Patients' beliefs about medications are associated with stated preference for methadone, buprenorphine, naltrexone, or no medication-assisted therapy following inpatient opioid detoxification

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Abstract

Subsequent to initial opioid detoxification, people with opioid use disorder are typically advised to engage in follow-up treatment to prevent relapse. Medication-assisted treatments (MATs) - i.e., the opioid agonist methadone (MMT) or partial agonist/antagonist, buprenorphine/ naltrexone (BUP) -- are the maintenance treatment options with the best research support for positive outcomes. A third MAT, injectable extended-release naltrexone (XR-NTX), was approved by the FDA for opioid dependence in 2010 and shows promise. However, relatively few eligible patients choose to initiate one of these MATs following initial detoxification treatment. Consistent with the Health Belief Model, we hypothesized that beliefs about 1) efficacy of each MAT; 2) safety of each MAT; and 3) perceived consistency with being drug-free would predict stated patient preferences for a particular MAT or for no MAT. We also hypothesized that perceived structural barriers (e.g., time, transportation) would decrease the likelihood of stating a preference for a given MAT. To assess these hypotheses, we surveyed 372 people undergoing inpatient opioid detoxification treatment. Results supported hypotheses for all 3 sets of patient beliefs, with the patient group stating that they preferred a particular MAT having significantly more positive beliefs about that MAT relative to other groups (p<.001). The group that preferred "no MAT" had the most negative beliefs about all MATs. Perceived structural barriers were not related to stated preferences, except that people who preferred BUP were more likely to endorse barriers to MMT than any of the other 3 groups. Notably, a relatively high proportion (32%) of participants were most interested in XR-NTX despite a lack of prior experience with this medication. These results suggest that efforts to

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increase MAT enrollment following detoxification might benefit from including patient beliefs as one set of factors to assess and target for change.

Keywords

opioids; preferences; methadone; buprenorphine; naltrexone

1. Introduction

In 2012, 2.1 million people in the U.S. met criteria for past-year abuse/ dependence of prescription pain relievers, and half a million people met criteria for heroin use disorders. Prescription pain reliever abuse/dependence rates have increased by one third since 2002, and heroin abuse/ dependence rates doubled in the decade after 2002 (Substance Abuse and Mental health Services Administration, 2013). After detoxification, most patients are advised to engage in maintenance treatment in order prevent relapse. Medication assisted treatments (MATs) – i.e., the opioid agonists methadone (MMT) or partial agonist/ antagonist, buprenorphine/ naltrexone (BUP) -- are the maintenance treatment options with the best research support for outcomes like retention and being drug-free from illicit drugs (Busch, Haas, Weigl, & Wirl, 2007; Connock et al., 2007; De Maeyer, Vanderplasschen, & Broekaert, 2010; Feelemyer, Des Jarlais, Arasteh, Phillips, & Hagan, 2014; Mattick, Breen, Kimber, & Davoli, 2014). A third MAT, injectable extended-release naltrexone (XR-NTX) was approved by the FDA for opioid dependence in 2010 and shows promise (Krupitsky et al., 2011). Observational data demonstrates XR-NTX use is associated with fewer inpatient hospitalizations than methadone or BUP (Baser, Chalk, Fiellin, & Gastfriend, 2011). Longer-term treatment research on XR-NTX is limited at this point.

However, many opioid dependent patients do not receive MATs either upon discharge from an inpatient detoxification program or at an outpatient appointment with a care provider. Stein et al (2012) analyzed Medicaid data from 2007–2009 that included over 14,000 opioid dependence treatment episodes. Of these episodes, 12% involved BUP, 25% involved methadone, and 63% did not involve any MAT despite most patients receiving care in a specialty addiction program (Stein et al., 2012).

Why do so few patients use MATs? There are likely many factors outside of control of the individual, such as cost, lack of access to services, lack of trained providers, lack of awareness of MAT options, expressed negative beliefs of family members, community members, and substance abuse treatment providers (Volkow, Frieden, Hyde, & Cha, 2014) or a wider cultural stigma against the use of MATs (Center for Substance Abuse Treatment, 2005), particularly MMT (Pinto et al., 2010). Our previous research has found that, for people undergoing opioid detoxification, the lower the perceived risk of one's own relapse, the lower the likelihood that one expresses a desire to start an MAT after detoxification (Bailey, Herman, & Stein, 2013). Consistent with the Health Belief Model (Rosenstock, Strecher, & Becker, 1988), we hypothesized that other types of patient beliefs – i.e., beliefs about barriers to MAT use (which include perceived danger or perceived emotional

discomfort) and efficacy of MATs --may also play a role in preference for a particular MAT following a short-term inpatient detoxification.

With respect to perceived barriers, patients may view MATs, and particularly methadone, as **<u>harmful</u>**. A study of opioid dependent individuals, including those in and not in treatment, found that participants had numerous negative beliefs about methadone, believing that it had a negative impact on physical health, that it was addicting, and that withdrawal from methadone was very difficult (Schwartz et al., 2008). A study of opioid-dependent patients found that beliefs about depression or anxiety as a medication side effect were associated with decreased likelihood of taking that particular MAT (Ridge, Gossop, Lintzeris, Witton, & Strang, 2009). Beliefs about harmful physical effects of methadone have also been associated specifically with the choice of BUP over MMT (Gryczynski et al., 2013; Pinto et al., 2010).

Second, patients may view MATs (particularly MMT and BUP) as **<u>inconsistent with being drug-free</u>**, as promoted in some (but not all) 12-step programs or by peers or other counselors, and therefore not an acceptable treatment. Although anyone with a desire to stop using drugs may join NA, local NA groups have the option of restricting participation of people using MATs, not allowing them to take leadership roles (White, 2011). This, combined with wider cultural stigma against the use of MATs (Center for Substance Abuse Treatment, 2005), might lead patients to believe that MATs are not an acceptable option. Indeed, in a study of BUP vs. MMT where patients were able to choose which MAT they wanted to take, those who chose BUP (vs. those who chose MMT) were more likely to believe that methadone was —swapping on addiction for another‖ (Pinto et al., 2010).

Finally, patients may view MATs as **<u>ineffective</u>**. For example, in a study of 104 opioid dependent patients, only approximately one third believed that MMT or BUP maintenance treatment was superior to detoxification in the prevention of heroin use (Luty, 2004). Indeed, beliefs that treatment will have a positive impact on one's life (i.e., be efficacious) predict the likelihood of engaging in long-term substance use treatment after acute detoxification (Millery, Kleinman, Polissar, Millman, & Scimeca, 2002). This was true even when controlling for other predictors of treatment engagement, including homelessness, being on parole, and long-term drug use (Millery et al., 2002). Further, a belief that treatment is efficacious – or the converse, that one will relapse without it – is associated with a desire to stay in treatment longer for patients already in BUP or MMT maintenance treatment (Bentzley, Barth, Back, Aronson, & Book, 2015; Winstock, Lintzeris, & Lea, 2011), as well as with actual retention in MMT (Kayman, Goldstein, Deren, & Rosenblum, 2006).

As reviewed above, there is surprisingly little research documenting whether these beliefs are in fact associated with stated treatment preferences prior to the onset of maintenance treatment, and no research including XR-NTX as a treatment option. The goal of this study was to examine whether beliefs about specific treatments, as well as perceived *structural* barriers (e.g., time, transportation), are associated with stated preferences for a specific MAT vs. no MAT following detoxification for opioid dependence. We hypothesized that beliefs about efficacy, safety, and consistency with being drug-free would be associated with a stated preference to use one MAT versus another, or to use no MAT. Further, we predicted

that a perceived lack of structural barriers to a particular MAT would be associated with a preference for that MAT. We compared whether the three MATs differed in perceived efficacy, safety, or consistency with being drug-free in the sample as a whole (i.e., regardless of stated medication preference). Finally, we examined whether previous use of a MAT would be associated with intent to reinitiate that MAT, and whether there was a difference between groups choosing different MATs in their confidence that they would be able to start that MAT when they left detoxification.

2. Material and methods

2.1. Participants

From August 2014 to March 2015, research staff approached consecutive patients within the first 24 hours of admission to an inpatient opioid detoxification program at Stanley Street Treatment Addiction and Resources, Inc. (SSTAR), in Fall River, Massachusetts. This program is a 38-bed, 24-hour medically supervised facility that provides evaluation and withdrawal management. Average length-of-stay at the detoxification program is 5.9 days using a methadone taper protocol as well as individual and group counseling and case management. Follow-up care is strongly encouraged for all patients. Case managers assist patients with setting up follow-up treatment, including a dedicated case manager for maintenance MAT.

2.2. Procedures

Of the 397 patients who were admitted to SSTAR for opioid detoxification during the recruitment period, were 18 years or older, and were English-speaking, 25 were not enrolled in the study because they were unable to provide verbal informed consent, refused study participation, or were discharged before staff could interview them. The remaining 372 persons completed a face-to-face 15-minute interview during which non-treating research staff administered measures detailed below. At the time of the interview, participants had been dosed with an opioid agonist and were comfortable to complete the interview. However, they had not had extensive contact with treatment staff who might influence participant beliefs. Participants were not compensated. This study was approved by the Butler Hospital Institutional Review Board.

2.3. Measures

The interviewer first assessed participant demographics. The interviewer asked participants about their gender, date of birth, marital status, race, ethnicity, highest grade in school completed, work status, legal status (e.g., none, probation, parole, etc.), living situation, and type of health insurance. Next, the interviewer asked about clinical characteristics, including the age the patient began using opiates, whether he/ she had ever been prescribed BUP or XR-NTX or enrolled in MMT, and whether he/ she had ever been in a detoxification program prior to the current admission.

In order to assess preferred MAT, the interviewer asked participants: "If you were to start a medication after you leave [inpatient detoxification], which medication would you be most likely to choose?" Participants were given the choice of "methadone," "Suboxone," "Vivitrol

shots," and "none." The interviewer provided short descriptions of each of the MATs to orient participants who may not have used a particular MAT in the past. Next, the interviewer asked about efficacy, safety, and the perceived consistency with being drug-free for each of the 3 MATs. The efficacy scale included three items, identical for each MAT, but illustrated here using methadone: "Methadone has been proven to help people stay off opiates," "Methadone helps to take away the craving for opiates," and "I don't think methadone helps people stay off of opiates" (reverse coded.) The safety scale included these items: "Methadone causes dangerous side effects" (reverse coded), "Methadone is bad for you physically" (reverse coded) and "It is safe to take methadone". The consistency with being drug-free scale included: "Taking methadone is only replacing one addiction with another" (reverse coded), "People taking methadone aren't really clean" (reverse coded), and "Methadone is a treatment that gives you a "high" just like heroin or pills" (reverse coded). Participants were asked to rate each item on a scale of 1 to 5, with 1 indicating "strongly disagree," and 5 indicating "strongly agree." For all three scales, we averaged across the three items to form a 1–5 scale score, with higher scores referring to more positive attitudes toward MATs. Cronbach's alpha was satisfactory for all three scales (see Table 2). Finally, to assess degree to which there were structural barriers to MATs, the interviewer told participants: "Barriers to treatment may include cost, transportation, finding a provider or program, or having enough time for appointments." We then asked them to rate the statement "There are barriers to my taking methadone [Suboxone/ Vivitrol]" on the same 5-point scale described above, and then to choose his/ her own single **main** barrier to that particular MAT. Participants chose from a list that included health insurance, cost, transportation, childcare, the wait-time to enroll in a program, not knowing where to go, and other. If participants chose "other," they were asked to provide more information about the barrier that they had in mind.

The interviewer also asked participants to describe their confidence that they would be able to start taking their medication of choice after leaving detoxification. Participants rated confidence on a 10 point scale, ranging from 1, "not at all confident" to 10 "very confident."

2.4. Data analysis

We report descriptive statistics to summarize demographic and clinical characteristics of this sample. We estimated the internal consistency of belief scales with Cronbach's alpha. We used F-tests for differences in means and the χ^2 – test of independence to statistically compare demographics, beliefs about efficacy, safety, consistency with being drug-free, and barriers by preferred treatment. We used repeated-measures ANOVA to compare differences in perceived efficacy, safety, or consistency with being drug free between the three MATs within the sample as a whole. We used the Holm-Bonferroni method ([Holm, 1979]) to control the family wise error rate when conducting follow-up pairwise comparisons. Finally, we used the χ^2 – test to compare differences in preferred treatment type by treatment history.

3. Results

The sample was primarily male, with a mean age of 31.8 years, and, consistent with the area in which we recruited the sample (Fall River, MA), the sample was primarily white (Table

1). Most people were unemployed and most were insured with a Massachusetts Medicaid product. A substantial minority of the sample had previously been in MMT or been prescribed BUP; relatively few people had previously been prescribed XR-NTX. When asked which maintenance medication they preferred for opioid use disorder treatment, 68 (18% of the total sample) stated that they preferred MMT, 104 (28%) preferred BUP, 118 (32%) preferred XR-NTX, and 82 (22%) preferred not to take any MAT (see Table 1). We found gender and racial/ethnic differences in patient preferences. Women appeared more likely to be interested in MMT and XR-NTX, and less likely to be interested in BUP or no MAT, than men. African Americans were more likely to state a preference for MMT and XR-NTX than other racial/ ethnic groups, and less likely to prefer BUP or no treatment. We examined whether preferred medication was associated with a history of using that medication; we did not find a significant association for any of the three MATs, although there was a trend for patients with a history of taking XR-NTX stating that they preferred XR-NTX.

As documented in Table 2, participants who stated that they preferred MMT, relative to participants who preferred BUP, XR-NTX, or no MAT, gave MMT higher ratings on efficacy, safety, and consistency with being drug-free. Similarly, participants who preferred BUP rated BUP as higher on efficacy than people who preferred other MATs or no MAT, and participants preferring BUP rated BUP as higher on safety and consistency with being drug-free than people who preferred XR-NTX or no MAT. Participants who stated that they preferred XR-NTX rated XR-NTX more highly on efficacy and consistency with being drug-free than people who preferred the other medications or no medication, and more highly on safety than people who preferred BUP or no medication. Finally, people who preferred no MAT tended to rate efficacy, safety, and consistency with being drug free as low for all three MATs.

We found fewer differences between groups on structural barriers. People with a stated preference for MMT were less likely to say that there were structural barriers to MMT than people who preferred BUP. There were no differences between the 4 groups in percentage endorsing structural barriers to BUP or XR-NTX. Amongst participants who endorsed barriers to the MATs, transportation was the most frequently endorsed barrier for all three MATs, with 85 of 131 (65%) citing transportation as a barrier to MMT, 32 of 80 (40%) citing transportation as a barrier to BUP, and 8 of 27 (30%) citing transportation as a barrier to XR-NTX . Other frequently endorsed barriers included the wait to find a provider for BUP, with 16 of 80 (20%) citing this as a barrier, and not knowing where to go to receive a prescription for XR-NTX, with 6 of 27 (22%) citing this as a barrier.

We next examined differences between perceptions of the three MATs in the sample as a whole. (See Table 2, column 2 for means). Differences with respect to perceived efficacy were statistically significant ($F_{2,371} = 5.57$, p = .004); BUP ($t_{371} = 3.10$, p = .002) and XR-NTX ($t_{379} = 2.48$, p = .014) were perceived as significantly more efficacious than MMT. Perceived differences in the efficacy of BU and XR-NTX were not statistically significant ($t_{371} = -0.12$, p = .907). There were statistically significant differences ($F_{2,379} = 67.51$, p < . 001) differences in perceived safety; BUP ($t_{371} = 10.99$, p < .001) and XR-NTX ($t_{371} = 9.21$, p < .001) were perceived as safer than MMT. Perceived differences in the safety of BUP and

XR-NTX were not statistically significant ($t_{371} = -0.17$, p = .864). Differences with respect to consistency with being drug-free were also statistically significant ($F_{2,371} = 107.90$, p < .001); BUP ($t_{371} = 7.83$, p < .001) and XR-NTX ($t_{371} = 14.12$, p < .011) were perceived as more consistent with being drug-free than MMT, and XR-NTX was more consistent with being drug-free than BUP. ($t_{371} = -10.12$, p < .001).

Finally, we examined whether confidence that one would be able to start one's preferred medication differed by medication (rated on a scale from 1–10). The overall mean level of confidence was 8.62 (± 2.2). A majority, 60.9%, said they were very confident they would be able to start their preferred medication. Differences in confidence by preferred medication type did not vary significantly ($F_{2,278} = 1.14$, p = .323); means were 8.7 (± 2.2), 8.4 (± 2.5), and 8.8 (± 1.9) for those who preferred MMT, BUP, XR-NTX, respectively.

4. Discussion

The primary goal of this study was to understand influences on opioid users' stated preferences for MMT, BUP, XR-NTX, or no maintenance MAT as they entered short-term inpatient detoxification and were asked to consider treatment following return to the community. As hypothesized, beliefs about efficacy, safety, and consistency with being drug-free were associated with post-detoxification treatment preferences. Our findings were consistent with our hypotheses and the Health Belief model: the group of participants who stated a preference for a particular MAT rated that MAT more positively than those who did not prefer that MAT. Not surprisingly given the burden of daily appointments, structural barriers (particularly transportation and time) were associated with disfavor for MMT, with participants who preferred BUP being particularly likely to endorse barriers to MMT. However, in contrast to the strong associations between beliefs and stated preferences, the four preference groups did not differ by endorsement of structural barriers to BUP or XR-NTX; nor did previous treatment experience affect one's choice of MAT. Most participants were confident that they would be able to start their preferred medication; this did not differ between the three MATs. Thus, particularly for BUP and XR-NTX, beliefs about the medications (rather than structural barriers or previous experience) may be very influential in patient medication preference. The importance of the perception of efficacy for patients' stated preferences is consistent with literature on correlates of retention in MMT (Kayman et al., 2006) and patient preferences for how long to continue MMT (Bentzley et al., 2015; Winstock et al., 2011).

Seventy-eight percent of participants stated a preference for a medication following inpatient detoxification, with more people preferring XR-NTX and BUP than MMT. In the sample as a whole, MMT was perceived as the least safe, least efficacious, and least consistent with being drug-free of all the MATs. We examined how these preferences correspond to scientific literature on efficacy and safety. The perception of poorer efficacy of MMT vs. BUP is not in fact supported by existing efficacy literature (Mattick et al., 2014). Literature comparing the safety of MMT and BUP is more complex. BUP has lower potential for overdose than MMT (Whelan & Remski, 2012), and there is some evidence from population based studies that there may be a higher death rate associated with MMT (Connock et al., 2007). However, studies comparing rates of serious adverse events in BUP maintenance vs

MMT found no significant differences in rates of serious adverse events (Connock et al., 2007).Therefore, the question of relative safety is clearly a complex one.

Although it is a fairly new option, participants in this study demonstrate considerable interest in XR-NTX. Despite (or perhaps because of) the fact that few people have tried XR-NTX in the past, it was the most commonly chosen preferred MAT. XR-NTX also requires only monthly visits, and given that transportation and time are important stated barriers to MMT, it represents a convenient option. (Like MMT and BUP, XR-NTX is also covered by insurance in Massachusetts). Other studies have documented patient willingness to try XR-NTX as well (Ahamad et al., 2015), with daily heroin injection use being associated with higher interest in XR-NTX. We do not know whether attitudes toward, or interest in XR-NTX will change once a substantial proportion of eligible people have had experience with it. It is possible that the level of interest in XR-NTX is simply a function of its novelty as a treatment. However, regardless of experience, if patients understand that XR-NTX does not contain a synthetic opioid, they may be more likely to believe it is consistent with being drug-free. Indeed, ratings for "consistency with being drug-free" for XR-NTX were higher than for BUP and MMT in the study sample as a whole

There is significant concern that opioid-dependent patients frequently do not initiate the treatment choices with the strongest efficacy data – i.e., MMT or BUP (Volkow et al., 2014), leaving persons at risk for opioid overdose in the days following detoxification (Volkow et al., 2014). Indeed, twenty-two percent of our sample stated a preference for no MAT, and undoubtedly some of the individuals who stated a preference of an MAT did not go one to start one. Although barriers to MAT use exist on a number of levels—from social support to treatment availability—our study suggests that attention to patients' beliefs about MATs may be an important component of a multi-factorial plan to increase the use of MATs among opioid users who are not seeking long-term residential treatment. One method for addressing patients' pre-existing knowledge, communicating risk information, and including patients' values in decisions about treatment is shared decision making processes and decision support tools (Lin & Fagerlin, 2014). To date, there is very little research on shared decision making interventions for treatment for substance use, although one such intervention has been shown to improve outcomes for individuals in drug treatment programs (Joosten, de Jong, de Weert-van Oene, Sensky, & van der Staak, 2009). Certainly, it would seem valuable to develop and evaluate structured education programs that correct factually incorrect attitudes (e.g., about efficacy) as well as help patients to accurately understand and weigh risks and benefits of all treatment options, including no aftercare treatment. Others have outlined principles for effectively communicating health risk information (Lin & Fagerlin, 2014). Further, to the extent that there is a dominant cultural narrative that MATs are inconsistent with being drug-free, including stories from peers (e.g., through the use of video) that challenge that narrative may be an important component of educational tools (Houston, Cherrington, et al., 2011). Indeed, videos of peer stories have been shown to improve control of other health problems such as hypertension (Houston, Allison, et al., 2011). Finally, not all substance use counselors have positive attitudes towards MATs (Rieckmann, Daley, Fuller, Thomas, & McCarty, 2007) or endorse the importance of evidence-based care (Rieckmann, Farentinos, Tillotson, Kocarnik, & McCarty, 2011). Counselors may benefit from accurate education about risks and benefits of MATs as well.

In this study, the proportion of people stating a preference for any MAT (78%) was higher than the proportion that we found in previous research in persons undergoing inpatient detoxification at the same site conducted in 2011. In the previous project (Bailey et al., 2013), when asked, "When you leave detoxification this time, do you want to take medication such as Suboxone, methadone, or Vivitrol for your opiate addiction?" 63% indicated an interest in MAT. The difference in proportions may be due to more positive attitudes towards MATs over time; however, we cannot rule out the different phrasing of the question as a possible explanation. In the current study, participants were explicitly given the opportunity to "opt out" of the question about MAT preferences (i.e., choose "none"), but a limitation of the current study is that the way that the preference question was worded, participants may have sensed that it was more desirable to choose an MAT rather than choose the response "none."

While theories of behavior change suggest that stated preferences, confidence, perceived benefits, and perceived barriers influence actual behavior (Webb, Sniehotta, & Michie, 2010), and there is empirical support that preferences (Lambooij et al., 2015; Salampessy et al., 2015) do in fact *predict* various health behaviors including choice of methadone vs. BUP (Ridge et al., 2009), our study did not assess whether participants actually started their preferred, or any, MAT. A limitation of this study is that it is quite likely that some of the participants stating a preference for a particular MAT did not start that MAT. An additional limitation was that although we measured whether participants had received a treatment previously, we did not measure the nature of that experience. It is possible that the positive and/or negative aspects of that experience would influence current attitudes and preferences. Some previous research has found that previous experience is related to choosing MMT vs. BUP, and that previous experience is more likely to be considered negative than positive (Pinto et al., 2010). Finally, we did not assess another potential perceived harm – concerns about the difficulty of withdrawal from a MAT – that may also have an impact on whether patients prefer to start that treatment.

This study contributes to the existing literature in several ways. First, we used a well-known conceptual model to predict stated treatment preferences. The scales we created to measure beliefs about MATs had satisfactory internal consistency, face validity, and were consistent with stated MAT preference, supporting the utility of the Health Belief Model and these scales in this population. Second, previous studies on patient beliefs about MATs either examined how beliefs predicted a preference for (or actual choice of) MMT vs. BUP (Gryczynski et al., 2013; Pinto et al., 2010; Ridge et al., 2009) or examined retention in (Kayman et al., 2006) or intended duration of (Bentzley et al., 2015; Winstock et al., 2011) maintenance treatment with either MMT or BUP. Another study contrasted attitudes toward BUP or MMT amongst patients enrolling in MMT or people not in treatment (Schwartz et al., 2008). Thus, our study is unique in that we were able to contrast stated preference for MMT or BUP to both XR-NTX and no MAT. Further, we were able to do so at a moment when that decision was very immediately relevant to patients (i.e., when they were in a detoxification program). Finally, we note that there was excellent participation, with approximately 94% of eligible patients taking part in the study. This supports the generalizability of our results to patients in detoxification programs.

5. Conclusions

In sum, this study demonstrates that, during in patient detoxification, beliefs about medications' efficacy, safety, and consistency with being drug-free are associated with patients preferences for MAT options after detoxification, and therefore may contribute to whether patients start an MAT following detoxification, and, if so, which MAT they choose. Patients who stated a preference for no MAT had the most negative beliefs about all of the MATs. Although structural, non-attitudinal barriers are sure to play a role in treatment preference and post-detoxification treatment initiation, efforts to increase MAT uptake might benefit from more focused attention to patient beliefs and educational interventions to promote appropriate aftercare enrollment.

Acknowledgments

7. References

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Highlights

- Opioid-dependent patients rated preferences for medication-assisted treatments

- Positive beliefs about a medication were associated with preference for that medication

- Patients preferring no medication-assisted treatments had the most negative beliefs

- A substantive proportion preferred naltrexone despite little prior experience with it

Table 1

Background Characteristics by Stated Medication Preference (n = 372).

	Sample[a] (n = 372)	PREFERRED MEDICATION[b]				F or χ2 (p =)
		MMT (n = 68)	BUP (n = 104)	XR-NTX (n = 118)	None (n = 82)	
Years Age	31.8 (± 9.1)	32.5 (± 9.0)	31.7 (± 9.0)	31.3 (± 8.7)	32.2 (± 10.0)	0.29 (.835)
Gender						19.36 (<.001)
Male	262 (70.4%)	37 (14.1%)	81 (30.9%)	76 (29.0%)	68 (26.0%)	
Female	110 (29.6%)	31 (28.2%)	23 (20.9%)	42 (38.2%)	14 (12.7%)	
Years Education	12.0 (±1.7)	11.9 (±1.5)	12.0 (±1.6)	12.0 (±2.1)	11.9 (±1.5)	0.17 (.916)
Race/Ethnicity						23.30 (.006)
African-American	10 (24%)	4 (40.0%)	1 (10.0%)	5 (50.0%)	0 (0.0%)	
Hispanic/ Latino	23 (6.2%)	1 (4.4%)	6 (26.1%)	8 (34.8%)	8 (34.8%)	
White or Caucasian	320 (86.0%)	62 (19.4%)	94 (29.4%)	100 (31.3%)	64 (20.0%)	
Other	19 (5.1%)	1 (5.3%)	3 (15.8%)	5 (26.3%)	10 (52.6%)	
Employment Status						9.01 (.436)
Full-Time	52 (14.0%)	5 (9.6%)	12 (23.1%)	18 (34.6%)	17 (32.7%)	
Part-Time	18 (4.8%)	2 (11.1%)	7 (38.9%)	6 (33.3%)	3 (16.7%)	
Unemployed	246 (66.1%)	48 (19.5%)	72 (29.3%)	75 (30.5%)	51 (20.7%)	
Other	56 (15.1%)	13 (23.2%)	13 (23.2%)	19 (33.9%)	11 (19.6%)	
Health Insurance Type						7.3 (.541)
Private	25 (6.7%)	3 (12.0%)	7 (28.0%)	9 (36.0%)	6 (24.0%)	
Mass. Health	283 (76.1%)	52 (18.4%)	80 (28.3%)	93 (32.9%)	58 (20.5%)	
None	52 (14.0%)	8 (15.4%)	15 (28.9%)	14 (26.9%)	15 (28.9%)	

	Sample[a] (n = 372)	PREFERRED MEDICATION[b]				F or χ2 (p =)
		MMT (n = 68)	BUP (n = 104)	XR-NTX (n = 118)	None (n = 82)	
Other	12 (3.2%)	5 (41.7%)	2 (16.7%)	2 (16.7%)	3 (25.0%)	
Homeless						2.80 (.424)
Yes	47 (12.6%)	12 (25.5%)	14 (29.8%)	11 (23.4%)	10 (21.3%)	
No	325 (87.4%)	56 (17.2%)	90 (27.7%)	107 (32.9%)	72 (22.2%)	
Age First Used Opiates	21.6 (± 7.0)	21.0 (± 6.2)	22.0 (± 7.9)	21.2 (± 6.5)	22.0 (± 7.3)	0.51 (.677)
Ever in MMT						2.57 (.463)
Yes	134 (36.0%)	29 (21.6%)	39 (29.1%)	41 (30.6%)	25 (18.7%)	
No	238 (64%)	39 (16.4%)	65 (27.3%)	77 (32.4%)	57 (24.0%)	
Ever Prescribed BUP						0.75 (.862)
Yes	155 (41.7%)	29 (18.7%)	40 (25.8%)	52 (33.6%)	34 (21.9%)	
No	217 (58.3%)	39 (18.0%)	64 (29.5%)	66 (30.4%)	48 (22.1%)	
Ever Prescribed XR-NTX						7.29 (.063)
Yes	26 (6.8%)	4 (15.4%)	6 (23.1%)	14 (53.9%)	2 (7.7%)	
No	346 (93.2%)	64 (18.5%)	98 (28.3%)	104 (30.1%)	80 (23.1%)	

Note. MMT = methadone maintenance treatment; BUP = buprenorphine/ naltrexone; XR-NTX = injectable extended-release naltrexone.

[a] Denominator for percentages in this column is the total sample (n = 372).

[b] Denominator for percentages in this column is the total number of participants with that particular demographic (e.g., gender) or clinical (e.g., Ever in MMT) characteristic.

Table 2

Attitudes Towards MAT by Stated Medication Preference (n = 372).

	Chronbach's Alpha	Sample (n = 372) Mean (SD)	MMT (n = 67) Mean (SD)	BUP (n = 105) Mean (SD)	XR-NTX (n = 118) Mean (SD)	None (n = 82) Mean (SD)	F (p =)
Efficacy of…							
MMT	.72	3.40 (0.79)	3.96 ^{abc} (0.57)	3.42 (0.72)	3.20 (0.83)	3.21 (0.77)	16.09 (<.001)
BUP	.70	3.52 (0.74)	3.54 (0.69)	3.91 ^{ade} (0.61)	3.32 (0.77)	3.27 (0.69)	17.79 (<.001)
XR-NTX	.74	3.53 (0.59)	3.42 (0.57)	3.44 (0.60)	3.79 ^{bdf} (0.56)	3.41 (0.53)	12.74 (<.001)
Safety of…							
MMT	.64	2.98 (0.64)	3.32 ^{abc} (0.65)	3.02 ^{d} (0.63)	2.83 (0.59)	2.85 (0.63)	10.56 (<.001)
BUP	.64	3.30 (0.61)	3.46 ^{bc} (0.59)	3.51 ^{de} (0.54)	3.22 ^{f} (0.52)	3.01 (0.69)	14.01 (<.001)
XR-NTX	.69	3.31 (0.47)	3.33 ^{c} (0.51)	3.30 ^{e} (0.43)	3.45 ^{df} (0.43)	3.10 (0.44)	9.38 (<.001)
Consistency with being drug free							
MMT	.71	2.72 (0.78)	3.21 ^{abc} (0.77)	2.86 ^{de} (0.75)	2.46 (0.69)	2.54 (0.74)	18.11 (<.001)
BUP	.69	2.91 (0.79)	3.21 ^{bc} (0.77)	3.17 ^{de} (0.74)	2.66 (0.74)	2.67 (0.76)	14.38 (<.001)
XR-NTX	.79	3.38 (0.61)	3.40 (0.51)	3.35 ^{e} (0.57)	3.61 ^{bdf} (0.55)	3.08 (0.67)	13.71 (<.001)
		n (% of 372)	n (% of 67)	n (% of 105)	n (% of 118)	n (% of 82)	χ^2(p =)
Endorses structural barriers to…							
MMT	NA	131 (35.2%)	20 ^{a} (29.4%)	52 ^{de} (49.5%)	37 (31.4%)	22 (26.8%)	13.74 (.003)
BUP	NA	80 (21.5%)	18 (26.9%)	24 (22.9%)	22 (18.8%)	16 (19.5%)	1.94 (.583)

	Chronbach's Alpha	Sample (n = 372) Mean (SD)	MMT (n = 67) Mean (SD)	BUP (n = 105) Mean (SD)	XR-NTX (n = 118) Mean (SD)	None (n = 82) Mean (SD)	F (p =)
				PREFERRED MEDICATION			
XR-NTX	NA	27 (7.3%)	4 (6.0%)	8 (7.6%)	11 (9.5%)	4 (4.9%)	1.67 (.644)

[a] MMT significantly different than BUP.

[b] MMT significantly different than XR-NTX.

[c] MMT significantly different than preference for no medication.

[d] BUP significantly different than XR-NTX.

[e] BUP significantly different than preference for no medication.

[f] XR-NTX significantly different than preference for no medication.

Note. MMT = methadone maintenance treatment; BUP = buprenorphine/ naltrexone; XR-NTX = injectable extended-release naltrexone