



Short Communication

Covid-19 vaccination status and beliefs of individuals with co-occurring serious mental illness and alcohol use disorder

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HIGHLIGHTS

- Vaccination rate and motivators of individuals with co-occurring alcohol use disorder (AUD) and serious mental illness (SMI) mirrored the general United States (US) population's.
- Hesitancy reasons of individuals with co-occurring AUD and SMI mirrored that of the unvaccinated US population.
- Vaccinated participants engaged in more interpersonal practices like wearing masks.
- Education about vaccine safety can boost vaccination rate among individuals with co-occurring AUD and SMI.
- Education on COVID-19's impact on high-risk loved ones can promote vaccination.

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ABSTRACT

Objective: The study objective was to determine factors associated with obtaining COVID-19 vaccination in people with co-occurring alcohol use disorder (AUD) and serious mental illness (SMI).

Methods: Survey responses were obtained from 135 adults with SMI seeking community-based AUD treatment about their primary series vaccination status, COVID-19 preventative practices, vaccination motivators, reasons for vaccine hesitancy, and strategies to increase vaccination uptake. Vaccinated and unvaccinated groups were compared. Responses to survey items with nominal or Likert scales were analyzed with chi-square tests of association. Logistic regression was employed to determine predictors of vaccine status.

Results: Seventy-nine percent (n=107) of participants reported they were vaccinated. A higher proportion of vaccinated participants believed COVID-19 was a serious disease. While both groups adopted preventative hygiene practices at similar rates (e.g., washing hands), vaccinated participants engaged in more interpersonal practices directly involving others (e.g., wearing masks and avoiding crowds). The strongest vaccine motivator was protecting personal health, while the primary reason for hesitancy was potential side effects. Most unvaccinated participants endorsed increased safety information availability (61.1 %) and living with a high-risk-for-severe-infection individual (55.6 %) as reasons to overcome hesitancy.

Conclusions: Vaccination rates, motivators, and hesitancy reasons were similar to the general United States population. Strategies to increase vaccination in this high-risk population should include education on vaccine safety and side effects and the impacts of COVID-19 and other respiratory illnesses on others.

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1. Introduction

The coronavirus disease 2019 (COVID-19) became a unique burden to people worldwide, including those experiencing co-occurring serious mental illness (SMI) and alcohol use disorder (AUD). Individuals with AUD experienced an increased likelihood of hospital admission and had increased severity and mortality with COVID-19 infection compared to those without AUD (Bailey et al., 2022). Likewise, during the pandemic, individuals with SMI had higher mental health symptoms, tobacco and alcohol use, distress, return to use, missed medical visits and medication doses, and were at disproportionately higher risk of COVID-19 morbidity and mortality compared to those with no psychiatric disorder (Bartels et al., 2020; Dickerson et al., 2022; Marchetti et al., 2023; Newby et al., 2020; Nooraeeen et al., 2023; Tzur Bitan et al., 2021).

Since becoming available, a reported 75 % of the general United States (US) adult population received at least one dose of a COVID-19 vaccine (Lazer et al., 2023). However, little is known about vaccine acceptance, hesitancy, and resistance among adults in the US with co-occurring disorders. Thus, the purpose of this study was to survey people with SMI seeking treatment for co-occurring AUD to determine whether vaccination rates paralleled those in the general US adult population, investigate reasons for receiving or not receiving a COVID-19 primary series vaccine, and the extent to which the pandemic affected respondents differentially by vaccine status in areas such as COVID-19 beliefs and attributions, preventative practices used by individuals, and mental and physical health. This work also sought to determine the acceptance of strategies for addressing vaccine hesitancy in unvaccinated participants. While the risk of severe COVID-19 infection has decreased, the risk of infection from various COVID-19 strains continues; therefore, it is important to explore willingness of this population to receive future immunizations and continued public health efforts.

2. Material and methods

2.1. Survey Sample

Survey respondents were participants enrolled in a randomized-controlled trial (RCT) comparing three variations of a contingency management (CM) intervention in adults diagnosed with a moderate or severe AUD and SMI, which included recurrent major depressive disorder, bipolar disorders, or schizophrenia/schizoaffective disorders. Written informed consent was obtained for the parent study examining CM intervention for AUD. After a complete description of the survey study to the participants, verbal informed consent was obtained before collecting survey responses. The Washington State University Institutional Review Board reviewed the survey and administration protocol and provided an exempt determination.

2.2. Survey development and implementation

Experts in mental health, AUD, public health, and survey research developed primary survey content themes and from these, survey items. Data were also collected on primary series vaccine status (received zero, one, or both doses of a bivalent vaccine), sex at birth, age, race, ethnicity, and SMI diagnosis. Content themes focused on COVID-19 exposure, mental and physical health effects of the pandemic, COVID-19 beliefs and attributions, preventative practices, perceived motivators for obtaining the COVID-19 vaccine, and reasons for not receiving the vaccine (i.e., vaccine hesitancy) in unvaccinated participants. The survey was delivered by phone or in-person interview in English and followed the Tailored Design Methodology (Dillman et al., 2014). The result was an opt-in nonprobability sample based on participants in the parent RCT.

2.3. Data analysis

Participation rates were calculated using The American Association for Public Opinion Research (2016) methods, which provide guidelines for calculating participation rate, including what should be included in the eligible or likely eligible participants denominator and how to handle various situations such as non-responses.

Responses to survey items with nominal or Likert scales were analyzed with chi-square tests of association to assess for significant differences in proportions between vaccinated and unvaccinated respondents. Logistic regression with forward variable selection was employed to determine predictors of vaccine status from among demographic variables. Predictors included sex assigned at birth, Hispanic ethnicity, mental health diagnosis, and age. All analyses used two-sided type I error rates of $p < .05$ and were conducted with SPSS, v. 28.0.

3. Results

148 RCT participants were invited to complete the survey; 135 individuals (50.4 % female, $n=68$; 83.5 % white, $n=111$; 12.6 % Hispanic, $n=17$) responded (91.2 % participation rate). Survey data were collected from 12/11/2020–12/23/2022. As seen in Table 1, the sample included 28 unvaccinated and 107 vaccinated respondents, with at least one dose of a COVID-19 primary series vaccine (79.3 % sample vaccination rate).

Vaccination status groups did not differ significantly by distribution of sex assigned at birth or mean age. Groups also did not differ by race or ethnicity; the predominant race and ethnicity were non-Hispanic White. Results of the Structured Clinical Interview for DSM Disorders indicated that most respondents were diagnosed with major depressive disorder, which did not differ by vaccination status group. Logistic regression analysis found no association between demographic variables and

Table 1

Survey responses for respondents who were unvaccinated ($n=28$) versus vaccinated ($n=107$) for COVID-19. For beliefs and attributions about COVID-19 and COVID-19 preventative practices, all the items used a yes/no response scale with percentages endorsing “yes” reported in the Table.

Survey Item	Vaccination Status	
	Unvaccinated	Vaccinated
Female at Birth	N (%) 14 (50.0)	N (%) 54 (50.5)
Race		
American Indian or Alaskan Native	0 (0.0)	5 (4.8)
Asian	0 (0.0)	3 (2.9)
Black or African American	2 (7.1)	2 (1.9)
Native Hawaiian or Pacific Islander	0 (0.0)	2 (1.9)
White	23 (82.1)	88 (83.8)
Multiracial	3 (10.7)	5 (4.8)
Hispanic/Latino Ethnicity	2 (7.1)	15 (14.0)
Serious Mental Illness Diagnosis		
Bipolar Disorder Type I or II	5 (19.2)	23 (23.2)
Major Depressive Disorder	16 (61.5)	62 (62.6)
Schizophrenia /Schizoaffective Disorder	5 (19.2)	14 (14.1)
Age (Mean ± Standard Deviation in years)	38.2 (12.9)	40.2 (12.0)
Beliefs or Attribution about COVID-19		
COVID-19 is a Serious Disease	15 (53.6)	97 (90.7*)
I am at Risk of Being Infected with COVID-19	10 (35.7)	63 (58.9)
If I Get Sick, I Believe I Can Stay Home for 7 Days	18 (64.3)	90 (84.1*)
Preventative Practices to Avoid COVID-19 Infection		
Wash Hands for 20 Seconds with Soap and Water	26 (92.9)	103 (96.3)
Use Alcohol-based Hand Sanitizer	26 (92.9)	101 (94.4)
Stand 6 Feet from Others	20 (71.4)	100 (93.5*)
Stay Home if Symptomatic	22 (78.6)	105 (98.1*)
Wear Face Mask When Well	17 (60.7)	102 (95.3*)
Clean Often-touched Surfaces	25 (89.3)	96 (89.7)
Avoid Gatherings of more than 10 People	20 (71.4)	98 (91.6*)
Avoid Gatherings of more than 50 People	21 (75.0)	101 (94.4*)

Groups did not differ significantly on demographic characteristics (all $p > .05$). Asterisks represent significantly larger group proportions at $p < .05$.

vaccine status (all $p > .36$).

Regarding pandemic effects on physical and mental health, vaccine status groups did not differ in their responses, with 61.5 % ($n=83$) and 26.7 % ($n=36$) of the overall sample indicating no physical or mental health effects, respectively. Across groups, 25.2 % ($n=34$) of the overall sample disclosed that their mental health had been "very much" or "extremely" affected. Worry about being personally infected by COVID-19 did not differ among vaccine status groups, with 80.7 % ($n=109$) of the overall sample indicating "no" to "slight" worry. A significantly higher proportion of unvaccinated respondents (50.0 %, $n=14$) expressed no worry about family or friends being infected with COVID-19 relative to vaccinated respondents (19.6 %, $n=21$; $\chi^2 [4]=11.78$, $p=.02$).

Also, as seen in Table 1, many group differences occurred in the beliefs and attributions of participants about COVID-19 and practices used to avoid infection. Although a majority in each group responded that COVID-19 was a serious disease, a significantly higher proportion in the vaccinated group felt so ($\chi^2 [2]=22.52$, $p<.001$). While groups did not differ on several COVID-19 mitigation hygiene practices employed at a personal level, such as hand washing, significantly larger proportions of vaccinated respondents engaged in preventative practices that directly involved others, such as mask-wearing when well (range for $\chi^2 [4]=8.20-25.45$, all $p<.01$).

Among the vaccinated, the greatest vaccination motivators were to protect the health of others (71.0 %, $n=76$), personal health (70.1 %, $n=75$), to contribute to community and public health (59.8 %, $n=64$), and it being required for work/school (23.4 %, $n=25$). Among the unvaccinated, primary hesitancy reasons included concerns about vaccine side effects (71.4 %, $n=20$), the belief that the vaccine would be ineffective (50.0 %, $n=14$), preference for developing immunity from infection (42.9 %, $n=12$), belief that a COVID-19 infection would not result in serious illness (32.1 %, $n=9$), and issues with vaccines having only emergency use authorization (32.1 %, $n=9$). Apart from two exceptions, the proposed methods to increase the likelihood of receiving the vaccine were viewed as largely ineffective at prompting unvaccinated respondents to obtain vaccination. The two exceptions included: (1) if more information was available on safety (motivating to 61.1 %, $n=11$), and (2) if someone they lived with was at high risk for severe infection (55.6 %, $n=10$). A minority of unvaccinated participants endorsed factors such as convenience for receiving the vaccination (16.7 %, $n=3$), vaccine requirements for work/school (22.2 %, $n=4$), \$200 compensation to receive the vaccine (22.2 %, $n=4$), and length of time since vaccine availability (27.8 %, $n=5$) were motivating for them to obtain COVID-19 vaccination.

4. Discussion

Little has been published about the COVID-19 pandemic's impact on individuals with co-occurring disorders. Nearly 80 % ($n=107$) of the sample reported receiving at least one dose of a COVID-19 primary series vaccine, which slightly exceeded the similar vaccination rate in the general US population of 75.0 % (Lazer et al., 2023). Lazer et al., 2023, collected data from December 22, 2022, until January 17, 2023, and defined primary series vaccination criteria the same as it is defined here. These proportions include those receiving the single-dose Johnson and Johnson vaccine and those who may not have completed the two-dose series for the Pfizer and Moderna vaccines. Among vaccinated participants, 92.5 % ($n=99$) had received the complete primary series of the COVID-19 vaccine, which exceeds the complete-series vaccination rate reported for the general US population of 73.0 % (Lazer et al., 2023).

Vaccinated and unvaccinated individuals in this sample were similar in many respects. Comparable proportions in both groups reported a slight to extreme impact of COVID-19 on their physical or mental health. A quarter of respondents indicated that their mental health was impacted severely, which may be related to the disruption of healthcare services this group experienced and the need for solutions to anticipated

barriers to care during future public health emergencies. Despite these challenges, both groups engaged in protective hygiene practices to similar degrees, such as hand washing and using alcohol-based hand sanitizer. This finding suggests that people with SMI-AUD were aware of public health recommendations to prevent COVID-19 infection regardless of vaccination status.

Despite some similarities, there were several differences between vaccinated and unvaccinated respondents. A significantly higher proportion of the vaccinated group believed COVID-19 to be a serious disease and endorsed the ability to stay home for seven days if infected. Additionally, a significantly higher proportion of vaccinated individuals engaged in preventative practices that directly involved their relationship with others. Within the general public, vaccinated individuals had significantly higher participation in preventative practices such as washing hands when in public places, maintaining social distancing, wearing a mask in public, and avoiding large crowds compared to unvaccinated individuals (Kimble et al., 2023).

The leading COVID-19 vaccination motivators were consistent with motivators reported for the general US vaccinated population, which included the protection of personal health and health of others, and contribution to community and public health (Uslu et al., 2021). Similarly, the reasons for COVID-19 vaccine hesitancy among the unvaccinated group were consistent with hesitancy reasons in the general US unvaccinated population, with the primary concerns being vaccine side effects and lack of trust in vaccine efficacy (Uslu et al., 2021). Respondents endorsed further hesitancy rationales, including the preference for developing immunity from infection, the belief that a COVID-19 infection would not result in serious illness, and concerns with vaccines having only emergency use authorization, which also have been endorsed by the general public (Fieselmann et al., 2022; Grove et al., 2023). The findings regarding hesitancy are consistent with a recent qualitative study of COVID-19 vaccination decision-making in community mental health outpatients (Grove et al., 2023). This study identified vaccine hesitancy themes of fear, uncertainty, and conflicting information about vaccines in participants with either a substance use disorder or SMI, but not co-occurring conditions. The current study extends these qualitative findings by exploring strategies to increase COVID-19 vaccination rates among unvaccinated individuals with co-occurring AUD and SMI.

Two strategies showed potential for increasing vaccination rates in this population: 1) more information regarding vaccine safety and 2) living with a high-risk-for-severe-infection individual. Similarly, a recent report on the general US population found that vaccinated and unvaccinated individuals trusted the vaccine-related messaging of hospitals, their doctors, and scientists (Green et al., 2021; Uslu et al., 2021). Further dissemination of information through these trusted sources about (1) vaccine safety and (2) education about potential adverse effects of COVID-19 infection on high-risk-for-severe-infection-symptom individuals signify additional opportunities to improve public health campaign messaging and encourage vaccination.

This study had a few limitations. As with all cross-sectional surveys, the data is limited to the respondents' opinions at this single point in time. The sample was a convenience sample from the Northwest US limited to a small number of racial and ethnic minorities. The sample size was small, and most respondents were vaccinated; therefore, the results could differ with a larger sample size, or a sample with a greater proportion of un-vaccinated participants. Future studies could examine the effects of strategies on COVID-19 vaccine uptake and attitudes among a broader representation of racial and ethnic minorities with co-occurring disorders.

5. Conclusions

This sample's vaccination rate paralleled that of the general US population. Regardless of vaccination status, respondents generally followed hygiene and personal health guidelines at the individual level;

however, the level of use of interpersonal-level preventative practices differed among groups. COVID-19 misinformation has led to decreased immunization for other illnesses (Guglielmi, 2022; Pandey and Galvani, 2023). While the risk of severe COVID-19 has decreased, people with AUD and/or SMI are at increased risk of medical complications related to COVID-19 and other illnesses that could be prevented with immunizations (De Hert et al., 2022; Nishimi et al., 2022; Wang et al., 2022). Strategies to improve vaccination rates for COVID-19 and other preventable infectious diseases are crucial because many people with co-occurring disorders live in unstable or congregate living situations where individuals are at a high risk of severe complications due to these communicable diseases (Brunette et al., 2004; Liu et al., 2020; Zhu et al., 2023). Providing science-based education related to vaccine safety and the impacts of COVID-19 and similar illnesses on high-risk family and friends may be particularly effective strategies for increasing vaccination in this population.

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CRediT authorship contribution statement

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Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Michael G. McDonell, Ph.D. reports financial support was provided by National Institute on Alcohol Abuse and Alcoholism. Michael G. McDonell, Ph.D. reports financial support was provided by National Institute on Drug Abuse. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Contributors

MK, DT, PK, KP, MB, JDJ, RB, SCP, RR, SMM, NSC, JMR, DLW, and MGM have made a substantial contribution to the concept and design of

the work, the acquisition, analysis, and interpretation of data for the article. MK, DLW, and MGM drafted the article and all authors revised it critically for important intellectual content. All authors approved the version to be published. All authors agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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