post lockdown, a significant increase in the number of alcohol intoxication cases presenting to the emergency department (11.3%) compared to lockdown (0.8%) and in the previous year (2.9%), were reported from Italy [15].

Studies from emergency departments in Ireland and United States (US) reported overall reductions in psychiatric and alcohol-related emergencies due to lockdown orders [16,17]. In a hospital-based study from the US, whereas there was significant reduction in motor vehicle accidents during the pandemic, alcohol-related motor vehicle accidents relatively increased [18,19].

Interestingly, alcohol bans in South Africa resulted in reduction of unnatural death by half, reduction in assaults, accidents, other injuries, sexual assaults [20*]. Disulfiram ethanol-reactions were observed in around 20% of the patients on disulfiram who used alcohol-based hand sanitisers [21].

Key findings with regard to alcohol-related emergencies

**Lockdown phase:**
1. Increase in withdrawal-related emergencies
2. Increase in methanol toxicity
3. Reduction in overall psychiatric and alcohol-related emergencies
4. Disulfiram Ethanol Reactions (DER) were observed due to use of hand sanitiser

**Post-lockdown phase:**
1. Increase in alcohol intoxication-related emergencies

Changes in alcohol use patterns

Most data available on changes in alcohol use patterns during lockdown are from web-based surveys. There is mixed evidence to the question of ‘whether alcohol use increased during lockdown?’

Overall, during the pandemic, there has been a surge in addiction related behaviours. Studies suggest an increase in alcohol, cannabis and tobacco use, screen time, behavioural addictions, higher salt and calorie intake [22–25]. As expected, there was also an increase in risky health behaviours like physical inactivity, sedentary lifestyle, but some evidence suggests that people adapted to the changes towards the end of lockdown [26].

Alcohol-related emergencies

Lockdown and sudden alcohol ban in many countries saw a sudden surge in complicated alcohol withdrawal [5**,9]. There were also reports of alcohol withdrawal resulting in cases of suicides during the COVID-19 pandemic from India [10,11], raising potential dilemmas of forced abstinence [12]. There have also been instances of doctors prescribing alcohol for withdrawal management, which also raises ethical issues [13].

Another major concern, in the absence of licit alcohol, has been the consumption of methanol or of household products leading to methanol toxicity, as reported from Iran [14**]. Serious complications, including blindness, putamen necrosis, subcortical white matter haemorrhage and even death have been reported.
A summary of studies from different countries (China, Finland, Belgium, Chile, US, Poland) reports increased alcohol consumption during lockdown compared to prelockdown [22,24,26–30]. Specifically, many studies report an increase in binge drinking, as well as solitary drinking [27,29,31,32*,33,34]. Although some studies observed an increase in drinking among women [27,35], others did not observe gender differences in alcohol use patterns [36]. Some studies report relative increase in drinking among black and non-Hispanic population [27,37**]. In a study from the UK on persons with registered alcohol use disorders prelockdown [38], there was greater relapse secondary to lockdown; past abstinence attempts were not protective, and people who relapsed had increased harmful drinking. Contact with health professionals reduced the risk of relapse.

A summary of factors associated with increased alcohol use include psychological distress related to COVID-19 [32*,33,35,39], increased availability of free time [40], misinformation about alcohol, heavy drinking prepanademic, job loss, eating more, changes in sleep, higher anxiety and depression [41–44], living with children [45], reduced physical activity [46], loneliness, [47], cyberbullying, victimisation at work [33], lower social connectedness and having one child under the age of 18 years [48]. In a US-based online survey, increase in alcohol-related problems was independent of the amount of alcohol consumption [29].

Data from other countries suggests reductions in alcohol use during the pandemic. An online survey in nine European countries [49] reported reduced alcohol use and harmful drinking secondary to lockdown and restrictions on sales, especially among young women [50,51,52]. Among regular drinkers in France, alcohol consumption reduced during lockdown [53].

With regard to decreased alcohol consumption, higher social support [39], workers with higher conscientious domain of personality, those from educational, health, welfare sectors and those living with families reported lower alcohol consumption [54]. A monthly cross-sectional survey in England that compared smoking and drinking practices for a year before and after lockdown found that, following lockdown, attempts to quit among smokers increased and alcohol use among high-risk drinkers reduced [55].

A repeat nationwide survey from the Czech Republic showed no change in alcohol use in 2020, as compared to 2017 [34].

### Key findings with respect to changes in alcohol use patterns

**Lockdown phase:**

1. Mixed evidence of increase or decrease or no-change in alcohol consumption pattern
2. Specifically, increase in binge and solitary drinking
3. Increased relapses and reduced quit attempts
4. Psychological, social, biological, economic and policy-related factors influenced changes in drinking

### Alcohol use among persons with co-morbid mental health problems

COVID-19 and the related lockdown has affected the mental health of people, particularly vulnerable populations [56]. Attributed reasons include 1) financial troubles due to job losses 2) uncertainty about the control of pandemic by the health system and 3) fear of life post pandemic [57].

Increase in alcohol use during the pandemic has been associated with higher mental distress, [58,59] and higher likelihood of depressive symptoms [36,60]. There are reports of increase in domestic violence across different countries and this increase in risk is fueled by alcohol [61]. A twitter-based analysis suggests increased violence secondary to alcohol use during lockdown [62]. A text-mining analysis of twitter tweets from US, among alcohol users, observed difficulties in coping during pandemic [63].

Surveys from Australia have found no increase in the alcohol use in persons with preexisting mental illness [64*].

Consultation-Liaison services across UK saw a sharp decline in alcohol-related and mental health referrals, during the lockdown, followed by a surge post lockdown for all disorders [65].

### Key findings with regard to comorbid mental health problems

**Lockdown phase:**

1. Increase in mental distress and depressive symptoms among alcohol users
2. Decrease in utilisation of consultation liaison services

**Post Lockdown:**

1. Increase in utilisation of consultation liaison services
Effect on co-morbid medical illness

In patients with alcohol-related liver disease, increased alcohol consumption can increase new onset hepatic decompensation. During treatment, patients with alcoholic hepatitis treated with steroids treatment may have increased susceptibility to severe COVID-19 infection. Higher mortality has been observed in patients with alcohol-related liver disease and COVID-19 [66]. In an Indian study, patients with liver cirrhosis with COVID-19 infection had poor outcomes, with worse outcomes among those presenting with acute on chronic liver failure [67]. In this study, one-third of the patients had alcoholic cirrhosis. Furthermore, alcohol induced liver disease has been found to be an independent risk factor for death following COVID-19 [68].

Dietary habits also changed during COVID-19 and are related to changes in alcohol use [69]. A Lithuanian study found that increased alcohol consumption was associated with increased weight gain [70]. In a Japanese study, people who increased alcohol consumption and had a sedentary lifestyle secondary to tele-working, had a worsening of diabetes [71].

Sleep has been affected during COVID-19 lockdown in people using alcohol and tobacco [50]. New onset sleep problems were associated with heavier alcohol use [72]. Increased alcohol consumption was also associated with increased nightmares during the pandemic [73].

Key findings with respect to effect on comorbid medical illness

1. Worse course in patients with alcohol-related liver disease

Lockdown phase:

1. New onset sleep problems, weight gain and worsening of diabetes noted among alcohol users

Alcohol and risk for COVID-19 infection

‘Alcohol lung’ among alcohol users increases the susceptibility and severity of COVID-19 [74] and using alcohol during COVID-19 infection has been described as a ‘dangerous cocktail’ [75,76].

In a hospital based observational study in Spain, among 2078 COVID-19 patients evaluated across 3 months, prevalence of SUDs was 1.3%, primarily among males (85%). Among the 1.3%, alcohol was the most commonly used substance in two-thirds [77].

Does alcohol use increase the risk of COVID-19?

It is postulated that chronic alcohol use increases COVID-19 risk by reducing immunity, increasing inflammatory response, and associated liver disease [78]. Recent reviews suggest an increased risk of infection in people with all SUD [79].

A large retrospective analysis of electronic health record data from US, showed people with lifetime SUD diagnosis being at a higher risk for COVID-19 compared to non-SUD population (Adjusted Odds Ratio (AOR) = 1.45 (1.42–1.49)). The risk is higher for people with opioid use disorder (AOR = 2.42 (2.24–2.60)) > cocaine use disorder (AOR = 1.57 (1.39–1.77)) > alcohol use disorder (AOR = 1.41 (1.22–1.50)) > tobacco use disorder (AOR = 1.33 (1.29–1.37)). Furthermore, patients with a recent diagnosis of SUD (AOR = 8.6 (8.4–8.9); P < 10^{-30}) had a higher risk [37**].

In a big data analysis using a machine learning approach from 154 countries and 50 US states which included 77 variables, alcohol use was associated with increased risk of COVID-19 (beta coefficient = 0.000452 for COVID cases; 0.01 for COVID deaths) [80**]. In a multicountry study, higher per capita alcohol consumption in litres was associated with higher COVID-19 related mortality [81]. During the phased reopening, there was an increase in alcohol use as well as an associated increase in COVID-19 cases [82]. A Danish register-based study suggests that males are at higher risk of COVID-19, related to their comparatively excessive consumption of alcohol [83]. Anecdotal case reports suggest that patients with dual diagnosis have a higher risk of progression to severe forms of COVID-19 [84]. However, some studies did not find any association between alcohol use and COVID-19 risk or severity [85,86]. Contrarily, a Chinese case control study, observed that low dose of alcohol intake is associated with lower risk of COVID-19 morbidity [87].

Alcohol users may not adhere to social distancing norms, increasing their risk of COVID-19. Anecdotal reports from Thailand suggest outbreaks of COVID-19 among families attending alcohol parties [88]. Further, among young adults with hazardous drinking, adherence to public policies was low and declined over a period of time during the lockdown [89].

Alcohol users are also at a higher risk due to associated comorbidities like diabetes, cirrhosis of liver and chronic kidney disease [90].

Finally, among alcohol users diagnosed with COVID-19, treatment of patients with alcohol-related liver disease and heavy alcohol use warrants caution when medicines such as chloroquine or hydroxychloroquine, as combination can lead to hepatotoxicity [91]. Hence, screening patients with alcohol use is...
important especially in areas with higher prevalence of alcohol use disorders or history of liver disease. Furthermore, use of medications like Non-Steroidal Anti-Inflammatory Drugs in patients with alcohol use disorder poses a risk of hepatotoxicity.

Key findings with respect to alcohol and risk of COVID-19 infection

1. Multiple studies suggest alcohol increases the risk of COVID-19 infection.
   Post-Lockdown:
   1. Opening of alcohol outlets and increased alcohol use was associated with increased risk of COVID-19 infection.

Effect on addiction treatment services

In England, the rates of smoking cessation and use of remote cessation support during lockdown were higher. Compared to prepandemic period, the use of evidence-based support to reduce the use of alcohol decreased among high-risk drinkers [55]. In India, in the early period of lockdown, less than 20% of registered patients with alcohol dependence were able to seek treatment. It was observed that there were difficulties to get help for withdrawal management and access to medication for preventing relapses (like disulfiram) [92*].

Admissions to rehabilitation centres have been severely impacted affected, as suggested from experience from India, where many were closed during lockdown and some who operated had an outbreak of COVID-19, due to difficulty in implementing stringent safety measures. Experience from US suggests similar difficulties in implementation of mitigation measures in recovery homes and making appropriate social adjustments [93].

Key findings with respect to effect on addiction treatment services

Lockdown phase:
1. Increased treatment seeking for tobacco.
2. Reduced treatment seeking and difficulties in accessing help for alcohol.

Effect on alcohol policy, sales, and on-line trends

There have been significant changes in alcohol policy globally in relation to the pandemic. Although many countries banned alcohol, some declared alcohol as an ‘essential’ commodity [94]. Both policy positions posed public health concerns and legal problems with increased alcohol withdrawal, consumption of hand sanitisers, methanol poisoning due to use illicit liquor, diversion of alcohol used for medical purposes in banned countries. In countries where alcohol was considered as an essential commodity, this resulted in increased home-based alcohol consumption [95].

A proxy marker for changes in alcohol trends during lockdown is the google trend. A google trend analysis in India compared prelockdown, lockdown 1.0 and lockdown 2.0. Compared to prelockdown, there was a significant increase in online searches for distilled spirits (and not for beer), access to alcohol, alcohol withdrawal during lockdown 1.0 (21 days). However, during the second phase of lockdown 2.0, as compared to prelockdown, there was an increase in search of terms related to benzodiazepines [96*]. These findings indicate that the initial search was towards procuring alcohol and later to access treatment for alcohol-related extended withdrawals. Similar google trend analysis suggests post lockdown increase in search terms related to alcohol withdrawal and methods of procurement, reflecting changes in trends [97*].

Another epidemiological proxy marker is wastewater analysis. An Australian longitudinal study from April 2016 to April 2020 observed a significant reduction in ethyl sulfate (alcohol metabolite) in wastewater during lockdown and significant reduction in weekend to midweek ratio by 12% compared to previous years [98].

In US, online tweets related to alcohol blackouts significantly increased during the lockdown [99]. This raises concerns related to drinking and driving in the absence of dine-in alcohol locations.

In Iran, misinformation related to alcohol being a ‘neutralizing agent’ and consumption of illicit alcohol led to a ‘syndemic of COVID-19 and methanol poisoning’. In the early part of pandemic, there were 5000 cases of methanol poisoning and 500 deaths [100]. Reports of consuming alcohol based sanitiser and leading to methanol toxicity were reported [101].

Alcohol policy is also reflected through media reporting. A qualitative study from India analysing 350 online newspaper articles during 1 month of lockdown reflected the lack of a comprehensive alcohol policy in India [102].

In the UK, alcohol purchase increased by 40% during lockdown across all strata [103]. A tendency to shift to high alcohol content beer was noted. However, this was levelled by a reduction in sales at bars and restaurants. The US reported increased...
alcohol sale during the initial part of the lockdown [104]. There are documented instances of attempts by the alcohol industry to influence public policy by framing alcohol as an essential product and arguing that restrictions are complex and ineffective [105]. In Australia, industry resorted to social media advertising through new means like memes. It was observed that there were advertisements every 35 s, focusing on easy access, encouragement to buy more alcohol, to drink during COVID-19, drinking to cope and normalising alcohol [106].

Despite World Health Organization (WHO) warnings, a lot of misinformation regarding a protective role of alcohol and tobacco has been circulating in the social media [107]. A hospital-based study on patients tested for COVID-19 observed that chronic alcohol use does not protect against COVID-19 [108]. However, a study to evaluate the effect of this misinformation on alcohol use, found significant increase in both tobacco and alcohol use (OR 4.16, 95% CI 2.00–8.67) among current drinkers [109].

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Key findings with respect to effect on alcohol policy, sales, and on-line trends

Lockdown phase:
1. Some countries banned alcohol; others declared as essential (implicitly/explicitly)
2. Increased google trends for alcohol and related terms in India
3. Increased blackout tweets from US and alcohol purchases from UK
4. Reduced alcohol metabolites from wastewater surveys from Australia
5. Increased industry driven social media promotion of alcohol in Australia
6. Increased online misinformation on protective effects of alcohol

Special populations

Adolescents: In Canada, an online survey among adolescents revealed increased alcohol and cannabis use during lockdown. Although most consumed alcohol alone, a quarter of patients were found to have taken alcohol face to face, putting them at risk for COVID-19. One-third of them consumed substances with their peers through online parties [110].

Elderly: Comorbid alcohol use puts the already vulnerable elderly population at even higher risk to COVID-19 [111]. The elderly are also at higher risk for mental health problems, suicide and physical illnesses.

Cancer: In patients with diagnosed cancer, heavy drinking was found to be associated with higher levels of anxiety related to contracting infection [112].

Healthcare workers: Mental health of healthcare professionals has been found to be significantly affected across pandemics. A recent review suggests they are at risk to mental health issues in both short term and long term. Psychological distress, insomnia, substance use, depression, anxiety, burnout, anger, and features of Post-Traumatic Stress Disorder (PTSD) have been commonly observed among health professionals working with patients during epidemics/pandemics [113]. In a UK-based online survey among quarantined physicians, more than half of them significantly increased their alcohol use. Although males binged, female physicians drank more regularly [114]. Similar increase in alcohol use was observed among urologists from Brazil [115].

Key findings with respect to special populations

Lockdown phase:
1. Increase in alcohol and cannabis use among adolescents.
2. Increase in binge drinking among male physicians and regular drinking among female physicians.

Limitations of the studies: Most of the studies are based on convenience samples and web-based surveys on social media platforms.

CONCLUSION

In this review to understand the effects of alcohol during the COVID-19 pandemic, changes in the pattern of use of alcohol and resultant effects are evident. Immediate effects have been an increase in alcohol-related emergencies including alcohol withdrawal, withdrawal-related suicides, methanol toxicity and alcohol-related motor vehicle accidents.

Although the results on changes in alcohol use patterns during lockdown are mixed, there have been reports of binge/heavy drinking during lockdown and relapses postlockdown. Multiple psychological, social, biological, economic and policy-related factors influence changes in drinking. A study from Switzerland shows that on an average, a person would lose 0.205 Years of Lost Life (YLL)
due to psychological consequences of COVID-19, including alcohol use. This loss would be borne by 2.1% of the population who in turn would suffer an average of 9.79 YLL [116]. Hence, steps to optimise resources and to mitigate suffering in the most affected populations is necessary.

Among patients with alcohol-related liver disease, caution is warranted related to use of medications, and outcomes appear to be worse. It has also been observed that alcohol increased the risk of COVID-19 infection.

Services for patients with alcohol use disorders have been adversely affected across the globe. It is thus important to focus and train healthcare workers like nursing health professionals to deliver addiction related services [117]. Another important way to reduce the treatment gap is to harness technology [57]. One such example is e-consult for people with SUD during the pandemic and training support to healthcare workers in distant places to manage with SUD [118]. Telehealth, group meetings and online consultations can be some ways to handle the increased demand during and after pandemic [119].

Although some nations banned alcohol sales completely others declared it as an essential product, resulting in varied problems across countries, including unintended messaging that alcohol is ‘essential’ [120]. There is a need for a rethinking about policy changes like online alcohol delivery, which can be difficult to roll back [121]. Evidence based restriction of alcohol pricing, availability and marketing are required for the future [122]. Governments should refrain from abrupt and knee-jerk alcohol policy changes (either a sudden ‘ban’, ‘online sale of alcohol’, declaring alcohol as ‘essential’) and instead adopt evidence-based decision making. Adequate information to the public in the event of anticipated limitations of access and information on treatment services should be provided on priority. Further, governments should adopt adequate measures to protect vulnerable populations. Importantly, post-hoc research on impact of such decisions need to be undertaken.

Among vulnerable groups like health professionals, elderly, patients diagnosed with cancer, alcohol has added to the burden of the problem.

As there are some countries in the second wave at the time of this review, we need newer protocols and cohorts to study the long-term effects on mental health and addiction of different populations [123].

Finally, adapting to the current situation and preparedness to handle the repercussions due to pandemic is important. It is important to focus on the preventive dimension and early intervention. Survivor guilt, PTSD among survivors may put people at risk to addiction [124]. Evidence based policy changes, improving access to treatment for alcohol use disorders, liaison services, evidence-based prevention, and prioritising care of vulnerable population are urgently required [125]. Preparedness plans to handle such emergencies in future are also required.

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REFERENCES AND RECOMMENDED READING

Papers of particular interest, published within the annual period of review, have been highlighted as:
- of special interest
- of outstanding interest

1. Wu P, Lu X, Fang Y, et al. Alcohol abuse/dependence symptoms among hospital employees exposed to a SARS outbreak. Alcohol Alcohol 2008; 43:706–712.
2. Melamed OG, Hauck TS, Buckley L, et al. COVID-19 and persons with substance use disorders: inequities and mitigation strategies. Subst Abuse 2020; 41:286–291.
3. Calvey T, Scheiben F, Saad NA, et al. The Changing landscape of alcohol use and alcohol use disorder during the COVID-19 pandemic - perspectives of early career professionals in 16 countries. J Addict Med 2020; 14:e284.
4. Durup A, Lokuge B, Masters D, et al. Challenges in maintaining treatment services for people who use drugs during the COVID-19 pandemic. Harm Reduct J 2020; 17:1–7.
5. Narasimha VL, Shukla L, Mukherjee D, et al. Complicated alcohol withdrawal- an unintended Consequence of COVID-19 lockdown. Alcohol Alcohol Off Oxf 2020; 55:380–383.

This article is one of the earliest reports on sudden impact of policy change and related effect on emergency services during pandemic.

6. Rehm J, Kilian C, Ferreira-Borges C, et al. Alcohol use in times of the COVID 19: implications for monitoring and policy. Drug Alcohol Rev 2020; 39:301–304.
7. Columb D, Hussain R, O’Gaora C. Addiction psychiatry and COVID-19: impact on patients and service provision. Ir J Psychol Med 2020; 37:164–168.
8. Ramalho R. Alcohol consumption and alcohol-related problems during the COVID-19 pandemic: a narrative review. Aust Psychiatry 2020; 28:524–526.
9. Behere PB, Behere AP, Chowdhury D. Rise in cases of alcohol withdrawal following lockdown in dry district of Wardha. J Neurosci Rural Pract 2020; 11:476–480.
10. Dsouza DD, Quadros S, Hyderabadwala ZJ, Mamun MA. Aggregated COVID-19 suicide incidences in India: fear of COVID-19 infection is the prominent causative factor. Psychiatry Res 2020; 290:113145.
11. Syed NK, Griffiths MD. Nationwide suicides due to alcohol withdrawal symptoms during COVID-19 pandemic: A review of cases from media reports. J Psychiatr Res 2020; 130:289–291.
12. Nadkarni A, Kapoor A, Pathare S, COVID-19 and forced alcohol abstinence in India: the dilemmas around ethics and rights. Int J Law Psychiatry 2020; 71:101579.
13. Alcohol withdrawal management during the COVID-19 lockdown in Kerala [Indian Journal of Medical Ethics [Internet]. [cited 2021 Jan 3]]. Available from: https://jme.in/articles/alcohol-withdrawal-management-during-the-covid-19-lockdown-in-kerala?
14. Simani L, Ramezani M, Razzahb M, et al. The outbreak of methanol intoxication during COVID-19 pandemic: prevalence of brain lesions and its pre-disposing factors. Drug Chem Toxicol 2020; 0:1–4.
15. Gringutis V, Cognigni M, Occhipinti AA, et al. Rebound of severe alcoholic intoxications in adolescents and young adults after COVID-19 lockdown. J Adolesc Health 2020; 67:727–729.
16. Lucero AD, Lee A, Huy J, et al. Underutilization of the emergency department during the COVID-19 pandemic. West J Emerg Med Integrating Emerg Care Popul Health 2020; 21:15–23. [cited 2021 Jan 11]. Available from: https://escholarship.org/uc/item/008pc38m.
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17. McAndrew J, O’Leary J, Cotter D, et al. Impact of initial COVID-19 restrictions on psychiatry presentations to the emergency department of a large aca- demic teaching hospital. J R Psychol Med 2020; 1–6.

18. Deavakarmon M, Wehrle CJ, Chibane FL, et al. The effects of the COVID-19 pandemic on trauma presentations in a level one trauma center. Am Surg 2020; 313489207917315.

19. Rhodos H, Petersen K, Binwas S. Trauma trends during the initial peak of the COVID-19 pandemic in the midst of lockdown: experiences from a Rural Trauma Center. Cureus 2020; 12:e9811.

20. Reuter H, Jenike LS, De Jong M, et al. Prohibiting alcohol sales during the coronavirus disease 2019 pandemic has positive effects on health services in South Africa. Afr J Prim Healthcare Fam Med 2020; 12:e1–4.

This article highlights a positive effect secondary to prohibition of alcohol in South Africa, where the data suggests a reduction in unnatural deaths.

21. Ghosh A, Mahintamali T, Balhara YPS, et al. Disulfiram ethanol reaction with alcohol-based hand sanitizer: an exploratory study. Alcohol Alcohol 2021; 58:42–46.

22. Ren Y, Qian W, Li Z, et al. Public mental health under the long-term influence of COVID-19 in China: Geographical and temporal distribution. J Affect Disord 2020; 277:893–900.

23. Rolland B, Haeberlaa F, Zante E, et al. Global changes and factors of increase in caloric/salty food intake, screen use, and substance use during the early COVID-19 containment phase in the general population of France: survey study. JIMR Public Health Surveill 2020; 6:e19630.

24. Sun Y, Li Y, Bao Y, et al. Brief report: increased addictive internet and substance use behaviors during the COVID-19 pandemic in China. Am J Addict 2020; 29:268–270.

25. Zajcova A, Jehn A, Stackhouse M, et al. Changes in health behaviours during COVID-19 and socio-demographic disparities: a cross-sectional analysis. Can J Public Health Rev Cane Sante Publique 2020; 111:953–962.

26. Lopera B, Calatayud J, Casas de L, et al. COVID-19 confinement and health behaviours in Spain. Front Psychol 2020; 11:11426.

27. Barbosa C, Cowell AJ, Dowd W, Alcohol consumption in response to the COVID-19 pandemic in the United States. J Addict Med 2020.

28. Blazczyk-Baberek E, Jagielski P, Boleslaska I, et al. Nutrition behaviors in polish adults before and during COVID-19 lockdown. Nutrients 2020; 12:3084.

29. Pollard MS, Tucker JS, Green HD. Changes in adult alcohol use and consequences during the COVID-19 pandemic in the US. JAMA Netw Open 2020; 3:e2022942; Sep 29 [cited 2021 Jan 11]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7572384/.

30. Vanderbruggen N, Matthys F, Laere SV, et al. Self-reported alcohol, tobacco, and cannabis use during COVID-19 lockdown measures: results from a web-based survey. Eur Addict Res 2020; 26:309–315.

31. McPhee MD, Keough MT, Rundle S, et al. Depression, environmental reward, coping motives and alcohol consumption during the COVID-19 pandemic. Front Psychiatry 2020; 11: [cited 2021 Jan 8]. Available from: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00126.

32. Niedzwiedz CL, Green MJ, Benzeval M, et al. Mental health and health behaviours before and during the initial phase of the COVID-19 lockdown: longitudinal analyses of the UK Household Longitudinal Study. J Epidemiol Community Health 2020; 75:224–231; Sep 24 [cited 2021 Jan 7]. Available from: https://jech.bmj.com/content/early/2020/09/24/jech-2020-215060.

This is longitudinal household study from UK which observed changes in alcohol during the pandemic compared to previous years.

33. Okasamaire K, Savelainen J, Savela N, et al. Psychological stressors predicting increased drinking during the COVID-19 crisis: A Longitudinal National Survey Study of Workers in Finland. Alcohol Alcohol 2020; 56:299–306.

34. Winkler P, Formanek T, Mlada K, et al. Purchasing, consumption, demographic and socioeconomic variables associated with shifts in alcohol consumption during the COVID-19 pandemic. Drug Alcohol Rev [Internet]. [cited 2021 Jan 8];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/ dra.13200.

35. Neill E, Meyer D, Toh WL, et al. Alcohol use in Australia during the early days of the COVID-19 pandemic: initial results from the COLLATE project. Psychiatry Clin Neurosci 2020; 74:542–549.

36. Tran TD, Hammerberg K, Kirkman M, et al. Alcohol use and mental health status during the first months of COVID-19 pandemic in Australia. J Affect Disord 2020; 277:810–813.

37. Ingram J, Maciejewski G, Hand CJ. Changes in diet, sleep, and physical activity are associated with differences in negative mood during COVID-19 lockdown. Front Psychol 2020; 11: [cited 2021 Jan 11]. Available from: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.588604/full.

38. Reyes-Olavarria D, Latorre-Roman PÁ, Guzman-Guzman IP, et al. Positive and negative changes in food choices, physical activity patterns, and weight status during COVID-19 confinement: associated factors in the Chilean Population. Int J Environ Res Public Health 2020; 17:.

39. Hoang VE, Schmidt RD, Feaster DJ. Loneliness, mental health, and substance use among US young adults during COVID-19. J Psychoactive Drugs 2021; 0:1–9.

40. Wardell K, Kempe T, Rapinda KK, et al. Drinking to cope during COVID-19 pandemic: the role of external and internal factors in coping motive pathways to alcohol use, solitary drinking, and alcohol problems. Alcohol Clin Exp Res 2020; 44:2073–2083.

41. Pisot S, Miovanovic I, Simunic B, et al. Maintaining everyday life praxis in the time of COVID-19 pandemic measures (ELP-COVID-19 survey). Eur J Public Health 2020; 30:1181–1186.

42. Romero-Blanco C, Rodriguez-Almagro J, Onieva-Zafría MD, et al. Physical activity and sedentary lifestyle in university students: changes during confinement due to the COVID-19 pandemic. Int J Environ Res Public Health 2020; 17:6567.

43. Scarmozzino F, Visoli F. Covid-19 and the subsequent lockdown modified dietary habits of almost half the population in an Italian sample. Foods 2020; 9:.

44. Callinan S, Mok-Juice-Perez Y, et al. Shifts in alcohol consumption during the COVID-19 pandemic: early indications from Australia. Addiction [Internet], [cited 2021 Jan 7];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/add.15275.

45. Constant A, Consens DF, Gallego-Morvan K, Raude J. Socio-cognitive factors associated with lifestyle changes in response to the COVID-19 epidemic in the general population: results from a cross-sectional study in France. Front Psychol 2020; 11: [cited 2021 Jan 13]. Available from: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.579460/full.

46. Panagiotidis P, Rantis K, Holeyeva V, et al. Changes in alcohol use habits in the general population, during the COVID-19 Lockdown in Greece. Alcohol Alcohol 2020; 55:702–704.

47. Jackson SE, Garnett C, Shabab L, et al. Association of the COVID-19 lockdown with smoking, drinking and attempts to quit in England: an analysis of 2019–20 data. Addiction [Internet], [cited 2021 Jan 8];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/add.15295.

48. Smith L, Jacob LB, Yakkundi A, et al. Correlates of symptoms of anxiety and depression and mental wellbeing associated with COVID-19: a cross-sectional study of UK-based respondents. Psychiatria Latinae 2020; 29:113138.

49. Hansel TG, Saltzman LY, Bordnick PS. Behavioral health and response to COVID-19. Disaster Med Public Health Prep 2020; 14:670–676.

50. Holingue C, Kalb LG, Reine K, et al. Mental distress in the United States at the beginning of the COVID-19 pandemic. Am J Public Health 2020; 110:1608–1634.

51. Rossinot H, Fantin R, Venne J. Behavioral changes during COVID-19 confinement in France: a web-based study. Int J Environ Res Public Health 2020; 17:8444.

52. Ustun G. Determining depression and related factors in a society affected by COVID-19 pandemic. Int J Soc Psychiatry 2020; 0020764020983807.

53. Sacco MA, Caputo F, Ricci P, et al. The impact of the COVID-19 pandemic on domestic violence: the dark side of home isolation during quarantine. Med Leg J 2020; 88:71–73.

54. Xue J, Chen J, Chen C, et al. The hidden pandemic of family violence during COVID-19: unsupervised learning of tweets. J Med Internet Res 2020; 22:e24861.
63. Glowacki EM, Wilcos GBB, Glowacki JB. Identifying addiction concerns on twitter during the COVID-19 pandemic: a text mining analysis. Subst Abuse 2020; 0:1–8.
64. Newby JW, O’M Keeley, Tang S, et al. Acute mental health responses during the COVID-19 pandemic in Australia. PLoS One 2020; 15:e0236562.
65. Chen S, Jones PB, Underwood BR, et al. The early impact of COVID-19 on mental health and community physical health services and their patients’ mortality in Cambridgeshire and Peterborough, UK. J Psychiatr Res 2020; 121:244–254.
66. Kim D, Ademi N, Lat N, et al. Predictors of outcomes of COVID-19 in patients with chronic liver disease: US Multicenter Study. Clin Gastroenterol Hepatol Off Clin Pract J Am Gastroenterol Assoc 2020.
67. Shalimar, Elhence A, Vashnav M, et al. Poor outcomes in patients with cirrhosis and coronavirus disease-19. Indian J Gastroenterol 2020; 1–7.
68. Marjat T, Moon AM, Cook JA, et al. Outcomes following SARS-CoV-2 infection in patients with chronic liver disease: An international registry study. J Hepatology 2020; 74:567–577. [cited 2021 Jan 6]. Available from: https://www.journal-of-hepatology.eu/article/S0168-8278(20)33669-7/Abstract.
69. Zhao A, Li Z, Ke Y, et al. Dietary diversity among Chinese Residents during the COVID-19 outbreak and its associated factors. Nutrients 2020; 12: [cited 2021 Jan 4]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7352896/.
70. Kuisiavcieni V, Bagdonaviaviciene L, Rodriguez-Perez C, Perkeviciav J. Association between changes in health behaviours and body weight during the COVID-19 quarantine in Lithuania: The Lithuanian COVIDiet Study. Nutrients. 2020; 12:3119.
71. Disho SH, Ishikawa T, Ogasawara M. Behavioral changes in patients with diabetes during the COVID-19 pandemic. Diabetol Int 2020; 1–5.
72. Robillard R, Dion K, Pennestré M-H, et al. Profiles of sleep changes during the COVID-19 pandemic associated with social distancing, behavioural, and psychological factors. J Sleep Res. n/a(n/a):e13231.
73. Musse FCC, Caströ L, de S, et al. Mental violence: The COVID-19 nightmare. Front Psychiatry 2020; 11: [cited 2021 Jan 9]. Available from: https://www.frontiersin.org/articles/10.3389/fspyt.2020.579298/full.
74. Bailey KL, Samuelson DR, Wyatt TA. Alcohol use disorder: a preexisting condition for COVID-19 Alcohol 2021; 90:11–17.
75. Finlay I, Gilmore I. Covid-19 and alcohol—a dangerous cocktail. BMJ 2020: 369:m1987.
76. Heterogeneity in the association between changes in alcohol use and mental illness among adults during the COVID-19 pandemic: Findings from the COVID-19 Mental Health and Substance Use Survey. JAMA Psychiatry 2020; 77(10):1015–1021.
77. Testino G. Are patients with alcohol use disorders at increased risk for Covid-19 infection? Alcohol 2020; 55:344–348.
78. Mallet J, Dubetrent G, Le Strat Y. Addictions in the COVID-19 era: current challenges for recovery homes during COVID-19. Int J Drug Policy 2021; 87:102962.
79. Testing G. Are patients with alcohol use disorders at increased risk for Covid-19 infection? Alcohol 2020; 55:344–348.
80. Kushner T, Cafardi J. Chronic liver disease and COVID-19: alcohol use disorder/alcohol-associated liver disease, nonalcoholic fatty liver disease/ nonalcoholic steatohepatitis, autoimmune liver disease, and compensated cirrhosis. Clin Liver Dis 2020; 15:196–199.
81. Wong GL-H, Wong VW-S, Thompson A, et al. Management of patients with liver derangement during the COVID-19 pandemic: an Asia-Pacific perspective. Lancet Gastroenterol Hepatol 2020; 5:776–785.
82. Balhara YPS, Singh S, Narang P. Effect of lockdown following COVID-19 pandemic on alcohol use and help-seeking behavior: Observations and insights from a sample of alcohol use disorder patients under treatment from a tertiary care center. Psychiatry Clin Neurosci 2020; 74:440–441.
83. Neufeld M, Lachenmeier DW, Feererre-Borges C, Rehm J. Is Alcohol an ‘Essential Good’ During COVID-19? Yes, but Only as a Disinfectant? Alcohol Clin Exp Res 2020; 44:1906–1908.
84. Reynolds J, Wilkinson C. Accessibility of ‘essential alcohol’ in the time of COVID-19: casting light on the blind spots of licensing? Drug Alcohol Rev 2020; 39:305–308.
85. Singh S, Sharma P, Balhara YPS. The impact of nationwide alcohol ban during the COVID-19 lockdown on alcohol use-related internet searches and behavior in India; An epidemiology study. Drug Alcohol Rev [Internet]. [cited 2021 Jan 11];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/dar.13187.
86. Newer ways of looking at the effects of lockdown among alcohol using population. 97. NG, O’D. Can google trends inform us about the population response and public health impact of abrupt change in alcohol policy? — a case study from India during the covid-19 pandemic. Int J Drug Policy. [cited 2021 Jan 6]. Available from: https://www.sciencedirect.com/science/article/pii/S0959712120300531.
87. Newer ways of looking at the effects of lockdown among alcohol using population. 98. Bade R, Simpson BS, Ghetia M, et al. Changes in alcohol consumption during lockdown and self-isolation policies triggered by COVID-19 in South Australia: a wastewater analysis study. Addiction [Internet]. [cited 2021 Jan 11];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/full/10.1111/add.15384.
88. Ward RM, Riordan BC, Merrille JE, Rauenheimer J. Describing the impact of the COVID-19 pandemic on alcohol-induced blackout tweets. Drug Alcohol Rev [Internet]. [cited 2021 Jan 11];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/10.1111/dar.13185.
89. Shooshki M, Nasiri N, Sharifi H, et al. Syndemic of COVID-19 and methanol poisoning in Iran: time for Iran to consider alcohol use as a public health challenge. Alcohol 2020; 87:25–27.
90. Yip L. Serious adverse health events, including death, associated with ingesting alcoholic-based hand sanitizers containing methanol — Arizona and New Mexico, May-June 2020. Morb Mortal Wty Rep 2020; 69:1070–1073. [cited 2021 Jan 12]. Available from: https://www.cdc.gov/mmwr/volumes/69/wr/mm6932e1.htm.
91. Ghosh A, Choudhury S, Basu A, et al. Extended lockdown and India’s alcohol policy: a qualitative analysis of newspaper articles. Int J Drug Policy 2020; 85:102940.
92. Anderson P, Lopis EL, O’Donnell A, Kaner E. Impact of COVID-19 confinement on alcohol purchases in Greater London: controlled interrupted time-series analysis during the first half of 2020 compared with 2015–2018. Alcohol Alcohol 2020; 56:307–316; Nov 19 [cited 2021 Jan 13]; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC715783.
93. Kmicie J. President’s message: alcohol use during the COVID-19 pandemic. J Addict Dis 2020; 38:385–386.
94. Freier D, Stafford J. Alcohol industry arguments for putting profit before health in the midst of a pandemic: The Western Australian experience. Drug Alcohol Rev [Internet]. [cited 2021 Jan 12];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/10.1111/dar.13147.
95. Leung J, Conover J, Hides L, Hall WD. Alcohol advertisers may be using social media to encourage parents to drink during COVID-19. Med J Aust 2020; 213:188–1186e1.
96. An important article on alcohol industry’s influence on alcohol users during lockdown.
97. Sharma A, Krumpouzou G, Lotti T, Goldust MJ and COVID-19 alcohol use. Drug Alcohol Rev [Internet]. [cited 2021 Jan 6];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/dar.13163.
98. Lebin JA, Mudan Å, Wu AH. Chronic alcohol use does not protect against COVID-19 infection. Am J Emerg Med [Internet]. 2021. [cited 2021 Jan 13]; Available from: https://www.ajemjournal.com/article/S0735-6707(20)31033-0/Abstract.
99. Luk TT, Zhao S, Wang X, et al. Exposure to health misinformation about COVID-19 and increased tobacco and alcohol use: a population-based survey in Hong Kong, Tob Control 2020; Aug 27 [cited 2021 Jan 6]; Available from: https://tobaccocontrol.bmj.com/content/early/2020/08/27/tobaccocontrol-2020-055287.
100. Dumas TM, Ellis W, Litt DM. What does adolescent substance use look like during the COVID-19 Pandemic? examining changes in frequency, social contexts, and pandemic-related predictors. J Adolesc Health 2020; 67:354–361.
111. Satre DD, Hirschtritt ME, Silverberg MJ, Sterling SA. Addressing problems with alcohol and other substances among older adults during the COVID-19 pandemic. Am J Geriatr Psychiatry 2020; 28:780–783.

112. Wang Y, Duan Z, Ma Z, et al. Epidemiology of mental health problems among patients with cancer during COVID-19 pandemic. Transl Psychiatry 2020; 10:1–10.

113. Stuijfzand S, Deforges C, Sandaz V, et al. Psychological impact of an epidemic/pandemic on the mental health of healthcare professionals: a rapid review. BMC Public Health 2020; 20:1230.

114. Sitzuk A. Threatening increase in alcohol consumption in physicians quarantined due to coronavirus outbreak in Poland: the ALCovid survey. J Public Health 2020; 42:461–465.

115. Gomes CM, Faroito LA, Henriques JVT, et al. Impact of COVID-19 on clinical practice, income, health and lifestyle behavior of Brazilian urologists. Int Braz J Urol 2020; 46:1042–1071.

116. Moser DA, Glaus J, Frangou S, Schechter DS. Years of life lost due to the psychosocial consequences of COVID-19 mitigation strategies based on Swiss data. Eur Psychiatry 2020; 63; ed [cited 2021 Jan 6]. Available from: https://www.cambridge.org/core/journals/european-psychiatry/article/years-of-life-lost-due-to-the-psychosocial-consequences-of-covid-19-mitigation-strategies-based-on-swiss-data/B6BFC8BADF08FD8350-B01AAC8B22B81.

117. Guilamo-Ramos V, Benzoki A, Thimm-Kaiser M, et al. Participation of the nursing workforce to address COVID-19 among people who use alcohol, tobacco, and drugs. Int J Drug Policy 2020; 83:102831.

118. Sahu P, Mathur A, Ganesh A, et al. Acceptance of e-consult for substance use disorders during the COVID 19 pandemic: a study from India. Asian J Psychiatry 2020; 54:102451.

119. Esterwood E, Saeed SA. Past epidemics, natural disasters, COVID19, and mental health: learning from history as we deal with the present and prepare for the future. Psychiatr Q 2020; 91:1121–1133.

120. Hobin E, Smith B. Is another public health crisis brewing beneath the COVID-19 pandemic? Can J Public Health 2020; 111:392–396.

121. Matthey EC, Schmidt LA. Home delivery of legal intoxicants in the age of COVID-19. Addiction [Internet]. [cited 2021 Jan 13];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/add.15289.

122. Stockwell T, Andreaasson S, Cherpitel C, Chikritzhs T, Dangardt F, Holder H, et al. The burden of alcohol on healthcare during COVID-19. Drug Alcohol Rev [Internet]. [cited 2021 Jan 6];n/a(n/a). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/dar.13143.

123. Westrupp EM, Karantzas G, Macdonald JA, et al. Study protocol for the COVID-19 Pandemic Adjustment Survey (CPAS): A Longitudinal Study of Australian Parents of a Child 0-18 Years. Front Psychiatry 2020; 11; [cited 2021 Jan 13]. Available from: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.555750/full.

124. Han RH, Schmidt MN, Waits WM, et al. Planning for mental health needs during COVID-19. Curr Psychiatry Rep 2020; 22:66.

125. Sugarman DE, Greenfield SF. Alcohol and COVID-19: how do we respond to this growing public health crisis? J Gen Intern Med 2020; Oct 26 [cited 2021 Jan 8]; Available from: https://doi.org/10.1007/s11606-020-06391-z.