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Original Article

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Alcohol consumption among older adults in the United States amidst the COVID-19 pandemic: an analysis of the 2017–2021 Behavioral Risk Factor Surveillance System

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Abstract

Context: Alcohol consumption is responsible for numerous life-threatening diseases, including liver cirrhosis, heart disease, and various cancers. During the pandemic, alcohol-related deaths increased from 2019 to 2021, topping out at approximately 108,000 deaths related to alcohol. This trend also introduced the question whether heavy alcohol consumption and binge drinking increased during the pandemic, particularly in those 65 and older.

Objectives: The objective of this study is to determine whether heavy alcohol consumption and binge drinking increased during the pandemic in older adults in the United States.

Methods: We performed a cross-sectional analysis of the Behavioral Risk Factor Surveillance System (BRFSS) to determine whether rates of overall alcohol consumption, heavy consumption, or binge drinking deviated from 2017 through 2021. We utilized chi-square tests to determine changes in rates over the included years.

Results: Our findings show that the overall rate of alcohol use in populations 65 and older from 2017 through 2021 was approximately 42.1 %, which peaked in 2017 at 43.7 % and declined each year, resulting in the lowest rate (41.3 %) in 2021 (χ^2=8.96, p<0.0001). Binge and heavy drinking rates were 5.1 % and 4.2 % overall during this time frame, respectively, and the annual changes were not statistically significant.

Conclusions: The impact of COVID-19 on the drinking behavior of older US adults was minimal in terms of binge or heavy drinking, although the overall rates of alcohol consumption among this group declined. Reports among other US age groups showed increased consumption and deaths from alcohol use. Future research is needed to determine the causes for the overall decrease in consumption or adaptive measures that this group may have taken, which led to minimal changes in binge or heavy drinking in contrast to younger populations.

keywords: alcohol consumption; COVID-19 pandemic; older adults

Alcohol consumption has been ingrained in human culture for centuries, with archaeologists claiming the majority of societies who consume alcohol experience social and health problems [1]. Liver cirrhosis, cancers, heart disease, diabetes, mental health and behavioral disorders, and other conditions and injuries are linked to excessive alcohol consumption [2, 3]. Studies on stress and alcohol consumption indicate that heightened stress is linked to increased overall alcohol consumption. In addition to psychological stress influencing alcohol consumption, consistent social support and regular physical activity are attributed to managing problematic substance use [4, 5]. In January 2020, China reported identification of a novel coronavirus leading to the World Health Organization (WHO) declaring COVID-19 a pandemic in early March 2020. As a result and in combination with the restrictive measures implemented to slow the spread of the virus, psychological stress soared while

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social support and physical activity dwindled, particularly in older adults [6–9]. Specifically, one study found a marked rise in anxiety disorders among older individuals during COVID-19 curfews, emphasizing the need for increased psychological and social support to mitigate the use of unhealthy coping mechanisms such as excessive alcohol use [10].

In a CDC report from 2015 to 2019, excessive alcohol use caused over 140,000 deaths and 3.6 million years of potential life lost annually in the United States [2]. According to researchers at the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the rate of alcohol-related death significantly increased by 25.5 % during the initial year of the COVID-19 pandemic – growing from 78,927 alcohol-related deaths in 2019 to 99,017 alcohol-related deaths in 2020 and finally 108,791 alcohol-related deaths in 2021 [11]. In comparison to younger age groups, overall rates of alcohol-related deaths are four times higher for middle-aged to older adults [12]. Studies of other large-scale events inflicting population-level trauma, such as Hurricane Katrina, the 2004 Indian Ocean tsunami, the 9/11 terrorist attacks, the Swissair Flight 111 crash, and the Murrah Federal Building bombing, further establish the trend of increased substance use following a large-scale disaster [13, 14]. Furthermore, a study of Chinese healthcare employees with high exposure risk deployed during the 2003 severe acute respiratory syndrome (SARS) epidemic concluded that healthcare employees were more likely to utilize alcohol as a stress-coping mechanism. Among those who resorted to alcohol for stress relief, there was a higher likelihood of developing alcohol use disorder (AUD) three years after their deployment [15]. This association may have been exaggerated in 2020, when the regulation of alcohol sales were relaxed during the COVID-19 pandemic.

Given that many states issued stay-at-home orders during the pandemic, as well as other restrictive measures to prevent the spread of COVID-19, law and policy adaptations resulted in notable changes in alcohol accessibility. During the initial phase of the lockdowns, 39 states enacted temporary laws that allowed the sale of to-go liquor, 18 of which have elected to make the change permanent [16]. In addition to laws enabling restaurants to sell liquor, alcohol e-commerce apps and websites saw a significant increase in the volume of both new users and sales as a result of COVID-19 [17]. The marked increase in accessibility to purchase alcohol through restaurants and delivery services was one of the contributing factors to the significant increase in overall alcohol sales from March 2020 through September 2020 – a 20.4 % increase during this time period [18]. Making alcohol more readily available amid the pandemic may result in increased consumption as a stress-coping mechanism and potentially increased risk for AUDs.

Individuals aged 65 and older are more susceptible to utilizing alcohol as a coping mechanism due to higher levels of anxiety and depression that ensued during and following the COVID-19 pandemic [10]. An Australian study analyzing alcohol use and mental health status during the start of the COVID-19 pandemic concluded that older populations had a stronger positive association between poor mental health status and increased alcohol consumption [19]. Several factors of the COVID-19 pandemic can exacerbate mental health status and, by relation, alcohol consumption in older adult individuals, such as increased mortality rate, forced early retirement and economic crisis, decreased physical activity, and worsened existing conditions due to avoiding or delaying medical care [20, 21]. Identifying trends in older adults' alcohol consumption during and following the COVID-19 pandemic has practical implications for the development of supportive strategies and understanding how to mitigate the impacts of increased alcohol consumption on this population's overall health postpandemic and during future disruptive events. Thus, our primary objective was to analyze rates of alcohol consumption among US adults 65 years of age and older in the contexts of the COVID-19 pandemic utilizing the Behavioral Risk Factor Surveillance System (BRFSS). Secondarily, we investigated rates of heavy alcohol consumption and binge drinking.

Methods

We utilized a cross-sectional study design specifically utilizing data from BRFSS 2017–2021. BRFSS is a random digit-dialed telephone survey conducted by the Centers for Disease Control and Prevention (CDC) and state health departments in each of the 50 states, the District of Columbia, and three US territories. Annually, over 400,000 adult US residents complete BRFSS telephone interviews with the goal of collecting data about risk behaviors associated with the nation's leading causes of morbidity and mortality including alcohol use [22].

Inclusion criteria

Because our study is to assess drinking behavior trends among those 65 years or older, we excluded respondents younger than 65.

Alcohol consumption

BRFSS defines binge drinking as "males having five or more drinks on one occasion, and females as having four or more drinks on one occasion," and heavy drinking as "adult men having more than 14 drinks per week, and adult women having more than seven drinks per week." To discern alcohol consumption in regard to heavy or binge drinking, the BRFSS survey first asks whether the respondent has consumed alcohol during the past 30 days, and if the answer is "yes," then there are inquiries about frequency with the following prompt: "One drink is equivalent to a 12-ounce beer, a 5-ounce glass of wine, or a drink with one shot of liquor. During the past 30 days, on the days when you drank, about how many drinks did you drink on the average?" Those who were unsure or refused to answer were excluded. Further, the survey includes the following, "Considering all types of alcoholic beverages, how many times during the past 30 days did you have five or more drinks for men or four or more drinks for women on an occasion?" to determine whether the respondent had episodes in which they binged with alcohol. Respondents who answered "not sure" or "refused," or if the response was missing, were not excluded from analysis. From these questions, BRFSS recodes data to produce a calculated variable determining whether the respondent had binged or had heavy alcohol use in the past 30 days. BRFSS defines heavy alcohol consumption as adult men having more than 14 drinks per week and adult women having more than seven drinks per week.

Statistical analysis

First, we applied survey design and sampling weights provided by the BRFSS for each annual cycle. Next, we calculated the annual sample size and population estimates for individuals 65+ years of age who reported consuming alcohol, and by those who were calculated to have heavy alcohol use, and by those who have binged in the past 30 days. We assessed differences in each of these categories over the years utilizing design-based chi-square tests. Statistical analyses were performed utilizing Stata version 16.1 (StataCorp, LLC, College Station, TX). Alpha for analyses was set at 0.05. This study was not subject to ethics committee review because it does not meet the requirements for human subjects research.

Results

The sample size of the participants included in our study were at least 65 years of age from the BRFSS was 713,412. We found that the overall the rate of alcohol use in those at least 65 years old between the years 2017 and 2021 was approximately 42.1 % (Table 1). The highest rate of alcohol use in those of at least 65 years of age was 43.7 % in 2017. The percentage of alcohol use gradually declined to its lowest rate of 41.3 % in 2021. Our chi-square tests showed that the relationship between consumption of any alcohol across these years was statistically significant (χ^2=8.96, p<0.0001).

Based on the criteria for heavy alcohol use, 4.2 % reported heavily utilizing alcohol overall. The highest rate of heavy alcohol consumption occurred in 2020 (4.4 %), whereas the lowest rate occurred in 2018 (4.0 %). Annual changes in heavy drinking rates were not statistically significant (χ^2=1.16, p=0.32).

Based on the criteria for binge drinking defined as five or more drinks for men or four or more drinks for women on one occasion, 5.1 % reported binge drinking overall. The highest rate of binge drinking occurred in 2019 (5.4 %), whereas the lowest occurred in 2021 (4.9 %). Annual changes in binge drinking rates were not statistically significant (χ^2=1.86, p=0.12).

Discussion

Overall, our results indicated that alcohol consumption among US residents aged 65 years and older decreased each year from 2017 through 2021 – with a total drop of 2.4 % with 41.3 % reporting alcohol consumption in 2021. We found no statistically significant association in binge drinking or heavy alcohol consumption during the investigated time 2017 through 2021.

At the beginning of the COVID-19 pandemic, the literature indicated a growing concern that isolation protocols would lead to an increase in overall alcohol consumption, heavy alcohol consumption, and binge drinking [23]. Supporting these concerns, a cross-sectional study on alcohol consumption found that the average number of drinks per day was 29 % higher after stay-at-home orders were enforced in 2020 than before. Additionally, heavy alcohol consumption and binge drinking increased 20 and 10 %, respectively, during this time [24]. Another two-part longitudinal study found that over 30 % of their respondents exhibited changes in drinking habits during the pandemic. This study found that nearly 16 % of respondents reported drinking less alcohol, whereas 14 % reported an increase in their drinking habits [25]. One smaller study (n=6,548) compared alcohol use in older Americans and found that 53 % of individuals with an average age of 67 acknowledged that they have an increase in alcohol consumption [26]. Contrary to the literature, our analysis of the BRFSS in those

Table 1: Annual rates of BRFSS respondents 65 years or older reporting any alcohol use, binge drinking, or heavy alcohol use from 2017 through 2021.

	2017 n, (%)	2018 n, (%)	2019 n, (%)	2020 n, (%)	2021 n, (%)	Overall	Design-based χ^2, p-value
Any alcohol consumption							
No	83,149 (56.3)	81,515 (58.0)	83,507 (58.0)	74,799 (58.3)	81,236 (58.7)	404,206 (57.9)	8.96, <0.0001
Yes	65,500 (43.7)	63,803 (42.0)	61,893 (42.0)	55,349 (41.7)	62,661 (41.3)	309,206 (42.1)	
Binge drinking							
No	140,756 (94.9)	137,229 (95.0)	137,035 (94.6)	122,919 (95.0)	135,880 (95.1)	673,819 (95.0)	1.86, 0.12
Yes	6,890 (5.1)	6,917 (5.0)	6,891 (5.4)	6,061 (5.1)	6,747 (4.9)	33,506 (5.1)	
Heavy alcohol consumption							
No	141,067 (95.7)	137,435 (96.0)	137,897 (96.0)	123,345 (95.6)	136,828 (95.8)	676,572 (95.8)	1.16, 0.32
Yes	6,379 (4.3)	6,353 (4.0)	6,159 (4.2)	5,837 (4.4)	5,952 (4.2)	30,680 (4.2)	

BRFSS, behavioral risk factor surveillance system.

aged 65 and older showed a decrease in overall alcohol consumption during and following the COVID-19 pandemic, with binge drinking and heavy alcohol consumption trends remaining stable. In order to summarize various publications reporting alcohol-related trends during and following the COVID-19 pandemic, a narrative review expressed the need for continual assessment of alcohol consumption trends in order to provide adequate support following the pandemic [23]. Likewise, a systematic review of 27 studies assessing the associations between the COVID-19 pandemic and alcohol consumption indicated significant heterogeneity in alcohol consumption. This study further highlighted the need for comprehensive population-level data collection stratified by sociodemographic characteristics, such as age, in order to aid public health responses [27].

Implications

As a result of novel challenges introduced by the pandemic, such as limited contact with others, travel restrictions, changes in physical activity level, monotony in day-to-day activities, and uncertainty surrounding the future, sufficient and culturally appropriate support diminished, leading to suboptimal coping mechanisms such as binge drinking and heavy alcohol consumption among some US adults [28]. However, by identifying decreased alcohol consumption trends during the COVID-19 pandemic in our observed population of individuals 65 and older, we have possibly isolated a US population that, unlike most other age groups during this traumatic period, took measures against stress-induced alcohol consumption [24]. Future research may be able to identify reasons and methods taken by this group for lowering alcohol intake to apply within other age groupings. Fully understanding the etiology of AUDs is not straightforward, making preventative health campaigns centered around alcohol use challenging. This is where the osteopathic philosophy emphasizing a comprehensive approach to individuals can facilitate not only treatment modalities but also prevention of AUDs. By utilizing a comprehensive biopsychosocial strategy, osteopathic physicians may be well equipped to identify and successfully manage AUDs, especially in high-risk populations such as older adults [29].

Recommendations

Further research on the subject of alcohol consumption trends throughout and following the COVID-19 pandemic is imperative to determine what measures, if any, the 65 and older population utilized to prevent increasing rates of binge drinking and heavy alcohol consumption. Recommendations for future research would include investigating and identifying whether certain environmental, social, and psychological factors disproportionately affected those 65 and older in regard to alcohol consumption habits during the COVID-19 pandemic. By identifying factors associated with the decrease in alcohol consumption in the evaluated population, ideally, preventative public health efforts can be made to support high-risk populations during traumatic times. According to a 2023 national Gallup poll, 61 % of US adults 55 or older continue to consume alcohol, which is in line with the reported 62 % of Americans regardless of age who consume alcohol following the COVID-19 pandemic, further indicating the need for continued AUD supportive measures [30]. Alcohol consumption increased in most

other age groups during the pandemic, indicating the need for identification of factors contributing to the observed decrease in drinking habits in the 65+ population and the development of preventative measures against increased alcohol consumption during times of crisis [27]. Such preventative measures include robust and culturally responsive education on how to cope with stress induced by the COVID-19 pandemic without resorting to alcohol consumption. For example, the Pandemic Stress Compensator Framework aims to mitigate stress leading to risky alcohol consumption habits by influencing the autonomous psychological intervention. By guiding people in developing their capacity of coping with uncertainties, the Pandemic Stress Compensator Framework along with other proposed preventative measures will help safeguard at-risk populations from stress-induced alcohol consumption leading to heavy alcohol consumption and binge drinking [31].

Limitations

The BRFSS is a telephone-conducted survey, which introduces potential bias as individuals with no access to a telephone are excluded from the study. Additionally, the binge drinking and heavy alcohol consumption parameters utilized by the BRFSS do not take into account older adults' possible increased sensitivity to alcohol [32]. The BRFSS alcohol consumption variables are known to underestimate the state-level mean volume, which has been partially alleviated by changes in survey methodology [33]. This could result in underestimations of both binge drinking and heavy alcohol consumption. Furthermore, related morbidity and mortality from the COVID-19 pandemic had a greater impact on older US adults in comparison to other age groups. However, due to the BRFSS sampling procedures, older US adults are still accurately represented in this sample. Finally, although the sales of alcohol delivery markedly increased during the pandemic, older adults may have been more cautious when it came to leaving their homes, decreasing their access to alcohol [18].

Conclusions

Excessive alcohol use is a major concern in the United States, with an alcohol-related death toll of close to 100,000 in 2021 alone [11]. Our study showed that alcohol consumption rates in individuals 65 and older decreased from 2017 to 2021, while binge drinking and heavy alcohol consumption rates remained consistent. Further research is vital to determine whether certain factors disproportionately affected those 65 and older regarding adverse stress-relieving habits, such as alcohol consumption, throughout and following the COVID-19 pandemic.

Research ethics: This study was not submitted for ethics review as it does not meet requirements for human subjects research as defined in 45 CFR 46.102(d) and (f) of the Department of Health and Human Services' Code of Federal Regulations. This study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

Informed consent: Not applicable.

Author contributions: The authors have accepted responsibility for the entire content of this manuscript and approved its submission. Dr. Hartwell had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Haight, Smith, Hartwell; Acquisition, analysis, or interpretation of data: Hartwell; Drafting of the manuscript: Haight, Smith, Hartwell; Critical revision of the manuscript for important intellectual content: Hartwell, Nolan, Bray; Statistical analysis: Hartwell.; Administrative, technical, or material support: Hartwell; Study supervision: Hartwell.

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Data availability: The raw data can be obtained on request from the corresponding author.

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