



## The effect of a pilot brief educational intervention on preferences regarding treatments for opioid use disorder

Emaun Irani<sup>a</sup>, Colin Macleod<sup>a,e</sup>, Stephanie Slat<sup>a</sup>, Adrienne Kehne<sup>a</sup>, Erin Madden<sup>b</sup>, Kaitlyn Jaffe<sup>c</sup>, Amy Bohnert<sup>d,e</sup>, Pooja Lagisetty<sup>a,e,\*</sup>

<sup>a</sup> Department of Internal Medicine, University of Michigan, Ann Arbor, MI, USA

<sup>b</sup> Department of Family Medicine and Public Health Sciences, Wayne State University, 3939 Woodward Ave, Detroit, MI 48201, USA

<sup>c</sup> Center for Bioethics and Social Sciences in Medicine, University of Michigan, Ann Arbor, MI, USA

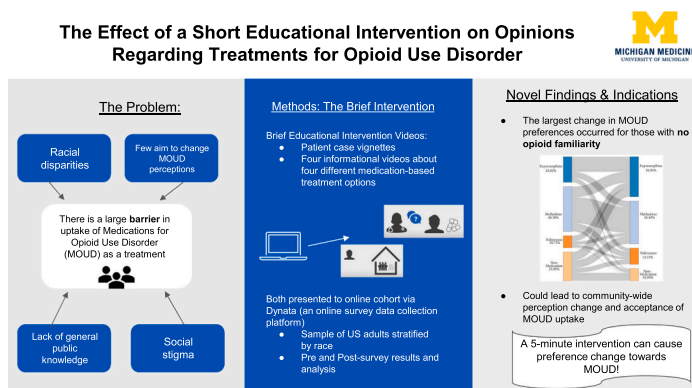
<sup>d</sup> Department of Anesthesiology, University of Michigan, Ann Arbor, MI, USA

<sup>e</sup> VA Center for Clinical Management Research (CCMR), VA Ann Arbor Healthcare System, Ann Arbor, MI, USA

### HIGHLIGHTS

- Educational videos on OUD treatment were evaluated in a public online cohort with and without OUD familiarity across three racial groups.
- A 5-minute intervention can increase preference for MOUD.
- Individuals with low opioid familiarity were most likely to change their preference towards MOUD.

### GRAPHICAL ABSTRACT



### ARTICLE INFO

#### Keywords:

Medication for Opioid Use Disorder (MOUD)  
Public stigma  
Harm-reduction  
Educational intervention  
Treatment preference

### ABSTRACT

**Purpose:** Negative perceptions around medications for opioid use disorder (MOUD) amongst the public could deter patients with opioid use disorder (OUD) from engaging with MOUD. Thus, we evaluated whether a brief intervention could improve preferences for MOUD in people who may or may not use opioids.

**Methods:** We employed a pre-post design to assess the effect of a brief educational intervention on preferences for methadone, buprenorphine, naltrexone, and non-medication treatment in an online sample of US adults stratified by race, who may or may not use opioids. Respondents ranked their preferences in OUD treatment before and after watching four one-minute educational videos about treatment options. Changes in treatment preferences were analyzed using Bhapkar's test and post hoc McNemar's tests. A binary logistic generalized estimating equation (GEE) assessed factors associated with preference between treatments.

\* Correspondence to: Division of General Medicine, University of Michigan Medical School, Center for Clinical Management and Research, VA Ann Arbor Healthcare System, 2800 Plymouth Road, Building 16, Room G243E, Ann Arbor, MI 48109, USA.

E-mail address: [lagiset@med.umich.edu](mailto:lagiset@med.umich.edu) (P. Lagisetty).

<https://doi.org/10.1016/j.dadr.2024.100235>

Received 10 January 2024; Received in revised form 19 April 2024; Accepted 22 April 2024

Available online 24 April 2024

2772-7246/© 2024 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

**Results:** The sample had 530 responses. 194 identified as White, 173 Black, 163 Latinx. Treatment preferences changed significantly towards MOUD ( $p < .001$ ). This effect was driven by changes toward buprenorphine ( $OR = 2.38$ ;  $p < .001$ ) and away from non-medication treatment ( $OR = 0.20$ ;  $p < .001$ ). There was no significant difference in effect by race/ethnicity. People with lower opioid familiarity were significantly more likely to change their preferences towards MOUD following the intervention.

**Conclusion:** Respondent preferences for MOUD increased following the intervention suggesting that brief educational interventions can change treatment preferences towards MOUD. These findings offer insights into perceptions of OUD treatment in a racially stratified sample and serve as a foundation for future educational materials that target MOUD preferences in the general public.

## 1. Introduction

In 2022, there were more than 2.1 million people with an opioid use disorder (OUD) and 120,000 deaths attributed to opioid use in the United States (Dydyk et al., 2023). From 2019–2020, non-Hispanic Black individuals faced a more pronounced increase in fatal overdoses than other racial groups (CDC, 2022). Worldwide, approximately 500,000 people died of opioid overdose in 2019, with 60 million people using opioids (“Opioid overdose,” 2024). Studies have shown that medications for opioid use disorder (MOUD), such as buprenorphine, naltrexone, and methadone are more effective in treating opioid use disorder than non-medication therapies (Committee on Medication-Assisted Treatment for Opioid Use Disorder et al., 2019). Methadone, a full opioid agonist, was approved as maintenance therapy for OUD in 1961 and has been the longest-used and accepted treatment for OUD globally (Payte, 1991). Although buprenorphine, a partial opioid receptor agonist, was discovered in 1966, it was not approved by the FDA to treat OUD until 2000. Despite its barriers to widespread acceptance, buprenorphine is now considered first-line treatment for OUD. Naltrexone, an opioid receptor antagonist approved by the FDA in 1984, was not used as a first-line treatment for OUD until 2010, when long-acting extended-release naltrexone became the only formulation that was proven to be more effective than a placebo in reducing opioid use overtime (Azhar et al., 2020). However, large racial disparities in MOUD uptake exist, which worsens the unequal opioid-related morbidity and mortality across racial demographics (Lagisetty et al., 2019; Schiff et al., 2020; Hansen et al., 2016; Lapham et al., 2020; Stahler et al., 2021).

While prior studies have established differences in the rate of MOUD uptake among different racial groups, this reality has largely been attributed to differential access to evidence-based treatment and has not focused on varied preferences for treatment, or the modification of these preferences (D’Aunno et al., 2019; Goedel et al., 2020; Hansen et al., 2013). Qualitative studies have demonstrated that anticipated stigma impacts racial and ethnic minority groups’ preferences for non-medication treatments (Husain et al., 2023). However, there has been a paucity of literature on how we can best intervene upon these preferences to increase knowledge and use of evidence-based treatments.

Educational interventions targeting an individual’s knowledge gaps and particular beliefs about a given issue are frequently utilized to reduce public stigma for a number of highly stigmatized diseases, such as HIV and mental illness (Rao et al., 2019). Additionally, interventions focused on “indirect social contact,” through vignettes or other forms of media, are considered effective low-cost alternatives to the face-to-face “social contact” that has proven effective in eliciting short-term changes in stigma among the general public (Makhmud et al., 2022; Thornicroft et al., 2016). However, prior studies evaluating educational interventions to increase preferences for MOUD have largely focused on special populations who already have an OUD. For example, a cross-sectional study assessed incarcerated individuals’ attitudes around MOUD both before and after an eight-minute video intervention featuring other incarcerated individuals speaking about their experiences using MOUD and found that this was effective in increasing

acceptance of MOUD (Lam et al., 2019). Other studies have focused on perceptions of medical practitioners or those who are already receiving specialty care for OUD (Bailey et al., 2013; Carson, 2019; Cioe et al., 2020; Gryczynski et al., 2013; Kenney et al., 2018; Louie et al., 2019; Majer et al., 2018; Schwartz et al., 2008). These prior studies have not evaluated or intervened upon perceptions in the general public which may influence MOUD uptake more broadly, particularly amongst different racial and ethnic groups (Madden et al., 2021).

Intervening at the level of the general public has the potential to alter community-wide perceptions of MOUD, eliciting more sustained, widespread changes in care-seeking behavior for those with an OUD through the reduction of social stigma. Additionally, within the general public, support from organizations, communities, families and social networks can mitigate stressors and influence the health behaviors of an individual, as noted in the Conceptual Model for the Relationship of Social Networks and Social Support to Health (Glanz et al., 2008). The preferences of the general public also affect MOUD through spatial policies, such as through community opposition to establishing opioid treatment programs in neighborhoods (Hansen and Roberts, 2012; Smith, 2010). Consequently, it is critical to distribute educational interventions to a broad public audience and consider the role of varied OUD and MOUD familiarity in our approach.

Thus, in this study we aimed to evaluate an education-based approach to improve preferences for MOUD among a racially diverse population who may or may not use opioids. This study also assessed differences in knowledge and preference for MOUD by race to establish the foundation necessary for tailoring educational interventions to different communities. As a result, the findings from this study may be used to inform future public MOUD education efforts by testing the ability of brief media interventions to address widespread perceptions about MOUD that may impede public support for effective treatment.

## 2. Methods

### 2.1. Study design and sample

We employed a pre-post design to assess the effect of a brief pilot educational intervention on preferences regarding four OUD treatment options. We did not recruit specifically for whether participants used opioids or were aware of OUD treatments. The survey was created in Qualtrics by members of the research team and was administered to a panel of respondents provided by Dynata, a survey firm that provides quota-based respondent recruitment and incentivizes participation through a points-based rewards system (Dynata, 2023). Dynata recruits individuals to their survey panel through a variety of sources such as online advertisements and secure, trusted partnerships with verified members in order to maintain a base of potential respondents for specific surveys (Dynata, 2023). Dynata and other survey firms are commonly used by health and social research teams to reach specific audiences based on criteria of interest and was selected as a vendor to optimize efficient recruitment of a racially diverse sample (Dossett et al., 2022; Nayak et al., 2021; Scherer et al., 2022). The study aimed to select 600 American adult survey participants, comprised of three equal subsamples stratified by race (200 White, 200 Hispanic, and 200 Black

respondents). Panel member respondents for this study were recruited according to our pre-specified eligibility and recruitment goals of recruiting approximately a 1:1 ratio of each racial group, in order for results to be sensitive to differential response patterns. Subsample recruitment was designed to approximate the American public with regards to age, gender, income, and education. Members of the panel who meet our recruitment criteria are emailed by Dynata and prompted to respond to an online survey to accrue points which can then be redeemed for financial rewards. Responses were collected in February 2021. The study design was approved by the University of Michigan Institutional Review Board and deemed exemption under Federal Exemption 2.

## 2.2. Educational Intervention

We designed a brief educational intervention consisting of a patient vignette and four informational videos describing four opioid use disorder treatment options: methadone, buprenorphine, naltrexone, and non-medication-based treatment.

The initial 30-second vignette described a 35-year-old man who began frequently using unprescribed opioids after trying them at a party, then lost his job due to his OUD and wanted to learn about all available treatment options from a healthcare professional. Participants were asked to imagine that this individual was from their neighborhood to assess how participants with or without opioid use experience would make decisions around MOUD for a hypothetical patient from their own racial and ethnic community (Mutz, 2015). Racial concordance between each survey respondent and the hypothetical patient was enhanced through the explicit statement of patient race (e.g. “a Black man”) as well as through use of racially distinctive patient names (Crabtree et al., 2023).

Following the vignette, participants were provided with informational videos on four treatment modalities: methadone, naltrexone, buprenorphine, and non-medication treatment. Informational videos about each treatment were structured as a conversation between the hypothetical patient and a healthcare provider and included information on the mechanism of action of the medication, efficacy, route of delivery, and healthcare settings where the medication is typically used (e.g., primary care settings versus specialized addiction treatment centers). This information was curated from evidence-based literature sources (SAMHSA, 2018; National Institute on Drug Abuse, 2023). The language was workshopped within the investigators on the team with subject matter expertise. In addition, we conducted preliminary cognitive interviews with individuals with low medical literacy and knowledge around OUD. During the interviews, these individuals were asked to watch the videos and read through the survey questions to identify where information could be clarified and language could be simplified. Each video began with the healthcare provider giving a short description of the mechanism for each medicine (e.g. “There is a medication called methadone that is a type of opioid. Since it is an opioid like Vicodin, you wouldn’t have as many cravings or feel the ups and downs that would happen if you suddenly stopped using opioids.”). The patient then proceeded to ask questions about the initiation of treatment (“How would I start treatment?”), statistical effectiveness (“How well does it work?”), treatment course (“How long would I need to take it?”), and safety (“Are there any risks?”) of naltrexone, buprenorphine, methadone, and non-medication treatment. After each question, the healthcare provider would respond with one to two sentences of information. Both the healthcare provider and the patient were presented as black-and-white graphic silhouettes, and questions from the patient were presented with speech balloons. The videos were presented as video links that were embedded in each survey, and participants were not allowed to advance in the survey until the videos played fully.

## 2.3. Survey measures

The primary survey outcome was the respondents’ top preference for treating the simulated patient’s OUD assuming that cost was no issue. Respondents were asked to answer the question using ‘what they already know’ to select their top treatment preference at baseline, and following the educational intervention by asking the participant to use ‘what they know and what they learned in the video’. There were four treatment options presented, buprenorphine, methadone, naltrexone, and non-medication treatments.

## 2.4. Additional covariates

Participants were asked if they had used any opioids in the past year and whether they had used street opioids or prescription opioids for medical or non-medical reasons in the past year. These questions were adapted from the metrics used in the National Survey on Drug Use and Health concerning past year and past three-month substance use (“National Survey of Drug Use and Health (NSDUH) Releases | CBHSQ Data,” 2020). Participants were also asked whether they had taken prescription opioids daily for the past three months, as a metric to assess long-term opioid therapy use as defined by the Centers for Disease Control and Prevention (Dowell, 2022). Participants indicated whether they themselves, a friend, or family member had experienced addiction and which of the following treatments, if any, either they themselves, a friend, or a family member had received for any type of addiction: methadone, buprenorphine, naltrexone, counseling or behavioral therapy, tapering, Alcoholics Anonymous or Narcotics Anonymous, detoxification, or residential treatment. Responses to these questions were scored from 0 to 3 (one point each if there was past-year non-medical or street opioid use, any personal or social exposure to OUD, and any personal or social exposure to MOUD) and summed to create an Opioid Familiarity Index.

## 2.5. Analysis

We generated descriptive statistics for all covariates. Analyses were performed in a step-wise fashion, first assessing the overall effect of the intervention on full and dichotomized treatment preferences, and then assessing the population averaged effect while accounting for relevant covariates. To first assess the overall effect of the intervention we used Bhappkar’s test with McNemar’s post hoc tests to determine both if preference change differed significantly across treatment type and if so, which types drove the effect. Top treatment choice outcome was then dichotomized into evidence-based (MOUD) options and the non-medication options. A single McNemar’s test was then used to assess the effect of the intervention on the dichotomized preference change to ensure that dichotomization maintained any treatment effects. In order to model the dichotomized treatment preference while accounting for time clustering and additional covariates, including assessment time (pre- vs. post-test), race, gender, MOUD and OUD exposure, and non-medical opioid use, we used a binomial logistic Generalized Estimating Equation (GEE) model clustering on participants to account for repeated observations. Marginal effects of the intervention were estimated using the fitted model to both examine interactions between variables and arrive at a weighted global effect of the intervention. Finally, we developed a composite “Opioid Familiarity Index” variable which was defined as the sum of the participants binary (0 = no; 1 = yes) responses to their previous exposure to MOUD treatment, personal or close relational OUD, and any previous personal non-medical opioid use. This variable was used to examine differences in intervention effect within varying levels of baseline familiarity with OUD and potential treatment options. We used McNemar’s test to assess the effect of the intervention to change the preferences towards MOUD for individuals with no, low, moderate, or high levels of opioid familiarity. Analysis was conducted using R version 4.2.2 and R Studio version 2022.12.0.353 (R Core Team, 2021).

### 3. Results

At the study's conclusion, 530 respondents (194 White, 173 Black, and 163 Latinx) watched all educational videos and completed paired pre- and post-surveys. 20 respondents were excluded due to missing or conflicting demographic data, and 53 respondents were excluded because of incomplete survey data. Respondents had a mean age of 45.3 years old, and 52.3% were female (Table 1). 11.1% of respondents reported personal use of non-medical prescription opioids or street opioids, 82.6% of respondents had no personal history of OUD, and 66.2% had no prior exposure to MOUD. When asked about whether they, a family member, or a friend had an OUD at some point, 43.0% of respondents reported some level of lifetime exposure. Hispanic participants were slightly more likely to have been exposed to OUD (51.5%) and MOUD treatments (41.1%) and had more participants with the highest levels of opioid familiarity (41.1% had moderate to high familiarity). White participants had the second-highest levels of familiarity (30.9% had moderate to high familiarity), and Black participants had the lowest levels of familiarity (22.6% had moderate to high familiarity).

Overall distribution of top treatment preference changed significantly from pre to post intervention ( $p < .001$ ). Post hoc tests suggested that this effect was driven by shifts toward buprenorphine (OR=2.38;  $p < .001$ ) and away from non-medication treatments (OR=0.20;  $p < .001$ ). Changes in the distribution of top treatment preference are presented visually in Fig. 1.

When top treatment preference was dichotomized between any MOUD option (methadone, buprenorphine, naltrexone) and non-medication treatment, a McNemar test of the discordant proportions (those who changes their minds from pre to post) suggested that participants who changed their top treatment preference following the intervention were significantly (OR 4.95,  $p < .001$ ) more likely to change from non-medication treatment to MOUD, rather than from MOUD to non-medication treatments (Table 2).

Several factors were found to be significant in predicting preference for MOUD over non-medication treatment when using a GEE model to account for repeated measures and additional covariates. Exposure to the educational intervention was associated with a statistically significant increase in MOUD preference [global AOR=2.79 ( $p < .001$ )] (See Fig. 2). The effect of the intervention was found to interact with non-

medical opioid use representing a stratified effect of the intervention across our sample. Respondents who reported non-medical opioid use remained relatively stable across time in their preference for MOUD [AOR=0.63, CI (0.17–2.30)] whereas the majority of the sample, those who did not report non-medical opioid use, saw significant increases in preference for MOUD [AOR=3.37, CI (2.37–4.79)] (Fig. 2). Prior exposure to MOUD treatment was also found to be a significant predictor of MOUD preference [AOR 4.03 (CI 2.14–7.57)]. In both pre- and post-survey settings, there was a non-significant trend in non-White individuals being less likely to select MOUD (OR 0.74 (CI 0.47–1.16)) for Black Americans and (OR 0.62 (CI 0.38–1.00)) for Hispanic/Latinx Americans). Prior exposure to OUD and gender were also not significant predictors for MOUD preference.

Participants with no opioid familiarity, defined in our study as no personal, familial, or social exposure to opioid use disorder, self-reported non-medical opioid use, or MOUD treatment, demonstrated a marked increase in their top-choice preference for MOUD, from 63.6% pre-intervention to 86.0% post-intervention (Fig. 3). MOUD preference among participants with low and moderate levels of opioid familiarity increased from 75.0% to 87.0% and from 88.7% to 95.1%, respectively. Changes in discordant proportions were significantly different in favor of switching to MOUD for the no familiarity ( $p < .001$ , OR 6.6), low familiarity ( $p = .03$ , OR 3.2), and moderate familiarity ( $p = .04$ , OR 5.0) groups, but not for the high familiarity group ( $p > .999$ ).

### 4. Discussion

This pilot study found that brief educational videos about MOUD, each lasting less than a minute and totaling <5 minutes, resulted in significant increases in the likelihood of participants selecting MOUD as the best treatment for OUD compared to non-medication treatment. The greatest change from pre- to post-survey preferences for MOUD occurred in individuals with no prior knowledge of opioid treatment.

Community stigma around MOUD treatment likely affects OUD treatment decision-making (Husain et al., 2023). An individual whose loved ones perceive MOUD as a substitution, rather than an evidence-based treatment, may be less likely to engage in MOUD treatment (McCadden et al., 2019). Qualitative research suggests community members and family members expressing negative views of MOUD can also lead people treated with methadone to prematurely cease their treatment (Chandler et al., 2013; Woo et al., 2017). Consequently, it is critical to distribute educational interventions to a broad public audience and consider the role of varied OUD familiarity in our approach. Our study tested the effectiveness of an educational intervention for MOUD treatment preference among a sample of U.S. respondents with varying levels of opioid use, OUD exposure, and MOUD familiarity, rather than only among individuals with a history of OUD (Lam et al., 2019). Our study is also novel in its finding that brief educational videos less than five minutes long can be an effective intervention in changing preferences towards MOUD across racial demographics, particularly for those with limited experience with OUD and MOUD. The heightened effectiveness of the educational intervention for those with no prior exposure might be attributed to the effect that lived experiences can have in solidifying an individual's perspectives on OUD treatments, meaning that those with an opinion uninfluenced by prior knowledge could be more easily persuaded to choose MOUD (Gryczynski et al., 2013). These results can also be explained by a ceiling effect observed in the group of participants who reported prior non-medical opioid use due to their overwhelming preference for MOUD prior to the intervention. Our results align with studies that have demonstrated that prior experiences are influential factors in selection of OUD treatment. For example, one prior qualitative study assessed patient perceptions on buprenorphine compared to methadone as a treatment for OUD and cited patient's positive experiences with unprescribed buprenorphine as a strong indicator towards them preferring buprenorphine in a hospital setting (Gryczynski et al., 2013).

**Table 1**  
Sample characteristics, stratified by race/ethnicity.

Characteristics	White (n=194)	Black (n=173)	Latino/a (n=163)	p-value
	N (%)			
Age [mean (sd)]	45.25 (17.06)	42.32 (17.74)	44.38 (17.54)	0.186
Gender				
Male	96 (49.48%)	67 (38.73%)	90 (55.21%)	0.009**
Use of Non-medical Rx or Street Opioids	17 (8.76%)	18 (10.40%)	24 (14.72%)	0.190
Exposed to OUD	83 (42.78%)	61 (35.26%)	84 (51.53%)	0.011*
Exposure to MOUD Treatment	66 (34.02%)	46 (26.59%)	67 (41.10%)	0.019*
Opioid Familiarity Index*				
None	102 (52.58%)	98 (56.65%)	72 (44.17%)	0.029*
Low	32 (16.49%)	36 (20.81%)	24 (14.72%)	
Moderate	46 (23.71%)	28 (16.18%)	50 (30.67%)	
High	14 (7.22%)	11 (6.36%)	17 (10.43%)	

\* Sum of Participants Exposure to MOUD treatment (0=no, 1=yes), Exposure to OUD (0=no, 1=yes), and Any Non-Medical Opioid Use (0=no, 1=yes)

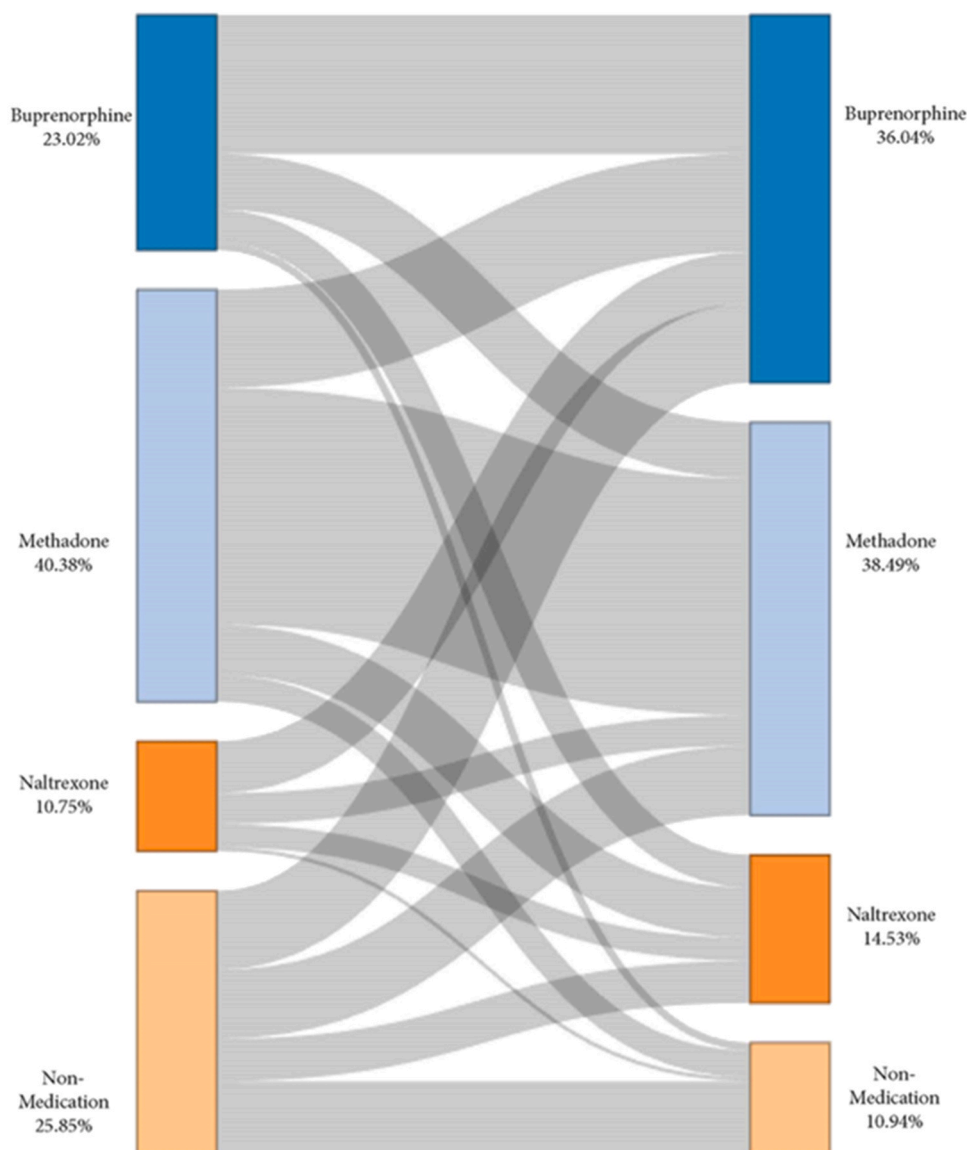


Fig. 1. Top Treatment Preference Pre- and Post- Intervention.

**Table 2**  
Paired Preference for MOUD vs. Non-Medication Treatment.

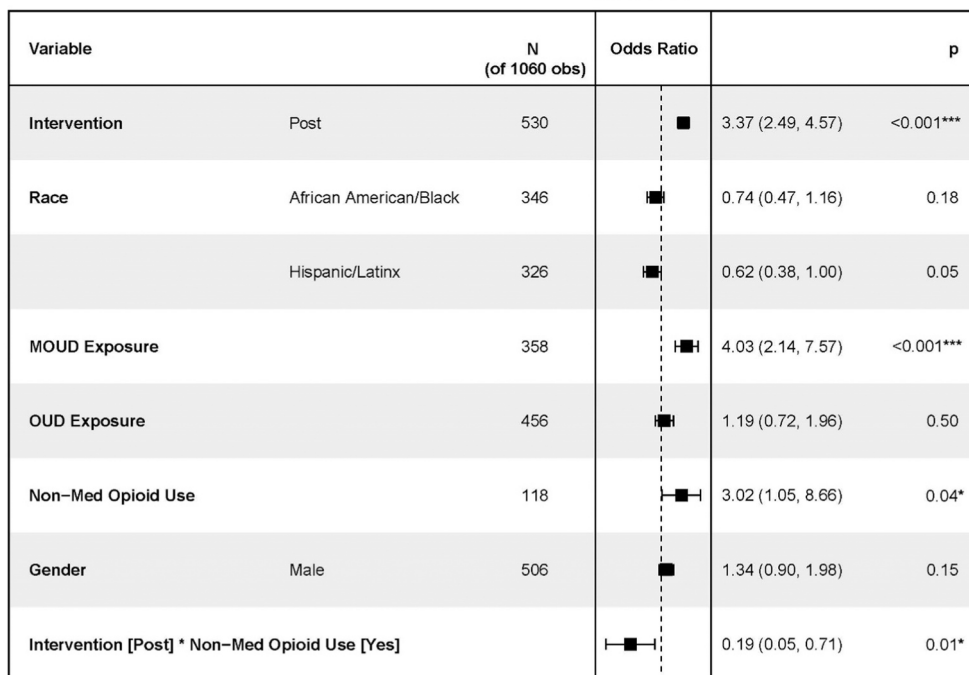
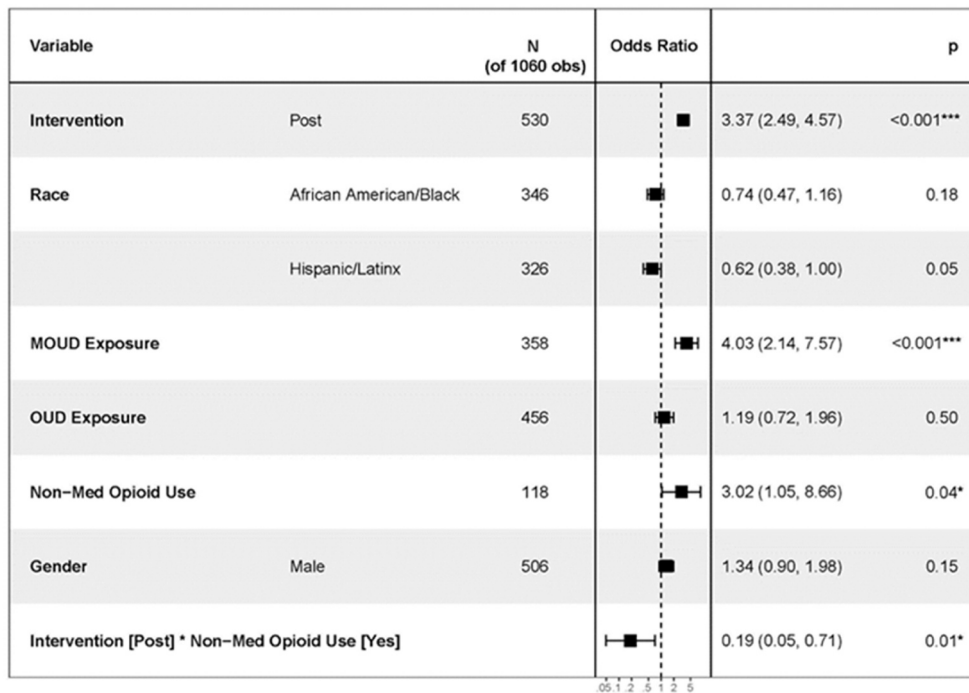
Pre-Intervention	Post-Intervention		OR	McNemar p-value
	Non-Med	*MOUD		
Non-Med	40	99	4.95	<.001***
MOUD	20	376		

\* Medications for opioid use disorder (MOUD) such as buprenorphine, naltrexone, and methadone

The effectiveness of a brief educational intervention in changing preferences towards MOUD treatment presents several possibilities to change community-wide perceptions of MOUD and increase medication treatment uptake. First, our findings in individuals who do not use opioids demonstrates the potential importance of broadening MOUD-related outreach to the social networks of those actively in treatment for OUD to align community perceptions towards evidence-based care. Second, the brief nature of this intervention highlights a potentially low-cost, high-efficacy method to conduct interventions improving knowledge around MOUD. The accessible nature of the videos presented to

participants in this study could also be scaled to commonly used resources, such as blogs, social media websites, which now commonly employ use of short videos, and general web searches, to broaden the effect of each educational intervention (Amsalem et al., 2021). The potential for a wider disruption of societal stigma surrounding MOUD could lead to better treatment outcomes for OUD in the future; numerous studies have cited the impact of social networks on MOUD use, suggesting that outreach targeting these networks would increase MOUD uptake (E Rudolph et al., 2020; Fox et al., 2014; Gyarmathy and Latkin, 2008; Kumar et al., 2020). These conclusions, along with our findings regarding significant MOUD treatment preference changes in those with low knowledge about opioids, suggest that dissemination of educational materials may be most effective when targeted towards individuals in the general public with low baseline knowledge who are motivated to learn because of a personal connection with a person who uses drugs.

This study had a few limitations. First, our analysis incorporates responses from an online survey where we do not receive information on the number of people who elect to not complete the survey limiting our ability to assess response bias. Respondents tend to be younger, more affluent, and have higher levels of digital and educational literacy



Interaction Decomposition of Intervention and Non-Med Opioid Use			
	Pre	Post	Intervention across strata
<b>No non-med opioid use</b>	N = 338/471 Estimated Prop = .72 (0.68-0.76) Conditional OR = 1.00 [ref]	N = 419/471 Estimated Prop = .89 (0.86-0.92) Conditional OR = 3.37 (2.37-4.79)	AOR = 3.37 (2.37-4.79) Estimated Prop = .14 (.11-.18)
<b>Non-med opioid use</b>	N = 55/59 Estimated Prop = .93 (0.87-0.99) Conditional OR = 3.02 (1.07-8.50)	N = 53/59 Estimated Prop = .90 (0.82-0.97) Conditional OR = 1.89 (0.79-4.50)	AOR = .63 (.17-2.30) Estimated Prop = -.05 (-.17-.08)
<b>Total</b>	N = 393/530 Estimated Prop = .74 (0.71-0.78)	N = 472/530 Estimated Prop = 0.89 (0.86-0.92)	AOR = 2.79 (2.06-3.80) Estimated Prop = .15 (.11-.19)

Fig. 2. Predictors of MOUD Selection.

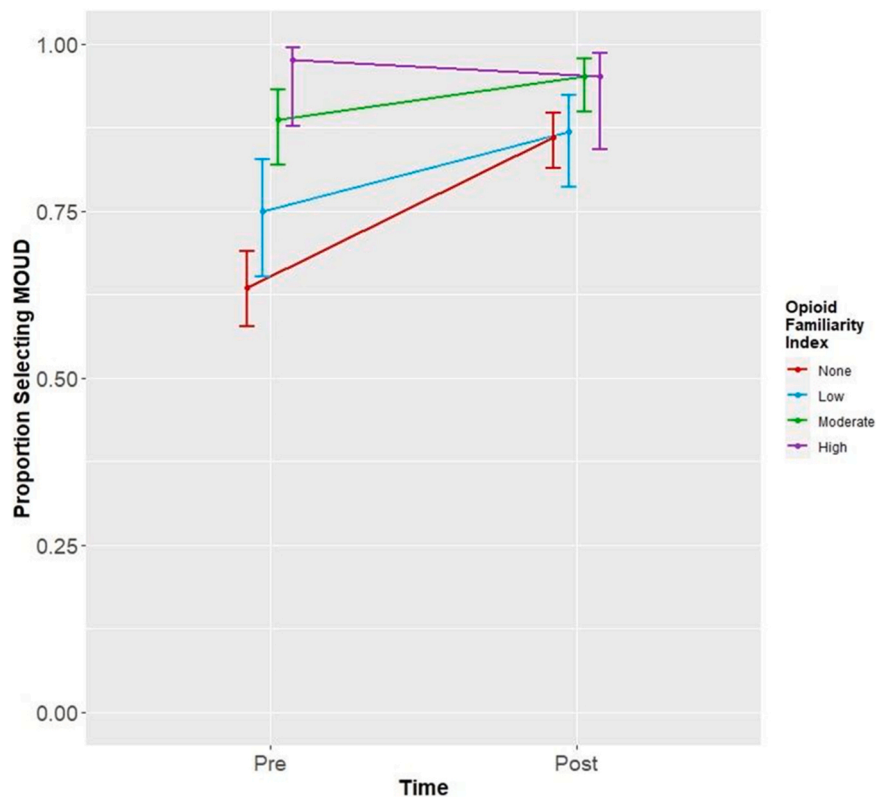


Fig. 3. Relationship Between Opioid Familiarity and Preference for MOUD Treatment Over Time.

compared to the general population (Jang and Vorderstrasse, 2019; Patten and Perrin, 2015). We found some of these characteristics to be reflected in our sample; our respondents were older, more female, and had more experience with opioid use than the general population on average (National Survey of Drug use and Health, 2020). These results align with prior studies on OUD that have similarly used online survey platforms (Huhn et al., 2017; Mellis and Bickel, 2020). Second, due to the stratified sampling design, we were unable to generate estimates representative of national population preferences. However, this stratified design did allow for stronger within and between race comparisons for MOUD preference changes. Third, the videos that were presented to respondents were brief, with limited tailoring for the race of the respondent due to resource limitations at this pilot stage. Further interventions can continue to refine and personalize the educational materials presented to respondents. While our study found that non-White individuals with varying exposure to OUD or MOUD demonstrated a non-significant preference for non-MOUD treatment, future studies that test the intervention across a wider swatch of the general public may find statistically significant results regarding racial groups' baseline preferences for MOUD. An accurate understanding of these preferences will be critical in ensuring that educational interventions are as effective as possible in increasing MOUD uptake. Fourth, our videos primarily focused on efficacy of the medications to help an individual abstain from opioid use. However, future interventions should also consider providing information around other benefits of MOUD, including reduction of overdose risk.

## 5. Conclusions

In conclusion, our study demonstrated that brief videos can be an effective way to alter preferences around MOUD in a racially diverse sample. However, future research is needed to further tailor the content of this educational intervention to different racial and cultural contexts while considering the inclusion of other information that could be

beneficial for community members, such as information around overdose and harm reduction. In addition, it will be important to start to develop different avenues of public dissemination for educational materials, particularly in settings where brief videos are commonly used such as on social networking sites or healthcare websites where people commonly turn to gather information on how to best support their loved ones with OUD. These findings may then provide better insight into the viability of the brief media-based format for altering preferences on a broader scale. This pilot study suggests that a brief educational intervention format minimally tailored to the race of the audience holds promise for altering preferences, and should be considered as a scalable component of future public stigma reduction efforts.

## Role of funding source

The study was funded by the National Institute on Drug Abuse at the US National Institutes of Health [K23 DA047475 (PL)].

## CRediT authorship contribution statement

**Adrienne Kehne:** Writing – review & editing, Supervision. **Colin Macleod:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Stephanie Slat:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Emaun Irani:** Writing – review & editing, Writing – original draft, Formal analysis. **Amy Bohnert:** Writing – review & editing, Methodology, Investigation, Formal analysis, Conceptualization. **Pooja Lagisetty:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Erin Madden:** Writing – review & editing, Writing – original draft. **Kaitlyn Jaffe:** Writing – review & editing, Writing – original draft.

## Declaration of Competing Interest

There are no conflicts or competing interests to declare.

## Acknowledgements

The authors would like to thank Katherine Grandinetti for her assistance with editing and formatting the manuscript and James Henderson for his assistance with statistical consultation.

## Contributors

The authors confirm contribution to the paper as follows: study conception and design: PL, SS, CM, AB. data collection: PL, SS, CM, AB. Author; analysis and interpretation of results: PL, EI, CM, SS, AB. Author; draft manuscript preparation: EI, PL, SS, CM, KJ, EM. All authors reviewed the results and approved the final version of the manuscript.

## References

- Amsalem, D., Markowitz, J.C., Jankowski, S.E., Yang, L.H., Valeri, L., Lieff, S.A., Neria, Y., Dixon, L.B., 2021. Sustained Effect of a Brief Video in Reducing Public Stigma Toward Individuals With Psychosis: A Randomized Controlled Trial of Young Adults. *Am. J. Psychiatry* 178, 635–642. <https://doi.org/10.1176/appi.ajp.2020.20091293>.
- Azhar, N., Chockalingam, R., Azhar, A., 2020. Medications for opioid use disorder: a guide for physicians. *Mo Med* 117, 59–64.
- Bailey, G.L., Herman, D.S., Stein, M.D., 2013. Perceived relapse risk and desire for medication assisted treatment among persons seeking inpatient opiate detoxification. *J. Subst. Abus. Treat.* 45, 302–305. <https://doi.org/10.1016/j.jsat.2013.04.002>.
- Carson, L., 2019. Stigma associated with opioid use disorders in adolescents limits naloxone prescribing. *J. Pediatr. Nurs.* 49, 92–96. <https://doi.org/10.1016/j.pedn.2019.10.005>.
- CDC, 2022. Overdose Deaths Rise, Disparities Widen [WWW Document]. *Cent. Dis. Control Prev.* URL (<https://www.cdc.gov/vitalsigns/overdose-death-disparities/ind ex.html>) (accessed 4.4.23).
- Chandler, A., Whittaker, A., Cunningham-Burley, S., Williams, N., McGorm, K., Mathews, G., 2013. Substance, structure and stigma: parents in the UK accounting for opioid substitution therapy during the antenatal and postnatal periods. *Int. J. Drug Policy* 24, e35–e42. <https://doi.org/10.1016/j.drugpo.2013.04.004>.
- Cioe, K., Biondi, B.E., Easley, R., Simard, A., Zheng, X., Springer, S.A., 2020. A systematic review of patients' and providers' perspectives of medications for treatment of opioid use disorder. *J. Subst. Abus. Treat.* 119, 108146 <https://doi.org/10.1016/j.jsat.2020.108146>.
- Committee on Medication-Assisted Treatment for Opioid Use Disorder, Board on Health Sciences Policy, Health and Medicine Division, National Academies of Sciences, Engineering, and Medicine, 2019. *Medications for Opioid Use Disorder Save Lives*. National Academies Press, Washington, D.C. (<https://doi.org/10.17226/25310>)
- Crabtree, C., Kim, J.Y., Gaddis, S.M., Holbein, J.B., Guage, C., Marx, W.W., 2023. Validated names for experimental studies on race and ethnicity. *Sci. Data* 10, 130. <https://doi.org/10.1038/s41597-023-01947-0>.
- D'Aunno, T., Park, S., (Ethan), Pollack, H.A., 2019. Evidence-based treatment for opioid use disorders: A national study of methadone dose levels, 2011–2017. *J. Subst. Abus. Treat.* 96, 18–22. <https://doi.org/10.1016/j.jsat.2018.10.006>.
- Dossett, L.A., Mott, N.M., Bredbeck, B.C., Wang, T., Jobin, C.T.C., Hughes, T.M., Hawley, S.T., Zikmund-Fisher, B.J., 2022. Using tailored messages to target overuse of low-value breast cancer care in older women. *J. Surg. Res.* 270, 503–512. <https://doi.org/10.1016/j.jss.2021.10.005>.
- Dowell, D., 2022. CDC clinical practice guideline for prescribing opioids for pain — United States, 2022. *MMWR Recomm. Rep.* 71. <https://doi.org/10.15585/mmwr.r71103a1>.
- Dydyk, A.M., Jain, N.K., Gupta, M., 2023. Opioid Use Disorder, in: StatPearls. StatPearls Publishing, Treasure Island (FL).
- Dynata, 2023. Dynata's World Class Quality. URL (<https://www.dynata.com/generate-new-data/>) (accessed 9.16.23).
- Rudolph, E., Fernau, A., Tobin, D.J., Latkin, C., K.E., 2020. Individual and social network correlates of recent treatment for substance use disorders among persons who use drugs in Baltimore, MD (2014–2017). *Drug Alcohol Depend.* 217, 108278 <https://doi.org/10.1016/j.drugalcdep.2020.108278>.
- Fox, A.D.F.M., BS, P.A.S., MPH, N.L.S.P., BA, C.M.L., MS, J.L.S.M., MS, C.O.C.M., 2014. I Heard About It from a Friend: Assessing Interest in Buprenorphine Treatment. *Subst. Abus.* 35, 74–79. <https://doi.org/10.1080/08897077.2013.804484>.
- Goedel, W.C., Shapiro, A., Cerdá, M., Tsai, J.W., Hadland, S.E., Marshall, B.D.L., 2020. Association of racial/ethnic segregation with treatment capacity for opioid use disorder in counties in the United States. e203711–e203711 *JAMA Netw. Open* 3. <https://doi.org/10.1001/jamanetworkopen.2020.3711>.
- Gryczynski, J., Jaffe, J.H., Schwartz, R.P., Dusék, K.A., Guga, N., Monroe, C.L., O'Grady, K.E., Olsen, Y.K., Mitchell, S.G., 2013. Patient perspectives on choosing buprenorphine over methadone in an urban, equal-access system: reasons for choosing buprenorphine. *Am. J. Addict.* 22, 285–291. <https://doi.org/10.1111/j.1521-0391.2012.12004.x>.
- Glanz, K., Rimer, B.K., & Viswanath, K. (Eds.). (2008). *Health behavior and health education: Theory, research, and practice* (4th ed. Chapter 9). Jossey-Bass.
- Gyarmathy, V.A., Latkin, C.A., 2008. Individual and social factors associated with participation in treatment programs for drug users. *Subst. Use Misuse* 43, 1865–1881. <https://doi.org/10.1080/10826080802293038>.
- Hansen, H., Roberts, S.K., 2012. Two tiers of biomedicalization: methadone, buprenorphine, and the racial politics of addiction treatment. In: Netherland, J. (Ed.), *Critical Perspectives on Addiction, Advances in Medical Sociology*. Emerald Group Publishing Limited, pp. 79–102. [https://doi.org/10.1108/S1057-6290\(2012\)0000014008](https://doi.org/10.1108/S1057-6290(2012)0000014008).
- Hansen, H., Siegel, C., Wanderling, J., DiRocco, D., 2016. Buprenorphine and methadone treatment for opioid dependence by income, ethnicity and race of neighborhoods in New York City. *Drug Alcohol Depend.* 164, 14–21. <https://doi.org/10.1016/j.drugalcdep.2016.03.028>.
- Hansen, H.B., Siegel, C.E., Case, B.G., Bertollo, D.N., DiRocco, D., Galanter, M., 2013. Variation in use of buprenorphine and methadone treatment by racial, ethnic, and income characteristics of residential social areas in New York City. *J. Behav. Health Serv. Res.* 40, 367–377. <https://doi.org/10.1007/s11414-013-9341-3>.
- Huhn, A.S., Tompkins, D.A., Dunn, K.E., 2017. The relationship between treatment accessibility and preference amongst out-of-treatment individuals who engage in non-medical prescription opioid use. *Drug Alcohol Depend.* 180, 279–285. <https://doi.org/10.1016/j.drugalcdep.2017.08.019>.
- Husain, J.M., Cromartie, D., Fitzelle-Jones, E., Brochier, A., Borba, C.P.C., Montalvo, C., 2023. A qualitative analysis of barriers to opioid agonist treatment for racial/ethnic minoritized populations. *J. Subst. Abus. Treat.* 144, 108918 <https://doi.org/10.1016/j.jsat.2022.108918>.
- Jang, M., Vorderstrasse, A., 2019. Socioeconomic status and racial or ethnic differences in participation: web-based survey. *JMIR Res. Protoc.* 8, e11865 <https://doi.org/10.2196/11865>.
- Kenney, S.R., Anderson, B.J., Bailey, G.L., Stein, M.D., 2018. Buprenorphine treatment formulations: Preferences among persons in opioid withdrawal management. *J. Subst. Abus. Treat.* 94, 55–59. <https://doi.org/10.1016/j.jsat.2018.08.011>.
- Kumar, N., Oles, W., Howell, B.A., Janmohamed, K., Lee, S.T., Funaro, M.C., O'Connor, P.G., Alexander, M., 2020. The role of social network support in treatment outcomes for medication for opioid use disorder: a systematic review. 2020.07.18.20156950 medRxiv. <https://doi.org/10.1101/2020.07.18.20156950>.
- Lagisetty, P.A., Ross, R., Bohnert, A., Clay, M., Maust, D.T., 2019. Buprenorphine Treatment Divide by Race/Ethnicity and Payment. *JAMA Psychiatry* 76, 979–981. <https://doi.org/10.1001/jamapsychiatry.2019.0876>.
- Lam, J.A., Lee, H.I.S., Truong, A.Q., Macmadi, A., Clarke, J.G., Rich, J., Brockmann, B., 2019. Brief video intervention to improve attitudes throughout medications for opioid use disorder in a correctional setting. *J. Subst. Abus. Treat.* 104, 28–33. <https://doi.org/10.1016/j.jsat.2019.06.001>.
- Lapham, G., Boudreau, D.M., Johnson, E.A., Bobb, J.F., Matthews, A.G., McCormack, J., Liu, D., Samet, J.H., Saxon, A.J., Campbell, C.I., Glass, J.E., Rossom, R.C., Murphy, M.T., Binswanger, I.A., Yarbrough, B.J.H., Bradley, K.A., Ahmedani, B., Amoroso, P.J., Arnsten, J.H., Bart, G., Braciszewski, J.M., Cunningham, C.O., Hechter, R.C., Horigian, V.E., Liebschutz, J.M., Loree, A.M., Matson, T.E., McNeely, J., Merrill, J.O., Northrup, T.F., Schwartz, R.P., Stotts, A.L., Szapocznik, J., Thakral, M., Tsui, J.I., Zare, M., 2020. Prevalence and treatment of opioid use disorders among primary care patients in six health systems. *Drug Alcohol Depend.* 207, 107732 <https://doi.org/10.1016/j.drugalcdep.2019.107732>.
- Louie, D.L., Assefa, M.T., McGovern, M.P., 2019. Attitudes of primary care physicians toward prescribing buprenorphine: a narrative review. *BMC Fam. Pr.* 20. <https://doi.org/10.1186/s12875-019-1047-z>.
- Madden, E.F., Prevedel, S., Light, T., Sulzer, S.H., 2021. Intervention Stigma toward Medications for Opioid Use Disorder: A Systematic Review. *Subst. Use Misuse* 56, 2181–2201. <https://doi.org/10.1080/10826084.2021.1975749>.
- Majer, J.M., Beasley, C., Stecker, E., Bobak, T.J., Norris, J., Nguyen, H.M., Ogata, M., Siegel, J., Isler, B., Wiedbusch, E., Jason, L.A., 2018. Oxford House Residents' Attitudes Toward Medication Assisted Treatment Use in Fellow Residents. *Community Ment. Health J.* 54, 571–577. <https://doi.org/10.1007/s10597-017-0218-4>.
- Makhmud, A., Thornicroft, G., Gronholm, P.C., 2022. Indirect social contact interventions to reduce mental health-related stigma in low- and middle-income countries: systematic review. *Epidemiol. Psychiatr. Sci.* 31, e79 <https://doi.org/10.1017/S2045796022000622>.
- McCraden, M.D., Vasileva, D., Orchanian-Cheff, A., Buchman, D.Z., 2019. Ambiguous identities of drugs and people: A scoping review of opioid-related stigma. *Int. J. Drug Policy* 74, 205–215. <https://doi.org/10.1016/j.drugpo.2019.10.005>.
- Mellis, A.M., Bickel, W.K., 2020. Mechanical Turk Data Collection in Addiction Research: Utility, Concerns and Best Practices. *Addict. Abingdon Engl.* 115, 1960–1968. <https://doi.org/10.1111/add.15032>.
- Mutz, D.C., 2015. Chapter Four. Vignette Treatments. In *Population-Based Survey Experiments*. Princeton University Press, pp. 54–67. <https://doi.org/10.1515/9781400840489-006>.
- National Survey of Drug Use and Health (NSDUH) Releases | CBHSA Data [WWW Document], 2020. URL (<https://www.samhsa.gov/data/release/2020-national-survey-drug-use-and-health-nsduh-releases>) (accessed 3.20.22).
- Nayak, S.M., Huhn, A.S., Bergeria, C.L., Strain, E.C., Dunn, K.E., 2021. Familial perceptions of appropriate treatment types and goals for a family member who has opioid use disorder. *Drug Alcohol Depend.* 221, 108649 <https://doi.org/10.1016/j.drugalcdep.2021.108649>.



- National Institute on Drug Abuse (NIDA) | Treatment [Highlights], 2023. URL (<https://nida.nih.gov/research-topics/treatment>) (accessed 4.10.2023).
- Opioid overdose, 2024. World Health Organization. URL (<https://www.who.int/news-room/fact-sheets/detail/opioid-overdose>) (accessed 3.31.24).
- Patten, E., Perrin, A., 2015. Who's left out in a Web-only survey and how it affects results. *Pew Res. Cent.* URL (<https://www.pewresearch.org/fact-tank/2015/09/22/who-s-left-out-in-a-web-only-survey-and-how-it-affects-results/>) (accessed 4.5.23).
- Payte, J.T., 1991. A brief history of methadone in the treatment of opioid dependence: a personal perspective. *J. Psychoact. Drugs* 23, 103–107. <https://doi.org/10.1080/02791072.1991.10472226>.
- Rao, D., Elshafei, A., Nguyen, M., Hatzenbuehler, M.L., Frey, S., Go, V.F., 2019. A systematic review of multi-level stigma interventions: state of the science and future directions. *BMC Med* 17, 41. <https://doi.org/10.1186/s12916-018-1244-y>.
- R Core Team, 2021. R: A language and environment for statistical computing.
- Scherer, A.M., Parker, A.M., Gidengil, C.A., Gedlinske, A.M., Askelson, N.M., Petersen, C. A., Lindley, M.C., 2022. COVID-19 Vaccine Uptake and Intentions Following US Food and Drug Administration Approval of the Pfizer-BioNTech COVID-19 Vaccine. *JAMA Intern. Med.* 182, 678–680. <https://doi.org/10.1001/jamainternmed.2022.0761>.
- Schiff, D.M., Nielsen, T., Hoepfner, B.B., Terplan, M., Hansen, H., Bernson, D., Diop, H., Bharel, M., Krans, E.E., Selk, S., Kelly, J.F., Wilens, T.E., Taveras, E.M., 2020. Assessment of Racial and Ethnic Disparities in the Use of Medication to Treat Opioid Use Disorder Among Pregnant Women in Massachusetts. e205734–e205734 *JAMA Netw. Open* 3. <https://doi.org/10.1001/jamanetworkopen.2020.5734>.
- Schwartz, R.P., Kelly, S.M., O'Grady, K.E., Mitchell, S.G., Peterson, J.A., Reisinger, H.S., Agar, M.H., Brown, B.S., 2008. Attitudes Toward Buprenorphine and Methadone Among Opioid-Dependent Individuals. *Am. J. Addict.* 17, 396–401. <https://doi.org/10.1080/10550490802268835>.
- Smith, C.B.R., 2010. Socio-spatial stigmatization and the contested space of addiction treatment: Remapping strategies of opposition to the disorder of drugs. *Soc. Sci. Med.* 70, 859–866. <https://doi.org/10.1016/j.socscimed.2009.10.033>.
- Stahler, G.J., Mennis, J., Baron, D.A., 2021. Racial/ethnic disparities in the use of medications for opioid use disorder (MOUD) and their effects on residential drug treatment outcomes in the US. *Drug Alcohol Depend.* 226, 108849 <https://doi.org/10.1016/j.drugalcdep.2021.108849>.
- SAMHSA, 2018. TIP 63: Medications for Opioid Use Disorder. URL (<https://store.samhsa.gov/product/tip-63-medications-opioid-use-disorder/pep21-02-01-002>). (accessed 4.10.2024).
- Thornicroft, G., Mehta, N., Clement, S., Evans-Lacko, S., Doherty, M., Rose, D., Koschorke, M., Shidhaye, R., O'Reilly, C., Henderson, C., 2016. Evidence for effective interventions to reduce mental-health-related stigma and discrimination. *Lancet* 387, 1123–1132. [https://doi.org/10.1016/S0140-6736\(15\)00298-6](https://doi.org/10.1016/S0140-6736(15)00298-6). London, England.
- Woo, J., Bhalerao, A., Bawor, M., Bhatt, M., Dennis, B., Mouravska, N., Zielinski, L., Samaan, Z., 2017. "Don't judge a book by its cover": a qualitative study of methadone patients' experiences of stigma. 1178221816685087 *Subst. Abus.* 11. <https://doi.org/10.1177/1178221816685087>.