

Organizational Response to the COVID-19 Crises and Associations with Client Perceptions of Risk and Impact

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Abstract

Background: Organizational responses to crises can profoundly impact the operations and functioning of programs. Specifically, the COVID-19 pandemic led to an 18% increase in drug overdoses and necessitating significant protocol adjustments. We examined opioid treatment programs (OTPs) responses to the pandemic, and associations with clients' perceptions of COVID-19 concerns and impact.

Methods: Data from 2023 encompassing 92 OTPs and 435 client surveys were analyzed using multilevel regression models. Dependent variables measured clients COVID-19 exposure concerns, and perception of the pandemic's broader impact. Independent variables included types of response, staff composition, funding, and accreditation.

Results: Clients in programs with higher proportions of African Americans, 1.01 (95 % Confidence Interval CI=1.00 - 1.03) or Latino staff, 1.02 (CI=1.00 - 1.04) expressed significantly greater concern about COVID-19 exposure. Conversely, clients in publicly funded programs reported significantly lower concern about exposure, 0.36 (CI=0.15 - 0.89). On the other hand, programs with more administrative responsiveness, 1.43 (CI=0.07 - 2.80), or accreditation by the Commission on Accreditation of Rehabilitation Facilities, 1.89 (CI=0.12 - 3.66), were associated with significantly higher perceived overall impact of the pandemic, respectively.

Conclusion: This study highlights the intricate connection between program characteristics and organizational responses during public health crises. Our findings underscore the importance of culturally sensitive approaches and effective communication to address client COVID-19 concerns and perceptions, particularly within disproportionately affected minority communities. These insights emphasize the necessity for OTPs to adapt to meet the evolving needs of clients, ensuring that they receive the support and care required during uncertainties.

Highlights

- Clients of OTPs with a higher proportion of minority staff reported greater COVID-19 concerns
- Publicly funded programs were associated with lower client concerns about exposure
- Programs administrative responsiveness increased perception of the overall impact of COVID-19
- Administrative responsiveness was marginally associated with a decline in exposure concerns
- Accreditation by CARF increased the perception of the overall impact of COVID-19

1. Introduction

The COVID-19 pandemic significantly disrupted the SUD treatment system in the U.S., leading to operational challenges and reduced access to services for individuals seeking treatment (White et al., 2024). Individuals with SUDs had a significantly higher rate of being hospitalized (40.96%) or dying (9.57%) from COVID-19 (Clingan et al., 2023; Wang et al., 2020). In response, treatment programs, during the COVID-19 pandemic, had to adjust their operational protocols to comply with government-mandated guidelines. For example, clients in residential programs were required to remain at treatment centers during the shelter-in-place orders, leading to overcrowded facilities (Pagano et al., 2021). Additionally, pharmacotherapy regulations were relaxed to allow programs to provide take-home methadone, facilitating continued treatment while minimizing exposure risks (Andraka-Christou et al., 2021).

In-person procedures such as physical assessments and counseling were adapted to telehealth platforms to minimize exposure risks during the COVID-19 pandemic (Andraka-Christou et al., 2021). However, the transition from in-person treatment to partially online service delivery did not prevent SUD clients from being at risk of contracting COVID-19. Overall, the pandemic reshaped how SUD programs functioned, including multifaceted responses related to administrative functions, provision of counseling services, and decision making regarding take-home methadone. The pandemic also revealed SUD clients' perceptions of exposure and risk to COVID-19, and within the context of treatment. Moreover, the crisis underscored the importance of understanding clients' perceptions of exposure and risk within the context of treatment, informing future strategies for SUD care during public health emergencies.

1.1. Administrative and treatment Responses

Treatment programs incorporated telehealth (Pagano et al., 2021) as a replacement for in-person individual and group counseling, which allowed treatment to continue while minimizing the risk of COVID-19 exposure (Pagano et al., 2021; Hubach et al., 2021). Interestingly, most clients preferred in-person counseling sessions (Pagano et al., 2021; Hubach et al., 2021; Hurley et al., 2021). Additionally, a considerable proportion of clients lacked access to devices with stable internet, resulting in missed sessions, or less than optimal sessions (Hubach et al., 2021; Saloner et al., 2022; Sugarman et al., 2021). This led to a significant decrease in group counseling and mutual aid groups (Hubach et al., 2021; Saloner et al., 2022; Sugarman et al., 2021).

1.2. Medication-Related Response

In response to COVID-19, federal agencies extended regulations to temporarily extend the allowable take-home supply of methadone for up to 28 days (Amram et al., 2021; Saloner et al., 2022). Clients could thus continue medication assisted treatment without the need for daily visits to a facility, and risk exposure to COVID-19, a measure that resulted in a significantly positive effect on recovery. Most programs also paired the take-home MOUDs treatment with telehealth counseling, which ensured that clients were receiving comprehensive services and significantly increased MOUD retention rates (Jones et al., 2022; Mark et al., 2021; Saloner et al., 2022).

1.3. Client Perception of COVID-19

Many individuals with SUD exhibit behaviors and perceptions that increase their vulnerability to COVID-19. One study found that individuals who had not received the vaccine were willing to expose themselves to COVID-19 in exchange for access to illicit substances (Clingan et al., 2023). Clients who were already participating in risky behaviors, such as injecting needles and sharing straws for drug usage, also did not perceive protective measures from COVID – 19 to be as relevant (Clingan et al., 2023). This lack of concern about exposure was compounded by vaccine hesitancy, as many SUD clients feared potential side effects, including the risk of contracting COVID-19 from the vaccine itself (Cioffi et al., 2022; Karavolis et al., 2024; Stack et al., 2022), and general skepticism towards the government (Clingan et al., 2023). While COVID-19 impacted all communities across the U.S., minority populations were disproportionately affected by the disease (Tai et al., 2020).

Many African Americans were at an increased risk of contracting COVID-19 due to their employment in “essential jobs,” like customer service and medical support, which required in-person interactions with a higher amount of people (Howard, 2021; Venegas-Murillo et al., 2022). Despite being aware of the risks associated with COVID-19 (Restrepo & Krouse, 2021; Bogart et al., 2020), African Americans were notably more distrustful of the COVID-19 vaccine compared to other racial groups (Clingan et al., 2023; Restrepo & Krouse, 2021; Howard, 2021; Karavolis et al., 2024). This vaccine hesitancy may stem from a long history of medical mistreatment and experimentation on African Americans, along with ongoing healthcare discrimination (Howard, 2021; Restrepo and Krouse, 2021; Okoro et al., 2021).

While the existing literature has discussed how COVID-19 has impacted the operation of SUD treatment programs and how clients perceived the nature and implications of COVID-19 (Masson et al., 2021), there is a lack of research on how specific responses COVID 19, adjustments to treatment, or program characteristics of SUD programs are associated with clients’ perception of COVID-19. This study aims to expand the literature on SUD treatment programs and COVID-19 by examining the relationship between program attributes and clients’ perception of COVID-19, with a focus on program response to COVID-19.

2. Methods

2.1 Data Source

This study utilized data from the National Drug Abuse Treatment System Survey (NDATSS), a nationally representative dataset that includes eight waves of surveys administered to outpatient substance use treatment programs in the years 1988, 1990, 1995, 2000, 2005, 2011, 2014, 2017, and 2023 (Friedmann et al., 2003; D’Aunno et al., 2014a; D’Aunno et al., 2014b; Guerrero et al., 2022). Each wave retained eligible programs from previous waves, excluding those that had closed, and added replacement programs to ensure adequate sample sizes. Additionally, representative samples of newly established programs were included to maintain the NDATSS’s national representativeness in reflecting the evolving landscape of U.S. treatment programs. For the present study, approved by the University Institutional Review Board (IRB2019-0268D), we used data from the most recent wave collected in 2023 and focused exclusively on opioid treatment programs (OTPs). The OTP programs in 2023 did not differ statistically

significantly from those in earlier waves with respect to key variables such as geographic region and participation in Medicaid expansion.

Five types of surveys were administered within each program: director, supervisor, counselor, referral, and client surveys. For our analysis, we relied solely on responses from director, supervisor, and client surveys. Each program provided one director and one supervisor survey, while up to twelve client surveys could be collected from each program. Our final analytic sample included 92 unique programs and 435 client surveys. Information on organizational responses to COVID-19 was obtained from either the director or supervisor survey, as the relevant items were identical across both instruments. When both responses were available, we used the director's responses. If the director's data were missing, we used responses from the supervisor.

2.2. Dependent Variables

The first dependent variable measured clients' concern about being exposed to COVID-19 at home. This variable was measured on a five-point scale (0 to 4) ranging from "not at all concerned" to "extremely concerned." The second dependent variable captured clients' perceptions of the broader effects of COVID-19 and was operationalized as a composite score. This score was calculated by summing up responses to seven items, each measured on a five-point Likert scale (0 to 4) from "strongly disagree" to "strongly agree." The items assessed: concern about family experiencing racism or discrimination related to COVID-19; increased family conflict since the beginning of the pandemic; belief that COVID-19 is not as serious as portrayed (reverse coded); perceived likelihood of contracting COVID-19; perceived likelihood of hospitalization or death due to COVID-19; perceived likelihood that someone close would contract COVID-19; and perceived likelihood that someone close would be hospitalized or die from COVID-19.

2.3. Independent Variables

The independent variables were organized into two categories. The first category included organizational response to COVID-19, which were measured using three composite variables. The first composite, administrative responses, represented the average of three binary indicators: whether the program had shut down due to COVID-19, whether it provided telehealth or telemedicine services, and whether it implemented infection control policies. The second composite captured counseling responses, indicating whether the program continued offering individual and group counseling. The third composite reflected medication-related responses, including whether the program used pharmacotherapy, offered take-home medications for opioid use disorder (OUD), or provided additional dosages of OUD medications.

The second category of independent variables encompassed program characteristics. These included the percentage of African American and Latino staff, ownership status (whether the program was owned by another organization), type of program, accreditation by the Commission on Accreditation of Rehabilitation Facilities (CARF), participation in Medicaid expansion, and geographic region (Northeast, Midwest, Southeast, Southwest, or West).

Statistical Analysis

Descriptive statistics were first calculated for all study variables, with means and standard deviations reported for continuous variables and frequencies and percentages for categorical variables. To examine associations between organizational characteristics and the two outcomes, we conducted multilevel regression analyses that accounted for the nested structure of the data, where multiple client responses were nested within each program. Specifically, we used a multilevel ordinal logistic regression model for the first outcome—client concern about COVID-19 exposure—and a multilevel linear regression model for the second outcome—client perception of the effects of COVID-19. Robust standard errors were estimated using the sandwich estimator to account for clustering at the program level.

3. Results

3.1. Descriptive

Descriptive statistics for all study variables are presented in Table 1. The mean score for client concern about exposure to COVID-19 was 1.10 on a scale from 0 (“strongly disagree”) to 4 (“strongly agree”), indicating relatively low levels of concern. The average score for clients’ perceived effect of COVID-19 was 10.44, suggesting moderate-level of worry about the pandemic’s overall impact. The range of this perceived effect of COVID-19 was 0 to 28 since it was the sum of seven items measured on a 5-point Likert scale (0 to 4 each). Regarding organizational responses to COVID-19, the average scores were 1.93 for administrative responses, 1.80 for counseling-related responses, and 1.75 for medication-related responses. Since these scores represent the sum of multiple binary indicators, they reflect active program-level engagement in addressing the challenges posed by the pandemic.

3.2. Regression

Results from the multilevel regression models are summarized in Table 2. Clients served by programs with a higher proportion of African American or Latino staff expressed significantly greater concern about exposure to COVID-19 (OR = 1.017, $p = 0.015$; OR = 1.026, $p = 0.004$, respectively). In contrast, clients in publicly funded programs reported significantly lower concern about exposure (OR = 0.368, $p = 0.028$). Additionally, a greater number of administrative responses to COVID-19 was marginally associated with reduced concern about exposure (OR = 0.632, $p = 0.051$). As for perceived effects of the pandemic, clients in programs that implemented more administrative responses or held CARF accreditation reported significantly higher levels of concern ($\beta = 1.435$, $p = 0.039$; $\beta = 1.897$, $p = 0.036$, respectively).

4. Discussion

The COVID-19 pandemic significantly transformed the landscape of SUD treatment, compelling programs to adapt their operational and clinical protocols (Goldsamt et al., 2021; Frimpong and Helleringer, 2021; Cantor and Laurito, 2021). This study aimed to examine the associations between

program-level factors and clients' perceptions of COVID-19 within opioid treatment programs (OTPs), utilizing data from the 2023 National Drug Abuse Treatment System Survey (NDATSS). Our findings highlight how organizational responses, staff demographics, and program characteristics may influence clients' concerns about COVID-19 exposure, and their broader perceptions of the pandemic's impact. A key finding of this study is the significant association between the racial and ethnic composition of program staff and clients' concern about COVID-19 exposure. Specifically, clients in programs with a higher proportion of African American or Latino staff expressed significantly greater concern about exposure to COVID-19. This finding aligns with existing literature and underscores the heightened concern about COVID-19 exposures, infections, and death within minority communities (Howard, 2021).

Particularly African Americans and Latinos, were disproportionately affected by the COVID-19 pandemic in terms of infection rates, hospitalizations, and deaths (Vasquez-Reyes, 2020; Tai et al., 2020). For instance, African Americans have a 50.7% chance of being hospitalized and a 13% chance of dying from COVID-19, significantly higher than Whites (Vasquez-Reyes, 2020; Wang et al., 2020). This heightened vulnerability is often attributed to systemic factors such as living in densely populated, racially segregated communities and a higher representation in essential jobs, increasing exposure risk (Howard, 2021; Venegas-Murillo et al., 2022). It is plausible that clients in programs with more African American or Latino staff may be more attuned to these community-level disparities and individual vulnerabilities, leading to increased personal concern about exposure. Furthermore, shared lived experiences and cultural understanding between staff and clients from similar racial or ethnic backgrounds could facilitate more open discussions about the pandemic's risks, fostering a greater sense of awareness.

Our findings indicated that clients in publicly funded programs reported significantly lower concern about COVID-19 exposure. It is possible that publicly funded programs, which often serve diverse populations with varying socioeconomic backgrounds, may face different challenges in disseminating information or addressing concerns compared to privately funded programs. The lack or pace of information from public programs may have created a false sense of safety, among clients of these programs. Alternatively, clients in publicly funded programs may have received the necessary information and may have implemented life style and protective changes that lead to them being safer, and less concerned about exposure. It is also worth noting that different perceptions of risk due to a variety of factors may not have been captured in this study. This observation warrants further investigation, ideally incorporating a broader set of variables and employing new methodological approaches (Kong et al., 2024).

Regarding organizational responses, a greater number of administrative responses to COVID-19 was marginally associated with reduced client concern about exposure. This suggests that proactive measures implemented by programs, such as telehealth services, infection control policies, and temporary shutdowns when necessary, might have instilled a sense of security among clients, mitigating their personal apprehension about contracting the virus within the treatment setting. This aligns with previous research highlighting the importance of clear and consistent communication and safety

protocols, including through exposure notification applications, in reducing anxiety during public health crises (Pagano et al., 2021; Frimpong and Helleringer, 2021).

Interestingly, clients in programs that implemented more administrative responses or held CARF accreditation reported significantly higher levels of perceived broader and overall effect (concern) of the COVID-19 pandemic. This seemingly counterintuitive finding could suggest that programs with robust administrative responses and accreditation may be more diligent in educating clients about the broader societal and health impacts of COVID-19. CARF accreditation, for example, often emphasizes comprehensive client education and adherence to best practices, which could include thorough discussions about the pandemic's implications beyond immediate personal exposure. Such programs might be effectively conveying the severity and wide-ranging consequences of COVID-19, leading to a higher level of perceived impact among their clients.

4.1. Limitations

Notwithstanding our findings, this study has some limitations. The cross-sectional nature of the data from the 2023 NDATSS does not allow for causal inferences regarding the associations observed. Longitudinal studies that monitor and evaluate changes in client perceptions over time in response to evolving program adaptations, and COVID 19 in particular, would be beneficial. Additionally, while the NDATSS provides useful data points, client perceptions are self-reported and may be subject to recall bias or social desirability bias. Lastly, the study focused exclusively on OTPs, limiting the generalizability of the findings to other types of SUD treatment programs. Future research could explore the relationships examined in this study, among relevant factors, in a wider range of treatment settings.

Conclusions

This study highlights the complex interplay between program-level characteristics, organizational responses, and clients' perceptions of COVID-19 within SUD treatment settings. The findings suggest that staff diversity, funding models, and robust administrative responses play a role in shaping client awareness and concerns. These insights can inform future public health strategies and clinical practices within SUD treatment to better address the unique needs and concerns of clients during widespread public health crises, particularly for those from disproportionately affected racial and ethnic minority groups. Continued efforts are needed to build trust, provide accurate information, and implement culturally sensitive approaches to mitigate the impact of future public health emergencies on vulnerable populations receiving SUD treatment.

Declarations

Ethics Approval and Consent to Participate

This study was reviewed and approved by the Institutional Review Board of the Texas A&M University (IRB2019-0268D). All participants provided informed consent prior to participation.

Consent for Publication

Not applicable.

Availability of Data and Materials

The datasets used for this study are available from the corresponding author upon reasonable request.

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Author Disclosures

CRedit Author Contribution Statement

Jemima A. Frimpong: Conceptualization, Writing – original draft, Writing – review & editing. **Maya-Grace T. Archer:** Writing – original draft, Writing – review & editing. **Yinfei Kong:** Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing. **Suojin Wang:** Conceptualization, Methodology, Writing – review & editing. **Tenie Khachikian:** Writing – original draft, Writing – review & editing, Supervision, Project Administration. **Daniel L. Howard:** Funding acquisition, Conceptualization, Writing – original draft, Writing – review & editing.

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Declaration of Competing Interests

The authors 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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Tables

Table 1. Characteristics of opioid treatment programs

<i>Dependent variables</i>	
Concern on exposure to COVID-19	1.10 (1.27)
Perception on the effect of COVID-19	10.44 (4.88)
<i>Organizational responses to COVID-19</i>	
Administration	1.93 (0.37)
Counselling	1.80 (0.46)
Medication	1.75 (0.88)
<i>Program Characteristics</i>	
Percent of African American staff	22.29 (22.15)
Percent of Latino staff	12.23 (16.60)
Owned by another organization	62 (16.6%)
Type of programs	
Private for-profit	188 (47.7%)
Private not-for-profit	156 (39.6%)
Public	50 (12.7%)
Licensed by CARF	272 (65.4%)
Participation in Medicaid expansion	287 (66%)
Region	
Northeast	144 (33.1%)
Midwest	96 (22.1%)
Southeast	75 (17.2%)
Southwest	74 (17%)
West	46 (10.6%)

Table 2. Multi-level regression model of organizational-level factors associated with client COVID-19 concerns and perceptions of impact

	Concern on exposure to COVID-19			Perception on the effect of COVID-19		
	Odds ratio	95% CI	p value	Beta	95% CI	p value
<i>Organizational responses to COVID-19</i>						
Administration	0.632	0.399, 1.001	0.051	1.435	0.070, 2.800	0.039
Counselling	0.972	0.552, 1.711	0.920	-0.080	-2.005, 1.845	0.935
Medication	1.188	0.916, 1.541	0.194	-0.611	-1.466, 0.244	0.161
<i>Program Characteristics</i>						
Percent of African American staff	1.017	1.003, 1.031	0.015	-0.003	-0.041, 0.035	0.890
Percent of Latino staff	1.026	1.008, 1.043	0.004	0.007	-0.042, 0.055	0.783
Owned by another organization	0.586	0.267, 1.283	0.181	-1.670	-4.316, 0.977	0.216
Type of program ^a						
Private not-for-profit	0.840	0.507, 1.392	0.498	0.766	-0.518, 2.049	0.243
Public	0.368	0.150, 0.899	0.028	-0.163	-2.838, 2.512	0.905
Licensed by CARF	1.546	0.908, 2.634	0.109	1.897	0.125, 3.669	0.036
Participation in Medicaid expansion	1.262	0.599, 2.663	0.540	0.521	-1.230, 2.272	0.560
Region ^b						
Midwest	0.857	0.497, 1.478	0.579	1.190	-0.190, 2.571	0.091
Southeast	0.756	0.283, 2.020	0.577	0.655	-1.930, 3.241	0.619
Southwest	0.603	0.235, 1.545	0.292	-0.388	-2.662, 1.886	0.738

West	0.760	0.293, 1.970	0.573	-1.313	-4.718, 2.092	0.450
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^aPrivate for-profit as reference; ^bNortheast region as reference