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Opioid Use Disorder and COVID-19: Treatment and Recovery Factors among Vulnerable Populations at the Intersection of Two U.S. Epidemics

Devin E. Banks^a, Maria E. Paschke^a, Xiao Li^b, Andrea Fentem^b, Amanda Rich^a, Hannah S. Szlyk^c, and Patricia Cavazos-Rehg^b

^aDepartment of Psychological Sciences, University of Missouri – St. Louis, One University Blvd, Louis, MO, US; ^bDepartment of Psychiatry, Washington University School of Medicine, Louis, MO, US; ^cSchool of Social Work, Rutgers, The State University of New Jersey, New Brunswick, NJ, US

ABSTRACT

Social inequities made some sociodemographic groups – including those of older age, minoritized race/ethnicity, and low socioeconomic status – disproportionately vulnerable to morbidity and mortality associated with the opioid epidemic and COVID-19 pandemic. Given shared vulnerability to these public health crises, it is critical to understand how COVID-19 impacts substance use disorder (SUD) treatment and recovery among people with these characteristics. The current study examined COVID-19's perceived impact on treatment factors and psychosocial outcomes by sociodemographic vulnerability. Patients receiving SUD treatment with a history of opioid misuse were recruited. Participants completed self-report questionnaires regarding the impact of COVID-19 on treatment indicators and mood and substance use symptoms. Most participants reported that COVID-19 decreased their treatment access and quality. There were no sociodemographic differences in treatment factors. Those with high sociodemographic vulnerability reported greater pandemic-related increases in depression and demonstrated greater mood symptoms. Post-hoc analyses demonstrated that unmet basic needs were significantly associated with lower treatment access and quality, greater mood symptoms, and higher substance use. Findings suggest pandemic-related stressors and barriers affected those across the sociodemographic spectrum. Treatment systems must address socioeconomic barriers to care exacerbated by the pandemic and bolster integrated treatment options for opioid use and mood disorders.

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Introduction

In the United States (U.S.), opioid overdose has contributed to nearly 500,000 deaths between 1999 and 2019 (Centers for Disease Control and Prevention [CDC], 2021b). This crisis has been further complicated by the emergence of the acute respiratory illness Coronavirus Disease 2019 (COVID-19) in 2020, which contributed to almost 700,000 deaths in the U.S. between March 2020 and September 2021 (CDC, 2021a). Social, economic, and institutional changes related to the COVID-19 pandemic exacerbated the opioid crisis by contributing to higher rates of psychological distress and introducing barriers to treatment access (Volkow, 2020). Accordingly, opioid morbidity and mortality increased significantly during the pandemic, with CDC data indicating that opioid overdose deaths reached a record number in 2020, increasing almost 20% from the previous year (Ahmad et al. 2021). In order to mitigate consequences of the collision of these two unprecedented health crises, it is critical to identify those most vulnerable to their intersecting impact.

Previous economic downturns demonstrated that drug use increases during periods of high unemployment, poverty, and widespread societal stress (De Goeij et al. 2015). Similarly, the COVID-19 pandemic increased substance use to cope among those without previous substance use disorders (SUDs) and increased risk for relapse and overdose among those with SUDs (Jacka et al. 2021; Volkow, 2020). Stay-at-home orders and increased isolation may have increased the number of people who are using alone, which increases the risk of accidental overdose and other negative consequences of use (Nguyen and Buxton 2021). The necessity of limiting in-person contact also meant that people with SUD experienced interruptions in services, including safe needle-exchange and peer support, as organizations cut back or discontinued services (Collins et al. 2020; Glick et al. 2020; Jacka et al. 2021).

Although these intersecting health crises impacted many Americans, existing and exacerbated structural inequities made certain sociodemographic groups

disproportionately vulnerable to morbidity and mortality related to both opioid use and COVID-19. These factors included older age, minoritized race or ethnic group, and low socio-economic status. Between 2013 and 2018, individuals over 65 experienced a three-fold increase in opioid-related mortality rate (Shoff, Yang, and Shaw 2021). With regard to race/ethnicity, people identifying as African American, Hispanic/Latinx, and American Indian/Alaska Native have also faced recent disproportionate increases in opioid-related mortality rates (Scholl et al. 2019; Wilson et al. 2020), with rates among African Americans and American Indians/Alaska Natives increasing at twice that of Whites (Furr-Holden et al., 2021; Joshi, Weiser, and Warren-Mears 2018). Regardless of race and ethnicity, those with socioeconomic disadvantage have also experienced higher morbidity and mortality related to the opioid epidemic (Albright et al. 2021; Pear et al. 2019; van Draanen et al. 2020).

These same populations also experienced higher rates of mortality from the COVID-19 virus. In 2020, older adults had a high risk of developing adverse complications and dying from the disease as compared to other age cohorts (Carew et al., 2018; Tiruneh et al. 2021). People identifying as African American, Hispanic/Latinx, and American Indian/Alaska Native also experienced a disproportionate burden of COVID-19 death compared to their White counterparts (Karmakar, Lantz, and Tipirneni 2021). Those with low-socioeconomic status also experienced higher mortality rates than those of higher socioeconomic standing regardless of race and ethnicity (Abedi et al. 2021; Hatef et al. 2020).

Disparities in opioid- and COVID-19 related mortality due to age are related to demographic changes, drug availability, and prescribing, increased life expectancy, and higher rates of secondary health conditions that can cause significant complications and death (Tiruneh et al. 2021). Racial disparities in opioid- and COVID-19 related mortality are related to the historical and present legacy of structural inequalities that disproportionately face minoritized racial groups, including higher rates of incarceration and uninsured adults (Dalsania et al. 2021; Siegel, 2021). Socioeconomic disadvantage includes several demographic and environmental factors associated with poor health outcomes and barriers to accessing appropriate healthcare services, leading to worse health outcomes related to COVID-19 infection and opioid use. Low income, unemployment, low educational attainment, and unstable housing have been associated with risk for both COVID-19 (Raifman & Raifman, 2020; Seligman, Ferranna, and Bloom 2021) and opioid fatalities (Altekruse et al. 2020; Dasgupta, Beletsky, and Ciccarone 2018).

Understanding how the COVID-19 pandemic affected the ability to receive and benefit from substance use treatment is critical for addressing the long-term impact of two of our nation's most pressing public health crises. Recent data demonstrate that during COVID-19, mental health problems and opioid misuse increased among substance use treatment-seeking and general populations, particularly those belonging to minoritized racial/ethnic groups (Brown et al. 2021; Mistler et al. 2021). Substance use treatment-seeking populations also struggled to access treatment, resulting in sharp decreases in medication for opioid use disorder (MOUD) induction and other opioid treatment services (Herring, 2021). However, it is also unknown whether those susceptible to both opioid overdose and COVID-19 based on sociodemographic factors were disproportionately affected by decreases in psychosocial wellbeing and increases in treatment barriers. The present study explores how sociodemographic vulnerability factors, including race/ethnicity, age, and socioeconomic status, were related to psychosocial outcomes and treatment factors among those with a history of opioid misuse seeking SUD treatment between March 2020 and April 2021 of the COVID-19 pandemic. We hypothesized that those with greater sociodemographic vulnerability would report a greater negative impact of COVID-19 on both psychosocial recovery and treatment factors.

Methods

Participants

The present study used baseline data among participants (N = 197) receiving substance use disorder treatment. Participants were enrolled into a supplemental digital intervention (*uMAT-R*) (Cavazos-Rehg et al. 2020), which intended to support recovery from opioid and stimulant use disorder. Participants were recruited in-person from various types of facilities (N = 15) within Missouri that provided recovery services to individuals diagnosed with SUD: outpatient and inpatient programs, recovery homes, hospital settings, medication for addiction treatment clinics, and a clinic supporting pregnant and postpartum women in recovery. Additional participants were recruited via snowball sampling methods, a strategy to engage hard to reach populations including individuals with SUD (Barati, Ahmadpanah, and Soltanian 2014; DeBeck et al. 2016; Wohl et al. 2017). Participants were eligible for study if they had ever received an opioid and/or stimulant use disorder diagnosis, were currently receiving SUD treatment, were 18 years or older, were a U.S. resident, were

fluent in English, and owned a smartphone with an iOS or Android operating system. All participants had been formally diagnosed with opioid and/or stimulant use disorder by their current treatment facility and all participants had a history of opioid misuse.

Procedure

Participants completed baseline surveys on the domains of sociodemographic characteristics and study measures. All responses were self-reported using the online Research Electronic Data Capture (REDCap) system, a secure, web-based application that can be used either on a computer or mobile device. Prior to enrollment, treatment facility staff confirmed in the client's chart that they met criteria for the research study. Research staff then reviewed the informed consent document with eligible participants, and participants then provided verbal or written consent. Study procedures were approved by Washington University's Institutional Review Board.

Measures

Demographics & COVID-19 vulnerability

Participant sociodemographic variables were assessed, including age range, gender identity, race and ethnicity, highest level of school completed, current employment status, current living arrangement, and insurance coverage. COVID-19-related vulnerability was based on sociodemographic risk factors for COVID-19 including: (1) older age (i.e., 51 years or older) (2) belonging to a minoritized racial/ethnic group (i.e., nonwhite), and low socioeconomic status. Low socioeconomic status was operationalized by (3) education (i.e., lower than GED/high school), (4) employment status (i.e., unemployed) and (5) being unhoused/housing insecure (i.e., does not own or rent an apartment or home). Participants with 0 to 2 demographic risk factors were considered low COVID-19 risk whereas participants with 3 to 5 risk factors were considered high risk.

COVID-19 impact on treatment and recovery

Participants responded to 15 items designed to assess how the COVID-19 pandemic has affected participants' recovery from SUD, including how the pandemic affected their co-occurring mood symptoms. Participants were asked if COVID-19 impacted their overall recovery ("Have circumstances surrounding COVID-19 impacted your recovery efforts?"), treatment access ("During the COVID-19 outbreak, were you able to access recovery treatment at your clinic?"), and treatment quality ("How do you feel about the treatment you received during COVID-19?"). They

were also asked about their treatment modality during the COVID-19 pandemic ("If you were able to continue to access recovery treatment at your clinic, how so?"). Regarding changes in mood, participants were asked "Have circumstances surrounding COVID-19 increased instances of sad and/or depressive feelings?" and "Have circumstances surrounding COVID-19 increased your level of worry and/or anxiety?" All responses were on a four-point Likert scale (e.g., from "Little or no impact" to "Great impact") except for treatment modality, which included the following options: in-person, video sessions (i.e., telehealth), phone, and other.

Substance use, craving, and perceived overdose risk

Participants responded to items measuring past 30-day non-opioid substance use by individual substance type taken from the National Survey of Drug Use and Health (Han et al. 2017). Given low endorsement of substance use, past 30-day use was dichotomized (yes/no) and the only substances examined for the current study were alcohol, tobacco, and cannabis.

Three items were included in the survey assessing current craving for opioids, ranging from 0 to 10 with 0 = "Not at all" and 10 = "Extremely Strong." The scale was adapted from Cocaine Craving Scale (Weiss, Griffin, and Hufford 1995) and the scale's validity has been demonstrated among a sample of participants in treatment for opioid use (McHugh et al. 2014). The total score can range from 0 to 30, with greater scores indicating stronger craving.

Perceived overdose risk was assessed by the question "What do you feel your risk is now for an overdose involving opioids or other drugs?" and three options were provided: no risk, low risk, and moderate-to-high risk.

Depression and anxiety symptoms

The Patient Health Questionnaire (PHQ-9) (Kroenke, Spitzer, and Williams 2001; Wulsin, Somoza, and Heck 2002) was used to assess symptoms of depression over the past two weeks. The nine-item standardized measure was used to screen for depression severity based on DSM-IV depression criteria. Participants were asked to identify the frequency of symptoms, from 0 = not at all to 3 = nearly every day). Standard cutoff scores were used to inform symptom severity: none, (0–4), mild (5–9), and moderate/severe (≥ 10) (Kroenke, Spitzer, and Williams 2001; Wulsin, Somoza, and Heck 2002). The PHQ-9 has good internal reliability (e.g., $\alpha = .89$ in primary care), test-retest reliability, validity, and feasibility (Kroenke, Spitzer, and Williams 2001).

The Generalized Anxiety Disorder-7 (GAD-7) (Spitzer et al. 2006) was used to assess symptoms of anxiety. Participants responded to several items to determine the frequency of anxiety symptoms, from 0 = (not at all) to 3 = (nearly every day). Standard cutoff scores were used to inform symptom severity: none, (0–4), mild (5–9), and moderate/severe (≥ 10) (Löwe et al. 2008). The GAD-7 has been validated for use in both primary care settings (Spitzer et al. 2006) and within the general population (Löwe et al. 2008).

Unmet basic needs

Participants responded to nine items asking how confident they were in their ability to access basic resources (i.e., rent, food assistance). Questions from this scale were adapted from the Wellbeing and Basic Needs Survey (Karpman, Zuckerman, and Gonzalez 2018). Responses ranged from confident at all (1) to very confident (8). The total score of items ranges from 9 to 72, with higher scores indicating more confidence in one's ability to access basic resources.

Data analysis

Preliminary analyses examined the COVID-19 pandemic's overall impact on psychosocial and treatment factors and compared each question by dichotomized demographic variables (as defined in the measures section) using chi-square tests. For primary analyses, we compared COVID-19 impact variables, depression and anxiety symptoms, and substance use variables (past 30-day substance use, opioid cravings, and perceived overdose risk) by COVID-19 vulnerability group (high risk and low risk) using chi-square tests. Post-hoc analyses examined the relationship between unmet needs and both psychosocial and treatment variables using ANOVAs and Tukey-Kramer post-hoc tests for significant ANOVAs. All analyses were conducted using SAS.

Results

Between March 2020 and April 2021, 197 participants responded to COVID-19-related questions at baseline, with most participants responding between October 2020 and April 2021 ($n = 132$). Participants were 48.2% women and most were between ages 31–50 (62.4%). Most participants were White (77.6%), followed by African American (19.8%) (See Table 1). Most participants held diagnoses of OUD ($n = 168$; 85.8%), whereas a minority held diagnoses of a stimulant use disorder ($n = 28$; 14.2%). Regarding COVID-19 and OUD vulnerability, 91 participants

Table 1. Demographics of the sample by COVID-19 vulnerability index.

		High Risk (N = 91)	Low Risk (N = 106)	Total (N = 197)
Age	18–30	20 (22.0)	29 (27.4)	49 (25.0)
	31–50	50 (55.0)	73 (68.9)	123 (62.4)
	51+	21 (23.1)	4 (3.8)	25 (12.7)
Gender	Man	47 (51.7)	54 (50.9)	101 (51.3)
	Woman	44 (48.4)	51 (48.1)	95 (48.2)
	Other	.	1 (0.9)	1 (0.5)
Race	White	58 (63.7)	94 (88.7)	152 (77.2)
	African American	28 (30.8)	11 (10.4)	39 (19.8)
	American Indian	3 (3.3)	.	3 (1.5)
	Hispanic	.	1 (0.9)	1 (0.5)
	Other	2 (2.2)	.	2 (1.0)
Education	Less than high school	67 (73.6)	48 (45.3)	115 (58.4)
	High school equivalent	14 (15.4)	21 (19.8)	35 (17.8)
	Some college	9 (9.9)	29 (27.4)	38 (19.3)
	2 year degree or higher	1 (1.1)	8 (7.5)	9 (4.5)
Employment	Full time	4 (4.4)	46 (43.4)	50 (25.4)
	Part-time	2 (2.2)	15 (14.2)	17 (8.6)
	Unemployed	85 (93.4)	45 (42.5)	130 (66.0)
Housing	Homeless	15 (16.5)	7 (6.6)	22 (11.1)
	Treatment facility	23 (25.3)	5 (4.7)	28 (14.2)
	Someone else's home	45 (49.5)	31 (29.3)	76 (38.6)
	Own home	8 (8.8)	62 (58.5)	70 (35.5)
Insurance	Uninsured	48 (44.0)	41 (38.7)	81 (41.1)
	Insured	42 (46.2)	56 (52.8)	98 (50.0)

(46.2%) were classified as high risk. There were no differences in COVID-19 vulnerability by gender or SUD.

COVID-19 impact on recovery

Most participants reported that circumstances surrounding the COVID-19 pandemic had impacted their overall recovery efforts with 25.8% reporting the pandemic somewhat impacted recovery efforts and 33.5% reporting it moderately or greatly impacted their recovery efforts. The remaining 40.7% reported that COVID-19 had not impacted their overall recovery efforts. Regarding treatment, 28.4% perceived treatment received during the COVID-19 pandemic to be better than that received prior to the pandemic, 37.6% perceived it to be the same, and 34.0% perceived it to be worse. Over 70% of participants reported changes in access to recovery treatment. Specifically, 51.8% reported moderate decreases in medication and/or in-person treatment access and 19.8% reported little-to-no treatment access during the pandemic. Among those reporting some form or continued treatment ($n = 195$; 99.0%), over three-quarters reported changes in treatment delivery, with 52.3% receiving treatment via telehealth, and 25.1% receiving treatment on the phone. The remaining 22.6% continued to receive treatment in person. We observed significant differences in treatment access by stage of the pandemic. Those who responded during the first seven months of the pandemic (March–September 2020) were more likely to report decreases in

treatment access (78.5%) than those who responded during the subsequent seven months (68.2%; $\chi^2 = 9.88$, $p = .007$). Specifically, the earlier responders reported less in-person treatment than later responders (14.3% vs. 26.5%) and more treatment via phone (36.5% vs. 19.7%; $\chi^2 = 7.79$, $p = .020$).

Treatment delivery type was significantly associated with perceived treatment quality ($\chi^2 = 10.15$, $p = .038$). Those who received treatment via telehealth or phone were more likely to report that treatment quality had worsened as a result of COVID-19 relative to those who received in-person treatment. For example, only 15.0% of those receiving in-person treatment reported worse quality relative to 37.3% of those receiving telehealth and 38.8% of those receiving phone-delivered treatment. Regarding psychosocial aspects of recovery, 41.3% reported that their depressive symptoms moderately or greatly increased due to COVID-19, whereas 37.5% reported that their anxiety or worry moderately or greatly increased. In total, 53.1% of participants reported at least a moderate increase in negative affect due to the pandemic.

COVID-19 vulnerability and recovery treatment

There were no differences in COVID-19-related treatment access, treatment type, or treatment quality by any demographic factors, including those risk factors attributed to greater COVID-19 vulnerability (i.e., gender, race, education, employment, housing status, or age). COVID-19 vulnerability (low or high risk) also was not associated with access to recovery treatment, treatment delivery method, or perceived treatment quality.

COVID-19 vulnerability & psychosocial recovery

There were significant socioeconomic and demographic differences in psychosocial recovery factors. Participants with a high-school education or less reported greater COVID-19-related increases in anxiety than those with higher education ($\chi^2 = 4.27$, $p = .039$) and participants with unstable housing reported greater increases in depression than those with stable housing ($\chi^2 = 4.10$, $p = .043$). Participants who were unemployed had higher depression scores on the PHQ-9 ($\chi^2 = 9.81$, $p = .007$) and anxiety scores on the GAD-7 than those who were employed ($\chi^2 = 10.13$, $p = .006$). Uninsured participants also had higher depression scores relative to those insured ($\chi^2 = 8.36$, $p = .017$). Unstable housing was also associated with higher cravings ($F = 7.18$, $p = .008$) and any perceived overdose risk when compared

to no perceived risk ($\chi^2 = 13.38$, $p = .001$). There were no other demographic differences in substance use indicators.

Participants in the high-risk group for COVID-19 were more likely to report that circumstances surrounding the COVID-19 pandemic increased feelings of depression relative to those in the low-risk group ($\chi^2 = 7.83$, $p = .005$) (see Table 2). There was no difference between groups in increases in anxiety related to the COVID-19 pandemic ($\chi^2 = .15$, $p = .702$). Those with high COVID-19 vulnerability also had significantly higher depression scores on the PHQ-9 ($\chi^2 = 12.63$, $p = .002$) and anxiety scores on the GAD-7 ($\chi^2 = 13.26$, $p = .001$). There were no significant differences between groups in past 30-day use of tobacco, cannabis, alcohol. There were also no differences in opioid cravings or in perceived overdose risk.

Post-Hoc analyses: unmet basic needs

Those in the high-risk COVID-19 vulnerability group reported significantly less confidence in meeting their basic needs than those in the low-risk group (high risk: $M = 42.65$, $SD = 16.77$; low risk: $M = 53.10$, $SD = 16.19$; $F = 12.60$, $p < .001$). To further illuminate this finding, we conducted post-hoc analyses comparing unmet basic needs to all previously discussed treatment and psychosocial recovery indicators. Post-hoc analyses demonstrated that unmet basic needs were significantly associated with treatment access ($F = 3.72$, $p = .026$), such that those who reported moderate decreases in treatment access during the pandemic reported more unmet needs than those who reported no change in access ($p = .022$). Unmet needs were also significantly

Table 2. Psychosocial recovery factors by COVID-19 vulnerability group.

	High Risk	Low Risk	
	<i>N (%) or M (SD)</i>		<i>p</i>
Depressive symptoms	17 (18.7)	43 (40.6)	0.003
None	33 (38.3)	25 (23.6)	
Mild	41 (45.1)	38 (35.9)	
Moderate /severe			
Anxiety symptoms	20 (22.0)	50 (47.2)	<.001
None	33 (36.3)	20 (18.9)	
Mild	38 (41.8)	36 (34.0)	
Moderate /severe			
Opioid cravings	9.4 (7.5)	8.3 (6.8)	0.27
Perceived overdose risk	39 (47.6)	61 (63.5)	0.09
No/Low	27 (32.9)	24 (25.0)	
Moderate	16 (19.5)	11 (11.5)	
High			
Alcohol use	31 (35.2)	24 (22.6)	0.08
Tobacco use	79 (86.8)	82 (77.4)	0.23
Cannabis use	29 (33.0)	26 (24.5)	0.26

Note: Significant p-values are bolded.

associated with treatment quality ($F = 7.27, p < .001$) such that those who reported worse treatment quality during COVID-19 also reported more unmet basic needs relative to those reporting that treatment quality had remained the same ($p < .001$). Unmet basic needs were not significantly related to treatment delivery method.

Unmet basic needs were also associated with psychosocial recovery factors. Regarding mood symptoms, those with more unmet needs were more likely to report COVID-19-related increases in depression ($F = 27.63, p < .001$) and anxiety ($F = 16.00, p < .001$). Unmet needs were also associated with clinical depression ($F = 15.28, p < .001$) and anxiety scores ($F = 13.36, p < .001$) such that confidence in the ability to meet basic needs decreased as depression and anxiety scores increased. Regarding substance use, those reporting cannabis use in the past 30 days had more unmet needs than those who did not ($F = 6.05, p = .015$). There was no association between alcohol or tobacco use and unmet needs; however, unmet needs were associated with higher reported opioid cravings ($r = -.29, p < .001$) and low and moderate-to-high perceived overdose risk relative to no perceived risk ($F = 7.04, p = .001$).

Discussion

The COVID-19 pandemic affected the recovery efforts of the majority of people surveyed in the present study regardless of sociodemographic vulnerability, with over 70% of respondents reporting the pandemic reduced their access to SUD treatment and over half reporting it negatively affected their mood. Contrary to our hypothesis, we found no difference in treatment access, type, or quality between those with high and low vulnerability for COVID-19 morbidity and mortality based on older age, minoritized race/ethnicity, and low socioeconomic resources. We also found no differences in substance use or opioid overdose indicators based on vulnerability. However, consistent with our hypothesis, people with high sociodemographic vulnerability were more likely to report increases in anxiety related to COVID-19. They also reported higher levels of clinical depression and anxiety symptoms.

Although access to treatment was similar across age, race, and ethnicity, those with more unmet basic needs (e.g., housing and food resources) reported less access to treatment. Unmet needs may limit a person's ability and means to adapt to new institutional changes and limitations to service such as reduced hours during the COVID-19 pandemic. Having unmet needs may also mean increased personal barriers to accessing treatment such as job and subsequent health insurance loss and a lack of

childcare and eldercare, barriers which were also meaningfully exacerbated by the COVID-19 pandemic (Gangopadhyaya and Garrett, 2020; Kalluri, Kelly, and Garg 2021). The current findings suggest that, although pandemic-related changes to treatment access and quality affected those with SUD across the sociodemographic spectrum, treatment systems, and providers must address practical structural barriers to accessing care that have been exacerbated by the pandemic.

Providers must attend to the dissimilar impact of COVID-19 on psychosocial outcomes among vulnerable sociodemographic groups. We found that patients with high COVID-19 vulnerability reported more COVID-related changes in negative affect than those with low vulnerability. Post-hoc findings demonstrating the link between basic unmet needs and psychosocial risks (i.e., mood symptoms, cravings, and perceived overdose risk) suggest that the differences between vulnerability groups were driven by socioeconomic inequities exacerbated by the pandemic, including housing, job, and financial insecurity. Older people, minoritized racial/ethnic groups, and those with lower socioeconomic advantage have been disproportionately affected by COVID-19-related morbidity and mortality (Abedi et al. 2021; Kim and Bostwick 2020). Thus, these groups likely experience more psychological stress from personal illness, grief related to sick or deceased friends and family members. Those with minoritized race/ethnicity and low socioeconomic status also faced higher job loss and unemployment during the pandemic potentially leading to psychological stress related to financial concerns and financial burden of lost wages (Moen, Pedtke, and Flood 2020). Since COVID-19 was declared a pandemic, researchers have demonstrated that national rates of depression and poor well-being have been higher among people belonging to minoritized racial/ethnic groups and those with socioeconomic disadvantage (e.g., low income or poverty, housing instability, less than a high-school education) relative to people who are White and socioeconomically advantaged, respectively (Lee and Singh 2021). Given the comorbidity between mood disorders and SUD, these disparities may be even more severe among those with OUD. Recent findings indicated that among individuals in treatment for OUD, those belonging to minoritized racial/ethnic groups reported more financial burden related to COVID-19 and more COVID-19 related stressors, including worry about contracting the disease and inability to access a COVID-19 test (Mistler et al. 2021).

Finally, among participants, remote telehealth treatment was associated with perceived decreases in treatment quality relative to in-person treatment. Some OUD treatment providers found that telehealth sustained or

increased patient engagement during COVID-19 (Langabeer, Yatsco, and Champagne-Langabeer 2021) while others found it decreased engagement for SUD patients relative to those with other behavioral health problems (Schoebel et al. 2021; Yang et al. 2020). Although temporary federal and state regulations allowed for telemedicine options for MOUD during COVID-19 (Stringer et al. 2021), providers also reported increased barriers to distributing MOUD, decreased MOUD initiation, and decreased provision of behavioral health services to those with OUD during this same time (Huskamp et al. 2020; Treitler et al. 2022). As telehealth options persist, treatment providers must consider that older people, those with fewer socioeconomic resources, and Black, Latinx, and Asian people may disproportionately experience low telemedicine treatment quality due to inequities in treatment and technology access they faced before and during the COVID-19 pandemic (Eberly et al. 2020; Lam et al. 2020; Roberts and Mehrotra 2020).

This study only captures those who have successfully enrolled in treatment and does not capture the experiences of those who were unable to access treatment altogether. The population of those at risk of opioid overdose who are not interested in treatment or were not able to access treatment may show other differences associated with socio-demographic vulnerability. Additionally, the inclusion criterion of personal smartphone access may have disproportionately excluded people with sociodemographic vulnerabilities, including those with low socioeconomic status, minoritized racial/ethnic groups, and older people. The inclusion criterion of English-language proficiency further may have excluded minoritized racial/ethnic groups and immigrants. The study was cross-sectional. Although participants were asked to compare their treatment and mood characteristics pre- and post-COVID, these historical reports should be interpreted with caution as they could be biased by hindsight. Additionally, the findings with regard to mood symptoms may be related to socioeconomic conditions regardless of COVID-19.

As the opioid and COVID-19 crises converged, 1 in 5 patients felt that they had little to no access to care at a time when fatal opioid overdoses were increasing (Alexander, 2020). As the outlook of the COVID-19 pandemic has transitioned from a short-term emergency into an ongoing and persistent public health threat, it remains paramount to bolster treatment options and quality for all patients, particularly those vulnerable due to systemic inequities due to agism, racism, and classism. As telehealth continues to be used for service delivery, providers, and treatment systems should seek to increase the quality and rigor of digital services so patients find the quality of care similar to in-person options. Further, as patients vulnerable to illness

and death related to COVID-19 and OUD may experience greater psychosocial stressors related to both crises, there is a need for integrated treatment options that address co-occurring disorders. Overall, it is paramount for providers continue to expand access to vulnerable populations, especially those who struggle to meet basic needs and who face unique financial and knowledge barriers to both in-person and digital care options.

Disclosure statement

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