





BRIEF REPORT

Describing the impact of the COVID-19 pandemic on alcohol-induced blackout tweets

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Abstract

Introduction and Aims. COVID-19, considered a pandemic by the World Health Organization, overwhelmed hospitals in the USA. In parallel to the growing pandemic, alcohol sales grew in the USA, with people stockpiling alcohol. Alcohol-induced blackouts are one particularly concerning consequence of heavy drinking, and the extent to which blackout prevalence may change in the context of a pandemic is unknown. The purpose of the current study is to describe the prevalence of publicly available tweets in the USA referencing alcohol-induced blackouts prior to and during the COVID-19 outbreak. **Design and Methods.** We used Crimson Hexagon's ForSight tool to access all original English tweets written in the USA that referenced alcohol-related blackouts in 2019 and 2020. Using infoveillance methods, we tracked changes in the number and proportion of tweets about blackouts. **Results.** More alcohol-related blackout tweets were written between 13 March and 24 April in 2020 than 2019. In addition, a greater proportion of all tweets referenced blackouts in 2020 than in 2019. In the period prior to the 'stay at home' orders (January to mid-March), the proportion of blackout tweets were higher in 2020 than 2019. **Discussion and Conclusion.** Our findings demonstrate that references to high-risk drinking persist during the pandemic despite restrictions on large social gatherings. Given that the internet is a common source of information for COVID-19, the frequent posting about blackouts during this period might normalise the behaviour. This is concerning because alcohol use increases susceptibility to COVID-19, and alcohol-related mortality can further tax hospital resources. [Ward RM, Riordan BC, Merrill JE, Raubenheimer J. Describing the impact of the COVID-19 pandemic on alcohol-induced blackout tweets. *Drug Alcohol Rev* 2021;40:192–195]

Key words: COVID-19, pandemic, Twitter, blackout, alcohol.

Introduction

COVID-19 (coronavirus), considered a pandemic by the World Health Organization, overwhelmed hospitals in the USA in early 2020. In parallel to the growing pandemic, alcohol sales grew in the USA [1]. The growth in alcohol sales is especially problematic because alcohol both weakens the immune system (increasing susceptibility to COVID-19; [2]) and can cause harm at high levels (e.g. injuries, overdose). Furthermore, heavy or rapid consumption of alcohol can result in alcohol-induced amnesia or 'blackouts' [3],

which are in turn associated with other alcohol-related harms and emergency room visits [4]. Alcohol-related hospital admissions further contribute to the load on the health-care system, already strained by additional COVID-19-related admissions. Therefore, the purpose of the current study is to infer change in the prevalence of alcohol-induced blackouts prior to and during the COVID-19 pandemic by using publicly available tweets about blackouts.

COVID-19 is a type of virus in the coronavirus family that infects humans [5]. Specifically, COVID-19 is a respiratory infection that includes a variety of

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symptoms including fever/chills, fatigue and muscle aches [6]. Due to the virus, individual states in the USA issued either ‘stay at home’ or ‘shelter in place’ orders starting between 15 March and 7 April 2020 [7], after the World Health Organization had declared it a pandemic on 11 March.

During the ‘stay at home’ or ‘shelter in place’ orders, sales of alcohol from liquor stores increased. Specifically, online sales of alcohol reached an all-time high [8]. The ‘stay at home’ and ‘shelter in place’ orders limited opportunities for social gatherings as well as access to alcohol via bars and restaurants. Such changes may have restricted alcohol consumption to home residences with potentially fewer people around. Analysing publicly available tweets provides researchers access to these more private drinking experiences without the use of self-report data.

When drinking to excess, some people experience alcohol-related blackouts [9]. An alcohol-related blackout is a period of time during or after an alcohol consumption event when the drinker fails to store memories [3]. Alcohol-related blackouts are markers of problematic alcohol consumption and associated with a number of other consequences (e.g. injuries, death; [3]) as well as increased likelihood of alcohol use disorder development over time [10].

Given the recent calls for tracking alcohol consumption during the pandemic [11], additional objective metrics are needed in order to quantify potential impacts on health-care systems and identify the need for attention to hazardous drinking under pandemic-related conditions. One solution is to observe the posts on a social media platform, such as Twitter. Twitter is a microblogging platform that generates roughly 1 billion tweets per month. Previous research utilised Twitter to monitor the H1N1 pandemic using ‘infodemiology’ methods (i.e. analysing real-time, online data to track health trends; [12]). Moreover, Paul and Dredze [13] used Twitter to mine for public health information and suggested that the platform is conducive to syndromic surveillance (i.e. monitoring of population level indicators as a pre-diagnostic tool).

In addition, previous research using tweets to track alcohol use patterns indicated that 2% of all tweets reference alcohol consumption [14]. Moreover, research suggests that social media users discuss alcohol-induced blackouts on Twitter [15,16]. Therefore, using Twitter to track alcohol-induced blackouts during the COVID-19 ‘stay at home’ and ‘shelter in place’ orders, allows for the examination of real-time data in a naturalistic setting.

Monitoring Twitter, specifically for references to alcohol-related blackouts, could provide information about how the pandemic impacted risky drinking. Given that some people tweet about desiring to

blackout [16], it might also provide an early warning system regarding additional factors straining the health-care system. Moreover, it provides data beyond self-report surveys by examining expressions of cognition and behaviour that are not prompted by researchers. As such, the purpose of the current study is to describe the prevalence of publicly available tweets in the US referencing alcohol-induced blackouts prior to and during the COVID-19 outbreak.

Methods

We used Crimson Hexagon’s ForSight tool to access all original English tweets written in the USA with search terms (‘blackout’ OR ‘black out’ OR ‘blacked out’ OR ‘blacks out’ OR ‘blacking out’). Because only 1% of tweets are geotagged [17], we relied on Crimson Hexagon’s statistical classifier which extracts additional available information from user profiles, enabling it to accurately determine the country of 90% of tweets [17]. Tweets which could not be accurately classified as being from the USA were excluded. In order to remove non-alcohol-related blackout tweets, we: (i) removed tweets containing terms consistently related to non-alcohol-related blackout (e.g. ‘curtains’; see Appendix S1, Supporting Information for full Boolean string); and (ii) trained Crimson Hexagon’s BrightView machine learning tool to identify unrelated content (i.e. an iterative process of examining a random sample of tweets and then changing the search terms until the tweets in the sample were all blackout related). This resulted in a final pool of 111 135 alcohol-related blackout tweets written between 2 January and 24 April 2020 and 58 402 in the same period in 2019 (1 January was excluded because of known binge drinking related to this date). To examine blackout-related Twitter chatter and to account for any general change in the number of tweets during the COVID pandemic, we examined both the number of blackout tweets per day and the proportion of all tweets that referenced blackouts for both time periods (see Figure 1a, b).

Results

As seen in Figure 1a, more alcohol-related blackout tweets were written between 13 March and 24 April in 2020 than 2019, $t(71.8) = 12.18$, $P < 0.001$, Cohen’s $d = 2.66$. Similarly, as seen in Figure 2, there was a greater proportion of all tweets that referenced blackouts in 2020 than in 2019, $t(68.9) = 4.33$, $P < 0.001$,

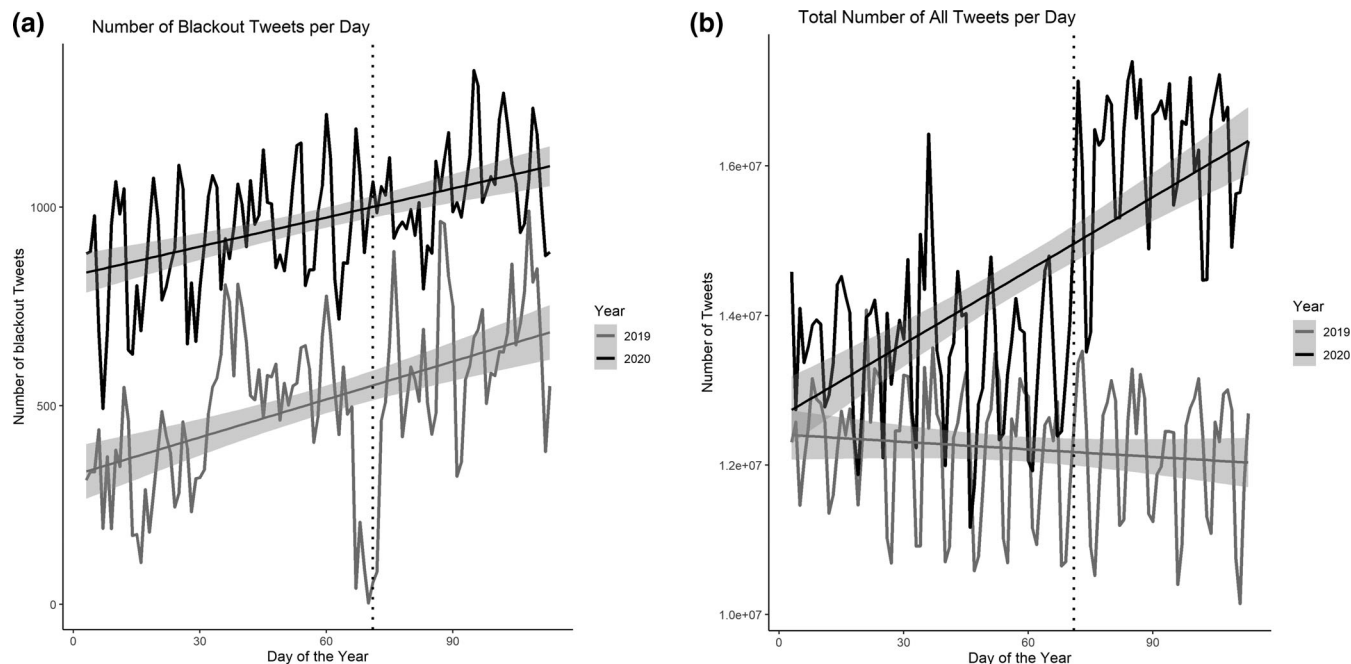


Figure 1. Tweets across time. Note: Dotted line represents the day the World Health Organization declared COVID-19 a pandemic.

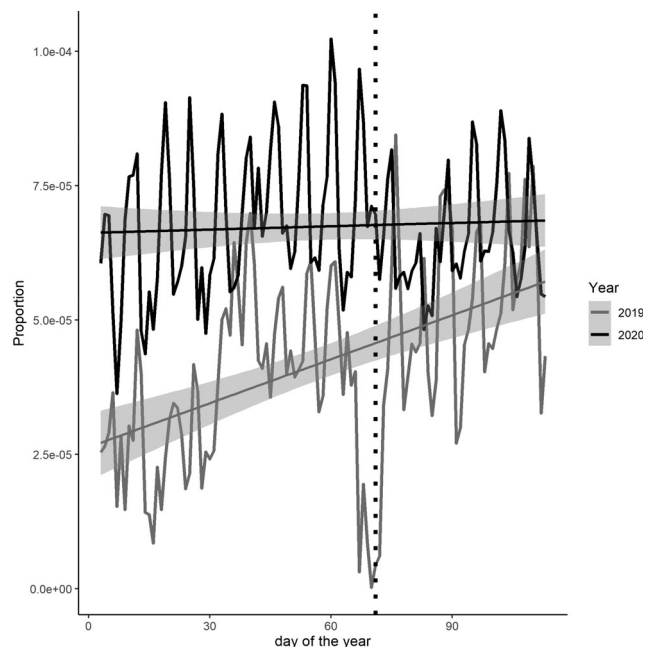


Figure 2. Proportion of blackout tweets before and after COVID-19 was declared a pandemic.

Cohen’s $d = 0.95$. When comparing 2019 to 2020, there was also a greater proportion of blackout tweets written prior to the date that the World Health Organization declared a pandemic (i.e. January to March 2020), $t(135.55) = 9.75$, $P < 0.001$, Cohen’s $d = 1.65$.

Discussion

Our findings demonstrate that references to high-risk drinking (i.e. blackouts) persist during the pandemic despite lack of access to venues where alcohol is commonly consumed and restrictions on large social gatherings. The continued trend of blackout mentions on Twitter during the pandemic is disconcerting due to the additional strain risky drinking may place on the health-care system. Furthermore, the consistent pattern of blackout tweets during the month of March to April 2020 is surprising given that traditional college spring break activities, the ability to drink in typical venues (e.g. bars, restaurants) and social interactions were limited. In short, we expected a dip in the rate of blackout tweets due to these restrictions. Drinking to the point of blackout appears to be continuing, though may be occurring in different contexts. Given that over 94% of people in the USA were instructed to observe ‘stay at home orders’ [18], there may be people consuming at risky levels with potentially fewer people around them that can help them in an alcohol-related emergency.

Furthermore, infoveillance [12] information such as that used here has the potential to provide insight into future alcohol problems in the USA. For example, exposure to 9/11 was linked to binge drinking rates 5–6 years later [19]. This indicates that experiences of mass stress (similar to a pandemic) increase later drinking rates. Similarly, with the 2003 SARS outbreak, hospital employees in China reported alcohol

abuse/dependence symptoms 3 years later [20]. Moreover, research suggests that alcohol-induced blackouts are a potential screener for additional alcohol-related negative consequences [3]. Additionally, posts about alcohol on Twitter are linked to self-reported drinking behaviours [21]. Therefore, while our data cannot speak to whether alcohol problems will increase in the future, using Twitter to monitor the impact of the pandemic on alcohol-induced blackouts informs potential immediate needs (e.g. extra hospital resources or points of intervention) and may forecast potential lasting impacts of the pandemic (e.g. increased rates of alcohol misuse).

The limitations of the current study must be considered. Because the sample is limited to English language tweets, it is possible it might not generalise to individuals who do not post in English. Furthermore, the tweets were limited to public tweets in the United States, which excludes tweets kept private or where no user information exists to locate the tweet. A further limitation is that the US States did not announce their 'stay at home' and 'shelter in place' orders on exactly the same date and the adherence to those orders is unknown. However, the total window across all states was only 23 days, and the trends observed here extend beyond that range. More detailed analyses examining data for each state relative to their specific announcement date are beyond the scope of this publication, but may be of value.

Whereas tweets about blackouts are not a perfect measure of the extent of risky drinking in a population, our methods can provide insight into the extent of extreme drinking that persisted despite pandemic conditions (e.g. stay at home conditions; lack of traditional college spring break celebrations) and the extent to which drinking behaviour is changing in tandem with the pandemic. In addition, tweets provide information beyond traditional self-report surveys. For example, the timing of the tweet (date, time of day), location and wording could provide information not only about past drinking experiences, but also about context and anticipation concerning future drinking experiences. Moreover, while it is yet to be seen, our findings suggest that there might be lasting impacts on alcohol consumption multiple years after the pandemic similar to the SARS outbreak [20] and 9/11 [19]. Our findings indicate that public health officials should consider monitoring behaviours presenting risk health such as alcohol-related blackouts as they might be intensifying the effects of the pandemic.

Conflict of Interest

We declare that we have no competing interests.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Appendix S1: Boolean String for Twitter Search.