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Gender disparities in access and retention in outpatient methadone treatment for opioid use disorder in low-income urban communities

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ABSTRACT

The purpose of this study was to detect and understand gender disparities in access and retention among outpatient methadone treatment programs located in low-income urban communities in Los Angeles, California. The study collected client- and program-level data in 4 waves in 2011, 2013, 2015, and 2017 from 34 publicly funded methadone treatment programs serving 11,169 clients with opioid use disorder (OUD). The sample included 29.8% female and 70.2% male clients, where 10.6% identified as Black or African American, 41.5% as Latino, 44.2% as non-Latino white, and 3.8% as Other. We conducted two multilevel negative binomial regression models to examine direct and moderated relationships related to both access (days on the waitlist) and retention (days in treatment) while accounting for clients clustered within programs. Gender disparities existed in both access and retention where women spent more time than men waiting to enter treatment but then remained in treatment longer. Further, female clients identifying as African American, Latino, and Other were at greater risk for shorter treatment duration than those who identified as non-Latino white and men. Overall, OUD clients receiving methadone treatment in low-income neighborhoods experienced barriers to access and retention in treatment associated with mental illness, family responsibilities, and use severity. OUD clients with MediCal insurance eligibility were consistently more likely to gain access to and remain in methadone treatment. Overall, findings call for improving treatment access and retention for women with OUD who receive methadone in outpatient methadone treatment programs through comprehensive, gender-specific, and evidence-based programming.

1. Background

The opioid epidemic has had a devastating impact on individuals, families, and communities in the United States. The disproportionate impact of the epidemic on women and racial/ethnic minorities in low-income communities has accelerated calls for comprehensive, evidence-based approaches to address gender disparities for clients with opioid use disorder (OUD), which includes heroin and opioid analgesics (DHHS Office on Women's Health HHS OWH, 2017). Deaths from opioid analgesics increased 5.0 times between 1999 and 2010 for women and 3.6 times for men (CDC, MMWR, 2013). While more men die from opioid use–related drug overdoses, women's overall opioid use overdose death rates have increased faster than men's (CDC, MMWR, 2013; CDC, MMWR, 2019). Women also are increasing their use of heroin at a faster rate than men and decreasing their use of opioid analgesics at a slower rate (Marsh et al., 2018).

The standard of care for OUD is comprehensive treatment that includes medication for OUD (MOUD) integrated with additional services, such as behavioral counseling, case management, and peer support (Madras et al., 2020; NASEM, 2019). Additionally, research has recommended culturally competent treatment tailored to meet the diverse needs of special populations such as women and racial/ethnic minorities (Barbosa-Leiker et al., 2020; Krawczyk et al., 2017; Madras et al., 2020). Mounting research suggests that substance use disorder (SUD) treatment programs with a higher degree of cultural competence are associated with improved access and longer retention among Latino and African

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Americans (Guerrero, 2013; Guerrero & Andrews, 2011). This competence generally includes organizational arrangements and service practices that include provider knowledge of and involvement in minority communities, staff diversity, and policies and practices that are culturally responsive (e.g., Latino staff offering Spanish speaking services covered by public health insurance during late evenings to accommodate clients' primary language, culture, insurance coverage, and work schedules). Altogether, these culturally competent practices are considered quality of care factors that may improve minority client treatment engagement.

The specific medications available to treat OUD include methadone, buprenorphine, and extended-release naltrexone. While studies have shown that these medications reduce the use of opioids and increase engagement in treatment (Friedmann & Schwartz, 2012; Hser et al., 2014), emerging research has examined the impact of specific medications alone or in combination with behavioral health or other treatments (Madras et al., 2020). For example, Haddad et al. (2013) found a positive association between buprenorphine maintenance treatment (BMT), alone or in combination with behavioral health counseling, to be positively related to retention. A number of studies have shown methadone is related to better retention rates than is buprenorphine (Hser et al., 2014; Mattick et al., 2008), although results vary among treatment settings (Soyka & Hillemacher, 2013).

Studies also have examined the impact of specific medications on gender disparities in treatment retention. A systematic review indicated either no difference in retention between women and men receiving MOUD or mixed results (Ling et al., 2019). Hser et al. (2014), found differential outcomes for women and men receiving different medications. Women receiving buprenorphine/naloxone maintenance were significantly *less* likely to be retained in treatment while women receiving methadone maintenance were *more* likely to be retained compared to men ($p < 0.01$).

Studies of gender disparities in access and retention in SUD treatment can inform our examination of gender disparities in OUD. Evidence shows women have less access to SUD treatment than do men (Cao et al., 2011; Greenfield et al., 2007; Guerrero, Marsh, et al., 2014; Marsh et al., 2004; NIDA, 2020). In particular, gender-specific predictors of treatment access in culturally diverse communities include individual factors such as race/ethnicity, pregnancy status, mental health problems, and family responsibilities (Grella et al., 2000; Grella et al., 2009; Marsh et al., 2009) as well as program factors, such as acceptance of public insurance and receipt of culturally competent services (McCaughrin & Howard, 1996; Guerrero et al., 2013). Overall, analyses of gender differences in retention in SUD treatment do not point to large differences in treatment retention. Some of the larger studies in SUD show that once women enter treatment, they spend as much time in treatment as do men and derive comparable benefits from it (Greenfield et al., 2007; Marsh et al., 2004). However, there is limited evidence of the drivers of access and retention in OUD treatment, particularly for low-income and minority women.

The purpose of this paper is to examine gender differences in MOUD treatment programs, specifically, in outpatient methadone treatment access and retention in low-income communities. This examination is designed to inform the development of initiatives for improving OUD treatment for underserved groups, especially women in low-income communities. The study draws from a conceptual framework that identifies three stages in disparities research: (a) detect health care disparities in a vulnerable population; (b) understand client risk and program capacity factors; and (c) reduce disparities through provision of comprehensive services by high capacity programs (Kilbourne et al., 2006). The application of this framework for *detecting* gender disparities suggests that women entering treatment with individual and sociocultural characteristics different from those of men will face greater barriers to initiate and remain in treatment. The *understanding* phase of the framework is informed by (a) individual factors, such as race/ethnicity, mental health problems, drug use severity, education/employment, family responsibilities, and insurance eligibility, as well as (b) programmatic factors, such as provision of culturally competent services that may differentially affect the vulnerable group. Treatment disparities persist partly because women and members of racial and ethnic minority groups may be exposed to a health care system with structural racism (Bailey et al., 2017) and providers' implicit bias about the health care needs of minority communities (Marcelin et al., 2019; Matsuzaka & Knapp, 2020).

The purpose of the study derives from this framework. We seek (1) to detect gender disparities in OUD treatment access and retention; (2) to understand factors associated with OUD treatment access and retention for women and men with OUD in low-income communities; and (3) to use study findings to identify interventions likely to reduce disparities in OUD treatment access and retention.

2. Methods

2.1. Research design, sample, and data

This is a multi-year cross-sectional study of publicly funded MOUD programs, specifically outpatient methadone treatment programs, serving clients with OUD in Los Angeles County, California. Methadone treatment programs are MOUD treatment programs providing methadone to their clients. Clients with OUD were individuals *who specified heroin or opioid analgesics as their primary or secondary drug* on the treatment intake form. There were 67 MOUD treatment programs serving clients with OUD in Los Angeles County. Of the 67 MOUD treatment programs, 34 (51%) provided methadone, 16 (24%) provided buprenorphine, and 28 (42%) provided other medications that may have been prescribed to alleviate symptoms of withdrawal (some programs offered more than one medication.) Although 24% of programs in this sample described themselves as providing buprenorphine, providers prescribed it for very few individuals in the sample. Because 99% of clients in these MOUD treatment programs were prescribed methadone as a medication for OUD, we restricted our analytic sample to 11,169 clients who were prescribed methadone. In this paper, we refer to these programs as either *MOUD* (*methadone*) or simply *methadone treatment programs*. This sample of 11,169 clients episodes included 29.8% female and 70.2% male clients; 10.8% who identified as Black or African American, 39.4% as Latino, 45.9% as non-Latino white, and 3.8% as Other.

The study collected client- and program-level data for the entire dataset in 4 waves: 2011 (12 programs, 490 client episodes), 2013 (25 programs, 3151 client episodes), 2015 (29 programs, 4043 client episodes), and 2017 (30 programs, 3485 client episodes).The multi-year client and program data derived from LACPRS as well as from the Integrated Substance Abuse Treatment to Eliminate Disparities (iSATed) Program Survey, a telephone survey, administered in the years specified. The response rate for the program survey averaged 90% across the four waves.

2.2. Measures

Intake counselors collected client-level data as part of LACPRS during personal interviews at program admission and discharge. Counselors collected information on individual characteristics, such as demographic characteristics (e.g., age, gender, race/ethnicity), education and employment, psychosocial characteristics (e.g., mental illness and family structure), housing status, referral source (whether treatment was court-mandated), and measures of severity such as age started using primary drug, days using primary drug in last 30 days. The study collected program-level data through a telephone survey completed by program directors and treatment staff that addressed programmatic characteristics, such as domains of organizational leadership, climate and cultural competence, and Medicaid payment acceptance. Methods are fully described elsewhere.

2.2.1. Dependent variables

The first dependent variable in this study was *access*, defined as number of days that clients were on the waiting list before being admitted to the treatment program. Intake counselors asked clients, "How many days were you on the waiting list before you were admitted to the treatment program?" The second variable was *retention*, defined as number of days clients were in treatment (i.e., days from treatment entry to treatment exit). Staff collected dates of treatment entry and exit as part of the intake and discharge process. These outcome measures have been used in several studies across datasets, time periods, and treatment systems (Guerrero, 2013; Guerrero, Aarons, et al., 2014; Guerrero et al., 2015; Guerrero & Andrews, 2011).

2.2.2. Independent variable

The study measured the independent variable, *gender*, as a dichotomous variable (1 = female; 0 = male). To assess gender-race intersectionality, the study also examined the variable of *race/ethnicity-specific gender* (the interaction terms for African American*female, Latino*female, and Other*female) with non-Latino white and male serving as the reference categories.

2.2.3. Explanatory variables

Additionally, we adjusted for several covariates that have a documented association with access and retention and may potentially confound the relation between gender and access and retention. *Year* reflected wave of data collection, i.e., whether data were collected in 2011, 2013, 2015, and 2017. The study controlled wave in the analyses by including a dummy variable for each of the waves except for wave 1, the reference category. Client demographics *race/ethnicity* (*race* includes individuals who identify as non-Latino white, African American, and Other; *ethnicity* includes individuals who identify as Latino; non-Latino white served as reference category). Respondents in the Other race category (3.8% of the sample) identified as American Indian, Asian, and mixed race. Consistent with other research approaches, we coded individuals identified as Latino as a primary category regardless of whether the same client also reported a race category. We coded white, African American, and Other when the client identified as any race category and did not identify as Latino. The Other category represents clients who did not identify as white, African American, and/or Latino.

Client respondents also reported other demographic and psychosocial characteristics, including client *age* (coded as a continuous variable), *education* (years in school), *employed* (unemployed = 0, employed = 1); *homeless* (coded no = 0, yes =1 when intake counselor assessed "Is this person homeless?"); *mental illness* (coded no =0, yes = 1), when client reported "Have you ever been diagnosed with a mental illness?"; *age started using primary drug* (years); *days using primary drug* (number of days of primary substance use during 30 days prior to admission); *court-mandated referral* (no = 0, yes = 1); *number of children under 18 living at home or not*; *MediCal* (*Medicaid program in California*) *insurance eligible* (no = 0, yes =1); and *number of prior SUD treatment episodes* (number of prior episodes in any alcohol or drug treatment/recovery program in which the client participated).

The iSATed program survey asked program supervisors to describe characteristics of their programs. This study measured *cultural competence* through 57 survey items assessing supervisors' responses to (1) their program staff's knowledge of racial and ethnic minority community needs; (2) development of resources and linkages to serve racial and ethnic minorities; (3) use of outreach to racial and ethnic minority communities; (4) hiring and retention of staff members from racial and ethnic minority backgrounds; and (5) development of policies and procedures to effectively respond to the service needs of racial and ethnic minority patients. We rated items on a 4-point Likert scale (1 = not at all to 4 = often). The study calculated a total score for each program that ranged from 10 to 40. Cronbach's α coefficients on these items ranged from 0.72 to 0.98. This measure of degree of cultural competence has been used in other studies (Guerrero, 2013; Guerrero et al., 2019; Guerrero & Kim, 2013) and those studies have shown it to be associated with access and retention in SUD treatment.

2.3. Data analysis

Drawing from the Kilbourne et al. (2006) framework, to *detect* gender disparities, we conducted descriptive analyses of demographic and service factors to assess statistical differences between women and men. We used inferential statistics, including negative binomial analysis to evaluate factors related to OUD treatment access and retention.

To *understand* gender disparities, we examined the relationship of gender and other covariates with trends in access and retention. We conducted multilevel negative binomial regression using the following formula:

$$log(E(Y)) = \beta_0 + \beta_1 * gender + \beta_2 * year + X\mathrm{B}$$

where Y refers to the dependent variable *access* and *retention* in days, X denotes the vector of covariates, and B is the coefficient vector for the covariates. The multilevel data structure, i.e., client-program, is accounted for by considering clients in the same program in the same year as a cluster. We incorporate correlation among those clients when calculating the standard errors of coefficient estimates. For both access and retention, we report incidence rate ratios (IRRs). As is common for these outcome measures, such as these collected through administrative data, both distributions were skewed to the right. We addressed this skewness through the use of binomial regression models that account for over dispersion.

To *understand* gender disparities as they intersect with race/ethnicity, we conducted moderated analysis. This analysis relied on the modification of the formula

$$log(E(Y)) = \beta_0 + \beta_1 * gender + \beta_2 * year + \gamma * gender * race + X\mathrm{B}$$

3. Results

3.1. Detecting gender disparities in sample characteristics

The descriptive analysis by gender in Table 1 shows that female clients compared with male clients spent more days waiting to enter treatment but then remained longer in treatment, although these disparities in access and retention were not statistically significant. A larger percentage of female clients in the sample identified as white, African American, or Other, while a larger percentage of males in the sample identified as Latino. The *year* variable shows the proportion of women versus men in the sample did not change over time (2011–2017).

In terms of client-level characteristics, women in this sample were statistically more likely to be younger (41.7 years versus 43.7 years, $p < 0.001$) and to have slightly more years of education (11.6 versus 11.3 years $p < 0.001$). Female clients compared to male clients were statistically less likely to be employed (14.2% versus 22.5%, $p < 0.001$), but statistically more likely to report ever being diagnosed with a mental illness (28.9% versus 15.3%, $p < 0.001$) and to have children under the age of 18 living with them (0.4 children for females versus 0.3 children for males, $p < 0.001$).

Female clients compared to male clients started using their primary drug at an older age (23.3 years versus 22.4 years, $p < 0.001$) and used the primary drug in the last 30 or fewer days (23.3 days versus 24.5 days, $p < 0.001$). Females were more likely to be MediCal eligible (67.4% versus 60.3%, $p < 0.001$). There were no statistically significant differences in degree of cultural competence in programs serving women compared to men.

3.2. Understanding gender disparities by examining factors associated with OUD treatment access and retention

To examine factors associated with access (days on waiting list) and

Table 1
Comparative analysis by gender for methadone users only.

	Female ($N = 3325$)	Male ($N = 7844$)
	Mean (SD) or count (%)	Mean (SD) or count (%)
Client characteristics		
Access (days)	0.3 (4.1)	0.2 (3.0)
Treatment duration (days)	53.5 (80.5)	51.3 (76.4)
Year		
2011	160 (4.8%)	330 (4.2%)
2013	899 (27.0%)	2252 (28.7%)
2015	1200 (36.1%)	2843 (36.2%)
2017	1066 (32.1%)	2419 (30.8%)
Age***	41.7 (12.8)	43.7 (13.5)
Race***		
White	1664 (50.2%)	3241 (41.6%)
Black	379 (11.4%)	793 (10.2%)
Latino	1131 (34.1%)	3483 (44.7%)
Other	141 (4.3%)	278 (3.6%)
Education (years)***	11.6 (2.8)	11.3 (2.9)
Employed***	486 (14.6%)	1761 (22.5%)
Homeless	421 (12.7%)	1026 (13.1%)
Mental health issues***	960 (28.9%)	1234 (15.3%)
# Children under 18***	0.4 (0.9)	0.3 (0.8)
Age using primary drug***	23.9 (9.3)	22.4 (8.4)
Days using primary drug***	23.3 (11.3)	24.5 (10.3)
Court mandated referral	6 (0.2%)	18 (0.2%)
Medical eligible***	2240 (67.4%)	4731 (60.3%)
# prior episodes	2.6 (4.0)	2.7 (4.5)
Program characteristics		
Degree of culture competence*,***	23.8 (3.9)	24.0 (3.9)

SD: standard deviation.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

retention (days in treatment) in methadone treatment in low-income communities, we compared the incidence rates of access and retention for women and men using negative binomial models (Table 2). We examined client-level covariates of demographic and sociocultural factors, including age, race/ethnicity, education, employment, homelessness, mental illness, drug use severity (including age started using primary drug, days using primary drug in 30 days prior to treatment entry), court-mandated treatment referral, MediCal insurance eligibility, number of prior treatment episodes, and program characteristics of cultural competence for both access and retention.

For access, we found a marginally statistically significant gender difference. Women compared with men were likely to spend more days on the waitlist to enter outpatient methadone treatment (IRR = 1.795, $p < 0.091$). Clients identifying their race as African American compared to whites spent more time on the wait list (IRR = 1.761), while clients identifying as Latino and Other were likely to spend less time on the waitlist (IRR = 0.628 and IRR = 0.209). Further, when we examined the interaction of race/ethnicity by gender, only female clients who identified as Other were more likely to experience longer wait times compared to those who identified as white men (IRR = 5.956, $p < 0.067$).

OUD clients more likely to spend days on the waitlist also had the following characteristics, often considered barriers to treatment access: mental illness (IRR = 2.193, $p < 0.01$), more days using in the 30 days prior to treatment entry (IRR = 1.045, $p < 0.001$), and more children under 18 (IRR = 1.686, $p < 0.001$). Clients with fewer days on the waitlist were more likely to be eligible for MediCal public insurance (IRR = 0.153, $p < 0.001$). Clients who received treatment in programs with a higher degree of culturally competent services were more likely to experience slightly longer wait times (IRR = 1.135), with marginal statistical significance ($p < 0.066$).

Compared to all male clients, female clients were significantly more likely to stay in OUD treatment (IRR = 1.227, $p < 0.01$). Further, when we examined the interaction of race/ethnicity by gender, we found that females who identified as Latino or as Other were less likely to stay in OUD treatment compared to those who identified as white and men (IRR = 0.715, $p < 0.01$ and IRR = 0.628, $p < 0.05$). As indicated by the *year* variable, retention also decreased over time (IRR = 0.792, $p < 0.001$). In addition, clients who reported using opioids at an earlier age and those reporting more days of opioid use in the 30 days prior to treatment entry stayed in treatment for fewer days (IRR = 0.988, $p < 0.01$ and IRR = 0.978, $p < 0.001$). Finally, clients who were eligible for MediCal were more likely to stay longer in MOUD (methadone) treatment (IRR = 1.365, $p < 0.01$).

Table 2
Negative binomial models for access and retention for methadone users only.

	Access		Retention	
	IRR	95% CI	IRR	95% CI
Client characteristics				
Female	1.795	0.911, 3.536	1.227**	1.076, 1.398
Year	1.363	0.696, 2.667	0.792***	0.700, 0.895
Age	1.018	0.986, 1.050	1.009***	1.004, 1.014
Race[a]				
African American	1.761	0.661, 4.687	1.167	0.964, 1.412
Latino	0.628	0.336, 1.175	1.033	0.891, 1.197
Other	0.209	0.043, 1.022	1.416*	1.073, 1.868
Interactions				
African American*female	0.889	0.237, 3.336	0.881	0.733, 1.058
Latino*female	0.875	0.213, 3.594	0.715**	0.565, 0.906
Other*female	5.956	0.880, 40.303	0.628*	0.410, 0.963
Education (years)	1.021	0.942, 1.106	1.005	0.983, 1.026
Employed	0.955	0.575, 1.587	1.075	0.930, 1.243
Homeless	1.249	0.705, 2.214	0.848	0.710, 1.012
Mental health issues	2.193**	1.333, 3.609	0.962	0.820, 1.129
Age using primary drug	0.978	0.940, 1.016	0.988**	0.980, 0.996
Days using primary drug	1.045***	1.018, 1.073	0.978***	0.970, 0.986
Court mandated referral	1.847	0.084, 40.496	2.258	0.855, 5.961
# Children under 18	1.686***	1.304, 2.178	0.991	0.931, 1.055
MediCal eligible	0.153***	0.060, 0.390	1.365**	1.085, 1.717
# prior episodes	1.023	0.916, 1.141	0.985	0.952, 1.019
Program characteristics				
Degree of cultural competence	1.135	0.992, 1.299	0.999	0.962, 1.038
Log Alpha	4.734	3.952, 5.516	0.381	0.338, 0.425
# observations (treatment episodes)	7270		4606	

[a] White as reference; IRR: incidence rate ratio; CI: confidence interval.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

4. Discussion

Findings from the study provide evidence that (1) detects gender

disparities in access and retention among clients with OUD receiving MOUD (methadone) treatment; (2) seeks to understand factors contributing to these disparities. In this study, we detected gender disparities in access and retention among females and disparities in retention among females identified as African American, Latino, and Other. Overall, clients in a methadone treatment program in low-income neighborhoods were more likely to experience barriers to access associated with mental illness, family responsibilities, and severity of use. Clients in methadone treatment with a greater severity measure were less likely to remain in treatment. Finally, clients with MediCal eligibility were more likely to gain access to treatment and to remain in treatment.

The findings related to access and retention for women in MOUD (methadone) treatment are consistent with findings in the SUD treatment literature, which show that women wait longer to get into treatment (Cao et al., 2011; Guerrero, Aarons, et al., 2014; NIDA, 2020) but once there they spend as much or more time as do men (Grella et al., 2000; Grella et al., 2009; Marsh et al., 2009). Further, barriers and facilitators to access and retention for women in OUD treatment were similar to those found in research on SUD treatment (Greenfield et al., 2007; Marsh et al., 2004). Comparable to the findings in this study, gender-specific barriers to SUD treatment access include how women are treated due to their race/ethnicity, substance use severity, mental illness, and family responsibilities. Similarly, insurance eligibility is a consistent facilitator of both access and retention both in the study as well as in SUD treatment (Guerrero, 2013; Guerrero et al., 2015).

What do we learn from this study about the third step in the model, i.e., identifying gender-specific elements that could be included in interventions to reduce the disparities that have been documented in MOUD (methadone) treatment for OUD? First, we know the standard of care for OUD treatment, for women and men, is comprehensive services that include MOUD integrated with additional culturally competent services. In this study, we have identified the specific needs of women and minority women that could be addressed in gender-specific interventions. For example, evidence suggests that interventions that integrate opioid disorder care with mental health care would address consistent findings of co-occurring mental health issues or psychiatric co-morbidities and could improve access for women in MOUD (methadone) treatment. Additionally, access interventions that incorporate child care and other family supports would address consistent findings that family responsibilities and need to care for children are serious barriers to access and retention for women. While research has documented and recommended for some time the need for comprehensive, gender-specific intervention elements such as these (Marsh et al., 2004; Terplan et al., 2015), such interventions are infrequently incorporated into treatment design and programming. Indeed, a recent analysis of gender-specific services in SUD treatment indicates that the need for these types of services remains great while the provision may be on the decline (Terplan et al., 2015).

Research also recommends provision of culturally competent services as the standard of care for OUD, and these services have been associated in other studies with improved access and higher retention among Latino and African Americans (Guerrero, 2013; Guerrero & Andrews, 2011). In contrast to the extant literature, this study found that in methadone treatment programs in low-income urban neighborhoods, clients waited longer to gain access to programs providing culturally competent services. High demand for methadone treatment programs providing culturally competent services to this sample of clients—where more than 50% are African American, Latino, or Other—may account for longer times spent on waitlists. Structural and interpersonal racism (or implicit bias) among health care providers may also serve as barriers to access and retention in services (Bailey et al., 2017; Marcelin et al., 2019). Low-income, urban, and minority clients face significant individual barriers to engage in treatment (e.g., inflexible job schedules, family obligations, transportation, etc.). These barriers are shaped by structural racism, or the ways in which society fosters racial discrimination through mutually reinforcing systems of housing, education, employment, earnings, benefits, credit, media, health care, and criminal justice (Bailey et al., 2017). Racial/ethnic disparities also are often perpetuated by unconscious bias that shapes client-provider interactions (Marcelin et al., 2019).

This study, which assessed gender disparities in methadone treatment programs in Los Angeles County with administrative data, has both strengths and limitations. A major strength is that the opioid epidemic has had a disproportionate impact on women and racial and ethnic minorities and this study provides insights about improving the quality of MOUD programs to these groups (Barbosa-Leiker et al., 2020; Madras et al., 2020). A second strength is the evidence of the differential availability of specific medications for OUD (methadone, buprenorphine, and naltrexone), both generally and for women and racial and ethnic minorities (Abraham et al., 2020; Barbosa-Leiker et al., 2020; Krawczyk et al., 2017). Given that Goedel et al., 2020 recently found that methadone is the most readily available MOUD in diverse communities, a strength of this study is the insights that it provides for improving access and retention in methadone treatment programs for these groups.

A limitation of this sample is that it is localized to methadone treatment programs in Los Angeles County, which may preclude us from generalizing findings to aid in the development of MOUD treatment programs more broadly. However, as the National Academies of Sciences, Engineering and Medicine notes in *Pain Management and the Opioid Epidemic*, evidence is needed that derives from diverse regions, populations, and study designs in order to develop effective, quality MOUD treatment programs serving diverse communities. Another limitation is related to our measures. Data from the LACPRS administrative dataset are essentially self-report; therefore, we cannot easily evaluate reliability and validity. Further, we used primary and secondary drug of choice (i.e., opioid) to identify clients with OUD instead of having a clinical measure of OUD diagnosis. Also, our data did not include standardized measures of psychological problems. Clients reported whether they had been diagnosed with a mental illness instead of reporting on diagnostic items to determine a mental health disorder.

Another limitation was the lack of additional measures of access that could help us to understand the marginally statistically significant gender differences that we found in our study. Finally, the lack of de-duplication of study participants across waves of data collection represents a limitation resulting from the possibility that clients with multiple treatment episodes or with long periods of treatment could be represented in more than one wave of data collection. The lack of individual identifiers in the dataset precluded identification of duplicates, but data do indicate whether a client had at least one prior treatment episode. Overall, we would expect the lack of de-duplication to bias findings in the direction of reducing variance on client-level variables in each wave of data collection.

5. Conclusion

This study contributes to emerging evidence related to gender disparities in access and retention in MOUD (methadone) treatment programs in low-income communities. Study findings documented that gender disparities found in SUD treatment programs persisted in methadone treatment programs. Gender disparities existed in both access and retention, where women spent more time than men waiting to enter treatment but then remained in treatment longer than did men. Further, clients identifying as African American, Latino, and Other were less likely to remain in treatment than those identifying as non-Latino white and men. This finding may be explained by minority clients' disproportionate patterns of homelessness, mental illness, and substance use severity, as well as by provider's challenge to effectively engage minority clients because of structural racism and counselors' implicit bias. Further, clients with MediCal eligibility were more likely to gain access to treatment and to remain in treatment. Overall, findings call for

improving treatment access and retention for women with OUD who served in outpatient methadone treatment programs through comprehensive, gender-specific, and evidence-based programming.

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