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Drug Use-Related Normative Misperceptions and Behaviors Among Persons Seeking Heroin Withdrawal Management

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Abstract

Objective: Normative perceptions about substance use are well-established predictors of substance use risk behaviors, yet no research to date has examined how people who use heroin perceive the drug use behaviors and their association with personal behaviors. In a sample of persons seeking heroin withdrawal, we compared normative beliefs (descriptive norms) about others' drug use behaviors, and examined the association between normative beliefs and behaviors.

Method: Participants (n = 241) were patients undergoing short-term inpatient heroin withdrawal management in Massachusetts. T-tests were used to compare participants' perceptions about various substance use behaviors among both U.S. adults and persons seeking heroin withdrawal at the same site. We also examined associations between participants' normative beliefs and personal substance use behaviors.

Results: Participants significantly overestimated drug-related risk behaviors of adults nationally; overall, participants estimated that 44.7% had tried heroin, 37.6% had injected drugs in the past year, and 63.2% had smoked marijuana in the past month when actual national rates are 2.0%, 0.3%, and 5.5%, respectively. Participants also held significant misperceptions about contemporaneous patients in the heroin withdrawal program; behaviors about sharing works, diverting buprenorphine or methadone, and exchanging sex for drugs or money were most substantially overestimated. Normative perceptions were associated with a range of personal drug-using behaviors (e.g., injection drug use, exchanging sex for drugs or money).

Conclusions: Consistent with existing substance use norms research, participants in the current sample tended to overestimate others' engagement in risky substance use, and these normative perceptions were associated with increased personal risk. Leveraging norms in heroin harm reduction interventions may hold substantial promise.

Keywords

Heroin; Perceptions; Descriptive norms; Drug use behavior

1. Introduction

Descriptive normative beliefs, or the perceptions about the prevalence or frequency of a behavior in a population, is a key component in predicting substance use risk behavior (e.g., Perkins 2003, Patrick et al. 2016). Individuals tend to overestimate how frequently and excessively peers engage in risky behaviors and these misperceptions, in turn, may lead individuals to engage in the respective behaviors (Borsari and Carey 2003, Berkowitz 2005). Descriptive normative beliefs have been extensively examined in drinkers (Neighbors et al. 2007), smokers (Buttross and Kastner 2003, Eisenberg and Forster 2008), and people who use marijuana (Neighbors et al. 2008, Walker et al. 2011). Research has also correlated higher descriptive norms about peers' injection drug use (IDU) with personal IDU behavior (Jozaghi and Carleton 2015) and network members' substance use and non-medical use of prescription drugs (Nargiso et al. 2015, Barman-Adhikari et al. 2017). Still, gaining a better understanding about normative perceptions about drug-use risk behaviors among persons who use heroin is important. How these normative perceptions relate to personal behavior may inform prevention targeted at this population currently in the midst of a public health crisis of overdose.

Previous studies indicate that perceptions of more proximal referents (McAlaney and McMahon 2007, Larimer et al. 2009, e.g., same residence or close friends; Collins and Spelman 2013) may be more influential than distal referents in driving individuals' behaviors (Terry and Hogg 2000), even though more proximal referent norms tend to be more accurate than more distal (Kenney et al. 2017). Therefore, gathering information on the normative perceptions about both distal and proximal referents among people who use heroin is important.

1.1. Study Aims and Hypotheses

In the current study, we interviewed people who use heroin to assess their descriptive normative perceptions about the substance use risk behaviors of both distal (i.e., U.S. adults overall) and more proximal (i.e., individuals seeking opioid withdrawal management at the same inpatient managed withdrawal program) referents. In order to shed light on the accuracy of participants' perceptions about substance use we compared their estimates to actual mean data retrieved from nationally representative data sources of U.S. adults and to survey data collected on the current sample of participants detoxifying from heroin, respectively. Based on broader normative substance use research, we hypothesized that participants would overestimate others' substance use. Moreover, we hypothesized that participants' descriptive perceptions about the norms of proximal referents would be more accurate than for distal referents. We also examined the relationship between proximal normative perceptions and participants' substance use risk behavior, and hypothesized that higher descriptive norms to be associated with engagement in associated risk behaviors.

2. Method

2.1 Recruitment

Between April and September 2017, consecutive persons seeking inpatient opioid withdrawal management 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 withdrawal management 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, 279 used opioids and were 18 years or older, English-speaking, and able to provide informed consent prior to in-person interviews as approved by the Butler Hospital Institutional Review Board. Twenty persons refused study participation or were discharged before staff could interview them. The remaining 259 persons completed a non-incentivized, face-to-face interview administered by non-treating research staff over the course of approximately 15 minutes. A total of 241 persons reported that heroin was the primary drug from which they were detoxifying and constitute the study sample.

2.2 Measures

The following definitions were provided to participants prior to respective questions. Overdose was defined as being "unarousable (couldn't be woken) with shaking or calling name because of the drugs consumed." Naloxone (Narcan) was defined as the "overdose antidote." For questions that asked about opioid agonist treatment (OAT), brief summaries were provided; e.g., "Suboxone is a medication-assisted treatment. Suboxone can be prescribed by a primary care doctor or psychiatrist. Patients typically see their doctor once per month to receive their prescription."

2.2.1 National Descriptive Norms.—Participants were asked to estimate the percentage of U.S. adults they believed had engaged in the following six substance use behaviors: ever used non-prescription opioid pills; ever tried heroin; injected drugs in the past year; consumed alcohol in the past month; smoked cigarettes in the past month; and smoked marijuana in the past month. These descriptive normative perceptions were compared with data retrieved from national data sources (SAMHSA 2016) and a meta-analysis using national data sources (Lansky et al. 2014).

2.2.2. Descriptive Norms among Persons Using Heroin.—Participants were asked to estimate the percentage of SSTAR patients detoxifying from heroin who had engaged in ten substance use behaviors. Earlier in the interview, participants responded "yes" or "no" as to whether they had engaged in each behavior. In addition to past month IDU, cocaine use, and benzodiazepine use (klonopin, Librium, Xanax, valium), participants were asked about the following behaviors: "shared works with other people when injecting drugs" in the past 30 days; ever overdosed; and exchanged sex for drugs or money to buy drugs in the last 30 days. For exchanged sex for money only, participants estimated the percentage of same-sex SSTAR patients they believed engaged in the behavior. Three items

asked about naloxone (Narcan), including “ever having naloxone in one’s possession,” “ever being given naloxone because of an overdose,” and “ever using naloxone on someone else.” Prior experience with OAT included ever being prescribed buprenorphine (Suboxone) or ever enrolled in a methadone maintenance program; and a buprenorphine or methadone diversion question asked about giving buprenorphine (Suboxone) or methadone “to another drug user to help them out.”

2.3. Analysis Plan

We compared participants’ descriptive norms about U.S. adults’ engagement in substance use behaviors to actual rates observed in national data sets. We compared participants’ estimated rates (i.e., descriptive norms) to actual sample rates of substance use behaviors of patients detoxifying from heroin at their same site. We report the observed rate, the estimated rate with 95% confidence interval, the difference, and the results of the one-sample t-test. We also used t-tests for differences in means to compare persons who had actually engaged in behaviors to those who had not with respect to perceived normative rates of these associated behaviors among persons in this withdrawal management program.

3. Results

Participants averaged 33.6 ($\pm$ 9.1) years of age and 74.3% were male. Most (83.4%) were White, 2.5% were Black, and 14.1% identified multiple or other racial origins. Twenty-seven (11.2%) were Latino/a. Mean years of education was 12.1 (SD = 1.64).

As shown in Table 1, normative perceptions about U.S. adults were significantly overestimated based on national data sources. For example, on average, participants believed that 44.7% of U.S. adults had ever tried heroin and 37.6% had injected drugs in the past year when actual national data report these figures to be 2.0% and 0.3% of the population, respectively. We also calculated observed percentages of participants engaging in the behaviors (see Table 1).

Table 2 shows the percent of the sample self-reporting ten individual substance use behaviors. In the past month about 72.3% had injected drugs, 18.6% had shared works, 48.3% had used cocaine, and 33.8% had used benzodiazepines. About 53.6% had a lifetime history of overdose, 56.5% had possessed naloxone, 45.7% had been given naloxone, 71.3% had received OAT (either buprenorphine or methadone), 23.6% had given either buprenorphine or methadone to others, and 6.6% (22% of females and 1.1% of males) said they had exchanged sex for drugs or money.

Descriptive norms (perceptions about these behaviors among persons in the same detox program) were generally higher (Table 2). And all comparisons were statistically significant ($p < .001$). Estimated rates of IDU in the past month were 10.4% higher, the estimated rate of sharing works was 36.2% higher, the estimated rate of cocaine use was 13.2% higher, and the estimated rate of benzodiazepine use was 23.3% higher. The estimated rate of drug overdose was 8.4% higher than the actual reported rate. Participants underestimated the number of persons who had ever possessed naloxone by 11.7%. But they estimated that 8.6% more persons in the withdrawal management program had been given naloxone, and

that 8.2% more had ever administered naloxone to others. Participants slightly underestimated (−5.0%) the number of persons who had ever received OAT but overestimated (+33.8%) the number of persons who had given buprenorphine or methadone to others. While 22.7% of females reported engaging in exchange sex, females estimated that the rate among persons in opioid management withdrawal programs was 62.5%. While only 1.1% of males reported engaging in exchange sex, they estimated the population rate to be 25.0%.

Compared with persons who had not engaged in the behaviors, persons who had engaged in the behavior perceived significantly higher perceived normative rates of past month IDU, sharing works in the past month, using cocaine in the past month, ever possessing Naloxone, ever having been given Naloxone, ever administering Naloxone, ever giving buprenorphine or methadone to others, and engaging in sex in exchange for drugs or money to buy drugs (Table 3).

4. Discussion

Consistent with hypotheses, we found that people who use heroin, overall, significantly overestimated the substance use-related behaviors of both distal and proximal referents, and higher proximal normative perceptions were associated with personal risk behaviors. These findings support norms theory and the broader literature that has examined descriptive substance use norms among persons who use alcohol, cigarettes, and marijuana (Buttross and Kastner 2003, Neighbors et al. 2007, Eisenberg and Forster 2008, Neighbors et al. 2008, Walker et al. 2011).

In this sample, people who use heroin believed that a significantly greater percentage of U.S. adults engaged in substance use than reported in national datasets. The disparity between people who use heroin perceptions about and the actual prevalence of risk behaviors among U.S. adults is striking; for example, participants estimated that nearly half (44.7%) of U.S. adults had tried heroin when national statistics show 2.0% and that over one-third (37.6%) had injected drugs in the past year when national data report a 0.3% prevalence rate. These results may point to people who use heroin social isolation and disengagement from the general population. A telescoping of social network ties that accompanies heroin addiction may also impact normative perceptions related to substance use risk in a way that normalizes risky substance use behaviors.

People who use heroin misperceived the substance use-related behaviors of peers who also use heroin, overestimating nine of the ten assessed behaviors. Consistent with extant research showing that more proximal normative perceptions are more accurate than distal (McAlaney and McMahon 2007, Larimer et al. 2009, Collins and Spelman 2013), participants overestimated SSTAR patients' substance use risk behaviors to a lesser degree than U.S. adult normative perceptions. Notwithstanding, the substantial discrepancy between attributions and actual behaviors indicates a false consensus effect (Marks and Miller 1987, Wolfson 2000), whereby people engaging in risky drug use behavior overestimate the prevalence of substance use behaviors in a proximal peer group to better align with their own behaviors. Interestingly, among the most inaccurate of norms were those related to the

least common, riskiest behaviors. For instance, participants most substantially overestimated that referents had exchanged sex for drugs or money (34.7% vs. 6.6% overall), ever shared works (54.8% vs. 18.6%), used benzodiazepines (BZDs) in the past month (57.1% vs. 33.8%), and diverted buprenorphine or methadone (57.4% vs. 23.6%). These misperceptions are particularly concerning given the impact norms are shown to have on behaviors, and that these behaviors are associated with serious consequences (e.g., transmission of blood borne infections, including HIV; polysubstance addiction; overdose; criminal prosecution).

In this study, participants reporting IDU, sharing works, cocaine use, methadone or buprenorphine diversion, and exchanging sex for drugs or money held significantly higher normative perceptions about SSTAR patients' engagement in the respective behavior. For example, those reporting sharing works in the past 30 days believed, on average, that 72.1% of SSTAR patients had also shared works, but those who had not shared works themselves perceived, on average, that half (51.0%) of SSTAR patients had shared works. Normative perceptions about naloxone possession and administration were also related to naloxone-associated behaviors. Despite the lack of temporal assessment, these strong correlations are a first step in understanding the influence of substance use-related norms in populations using heroin. Future research can determine if normative feedback interventions that provide detoxifying people who use heroin with actual data on reference group behaviors to correct misperceptions, with the potential to reduce engagement in risky behaviors (or increase harm reduction behaviors) hold promise to improve treatment outcomes.

4.1. Limitations

This study is limited by its recruitment from a single inpatient withdrawal management site. Also, findings should be interpreted cautiously given this study's cross-sectional design. The relationship between norms and behavior is likely bidirectional and hence causal conclusions about the impact of normative perceptions on behavior cannot be made. It is also possible that answering questions about their own opioid use risk behaviors may have primed participants to report that others also engaged in those same behaviors. While all survey-based normative assessment must contend with this possibility, we asked participants about drug use-related behaviors early in the interview and norms questions towards the end of the interview in order to mitigate potential response bias. Although existing substance use norms research has established a causal relationship in which normative beliefs predict behavior, including alcohol use (Rinker and Neighbors 2013, Lewis et al. 2015) and marijuana use (Napper et al. 2016), prospective research focusing on people who use heroin is needed. We also did not examine whether descriptive normative perceptions influenced substance use, heroin use, or treatment utilization following withdrawal management, which presents a worthy topic for future study. Finally, while personal social networks are shown to have significant normative influence over behaviors (Latkin et al. 2003a, Latkin et al. 2003b), our reference group comprised of same-site detoxifying people who use heroin may not necessarily represent the heroin-associated networks with which participants most strongly identify. Social network analysis that examines nominated peers may be particularly informative. Finally, given the personal nature of the assessed questions about illegal behaviors, response bias may have influenced the behaviors reported by participants,

potentially widening the gap between normative perceptions and actual behaviors exhibited in the current study. However, we assured participants that responses would be confidential.

4.2. Conclusion

The current findings point to substantial discrepancies between normative perceptions and the actual behaviors of others, and suggest that overestimated substance use norms may be tied to greater risk behavior among individuals seeking heroin withdrawal management. The current results call attention to the need to further explore how misperceptions among people who use heroin may drive risk behavior.

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Table 1.

Descriptive Normative Perceptions about U.S. Adults Relative to National Data.

Behavior	Valid n	Actual National	Normative Perception (95%CI)	Actual Sample
Ever Used Non-Prescription Opioid Pills ¹	241	7.1% ²	60.0% (57.0 – 63.0)	95.4%
Ever Tried Heroin	240	2.0%	44.7% (41.7 – 47.7)	95.2%
Injection Drug Use (Past Year)	237	0.3%	37.6% (34.6 – 40.6)	74.4%
Consumed Alcohol (Past Month)	238	55.0%	76.7% (74.2 – 79.1)	45.6%
Smoked Cigarette (Past Month)	237	20.6%	68.2% (65.6 – 70.9)	91.1%
Smoked Marijuana (Past Month)	237	5.5%	63.2% (60.4 – 66.0)	55.7%

¹ On national datasets, the current definition for prescription psychotherapeutic drug misuse includes opioids that are both prescribed and non-prescribed. In contrast, participants were asked about the use of non-prescribed opioid pills.

² Data available for past year only

Table 2.

Percent of Sample Self-Reporting Behaviors and Estimated Rates of Behavior Among Persons Undergoing Opioid Withdrawal Management.

Behavior	Valid n	Obs. %	Est. % (95%CI)		t (p =)
IDU Past Month	235	72.3%	82.7% (80.4 – 85.0)	10.4%	8.97 (<.001)
Shared Works Past Month	232	18.6%	54.8% (51.6 – 58.0)	36.2%	22.53 (<.001)
Used Cocaine Past Month	234	48.3%	61.5% (58.5 – 64.4)	13.2%	8.79 (<.001)
Used BZDs Past Month	234	33.8%	57.1% (54.3 – 60.0)	23.3%	16.20 (<.001)
Ever Overdosed	233	53.6%	62.0% (59.0 – 65.1)	8.4%	5.43 (<.001)
Ever Possessed Naloxone	231	56.5%	44.8% (41.1 – 48.4)	–11.7%	–6.40 (<.001)
Ever Been Given Naloxone	232	45.7%	54.3% (51.1 – 57.5)	8.6%	5.26 (<.001)
Ever Administered Naloxone	230	28.4%	36.6% (33.5 – 39.7)	8.2%	5.28 (<.001)
Ever Buprenorphine or Methadone	230	71.3%	66.3% (63.5 – 69.1)	–5.0%	–3.51 (<.001)
Given Buprenorphine or Methadone	229	23.6%	57.4% (54.0 – 60.9)	33.8%	19.21 (<.001)
Engaged in Exchange Sex	228	6.6%	34.7% (31.0 – 38.4)	28.1%	14.91 (<.001)
Engaged in Exchange Sex (Males)	169	1.1%	25.0% (21.6 – 28.5)	23.9%	13.72 (<.001)
Engaged in Exchange Sex (Females)	59	22.7%	62.5% (55.9 – 69.0)	39.8%	12.18 (<.001)

Table 3.

Perceived Normative Behavior in Detox by Actual Behavior. Cell Values are Estimated Mean ($\pm$ SD) Percent of Persons Undergoing Opioid Withdrawal Management Believed to Engage in the Behavior.

	Engaged in Behavior		t (p =)
	No	Yes	
IDU Past Month	78.0 ($\pm$ 21.7)	84.5 ($\pm$ 15.6)	-2.56 (.011)
Shared Works Past Month	51.0 ($\pm$ 23.8)	72.1 ($\pm$ 19.2)	-5.40 (<.001)
Used Cocaine Past Month	56.0 ($\pm$ 24.0)	67.3 ($\pm$ 20.3)	-3.88 (<.001)
Used BZDs Past Month	55.2 ($\pm$ 23.1)	60.9 ($\pm$ 19.6)	-1.89 (.060)
Ever Overdosed	59.4 ($\pm$ 24.7)	64.3 ($\pm$ 22.4)	-1.57 (.119)
Ever Possessed Naloxone	34.3 ($\pm$ 25.9)	52.3 ($\pm$ 26.6)	-5.14 (<.001)
Ever Been Given Naloxone	51.3 ($\pm$ 26.1)	57.8 ($\pm$ 23.2)	-1.99 (.048)
Ever Administered Naloxone	33.1 ($\pm$ 23.3)	45.7 ($\pm$ 22.4)	-3.72 (<.001)
Ever Buprenorphine or Methadone	68.0 ($\pm$ 22.0)	65.6 ($\pm$ 21.6)	0.76 (.451)
Given Buprenorphine or Methadone	55.2 ($\pm$ 27.3)	64.6 ($\pm$ 23.3)	-2.28 (.024)
Engaged in Exchange Sex	31.6 ($\pm$ 26.3)	79.0 ($\pm$ 19.9)	-6.83 (<.001)