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Patient Predictors of Substance Use Disorder Treatment Initiation in Primary Care

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Abstract

Introduction—Primary care clinics are opportune settings in which to deliver substance use disorder (SUD) treatment, but little is known about which patients initiate treatment in these settings.

Methods—Using secondary data from a RCT that aimed to integrate SUD treatment into a federally qualified health center (FQHC) using an organizational readiness and collaborative care (CC) intervention, we examined patient-level predictors of initiation of evidence-based practices for opioid and/or alcohol use disorders (OAUDs): a brief behavioral treatment (BT) based on motivational interviewing and cognitive behavioral therapy and medication-assisted treatment (MAT) (extended-release injectable naltrexone (XR-NTX) for patients with an alcohol use disorder or opioid use disorder and buprenorphine/naloxone (BUP/NX) for patients with an opioid use disorder). Using the Andersen model of health care access, we tested bivariate and multivariate logistic regression models to assess associations between patient factors and initiation of BT and MAT.

Results—Twenty-three percent of all participants (N=392) received BT and 13% received MAT. In the multivariate model examining factors associated with initiation of BT, being of “other” or “multiple” races compared with being White ($OR = .45$, $CI = .22, .92$), being homeless ($OR = .45$, $CI = .21, .97$) and having been arrested within 90 days of baseline ($OR = 0.21$, $CI = 0.63, 0.69$) were associated with significantly *lower* odds of initiating BT. Greater self-stigma ($OR = 1.60$, $CI = 1.06, 2.42$), receiving MAT ($OR = 5.52$, $CI = 2.34, 12.98$), and having received the CC study intervention ($OR = 12.95$, $CI = 5.91, 28.37$) were associated with higher odds of initiating BT. In the multivariate model examining patient factors associated with initiating MAT, older age ($OR = 1.07$, $CI = 1.03, 1.11$), female gender ($OR = 3.05$, $CI = 1.25, 7.46$), having a diagnosis of heroin abuse or dependence (with or without alcohol abuse or dependence compared with have a diagnosis of alcohol dependence only ($OR = 3.03$, $CI = 1.17, 7.86$), and having received at least

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one session of BT ($OR = 6.42$, $CI = 2.59, 15.94$), were associated with higher odds of initiating MAT.

Conclusions—Individuals who initiate BT for OAUDs in a FQHC are less likely to be homeless and more likely to have greater self-stigma. Those who receive MAT are more likely to be of older age, female, and to have a diagnosis of heroin abuse or dependence, with or without concomitant alcohol abuse or dependence, rather than alcohol abuse or dependence alone. Receiving collaborative care (e.g., a warm handoff, and follow-up by a care coordinator) may be critical to initiating BT. Receiving at least one session of BT is associated with higher odds of receiving MAT, and receiving MAT is associated with higher odds of receiving BT. The Andersen model of health care access provides some insight into who initiates BT and MAT for OAUD treatment in FQHC-based primary care; further research is needed to explore system-level factors that may also influence treatment initiation.

Keywords

Substance use disorder treatment predictors; medication-assisted treatment; MAT; primary care; federally qualified health center; FQHC; community health center

1. Introduction

There is a large, unmet need for substance use disorder (SUD) treatment in the United States and, because specialty care settings cannot accommodate this need, there is a nationwide call for primary care practices, including federally qualified health centers (FQHCs) which provide primary care to medically underserved populations, to integrate SUD services (National Prevention Council, 2011; Office of National Drug Control Policy (ONDCP), 2010; U.S. Department of Health and Human Services (HHS) Office of the Surgeon General, 2016). In 2015, 20.4 million adults in the U.S. (representing 8.4 % of all adults) needed treatment for an illicit drug or alcohol use problem; of these, 18.1 million did not receive it (Park-Lee, Lipari, Hedden, Copello, & Kroutil, 2015). Among those who perceived they needed treatment and did not receive it (863,000), 39% tried to get treatment but did not succeed (Park-Lee et al., 2015). Untreated opioid and/or alcohol use disorders (OAUDs) are of particular concern because of high rates of morbidity, and mortality (Coben et al., 2010; Hines, Barrett, Jiang, & Steiner, 2014; Owens, Barrett, Weiss, Washington, & Kronick, 2014; Ronan & Herzig, 2016), as well as increasing consequences, including overdose deaths, from the non-medical use of prescription opioids and transition to heroin (Mendelson, Flower, Pletcher, & Galloway, 2008).

Historically, SUD treatment in the U.S. has been provided in specialty care settings, but barriers such as long waiting lists, lack of child care, and lack of availability hinder treatment utilization in these settings (Appel, Ellison, Jansky, & Oldak, 2004; Cunningham, Sobell, Sobell, Agrawal, & Toneatto, 1993; Grant, 1997). Further, many people who need treatment are not aware that they need it or do not know how or where to seek it (Park-Lee et al., 2015; Substance Abuse and Mental Health Services Administration, 2013). There is growing evidence that integrated medical and SUD care compared with non-integrated care improves outcomes for people with SUDs and that it is cost-effective (Savic, Best, Manning, & Lubman, 2017).

Primary care is thought to be well-suited to provide SUD treatment because the prevalence of alcohol use disorders and use of illicit drugs is higher among primary care patients than it is in the general population due to comorbidity of SUDs with other illnesses that bring people into medical care (Cherpitel & Ye, 2012; Pilowsky & Wu, 2012), and most individuals visit a primary care provider at least once a year (Blackwell, Lucas, & Clarke, 2014). Further, several evidence-based treatments for SUDs — medications for OAUDs in particular but also brief therapy interventions—are available and appropriate for delivery in primary care settings (Balhara, 2014; Doolittle & Becker, 2011; Drainoni et al., 2014; Mauger, Fraser, & Gill, 2014; Myles, F., & Raybould, 2000; Schackman, Leff, Polsky, Moore, & Fiellin, 2012; Tofighi et al., 2014). And, because SUDs are increasingly understood as chronic and similar to medical conditions that require long-term, continuous care, SUDs are thought to be well-suited for treatment in primary care (McLellan, Lewis, O'Brien, & Kleber, 2000; Tai & Volkow, 2013). Community health centers such as FQHCs are of particular importance because expanded health insurance coverage under the Patient Protection and Affordable Care Act substantially increased the number of individuals seeking medical care in these settings (Angier et al., 2015; Wallace, Young, Rodriguez, Bonilla, & Pourat, 2016), they are the largest source of primary health care for underserved individuals, and 1 in 12 people in the U.S. receives primary care in these settings (Rosenbaum et al., 2017). Increased identification and treatment of SUDs in FQHCs and other community health centers could address unmet need among a substantial number of individuals who never receive treatment (Substance Abuse and Mental Health Services Administration, 2011).

As integration of SUD treatment with primary care expands, additional study is needed to ensure that services meet patient needs (Buck, 2011; LoSasso & Byck, 2010; Substance Abuse and Mental Health Services Administration, 2017). Because primary care patients initially may not be seeking treatment for their SUD from their primary care provider when they present for an appointment, understanding which factors may facilitate or hinder treatment initiation after a positive screen for an SUD can inform efforts to increase treatment initiation. In a prior study from which data for the present study were drawn, we studied the effects of a dual intervention strategy—organizational readiness and collaborative care (CC)—on integrating OAUD treatment into a FQHC. Although that study resulted in 61% of providers prescribing MAT, only 23.5% of all participants received BT and only 13% received MAT (CITATION BLINDED FOR REVIEW), suggesting the need to understand which patients are most (and least) likely to receive services in primary care and, ultimately, to improve treatment access and initiation.

With regard to access to health care in general, Andersen (1995) suggests that health care settings must have the capacity to provide appropriate treatment, and that three domains of patient factors predict health care access: predisposing characteristics, i.e., those that cannot easily be changed to facilitate access to care; enabling or inhibiting resources, which are factors that are mutable and facilitate or hinder access; and need or severity factors, which are factors related to the current illness, in this case the SUD (R.M. Andersen, 1995). Addressing these factors can facilitate targeted interventions that increase access to care and treatment initiation. Although several studies have examined patient-level predictors of treatment initiation in SUD specialty care settings, we are only aware of one study that has

examined SUD treatment initiation in a primary care setting, finding that entry into a primary care-based buprenorphine treatment program was associated with identification of other chronic medical conditions (Rowe, Jacapraro, & Rastegar, 2012).

The present study examines patient-level factors associated with treatment initiation in two of the largest clinics of a FQHC that recently implemented a motivational-interviewing and cognitive behavioral therapy - based brief treatment (BT) and medication-assisted treatment (MAT) for patients identified with an OAUD during routine screening (CITATIONS BLINDED FOR REVIEW). We included variables from prior literature predictive of treatment entry in specialty care across the Andersen categories of treatment access, such as race/ethnicity (Kirchner, Booth, Owen, Lancaster, & Smith, 2000; Saum, Hiller, Leigey, Inciardi, & Surratt, 2007; Schwartz, Kelly, O'Grady, Mitchell, & Brown, 2011; Weisner, Matzger, Tam, & Schmidt, 2002); age (Weisner et al., 2002), gender (Green, Polen, Dickinson, Lynch, & Bennett, 2002), education (Weisner et al., 2002) (predisposing characteristics); being stably housed and not homeless (Corsi, Kwiatkowski, & Booth, 2007), being legally employed (Saum et al., 2007; Schwartz et al., 2011), having health insurance (Saum et al., 2007), stigma (Barry, McGinty, Pescosolido, & Goldman, 2014; Crapanzano, Vath, & Fisher, 2014; Florez et al., 2015; Kulesza et al., 2016; Matthews, Dwyer, & Snoek, 2017) (enabling/inhibiting resources); and history of treatment for a SUD (Schwartz et al., 2011; Siegal, Falck, Wang, & Carlson, 2002), legal and social problems (Carlson et al., 2010; Siegal et al., 2002; Weisner et al., 2002), having more problems associated with drugs than with alcohol (Corsi et al., 2007), SUD severity (measured by frequency, consequences and symptoms of dependence) (Weisner et al., 2002), and perceived need, readiness or desire for treatment (Corsi et al., 2007; Schwartz et al., 2011; Siegal et al., 2002) (need/severity factors).

Our primary research questions were: “What predisposing, enabling/inhibiting resources, and need/severity factors predict initiation of BT for an OAUD in primary care, and, “what predisposing, enabling/inhibiting resources, and need/severity factors predict initiation of MAT for an OAUD in primary care?”

This study is a secondary analysis of data from a randomized controlled trial (RCT) that tested the effectiveness of a dual intervention strategy (organizational readiness and collaborative care (CC)) for implementing BT and MAT to treat OAUDs in primary care (CITATIONS BLINDED FOR REVIEW). The study focused on OAUDs because these disorders are common among primary care patients and because there are effective, FDA-approved medications approved for use across medical settings (Balhara, 2014; Doolittle & Becker, 2011; Drainoni et al., 2014; Mauger et al., 2014; Myles et al., 2000; Schackman et al., 2012; Tofighi et al., 2014). In that study, all behavioral health and medical providers at both sites received the organizational readiness intervention to prepare to deliver BT or MAT, and patients were randomized to receive CC or usual care. The CC intervention consisted of a warm-handoff to a care coordinator after a positive screening for an OAUD by a medical assistant, population- based management using a patient registry, ongoing follow-up monitoring by the care coordinator of all OAUD patients in the registry, and decision support for BT and MAT provided to care coordinators, behavioral health therapists and medical providers. The control condition consisted of participants receiving referral

information and being asked if they needed to see a therapist immediately (CITATIONS BLINDED FOR REVIEW). Patients in the usual care condition were told that treatment (BT and MAT) for their OAUD was available at the clinic and were given referral information.

2. Methods

2.1. Study Setting and Participants

We partnered with a multi-site FQHC located in Los Angeles, California. Of 22,000 patients seen each year, 58% are of Hispanic origin, and 11% are African-American (Hispanic or non-Hispanic). Participants were recruited from June 3, 2014 to January 15, 2016 from the FQHC's two largest clinical sites. All patients attending primary care were screened by a medical assistant at the clinic for substance use in the past 3 months using a 3-question screener based on the NIDA quick screen (National Institute on Drug Abuse, undated). Consenting patients who screened positive for risky or worse substance use (i.e., they indicated they drank 4 (women) or 5 (men) drinks a day once a month or more frequently in the past three months, and/or had used prescription pain medicine in a manner other than prescribed by a doctor and/or heroin once a month or more in the past three months) were referred for additional assessment by the research team. Inclusion criteria were (1) age 18 years or older; (2) probable OAUD diagnosis based on the NIDA-modified ASSIST (Humenuik & Ali, 2006; National Institute on Drug Abuse (NIDA), 2012); (3) English or Spanish-speaking; (4) willing to switch therapists if already receiving therapy for a mental health disorder at the clinic. Exclusion criteria were marked functional impairment from bipolar disorder or schizophrenia (Arbuckle et al., 2009; Luciano et al., 2010) and current receipt of substance use treatment outside of the primary care setting. (Prior to the trial, the FQHC did not provide substance use disorder treatment.) Comprehensive descriptions of the trial design, eligibility criteria, and outcomes are reported elsewhere (CITATIONS BLINDED FOR REVIEW). Participants included in the present study are all patients who consented to be in the study and completed a baseline interview (N=392).

2.2 Procedures

After providing informed consent, trained study personnel conducted computer-assisted face-to-face structured interviews. These interviews lasted an average of 60 minutes, and participants were paid \$50. The research protocol was approved by the institution's internal review board and a Certificate of Confidentiality was obtained from the National Institutes of Health.

2.3 Measures

2.3.1 Dependent Variables—Our two binary dependent variables were, within six months of enrollment: (a) initiation of BT for an OAUD; and (b) initiation of MAT (XR-NTX or BUP/NX) for an OAUD. Initiation of BT was defined as a patient having at least one in-person session with a therapist to discuss their OAUD. Initiating MAT for an OAUD was defined as a patient (a) having a diagnosis of alcohol abuse or dependence or abuse or dependence on prescription opioids or heroin with or without a co-occurring alcohol use disorder (AUD), based on the Comprehensive International Diagnostic Interview (CIDI) Version 3.0, sections 11 and 12 (Forman, Svikis, Montoya, & Blaine, 2004; Haro et al.,

2006), and (b) receiving at least one dose of XR-NTX (for an AUD) or opioid use disorder (OUD), or BUP/NX for an OUD). While in the RCT initiation of MAT for an OUD was defined as initiation of BUP/NX only, during the RCT some clinicians also prescribed XR-NTX for patients with an OUD. Therefore, patients who initiated either medication for an OUD are included in this secondary analysis.

2.3.2 Predictor Variables—We organized the predictor variables into the following three categories of predictors of health care access based on the Andersen model (R.M. Andersen, 1995): predisposing characteristics; enabling or inhibiting resources; and need or severity factors.

2.3.2.1 Predisposing (or generally immutable) characteristics: These included self-reported (a) age in years; (b) gender identity (female, male); (c) race (White, Black, other/multiple races); (d) Hispanic ethnicity, and (e) education (less than high school, high school graduate/GED, greater than high school).

2.3.2.2 Enabling or inhibiting resources (i.e., resources that may facilitate or impede treatment access): (a) a binary variable indicating marital status (0=not married or living with a partner; 1=married or living with a partner); (b) income (categorized as ≤\$10,000 or >\$10,000); (c) work status (working full- or part-time for pay or not working); (d) whether the participant was homeless, defined as lacking a regular place to stay or spending the previous night sleeping outside, in a shelter, or in an abandoned building; (e) health-related quality of life using the SF-12 Health Survey (SF-12 mental component summary [MCS] and physical component summary [PCS] scores; range of 0-100) (Gandek et al., 1998; Ware, Kosinski, & Keller, 1996); (f) an eight-item, internalized addiction self-stigma assessment which inquired about the frequency of self-devaluating thoughts and feelings during the past 90 days, on a five-point scale (1= never to 5= very often), with higher scores indicative of greater stigma (measured by the Self-Devaluation Subscale, of the Substance Abuse Stigma Scale (SASS) (Luoma et al., 2013)) (note that we only measured “self-stigma” and not the range of possible stigma variables); (g) number of visits to primary care in the last 90 days (0, 1, 2 or more); (h) a binary variable indicating whether the participant received at least one session of BT (included in the two MAT initiation models only) (0=no; 1=yes).

2.3.2.3 Need or severity factors related to a SUD: (a) OAUD diagnosis group: DSM IV diagnosis of abuse or dependence on (1) alcohol only, (2) heroin with or without co-occurring alcohol abuse or dependence, or (3) prescription opioids with or without co-occurring alcohol abuse or dependence (assessed using the Comprehensive International Diagnostic Interview (CIDI) Version 3.0, sections 11 and 12 (Forman et al., 2004; Haro et al., 2006)); (b) diagnosis of dependence (compared with abuse only, also assessed with the CIDI); (c) recent (past 90 days) reported negative consequences from alcohol or opioid use (using the Short Inventory of Problems Alcohol and Drugs (SIP-AD), range 0-15 (Alterman, Cacciola, Ivey, Habing, & Lynch, 2009); (Blanchard, Morgenstern, Morgan, Lobouvie, & Bux, 2003)); (d) a binary variable indicating whether the participant reported ever talking to a professional about their substance use (0=no; 1=yes); (f) a binary variable indicating whether the participant reported ever attending a self-help group for their substance use

(0=no; 1=yes); and (g) a binary variable indicating whether the participant reported ever in their lifetime being stopped by police or arrested for a substance-related charge (0=no; 1=yes); and (h) a binary variable indicating whether the participant had been arrested in the past 90 days for any activity.

2.3.2.4 Other factors: We included in all models a site fixed effect (0=Clinic A; 1=Clinic B) and a variable controlling for whether participants were in the treatment condition (“CC”) (0=control group; 1=CC) in the RCT (CITATIONS BLINDED FOR REVIEW).

2.4 Analyses

First, we ran descriptive statistics for all participants and for those who received BT and MAT within the categories of healthcare utilization set forth by Andersen et al. (1995). Next, we fit bivariate logistic models to the data to compare characteristics across patients who did and who did not receive BT and/or MAT for either an AUD (XR-NTX) or OUD (XR-NTX or BUP/NX) during the study period. Any variable that predicted receipt of any BT or any MAT with a liberal p-value less than 0.2 in bivariate models was included as a covariate in a multivariate logistic regression models. After checking for collinearity of predictor variables, we ran two multivariate logistic regression models – one to test whether each characteristic was individually associated with receiving BT and the other to test whether each characteristic was individually associated with receiving MAT, after controlling for the other characteristics. Due to the relatively small sample size of those receiving any MAT (N=52), this analysis was mainly exploratory. All analyses were done in STATA 12.0.

3. Results

3.1 Participant Characteristics

Table 1 shows characteristics of all study participants, as well as those who did and did not receive BT and MAT, organized according to the Andersen (1995) model of health care access. Twenty-three percent of all participants received BT and 13% received MAT. Twenty-seven percent of patients who received either treatment received both BT and MAT.

3.1.1. Predisposing characteristics—The mean age of participants was 41.8 (SD=12.0). Most participants were male (79.1%) and non-Hispanic (68.9%); 43.9% were White and 42.6% describe themselves as “other or multiple races.” About one third had graduated from high school or obtained a GED (30.6%) and 41.1% obtained greater than a high school education. Among those who initiated BT, the mean age was 43.9 (SD=11.2), 67.4% were male, the majority were non-Hispanic (70.6%) and White (53.35), and 52.2% had greater than a high school education. MAT initiators were older, with a mean age of 47 (SD=11.1); 57.7% were White, and 57.7% had greater than a high school education.

3.1.2 Enabling or inhibiting resources—Participants were low-income, with the majority (62.0%) having an income of \$10,000 or less per year; most (73.5%) were not working. Almost half (49.2%) of the participants reported being homeless. Enabling or inhibiting resource characteristics were relatively similar across the BT and MAT groups, with more than half of the BT group (55.4%) and the MAT group (59.6%), respectively,

having an income of less than \$10,000, and 28.3% of BT initiators and 25% MAT initiators reporting being homeless.

3.1.3. Need/Severity—More than half (54.8%) of participants in the study had an AUD diagnosis only, while 29.6% had an OUD diagnosis of heroin abuse or dependence with or without an AUD, and 15.6% had an OUD diagnosis of prescription opioid abuse or dependence with or without an AUD. More than half had ever talked to a professional about or received self-help for their OAUD. Of those who initiated BT, 57.6% had a diagnosis of AUD only, while 44.2% of those who initiated MAT had this diagnosis. 26.1% of BT initiators had an OUD (heroin) diagnosis, compared with 38.5% of MAT initiators. A higher proportion of those who initiated MAT had ever talked to a medical professional about their substance use (73.1% of MAT initiators, 67.1% BT initiators) or had received self-help (67.3% of MAT initiators, 61% of BT initiators) than those who initiated BT.

3.2 Bivariate and Multivariate Logistic Regression Analyses Predicting Initiation of BT

We present results of bivariate and multivariate models of factors predicting BT initiation in Table 2. In bivariate models, predisposing characteristics significantly associated with initiating BT ($p < .05$) were gender, with females having higher odds of initiating BT than males, and education, with individuals with greater than a high school education more likely to initiate than those with less than a high school education. Within the enabling or inhibiting resources category, factors significantly associated with higher odds of initiating BT were higher self-stigma and receiving MAT; homeless individuals had lower odds of initiating BT. Need and severity factors associated with higher odds of initiating BT were having more negative consequences from an OAUD and ever having talked to a professional about and ever receiving self-help for substance use. Having been arrested within 90-days of the baseline interview was associated with lower odds of initiating BT. Receiving services at Clinic B was also associated with lower odds of initiating BT, and being in the “CC” intervention group of the parent RCT was associated with higher odds of initiating BT.

In the multivariate model, in the predisposing characteristics category, being of “other” or multiple races was associated with significantly ($p < .05$) lower odds of initiating BT compared with being White ($OR = 0.45$, $CI = 0.22, 0.92$). In the enabling or inhibiting resources category, homelessness was associated with lower odds of initiating BT ($OR = 0.45$, $CI = 0.21, 0.97$), and higher self-stigma ($OR = 1.60$, $CI = 1.06, 2.42$) and receiving MAT ($OR = 5.52$, $CI = 2.34, 12.98$) were associated with higher odds of initiating BT. Among need and severity factors, having been arrested within 90 days prior to baseline was associated with lower odds of initiating BT ($OR = 0.21$, $CI = 0.63, 0.69$). Receiving treatment at “Clinic B” also was associated with lower odds of initiation ($OR = 0.30$, $CI = 0.14, 0.66$). Having been in the experimental (“CC”) study condition was associated with much higher odds of BT initiation ($OR = 12.95$, $CI = 5.91, 28.37$).

3.3 Exploratory Bivariate and Multivariate Logistic Regression Analyses Predicting Initiation of MAT

We present results of bivariate and multivariate models of factors predicting MAT initiation in Table 3. In bivariate models, predisposing characteristics significantly associated with

higher odds of initiating MAT ($p < .05$) were older age, female gender, and having greater than a high school education. Among enabling or inhibiting resources, being married, working for pay, having higher self-stigma, and receiving BT were associated with higher odds of receiving MAT, and being homeless was associated with lower odds of receiving MAT. Of need and severity factors, a diagnosis of heroin dependence with or without and AUD, higher negative consequences, and having ever talked to a professional about or receiving self-help for substance use were associated with higher odds of receiving MAT. Receiving services at Clinic B was also associated with lower odds of initiating MAT.

In the multivariate model, in the predisposing characteristics category, older age ($OR = 1.07$, $CI = 1.03, 1.11$) and female gender ($OR = 3.05$, $CI = 1.25, 7.46$) were significantly ($p < .05$) associated with higher odds of receiving MAT. In the enabling or inhibiting resources category, working full time was marginally ($p = .051$) associated with higher odds of receiving MAT ($OR = 2.35$, $CI = 1.00, 5.54$) and those who received BT were over 6 times as likely to receive MAT than those who didn't receive BT ($OR = 6.43$, $CI = 2.59, 15.94$). Among need and severity factors, those with a heroin diagnosis, with or without an AUD, were more likely to receive MAT than those with an AUD-only diagnosis ($OR = 3.03$, $CI = 1.17, 7.86$). Neither clinic site nor having been in the "CC" study condition was significantly associated with higher odds of receiving MAT.

4. Discussion

We examined patient-level determinants of initiating BT for OAUD and MAT (XR-NTX for AUDs and XR-NTX or BUP/NX for OUDs) in a FQHC. Predictors were selected and organized using the Andersen (1995) model of healthcare access and prior studies examining SUD treatment initiation in specialty care settings.

In our examination of predictors of initiating BT, we found that individuals initiating BT were more likely to be White than of "other" or multiple races (a predisposing characteristic), were more likely to have higher self-stigma, and were less likely to be homeless or recently arrested (enabling or inhibiting resources). This is consistent with prior studies which have found that being stably housed (Corsi et al., 2007) and having higher stigma (Earnshaw, Smith, & Copenhaver, 2013) are associated with greater likelihood of entering treatment in specialty care. These findings suggest the need for strategies to facilitate BT initiation for the homeless in primary care settings, and for practitioners to be aware that individuals entering BT in primary care are carrying stigma around their substance use. The significance of individuals of "other" or multiple races being less likely to initiate treatment than White participants is less clear. While prior studies have found associations between race and treatment initiation, (Saum et al., 2007) (Schwartz et al., 2011) with greater likelihood of treatment entry among African Americans, indicating an overrepresentation of African Americans in publicly funded specialty care settings. (Saum et al., 2007) Our findings suggest underrepresentation of racially diverse individuals initiating substance use disorder treatment in primary care, and highlight the need for culturally relevant strategies for engaging patients in treatment.

We also found that individuals who received MAT were over five times as likely to initiate BT, and that those who were in the collaborative care (CC) arm of the larger study were more than six times as likely to initiate BT. Although we did not examine the temporal relationship between receive MAT and BT, the majority (69%) of participants who received BT received it prior to initiating MAT. CC may help have helped individuals initiate BT through a warm-handoff to and follow-up by a care coordinator prior to the first BT visit, and the BT may have facilitated MAT initiation after a thorough SUD assessment and discussion of treatment options (CITATIONS BLINDED FOR REVIEW). Future research examining these factors and their temporal relationship to BT initiation may help guide efforts to support initiation efforts among those who use OAUD.

In our mainly exploratory (due to small sample size) analysis of predictors of MAT initiation, older age, female gender, also receiving BT, working full-time ($p=.051$) and having heroin abuse or dependence with or without an AUD, compared with having an AUD only diagnosis, were associated with higher odds of receiving MAT. Unlike our findings from the BT model, being in the “CC” arm of the parent RCT was not associated with initiating MAT. One reason women may be more likely than men to receive MAT in primary care is that men are more likely to receive SUD treatment in speciality care settings than women (Substance Abuse and Mental Health Services Administration, 2014) and women visit primary care more often than men (U.S. Department of Health and Human Services Centers for Disease Control and Prevention National Center for Health Statistics, 2015). Strategies to engage women in both treatments are needed, and the primary care setting may be an ideal setting in which to provide OAUD treatment to women who might not receive it otherwise. We also found that those who are working full-time may be more likely to initiate MAT, possibly because lower-income patients who were not working perceived that the medication was too expensive and therefore were reluctant to initiate. Given that BUP/NX is covered by Medicaid (MediCAL in California), and the study provided XR-NTX free of charge to eligible patients, cost should not have been a barrier. Additional patient education could be useful in making MAT more widely available to low-income patients. Another possible explanation for this finding is that those who work may be more receptive to MAT because they have more incentive to initiate treatment to keep their jobs. Finally, we observed that individuals who used heroin were three times as likely to initiate MAT than those with an AUD only. Heroin users may be more receptive to pharmacotherapy compared to individuals with AUD.

CC was the strongest predictor of initiating BT, and receiving BT (but not CC) was the strongest predictor of initiating MAT. The first BT session in the RCT consisted of an in-depth SUD assessment and motivational interviewing-based discussion about treatment options, with an exploration of readiness to begin treatment, either with BT, MAT, or both. Although those who initiate MAT may not need a warm-handoff to a care-coordinator to initiate treatment, receiving at least one BT session that provides detailed information about MAT, addresses readiness for treatment, and presents a menu of treatment options may be useful to increase readiness for and initiation of MAT.

4.1 Limitations

There are limitations to our study. First, our study was conducted at two large sites of a single FQHC in Los Angeles, limiting the generalizability of our findings. Second, only a small number of patients in the larger RCT received MAT (N=52), limiting the power of the study to estimate MAT-specific effects. As such, we consider our study of predictors MAT initiation to be exploratory. Last, our study does not include other measures that may also predict treatment entry, such as “readiness to change,” thus there may be additional, unmeasured variables that were not accounted for in this study.

5. Conclusions

This study is among the first to examine patient-level predictors of initiation of evidence-based SUD treatment in a primary care setting. The Andersen model of health care access (R. M. Andersen, 1995) provides some insight into who initiates OAUD treatment in FQHC-based primary care, with predictors of SUD treatment initiation falling into each of the three categories—pre-disposing factors, enabling or inhibiting resources, and need or severity factors—with some variation across the two categories – receiving BT and receiving MAT. Our study did not measure organizational capacity to implement treatment for OAUD in primary care, which also may influence treatment utilization. This suggests that more work needs to be done to understand organizational factors, including as staffing, resources, and provider motivation and willingness (Aarons, Hurlburt, & Horwitz, 2011; Damschroder et al., 2009; Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Godley, Garner, Smith, Meyers, & Godley; Holt, Helfrich, Hall, & Weiner, 2010; Knudsen, Abraham, & Oser; Meyer, Davis, & Mays, 2012; Ober et al., 2017; Padwa et al., 2012; Roman, Abraham, & Knudsen, 2011; Scaccia et al., 2015; Weiner, Amick, & Lee, 2008). Our finding that patients who received services at “Clinic B”—a clinic with fewer behavioral health therapists on site—were less likely to initiate any BT (with significance at .09 for receiving MAT) are suggestive of the need for studies evaluating the effects of organizational factors on treatment initiation. Findings from the study suggest that strategies are needed to engage homeless individuals in SUD treatment in primary care settings, and for culturally congruent strategies for increasing treatment initiation among racially diverse individuals. Further research will address these issues, as well as the effects of organizational capacity on utilization of SUD treatment in primary care.

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Abbreviations

ASSIST	Alcohol, Smoking and Substance Involvement Screening Test
AUD	Alcohol use disorder
BT	Brief treatment
BUP/NX	Buprenorphine/naloxone
CC	Collaborative care
CI	Confidence interval
CIDI	Comprehensive International Diagnostic Interview
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, Fourth edition
EBP	Evidence-based practice
FDA	Food and Drug Administration
FQHC	Federally Qualified Health Center
GED	General Equivalency Diploma
MAT	Medication-assisted treatment
NIDA	National Institute on Drug Abuse
OAUD	Opioid and alcohol use disorder
OR	Odds ratio
OD	Opioid use disorder
RCT	Randomized controlled trial
SASS	Substance Abuse Stigma Scale
SD	Standard deviation
SF-12	Short-Form 12 Health Survey
SUD	Substance use disorder
XR-NTX	Extended-release injectable naltrexone

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Highlights

- Individuals who initiate brief treatment for opioid or alcohol use disorders (OAUDs) in federally qualified health centers (FQHCs) may be more likely to be stably housed than homeless
- Receiving a collaborative care intervention consisting of a warm-handoff to a care coordinator and ongoing monitoring through a patient registry may facilitate initiation of brief treatment for OAUDs in FQHCs
- Receiving at least one session of brief therapy may important to initiating MAT among those with OAUDs seeking treatment in FQHCs
- Women and those with full-time jobs may be more likely to initiate MAT for opioid use disorder in FQHCs
- Those with a heroin use disorders may be more likely to initiate MAT in an FQHC than those with alcohol use disorders

Table 1

Characteristics of all Study Participants and those who Initiated BT and MAT within Andersen et al. Categories of Predictors of Healthcare Utilization

Characteristic	Full Sample N=392			Initiated BT N=92			Initiated MAT N=52		
	N/Mean	%/SD	No	N/Mean	%/SD	Yes	N/Mean	%/SD	Yes
Predisposing, Immutable Characteristics									
Age	41.8	12.0	41.1	12.18	43.9	11.2	41.0	12.0	47.0
Gender									
Female	82	20.9	52	17.3	30	32.6	59	17.1	23
Male	310	79.1	248	82.7	62	67.4	281	82.7	29
Race									
White	172	43.9	123	41.0	49	53.3	142	41.8	30
Black	53	13.5	44	14.7	9	9.8	48	14.1	5
Other/multiple	167	42.6	133	44.3	34	37.0	150	44.1	17
Of Hispanic origin	122	31.1	95	31.7	27	29.4	108	31.8	14
Education									
Less than high school	111	28.3	91	30.3	20	21.7	104	30.6	7
High school graduate/GED	120	30.6	96	32.0	24	26.1	105	30.9	15
Greater than high school	161	41.1	113	37.7	48	52.2	131	38.5	30
Enabling or Inhibiting Resources									
Married/living w partner	66	16.8	45	15.0	21	22.8	52	15.3	14
Income is greater than \$10,000 per year	148	38.0	107	35.7	41	44.6	127	37.4	21
Working full- or part-time for pay	104	26.5	73	24.3	31	33.7	84	24.7	20
Homeless	193	49.2	167	55.7	26	28.3	180	52.9	13
SF 12 mental health component score	40.3	10.6	42.6	11.7	42.0	11.7	42.7	11.6	41.4
SF 12 physical health component score	47.2	9.8	47.9	10.7	48.3	9.7	48.0	10.5	47.9
Stigma	2.5	1.0	2.4	1.0	2.9	1.1	2.5	1.0	3.0
Outpatient visits - past 90 days									
0	170	43.5	133	44.3	37	40.2	148	43.5	22
									42.3

Characteristic	Full Sample N=392				Initiated BT N=92				Initiated MAT N=52			
			No		Yes		No		Yes		No	
	N/Mean	%/SD	N/Mean	%/SD	N/Mean	%/SD	N/Mean	%/SD	N/Mean	%/SD	N/Mean	%/SD
1	96	24.6	74	24.7	22	23.9	88	25.9	8	15.4	8	15.4
2+	125	32.0	92	30.7	33	35.9	103	30.3	22	42.3	22	42.3
Received any brief therapy	92	23.5					58	17.1	34	65.4		
Received any MAT	52	13.3	18	6.0	34	37.0						
Need/Severity												
Diagnosis group												
Alcohol abuse or dependence only	215	54.8	162	54.0	53	57.6	192	56.5	23	44.2		
Heroin abuse or dependence with or without alcohol	116	29.6	92	30.7	24	26.1	96	28.2	20	38.5		
Prescription opioid abuse or dependence with or without alcohol	61	15.6	46	15.3	15	16.3	52	15.1	9	17.3		
Dependence	288	73.5	216	72.0	72	78.1	245	72.1	43	82.7		
Negative consequences (SIP AD)	9.3	4.8	9.0	4.9	10.3	4.5	9.1	4.9	11.1	3.6		
Ever talked to a medical or healing professional about substance use	227	58.4	165	55.0	62	67.4	189	55.6	38	73.1		
Received SUD treatment in past 12 months	54	13.9	41	13.7	13	14.1	46	13.5	8	15.4		
Ever got self-help for substance use	195	50.1	139	46.3	56	61.0	160	47.1	35	67.3		
Ever arrested for a substance-related incident	236	60.2	182	60.7	54	58.7	205	60.3	31	59.6		
Arrested in 90 days prior to baseline	65	16.6	60	20.0	5	5.4	60	17.7	5	9.6		
Other												
Clinic B	321	81.9	264	88.0	57	62.0	292	85.9	29	55.8		
CC	195	49.7	123	41.0	72	78.3	167	49.1	28	53.9		

Table 2
Bivariate and Multivariate Logistic Regression Analysis of Predictors of Initiating Brief Therapy (BT) (N=392)

Characteristic	Bivariate			Multivariate				
	Odds Ratio	95% CI	P-value	Odds Ratio	95% CI	P-value		
Predisposing, Immutable Characteristics								
Age	1.02	1.00	1.04	0.050	1.03	1.00	1.06	0.075
Gender								
Male	1.00				1.00			
Female	2.31	1.36	3.91	0.002	1.07	0.48	2.38	0.869
Race								
White	1.00				1.00			
Black	0.51	0.23	1.13	0.098	0.71	0.27	1.88	0.493
Other/multiple	0.64	0.39	1.06	0.083	0.45	0.22	0.92	0.028
Of Hispanic origin	1.12	0.67	1.86	0.674				
Education								
Less than high school	1.00				1.00			
High school graduate/GED	1.14	0.59	2.20	0.702	0.93	0.39	2.21	0.861
Greater than high school	1.93	0.54	2.63	0.029	1.19	0.54	2.64	0.662
Enabling or Inhibiting Resources								
Married/living w partner	1.68	0.94	3.00	0.081	0.80	0.36	1.79	0.592
Income is greater than \$10,000 per year	1.50	0.93	2.42	0.095	1.36	0.68	2.71	0.379
Working full- or part-time for pay	1.58	0.95	2.62	0.077	1.04	0.49	2.19	0.923
Homeless	0.31	0.19	0.52	0.000	0.45	0.21	0.97	0.042
SF12 mental health component score	1.00	0.97	1.02	0.636				
SF12 physical health component score	1.00	0.98	1.03	0.740				
Stigma	1.52	1.21	1.91	0.000	1.60	1.06	2.42	0.024
Outpatient visits - past 90 days								
0	1.00							
1	1.07	0.59	1.95	0.828				

Characteristic	Bivariate			Multivariate		
	Odds Ratio	95% CI	P-value	Odds Ratio	95% CI	P-value
2+	1.29	0.75 2.21	0.356			
Received MAT	9.18	4.86 17.37	0.000	5.52	2.34 12.98	0.000
Need/Severity						
Diagnosis group						
Alcohol abuse or dependence only	1.00					
Heroin abuse or dependence with or without alcohol	0.80	0.46 1.38	0.416			
Prescription opioid abuse or dependence with or without alcohol	1.00	0.52 1.93	0.992			
Dependence	1.40	0.80 2.44	0.235			
Negative consequences (SIP AD)	1.06	1.01 1.12	0.022	1.04	0.94 1.14	0.451
Ever talked to professional about substance use	1.65	1.01 2.71	0.045	0.50	0.14 1.86	0.303
Received SUD treatment in past 12 months	1.03	0.52 2.01	0.937			
Ever got self-help for substance use	1.77	1.10 2.85	0.019	2.86	0.80 10.16	0.105
Ever arrested for a substance-related incident	0.92	0.57 1.48	0.735			
Arrested in 90 days prior to baseline	0.23	0.09 0.60	0.002	0.21	0.63 0.69	0.010
Other						
Clinic B	0.22	0.13 0.38	0.000	0.30	0.14 0.66	0.003
CC	5.18	3.00 8.95	0.000	12.95	5.91 28.37	0.000

Note: In the multivariate model column, empty cells indicate that variable was not significant at $p < 0.2$ in bivariate analysis and was not included in the multivariate model

Table 3
Bivariate and Multivariate Logistic Regression Analysis of Predictors of Initiating Medication-Assisted Treatment (MAT)* (N=392)

Characteristic	Bivariate			Multivariate		
	Odds Ratio	95% CI	P-value	Odds Ratio	95% CI	P-value
Predisposing, Immutable Characteristics						
Age	1.03	1.01	1.05	1.07	1.03	1.11
Gender						
Male	1.00			1.00		
Female	3.78	0.2 0.4	6.99	3.05	1.25	7.46
Race						
White	1.00			1.0		
Black	0.49	0.18	1.34	0.89	0.25	3.11
Other/multiple	0.54	0.28	1.02	0.64	0.27	1.52
Of Hispanic origin	1.26	0.66	2.43	0.483		0.310
Education						
Less than high school	1.00			1.00		
High school graduate/GED	2.12	0.83	5.42	1.77	0.56	5.60
Greater than high school	3.40	1.44	8.06	1.49	0.50	4.43
Enabling or Inhibiting Resources						
Married/living w partner	2.04	1.03	4.03	1.96	0.79	4.87
Income is greater than \$10,000 per year	1.12	6.17	2.03	0.709		
Working full- or part-time for pay	1.90	1.03	3.51	0.039	2.35	1.00
Homeless	0.30	0.15	0.57	0.000	0.51	0.20
SF12 mental health component score	0.99	0.96	1.02	0.485		
SF12 physical health component score	1.00	0.97	1.03	0.946		
Stigma	1.57	1.18	2.07	0.002	1.09	0.70
Outpatient visits - past 90 days						
0	1.00					
1	0.61	0.26	1.43	0.257		

Characteristic	Bivariate			Multivariate		
	Odds Ratio	95% CI	P-value	Odds Ratio	95% CI	P-value
2+	1.44	0.94	2.33	0.269		
Received brief therapy	9.18	4.86	17.37	0.00	6.43	2.59 15.94 0.00
Need/Severity						
Diagnosis group						
Alcohol abuse or dependence only	1.00			1.00		
Heroin abuse or dependence with or without alcohol	1.74	0.91	3.32	0.094	1.17	7.86 0.023
Prescription opioid abuse or dependence with or without alcohol	1.44	0.63	3.31	0.384	1.77	0.57 5.55 0.326
Dependence	1.85	0.87	3.95	0.110	1.47	0.49 4.44 0.495
Negative consequences (SIP AD)	1.12	1.03	1.19	0.005	1.09	0.97 1.22 0.148
Ever talked to professional about substance use	2.13	1.11	4.07	0.023	0.81	0.16 4.09 0.801
Received SUD treatment in past 12 months	1.15	0.51	2.60	0.736		
Ever got self-help for substance use	2.28	1.23	4.22	0.009	1.55	0.35 6.89 0.5 63
Ever arrested for a substance-related incident	0.97	0.54	1.76	0.926		
Arrested in 90 days prior to baseline	0.50	0.19	1.30	0.154	1.43	0.43 4.78 0.5 56
Other						
Clinic B	0.21	0.11	0.39	0.000	0.47	0.20 1.11 0.087
CC	1.21	0.67	2.17	0.526	0.68	0.28 1.64 0.384

* MAT = Extended release injectable naltrexone (XR-NTX) for an alcohol use disorder (AUD) or XR-NTX or buprenorphine/naloxone (BUP/NX) for an opioid use disorder (OUD)

Note: In the multivariate model column, empty cells indicate that variable was not significant at $p < 0.2$ in bivariate analysis and was not included in the multivariate model