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Heroin Refusal Self-Efficacy and Preference for Medication-Assisted Treatment after Inpatient Detoxification

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Abstract

Objective—An individual's self-efficacy to refuse using heroin in high-risk situations is believed to minimize the likelihood for relapse. However, among individuals completing inpatient heroin detoxification, perceived refusal self-efficacy may also reduce one's perceived need for medication-assisted treatment (MAT), an effective and recommended treatment for opioid use disorder. In the current study, we examined the relationship between heroin refusal self-efficacy and preference for MAT following inpatient detoxification.

Method—Participants (N = 397) were interviewed at the start of brief inpatient opioid detoxification. Multiple logistic regression was used to estimate the adjusted association of background characteristics, depressed mood, and perceived heroin refusal self-efficacy with preference for MAT.

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Contributors

Drs. Stein and Bailey collected the data used in the current manuscript. Drs. Kenney, Stein, and Anderson generated the design and analyses used in the current study. Dr. Kenney conducted the literature review, wrote the Introduction, Methods, and Discussion, and revised the final draft of the manuscript. Dr. Anderson conducted statistical analyses, wrote the Results section, and reviewed manuscript drafts. Drs. Stein and Bailey reviewed and provided feedback on drafts of the manuscript. All authors contributed to and have approved the final manuscript.

Conflict of Interest

Dr. Bailey reports personal fees from BioDelivery Science International, Inc., grants, personal fees and other from Braeburn Pharmaceuticals, Inc., personal fees from Camurus AB, grants from Orexo, grants and other from Reckitt-Benckiser (Indivior), other from Titan Pharmaceuticals, Inc., outside the submitted work. (ICMJE form available upon request.)

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Results—Controlling for other covariates, depressed mood and lower perceived refusal self-efficacy were associated with a significantly greater likelihood of expressing preference for MAT (versus no MAT).

Conclusions—Perceived ability to refuse heroin after leaving detox is inversely associated with a heroin user's desire for MAT. An effective continuum of care model may benefit from greater attention to patient's perceived refusal self-efficacy during detoxification which may impact preference for MAT and long-term recovery.

Keywords

Heroin dependence; Refusal self-efficacy; Opioid detoxification; Medication-assisted treatment

1. Introduction

From 2002 to 2013, the number of Americans addicted to heroin doubled and heroin-related overdose deaths nearly quadrupled (Hedegaard, Chen, & Warner, 2015; SAMHSA, 2014). High rates of readmission following heroin detoxification, early relapse, and fatal overdose (Smyth, Barry, Keenan, & Ducray, 2010; Wines, Saitz, Horton, Lloyd-Travaglini, & Samet, 2007) emphasize the need for continuity of treatment after discharge. Opioid dependent patients who undergo detoxification often do not transition to medically-assisted treatment (MAT) (e.g., methadone, buprenorphine or vivitrol), the most efficacious therapy for preventing relapse and maintaining long-term abstinence (see Connery, 2015 for review; Volkow, Frieden, Hyde, & Cha, 2014). Therefore, gaining a better understanding of individual-level factors that may limit the post-detoxification transition to MAT could have public health benefits.

Social cognitive theory posits that perceived self-efficacy, or the ability to successfully deal with difficult situations to achieve desired outcomes, is the most proximal predictor of behavioral change (Bandura, 1977, 1998). While self-efficacy is among the most robust predictors of positive substance use treatment outcomes (see Kadden & Litt, 2011 for review), few studies have investigated the role of self-efficacy among heroin users initiating treatment. Heroin dependence is associated with the lowest levels of refusal self-efficacy of all drug classes (El-Sheikh Sel & Bashir, 2004), and perceived self-efficacy to resist urges to use heroin has been shown to predict abstinence (Cirauro, Piechniczek-Buczek, & Iscan, 2003; Senbanjo, Wolff, Marshall, & Strang, 2009). Although there is theoretical support that one's self-efficacy to resist substance use impacts motivation to change and personal goal setting (Bandura 1998), no study to date has examined the association between perceived refusal self-efficacy and desire for treatment among heroin users.

1.1. Current Study and Hypotheses

We hypothesized that lower refusal self-efficacy would be associated with preference for MAT (as opposed to no MAT) following detoxification. Major depression and heroin use are highly comorbid (Havard, Teesson, Darke, & Ross, 2006; Teesson et al., 2015), depressive symptoms are associated with lower levels of perceived refusal self-efficacy (Senbanjo et al., 2009) and greater compulsion to use heroin (Lee, Lin, Wang, & Yen, 2016), and major

depression is a risk factor for heroin relapse (Hasin et al., 2002; Samet et al., 2013). Therefore, our analysis controlled for depressed mood as well as demographic and drug use factors that are prevalent among heroin users and MAT patients, including unemployment status (Becker, Fiellin, Merrill, Schulman, Finklestein, Olsen, & Busch, 2008; Fischer, Nakamura, Rush, Rehm, & Urbanoski, 2010) and criminal justice involvement (Hakansson & Berglund, 2012; Rastegar, Kawasaki, King, Harris, & Brooner, 2016).

2. Method

2.1. Recruitment

Between December 2015 and August 2016, consecutive persons seeking inpatient opioid detoxification were approached at the time of admission to Stanley Street Treatment and Resources, Inc. (SSTAR) in Fall River, Massachusetts to participate in a survey research study. SSTAR's detoxification program provides evaluation and withdrawal management using a methadone taper protocol, individual and group counseling, and aftercare case management, and has a mean length-of-stay of 4.9 days. This length of stay is typical of short-term inpatient detoxification units in our region.

Of patients admitted to SSTAR during the recruitment period, 497 were opioid users who were 18 years or older, English-speaking, and able to provide informed consent as approved by the Butler Hospital Institutional Review Board. Twenty-three refused study participation or were discharged before staff could interview them. The remaining 474 persons completed a non-incentivized, face-to-face interview administered by non-treating research staff that required approximately 15 minutes. Of these, 429 (90.5%) were detoxing from heroin. The 397 participants who provided responses to all the measures of interest constitute the study sample.

2.2. Measures

In addition to age, sex, race/ethnicity, past 30-day injection drug use, and prior opioid detox experience, the following variables were assessed:

2.2.1. Legal involvement—Respondents were asked about their current legal involvement. Those responding “none” were coded as having no legal involvement and all other responses (“on probation,” “on patrol,” “on pretrial release,” or “incarceration”) were coded as having pending legal issues.

2.2.2. Employment status—Respondents were given options to describe their current work status. Those reporting “full time (>35 hours per week)” or “part-time (<35 hours per week)” work status were coded as employed while students and those “currently unemployed” or “receiving disability” were coded as unemployed.

2.2.3. Depressed mood—Depressive symptoms were assessed using the two-question Patient Health Questionnaire (PHQ-2; Kroenke, Spitzer, Williams, & Lowe, 2009) that assesses the frequency of depressed mood or anhedonia over the past two weeks. A score of 3 or greater was defined as depressed mood.

2.2.4. Prior MAT experience—Three questions were used to measure participants' prior experience with MAT. Participants were asked if they have ever been prescribed buprenorphine (Suboxone), been prescribed Vivitrol, or enrolled in a methadone maintenance program. Each question provided a brief summary of the respective MAT (e.g., "Vivitrol is a medication-assisted treatment. It's an injection (shot) of naltrexone that the patient receives once per month. Vivitrol works by blocking the "high" one might experience from opiate use"). Participants responding "yes" to at least one of the three medications were coded as having prior MAT experience.

2.2.5. Preference for medication-assisted treatment—Participants were asked, "If you were to start a medication after you leave SSTAR, which medication are you most likely to choose?" Response options were methadone, suboxone, vivitrol shots or none. Participants responding "none" were defined as having a preference for no MAT as part of the aftercare treatment plan; those choosing a medication were coded as having a preference for MAT. Participants were also asked, "If you had unlimited treatment options (and all were free), which one would work best for you when you leave here?" Among the 87 participants who did not want MAT after discharge, 39 (44.8%) reported they were not interested in any post-discharge treatment, 11 (12.6%) wanted residential treatment, 16 (18.4%) wanted outpatient counseling, 21 (24.1%) wanted NA/AA meetings only.

2.2.6. Refusal self-efficacy—A one-item refusal self-efficacy question was adopted from a three-item self-efficacy measure used by Barta et al. (2009). Participants were asked to think about the day they leave treatment and respond to the statement, "I will be able to refuse (heroin) even if it is offered to me" using four response options: *not at all*, *slightly true*, *somewhat true*, and *very true*.

2.3. Analysis Plan

We present descriptive statistics to summarize the characteristics of the sample. Unadjusted associations of background characteristics and refusal self-efficacy with preference for MAT after discharge from detox were evaluated using the Pearson χ^2 -test of independence and t-tests for differences in means. Logistic regression was used to estimate the adjusted associations of background characteristics and refusal self-efficacy with preference for MAT. We used a difference in likelihood ratio chi-square test to compare models parameterizing the effect of refusal self-efficacy as linear versus unordered categorical. To further evaluate the model, we report BIC and AIC statistics for the full and constant only model. Models with small BIC and AIC statistics are preferred. Additionally, we report the area under the receiver operating characteristic curve (AROC). For any randomly selected pair of observations (1 from each group) the AROC gives the probability of correctly identifying group membership based on the model; a value of .5 indicates the model is no better than chance.

3. Results

Participants averaged 32.2 ($\pm$ 8.56) years of age, 72.8% were male, and 8.8% were Hispanic (Table 1). Most (87.2%) were White, 3.8% were Black, and 9.1% were of mixed or other

racial origins. Seventy-four (18.6%) were employed part- or full-time and 36.8% had pending legal involvement in the legal system. About 64.5% screened positive for depressed mood on the PHQ-2, 84.9% had a history of prior detox, and 68.0% had previously been prescribed some form of MAT for opioid dependence. In t-tests, persons preferring MAT ($n = 310$; 78%) did not differ significantly from those who did not want MAT ($n = 87$; 22%) with respect to age, gender, ethnicity, race, employment status, legal status, recent injection drug use, history of prior detox, or history of prior MAT. A significantly ($\chi^2 = 7.92$, $p = .005$) higher percentage of persons expressing a preference for MAT (68.1% vs 51.7%) screened positive for depressed mood.

Adjusting for covariates included in the multivariate model, persons screening positive for depressed mood on the PHQ-2 had a significantly higher likelihood (OR = 1.91, 95% CI 1.15; 3.15, $z = 2.52$, $p = .012$) of expressing a preference for MAT than those who screened negative for depressed mood (Table 2). Each one category increase in refusal self-efficacy was associated with a .72 (95% CI 0.58; 0.90, $z = -2.88$, $p = .004$) factor decrease in the expected odds of preferring MAT. A likelihood ratio difference in chi-square test ($LR^2 = 1.03$, $df = 2$, $p = .598$) indicated this association was approximately linear across the range of refusal self-efficacy assessed by the ordered categorical measure used here. Other covariates included in the multivariate model were not associated significantly with preference for MAT in the multivariate model. Compared to the much more parsimonious constant only model, information criteria only weakly favored the full model; BIC statistics were 459.9 and 462.4 for the full and constant only models, respectively. AIC statistics were 416.1 for the full model and 419.5 for the constant only model. The AROC = .68, indicating that relative to chance, the model reduces classification error by about 18%.

4. Discussion

In this sample of patients entering an inpatient detoxification program for heroin use, we found, as hypothesized, that higher perceived refusal self-efficacy was strongly associated with a preference for not pursuing aftercare MAT, controlling for demographic and drug use factors and depressed mood. Higher refusal self-efficacy suggests that these patients may feel confident that they can resist using in high-risk situations without medication such as methadone or buprenorphine when they return to the community. Because other work has found that brief detoxification without aftercare MAT puts opioid users at increased risk of death (Kakko, Svanborg, Kreek, & Heilig, 2003), our data support the provision of accurate information about MAT options, highlighting the immediate challenges associated with resisting heroin without medication.

Lower perceptions of refusal self-efficacy were associated with desire to initiate MAT after detoxification, indicating potential for MAT to enhance self-efficacy in this subgroup. Indeed, enhancing drug use refusal self-efficacy is considered a critical component of relapse prevention (Roffman & Stephens, 2005). Cognitive behavioral coping skills training has been shown to improve efficacy to resist drug use (see Kadden & Litt, 2011 for review; Litt & Kadden, 2015; Yen, Wu, Yen, & Ko, 2004), and medications such as buprenorphine appear to increase patients' general self-efficacy to cope with difficult situations (Ponizovsky, Grinshpoon, Margolis, Cohen, & Rosca, 2006). Indeed, knowing that use of

medication (buprenorphine, methadone or vivitrol) renders continued use of heroin non-euphoric likely lends confidence to avoiding continued use. Interventions to improve refusal self-efficacy among patients recovering from heroin addiction who do not want MAT are needed.

Similar to rates found in other samples of patients attending detoxification for opioid dependence (Uebelacker, Bailey, Herman, Anderson, & Stein, 2016), we found that 22% of patients detoxing from heroin did not want to initiate MAT after discharge. Of those with no interest in MAT, 55% still preferred some form of other treatment (i.e., long term residential treatment, outpatient counseling or 12-step meetings) to no treatment whatsoever, indicating that the majority of detoxifying patients appear amenable to receiving aftercare assistance.

The current findings regarding depressive status are consistent with somewhat paradoxical findings that major depression increases the likelihood for heroin relapse (Havard, et al., 2006; Teesson et al., 2015), even though depressive symptoms are associated with a greater interest in achieving abstinence and receiving treatment, such as MAT (Avants, Margolin, & McKee, 2000; Mukherjee et al., 2016). Our finding that persons with depressed mood, relative to those with non-depressed mood, were more likely to prefer MAT after detoxification—68% of those preferring MAT met criteria for depressed mood—indicates that depressive symptoms may influence patients' interest in treatment, and perhaps their recognition of heightened risk. While we cannot affirm that participants preferring MAT initiated MAT using our data, prior research shows a disproportionate number of depressed heroin users in methadone and buprenorphine treatment (Teesson et al., 2005). Continuity of care efforts should implement depression screening to identify patients with comorbid heroin dependence and depressed mood as such individuals may face considerable risk for relapse and overdose (Hasin et al., 2002; Samet et al., 2013) but may also be amenable to MAT as part of aftercare.

4.1. Limitations

Our data came from a single detoxification program in the northeastern United States. Second, refusal self-efficacy and preference for MAT were based on single items. Third, we did not assess several variables associated with disinterest in MAT, including lack of knowledge about MAT, negative views or cultural stigma about MAT (Uebelacker et al., 2016; Volkow et al., 2014). Finally, interviews were performed on the first day of detoxification; different levels of self-efficacy or treatment preference might have emerged in later days of the program.

4.2. Conclusions

The heroin epidemic and high rates of relapse among patients undergoing detoxification call for improved efficacious aftercare following detoxification. The limits of refusal self-efficacy will be tested for heroin users immediately upon reentry into the community after completing a brief inpatient stay. Discussions about the challenges of refusal self-efficacy and the advantages of MAT should be part of all detoxification programs.

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Highlights

- Controlling for background factors and depressed mood, lower perceived refusal self-efficacy was associated with a significantly greater likelihood of expressing preference for MAT (versus no MAT).
- Controlling for background factors and refusal self-efficacy, depressed mood was associated with a significantly greater likelihood of expressing preference for MAT (versus no MAT).
- Persons preferring MAT did not differ significantly from those who did not want MAT with respect to age, gender, ethnicity, race, recent injection drug use, history of prior detox, or history of prior MAT.

Table 1

Background Characteristics and Refusal Self-Efficacy by Preference for MAT.

	Sample (n = 397)	Prefers MAT		t or χ^2 (p =)
		No (n = 87)	Yes (n = 310)	
Age	32.2 ($\pm$ 8.56)	33.1 ($\pm$ 9.20)	32.0 ($\pm$ 8.37)	1.08 (.281)
Gender (Male)	289 (72.8%)	65 (74.7%)	224 (72.3%)	0.21 (.649)
Ethnicity (Hispanic)	35 (8.8%)	8 (9.2%)	27 (8.7%)	0.02 (.888)
Race				
White	346 (87.2%)	77 (88.5%)	269 (86.8%)	0.80 (.670)
Black	15 (3.8%)	4 (6.6%)	11 (3.6%)	
Other	36 (9.1%)	6 (6.9%)	30 (9.7%)	
PHQ-2 (Depressed mood+)	256 (64.5%)	45 (51.7%)	211 (68.1%)	7.92 (.005)
Employed (Yes)	74 (18.6%)	21 (24.1%)	53 (17.1%)	2.22 (.136)
Pending Legal Issues (Yes)	145 (36.8%)	31 (35.6%)	114 (36.8%)	0.04 (.845)
Recent IDU (Yes)	309 (77.8%)	71 (81.6%)	238 (76.8%)	0.92 (.337)
Prior Detox (Yes)	337 (84.9%)	71 (86.6%)	266 (85.8%)	0.93 (.334)
Prior MAT (Yes)	270 (68.0%)	57 (65.2%)	213 (68.7%)	0.32 (.573)
Refusal Self-Efficacy				
Not at all	107 (27.0%)	13 (14.9%)	94 (30.3%)	12.37 (.006)
Slightly True	88 (22.2%)	16 (18.4%)	72 (23.2%)	
Somewhat True	85 (21.4%)	23 (26.4%)	62 (20.0%)	
Very True	82 (26.5%)	35 (40.2%)	82 (26.5%)	

Table 2

Adjusted Associations of Preference for MAT with Background Characteristics and Refusal Self-Efficacy (n = 397).

	Preference For MAT	
	OR (95%CI)	z (p =)
Age	0.98 (0.95;1.01)	-1.29 (.197)
Gender	1.07 (0.60; 1.91)	0.23 (.814)
Non-Latino Caucasian	1.05 (0.53; 2.08)	0.02 (.883)
Employed (Part- or Full-Time)	0.68 (0.38; 1.25)	-1.25 (.213)
Pending Legal Issues	1.09 (0.65; 1.84)	0.32 (.751)
Recent IDU	0.61 (0.31; 1.18)	-1.48 (.139)
Prior Detox (Yes)	1.23 (0.58; 2.60)	0.54 (.587)
Prior MAT (Yes)	1.18 (0.66; 2.11)	0.55 (.585)
PHQ-2 Depressed mood ³	1.91 (1.15; 3.15)	2.52 (.012)
Refusal Self-Efficacy ^a	0.72 (0.58; 0.90)	-2.88 (.004)
Intercept	8.33	
Model Statistics		
	LR ² = 23.36, df = 10, p = .010	
	BIC = 459.97; AIC = 416.14	
	AROC ^b = .664	

^aRefusal self-efficacy was assessed using an ordered-categorical response framework ranging from 0 "Not at All" to 3 "Very True." A difference in likelihood ratio test (LR² = 1.03, df = 2, p = .598) is consistent with the hypothesis that the association of refusal self-efficacy with the likelihood of preferring MAT is approximately linear.

^bArea under the receiver operating characteristic curve.