



# The relationship between diversion-related attitudes and sharing and selling buprenorphine☆



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## ABSTRACT

**Objective:** Buprenorphine medication-assisted treatment (B-MAT) is an efficacious and popular outpatient treatment for opioid use disorder. However, the likelihood of buprenorphine diversion is a public health concern. We examined the relationship between attitudes toward diversion as predictors of both sharing and selling buprenorphine.

**Method:** Participants ( $n = 476$ ) were patients undergoing short-term inpatient opioid detoxification. Multinomial logistic regression was used to estimate the adjusted association of sharing and selling buprenorphine with demographics, substance use behaviors, and attitudes toward sharing and selling buprenorphine.

**Results:** Among the two hundred persons who had ever been prescribed buprenorphine (73.4% male, 89% heroin users), 50.5% reported they had shared buprenorphine and 28.0% reported they had sold buprenorphine. Controlling for other covariates, the odds of sharing buprenorphine were 3.17 (95% CI 1.21; 8.32) times higher for persons who agreed that it was “right to share buprenorphine with dope sick friends” than for those who did not agree with this attitude. Attitudes toward selling (OR 2.92; 95% CI 1.35; 6.21) and sharing (OR 4.12; 95% CI 1.64; 10.32) buprenorphine were the only significant correlates of selling, with the odds of selling exponentially greater among persons with favorable attitudes toward sharing or selling buprenorphine.

**Conclusions:** Although considered diversion, sharing B-MAT is normative among B-MAT patients. Assessing B-MAT patients’ attitudes about diversion may help identify patients requiring enhanced oversight, education, or intervention aimed at modifying attitudes to reduce their likelihood to share or sell buprenorphine.

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## 1. Introduction

Buprenorphine-based medication-assisted treatment (B-MAT) is a recommended long-term recovery strategy for persons with opioid use disorder (Volkow, Frieden, Hyde & Cha, 2014). However, legitimate concerns about the risk for diversion, or the “unauthorized rerouting or misappropriation of prescription medication to someone other than for whom it was intended” (Lofwall & Walsh, 2014), undermine the application of B-MAT. Particularly considering the recent two-year, \$1 billion federal allocation to expand MAT for opioid use disorders (Office of the Press Secretary, The White House, 2016), identifying factors associated with diversion and related risk outcomes is warranted.

### 1.1. Buprenorphine diversion

Outpatient B-MAT is increasingly available and is effective in preventing relapse, emergency department admissions and overdose, and improving the likelihood for long-term recovery (for review see Mattick, Mattick, Breen, Kimber and Davoli, 2014; Parran et al., 2010). While the ease of self-administration and sublingual formulation of buprenorphine enhance the feasibility of B-MAT approaches, they also increase the likelihood for diversion—prevalence rates for buprenorphine diversion are exponentially higher than those for methadone diversion (Winstock and Lea, 2010; Winstock, Lea & Sheridan, 2008; Johnson & Richert, 2015a). From just 2006 to 2009, B-MAT patients reporting buprenorphine diversion nearly doubled and emergency department visits attributed to buprenorphine abuse more than tripled (Mattick, Mattick, Breen, Kimber and Davoli, 2014). The proliferation of buprenorphine and new modes of non-medical administration (e.g., injection) have contributed to an increase in buprenorphine-related consequences, including overdose (Lee, Klein-Schwartz, Welsh and Doyon, 2013; Bretteville-Jensen, Lillehagen, Gjersing and Andreas,

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2015). Given that the growing availability of B-MAT is projected to coincide with increasing buprenorphine misuse and diversion, explicating the role of B-MAT patients' attitudes regarding diversion behaviors may point toward promising avenues for prevention efforts.

### 1.2. Diversion-related attitudes and behaviors

Although the relationship between attitudes toward substance use and substance use behaviors is well-established (e.g., Hohman, Crano, Siegel & Alvaro, 2014; Simons & Carey, 2000), little is known about the relationship between diversion-related attitudes and behavior. The theory of planned behavior (TPB; Ajzen, 1991, 2011), which posits that attitudinal valence toward a specific behavior contributes to one's likelihood to engage in that behavior, is an important framework for better understanding opioid use disorder. For instance, TPB has been used to study treatment intentions following drug detoxification (Kelly, Frank, McCarthy and Crowe, 2011), injection drug use (IDU) behaviors (Jozaghi & Carleton, 2015), and heroin use (Liu, Li, Lu, Liu and Zhang, 1979). In the one known study to examine the relationship between diversion-related attitudes and behavior, Johnson and Richert (2015b) found that MAT patients agreeing, relative to those not agreeing, that it is "right to share medication with a dope sick friend" were more likely to report diverting buprenorphine or methadone during current treatment, even after controlling for current drug use and other social and environmental factors. However, these same attitudes were not associated with past month diversion, and attitudes that illicit medication saves lives did not predict diversion behaviors. These inconsistent results necessitate further investigation into the association between diversion-related attitudes and behaviors.

### 1.3. Motives for diverting

The limited research examining the diversion of opioid replacement treatment medication has suggested both monetary and altruistic motivations. Fountain and colleagues (2010) found that methadone users most often sold their prescribed medication for profit that, in turn, would be used to obtain other desired illicit or prescription medication. In contrast, in a study of 886 methadone users (Duffy & Baldwin, 2012), 13% reported giving away and only 5% reported selling their methadone in the past year; and among those reporting past year methadone diversion, 80% reported altruistic reasons (e.g., helping another substance user out) and 46% reported monetary reasons (buying or trading for other drugs, buying other items) (Duffy & Mackridge, 2014). Among 88 IDUs who reported removing at least a portion of supervised doses of opioid replacement medication in the past six months, one in three reported doing so to help a friend in withdrawal and one in ten to sell (Larance et al. 2011). In sum, research points to both altruistic and monetary motives for diversion and calls for additional research on motives for buprenorphine diversion (Lofwall & Walsh, 2014).

### 1.4. Study aims and hypotheses

In the current study, we advance knowledge about diversion-related attitudes and behaviors in several ways. First, unlike existing studies that have merged methadone and buprenorphine diversion, our focus on buprenorphine allows for targeted analysis and implications. Second, no study to date has examined attitudes regarding diversion-related to sharing and to selling independently. This distinction is important because individuals' attitudes about sharing and selling buprenorphine may differ substantially. For example, selling prescribed buprenorphine for profit is more likely to be viewed as exploitative and immoral (Johnson & Richert, 2014), while sharing one's medication with friends in need (e.g., medicating a friend's withdrawal symptoms) tends to be viewed more favorably by both patients and treatment providers (Johnson & Richert, 2014). Moreover, while reasons for sharing buprenorphine may be driven by attitudes about helping others, selling

buprenorphine may be more tied to one's financial needs or desire to use profits to acquire a preferred illicit opioid (Lofwall & Walsh 2014). In this study, we controlled for individual-level factors associated with buprenorphine diversion, including current illicit drug use (Johnson & Richert, 2015ab) and IDU (Winstock, Lea & Sheridan, 2008). We also controlled for gender and age, although demographic factors have not emerged as significant predictors of diversion behaviors (Johnson & Richert, 2015a; Winstock, Lea & Sheridan, 2008).

We hypothesized that more positive attitudes toward sharing buprenorphine would predict greater likelihood for sharing buprenorphine, and stronger beliefs about selling buprenorphine would predict selling buprenorphine. We expected attitudes to remain significantly associated after controlling for known predictors of buprenorphine diversion. We hypothesized that IDU history (a marker of opioid use severity) would be associated with sharing and selling buprenorphine, and that economic deprivation would be associated with selling, but not sharing buprenorphine.

## 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.

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 476 persons completed a non-incentivized, face-to-face interview administered by non-treating research staff over the course of approximately 15 min. Two hundred persons reported a history of having been prescribed buprenorphine.

### 2.2. Measures

In addition to age, sex, race/ethnicity, age of opioid use initiation, and prior detox experience, the following variables were assessed.

#### 2.2.1. Injection drug use

Participants were asked if they had injected drugs (yes or no) in the past 30 days.

#### 2.2.2. Economic deprivation

Four items (i.e., inability to afford food, housing, utilities, and medications) were assessed to measure difficulties meeting basic economic needs in the past year (see Berkowitz et al., 2015). Participants reporting any affirmative responses (59.5%; i.e., responding "yes" on yes/no response options) were coded as reporting economic deprivation.

#### 2.2.3. Attitudes toward sharing and selling buprenorphine

Attitudes were assessed using items from Johnson & Richert's (2015b) study. Participants were asked how much they agree or disagree with the statement, "It's the right thing to do to share your buprenorphine with a friend who is dope sick" using a five-point Likert scale (strongly disagree to strongly agree). Participants reporting agreement (i.e., strongly agree or agree) were coded as having positive attitudes toward buprenorphine sharing. Attitudes about buprenorphine selling was measured using the statement, "Buying or selling

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