



## Research Paper

## Narratives of people who inject drugs on factors contributing to opioid overdose

Jamie Suki Chang<sup>a,b,\*</sup>, Emily Behar<sup>b</sup>, Phillip O. Coffin<sup>b</sup><sup>a</sup> Santa Clara University, Public Health Science Program, United States<sup>b</sup> University of California, San Francisco, United States

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## ABSTRACT

**Background:** In recent years, there has been increasing national and global attention to opioid overdoses. In San Francisco, it is estimated that the population of people who inject drugs (PWID) has more than doubled in the past ten years. The risk factors for opioid overdose have been examined closely, but firsthand accounts of PWID who have experienced overdoses are less documented. In this paper, we use two theories - lay expertise and structural vulnerabilities - as frameworks to frame and qualitatively examine the narratives of PWID surrounding their recent overdose experiences.

**Methods:** Audio-recorded semi-structured open-ended motivational interviewing counseling sessions were conducted with PWID in San Francisco who have experienced at least one non-fatal overdose event (N = 40). Participants discussed the context of recent opioid overdoses, either witnessed or personally experienced, focusing on their perceptions of unique contributing factors. Interview data were coded and analysed using ATLAS.ti. We used a thematic content analysis approach to qualitatively analyze data queries and generate themes. We used theories of structural vulnerability and lay expertise to frame the analysis.

**Results:** Using quotes from the participants, we report four central themes that contributed to participants' overdose experiences: 1) Social Dynamics and Opioid Expertise; 2) Uncertain Supply, Composition, Source; 3) Balancing Polysubstance Use, and 4) Emotional Pain.

**Conclusion:** As PWID described their overdose experiences, many factors that contributed to their overdoses were situated at the structural level. The everyday, lived experiences of PWID often competed or conflicted with public health messages and approaches. The accumulated expertise of PWID about everyday risk factors can be leveraged by public health practitioners to inform and improve overdose prevention interventions and messages.

## Introduction

Recent estimates indicate there are 15.6 million people globally who inject drugs (Degenhardt et al., 2017). Estimating prevalence of people who inject drugs (PWID) is methodologically challenging but in San Francisco, California, it is approximated that in 2012 there were 22,500 PWID, more than double the 2005 estimate of 10,158 (Chen, McFarland, & Raymond, 2016). The dramatic increase is arguably linked to the opioid epidemic (Knight, 2017), and increases in the overall numbers of people who inject opioids across the United States (Zibbell et al., 2018). In San Francisco, the public health community has worked to provide support for PWID, and studies indicate that local efforts have been effective at curbing major health risks - the rates of opioid overdose and new HIV infection have been steady or slightly decreasing since 2011. Despite these efforts, PWID are still at the

highest risk of HIV, hepatitis C, and opioid overdose (Coffin & Rowe, 2017).

A large body of research primarily based on epidemiologic or survey data has identified numerous independent predictors of opioid overdose among PWID, including recent incarceration or institutionalization, polysubstance use (primarily methamphetamines, cocaine, sedatives, alcohol), homelessness, having witnessed or experienced another overdose, frequency of use, assisted injecting, and younger age (Binswanger, Blatchford, Mueller, & Stern, 2013; Coffin et al., 2007; Jenkins et al., 2011; Jones, Logan, Gladden, & Bohm, 2015; Kerr et al., 2007; Kinner et al., 2012; Ochoa et al., 2005). Identifying these risk factors has enabled public health practitioners to develop overdose prevention public health messages and interventions targeting PWID.

What are less understood and explored are the *firsthand accounts* of opioid overdose told from the perspective of PWID. Opioid overdose is a

\* Corresponding author.

E-mail address: [jschang@scu.edu](mailto:jschang@scu.edu) (J.S. Chang).<https://doi.org/10.1016/j.drugpo.2019.07.038>

public health epidemic that has been widely discussed, yet the actual overdose events are often private and known to a limited number of people. Researching these firsthand accounts of PWID is crucial as they fill gaps in our understanding of the lived experiences and context of opioid overdose. The data generated can situate, elucidate, and expand on what is understood from public health or biomedical studies (Rhodes et al., 2012). Recent qualitative studies on overdoses among PWID have focused on overdose response or treatment response such as naloxone utilization (Baca & Grant, 2007; Holloway, Hills, & May, 2018; Lankenau et al., 2013; Pollini et al., 2006; Sherman et al., 2008). Our analysis aims to contribute to our understanding of how PWID perceive and describe the unique factors or conditions that surrounded a given overdose event. Toward this goal, we report on findings from our analysis of narratives of personal and witnessed opioid overdoses told by 40 PWID.

### Theoretical frameworks

Two social science theories provide frameworks for our analysis: structural vulnerability and theories of lay expertise. *Structural vulnerability* is a framework for examining the violence that is structured into the lives of PWID, with recognition that there is a dynamic relationship between PWID and the risk environments they inhabit (Rhodes, 2002; Rhodes et al., 2012). The term “structural” represents the human-made political, economic, and social organization of risk environments. Power and powerlessness in the face of structures - contingent on one’s social position that is frequently defined by race, class, gender, sexuality, and other categories - shape individual health risks in patterned ways. These structures are called violent because they are consequential and cause injury/death to people (Farmer, Nizeye, Stulac, & Keshavjee, 2006).

Structural vulnerabilities profoundly impact people who use opioids (Dasgupta, Beletsky, & Ciccarone, 2018) and particularly PWID. Across the globe, structural vulnerabilities built into societies leave PWID susceptible to poor health outcomes, including the laws and policies governing substance use, incarceration and criminalization of injection drug users, unequal treatment in the healthcare system, housing policies that can lead to homelessness, and social stigmas to name some examples (Ahern, Stuber, & Galea, 2007; Bourgois, Prince, & Moss, 2004; Corneil et al., 2006; Hansen & Roberts, 2012; Rhodes et al., 2012; Rhodes, Singer, Bourgois, Friedman, & Strathdee, 2005; Young, Stuber, Ahern, & Galea, 2005). The structural vulnerability perspective places structural factors as more fundamental, upstream causes of drug-related illness and disease. Hence, the structural conditions that situate and influence the health outcomes of PWID must be attended to in public health policies and interventions, rather than focusing solely on individual factors influencing poor health. We use structural vulnerability as a lens to interpret and situate the overdose narratives of PWID.

Qualitative methods can be used to examine the lived experiences and expertise of PWID to construct an understanding of structural vulnerability and opioid overdose (Rhodes et al., 2012). *Theories of lay expertise* refers to the ways non-credentialed people influence what is accepted by experts as “legitimate knowledge” (Epstein, 1995). When examined against the everyday lived realities and experiences of patients, the professional knowledge of public health experts can be contradicted and challenged (Shim, 2005).

Frequently, the position of PWID is stigmatized and illegitimized, despite the wealth of firsthand expertise they possess on the lived experiences of overdose. Research indicates that the stigma directed at PWID shapes their attitudes toward drug policies and other PWID. (Lancaster, Santana, Madden, & Ritter, 2015). One study in Australia examined the “risk neutralization” strategies used by PWID, which are based on the collective and individual lay knowledges they possess through observation and lived experiences with drug use (Miller, 2005). Lay expertise is a useful theory for this study in particular because people who use drugs in San Francisco have organized into influential

stakeholder groups, such as the San Francisco Drug Users Union. Our analysis is informed by lay expertise in two ways: by qualitatively focusing the analysis on the firsthand accounts of PWID, and by examining how their accounts of their lived experiences compare with dominant professional public health overdose prevention messages.

### Methods

This study was approved by the University of California San Francisco Institutional Review Board (#13-11168). Between 2016–2017, we analyzed the transcripts of 40 counseling sessions conducted with people who inject opioids recruited between 2014–2015 who have experienced at least one nonfatal overdose event. The data analyzed for this study came from a broader pilot study of a motivational interviewing (MI) counseling intervention to reduce opioid overdose risk behaviors (REBOOT study; ClinicalTrials.gov Identifier: NCT02093559). In the REBOOT study, an opioid overdose event was defined as when someone takes opioids and then 1) is unresponsive when shaken or their name is called, 2) cannot be woken up without help (for example CPR or Naloxone), 3) skin, lips, or fingers turn blue, and/or 4) the person stops breathing, or breathes slowly.

Participants lived in or near San Francisco, California, and were recruited from syringe exchange programs. Study flyers and business cards were disseminated at syringe exchanges for passive recruitment and snowball sampling. Recruiters used a field screener to determine potential eligibility. Eligible participants were 18–65 years of age, opioid dependent, had an opioid overdose in the preceding 5 years, had previously received take-home naloxone, and were able/willing to provide informed consent and communicate in English. All participants who were enrolled in the REBOOT study (N = 63) underwent informed consent, received naloxone, and underwent a survey that took place at the San Francisco Department of Public Health. Two-thirds of participants (N = 41) were randomized to undergo a series of MI counseling sessions to reduce overdose risk. The other one-third (control group) received information about overdose risk reduction only, without MI.

The data we analyzed were drawn from the first MI sessions for the treatment group, which were audio recorded and transcribed verbatim. Participants were aware that the MI sessions were recorded for research purposes. We excluded one participant because they were not a person who injects opioids, thus the final sample size was 40 PWID. Participants were interviewed by one of three counselors who were trained in MI and research interviewing by an experienced substance use research psychologist. The MI session consisted of two parts. Part 1 was a 20–25-minute in-depth background interview on the participant’s experiences with opioid overdose, both witnessed and personally experienced. Counselors asked about both witnessed and personally experienced overdoses because we hypothesized that the individual’s experience and role, and therefore perception, may be different in these scenarios (Behar et al., 2019). Participants were asked to describe in detail the series of events surrounding recent overdose events and recall the factors they perceived contributed to given overdose occurrences. The objective of Part 1 was to understand the participants’ perceptions and interpretations of the unique circumstances were involved in their recent overdoses. Part 2 was a 30–40 minute MI counseling session during which the counselor provided information on overdose risks, elicited motivation on overdose prevention, reviewed naloxone training, and evaluated the participant’s readiness for change. We analyzed the whole counseling session, but the majority of the data used in the analysis were derived from Part 1. In the cases in which participants discussed opioid overdose stories and experiences in Part 2, these data were also coded and analyzed.

To analyze the interview transcripts, we used a content analysis approach based on the comparative, constructivist principles of grounded theory (Charmaz, 2014). The data analysis involved inductive and then deductive analysis. First, two researchers independently reviewed the MI transcripts and audio files and wrote a series of memos

on first thoughts and impressions. We met several times to discuss and compare the memos and developed an initial inductive code list. We used the code list to independently code approximately 10 interviews at a time, in order of enrollment, in ATLAS.ti. We compared transcripts and codes over a series of meetings and discussed our coding process with the research team several times. The research team discussed any coding discrepancies. During this process, new, emerging codes were added, and other codes were combined. The final code list was developed and used to code the remainder of the interviews and re-code interviews when necessary. Examples of codes were: harm reduction strategies, polysubstance use, mental health, incarceration/institutionalization, experience with naloxone, and social networks.

Through successive iterations of coding, comparing codes, and analyzing queries and memos, the interview content was organized into thematic findings. Some codes were collapsed to combine themes. The theoretical frameworks described above - structural violence and lay expertise - were a strong fit with the emerging themes. We conducted a deductive analysis when analyzing theme queries, interpreting the data from the perspective of these theories, which provided a foundation for analysis. Quotes that the research team agreed were most exemplary were selected to illustrate the emergent themes. The quotes presented are de-identified and participant descriptors reported below are approximated to protect participant privacy.

**Results**

*Demographics and overdose experiences*

The participants in the sample were mostly male (72%), white (63%), and had an average age of 43 years. Nearly all experienced homelessness at some point in their lives (95%) and most (88%) had undergone some form of substance use treatment. Eighty-three percent of participants were seropositive for hepatitis C virus and 10% were HIV positive. All study participants had experienced an opioid overdose in the past five years, with 52% having overdosed at least once in the preceding 12 months. The average number of personally overdoses in the past five years was 6.4. All participants had witnessed overdoses, with an average of 14.6 witnessed overdoses over their lifetime

**Table 1**  
Study sample demographics (N = 40).

Characteristics	N	%
Gender, female	11	28%
Race/Ethnicity		
White	25	63%
African American	6	15%
Hispanic	8	20%
Biracial, multiracial or other	1	3%
Age, mean (SD, range, IQR)	43 (11.5, 21-60, 34-52)	
HIV status, positive	4	10%
HCV status, positive	33	83%
Ever homeless	39	98%
Ever enrolled in drug treatment	35	88%
Ever injected opioids	40	100%
Personal ODs, lifetime, mean (SD, range, IQR)	6.4 (15.9, 1-100, 1-4)	
Number ODs prior 12 months		
Zero	19	48%
One	14	35%
≥ Two	7	18%
Witnessed ODs, lifetime, mean (SD, range, IQR)	14.6 (22.6, 1-100, 3.5-14)	
Number witnessed overdoses, prior 12 months		
Zero	11	28%
1-5	22	55%
≥ 6	7	18%
Years of illicit opioid use, lifetime, mean (SD, range, IQR)	24.5 (11.7, 4-52, 17-33.5)	

(Table 1).

To preview, participants discussed the context of and contributing factors in recent overdoses, both those they witnessed and those they personally experienced. We report four themes that characterize how participants described overdose experiences: 1) Social Dynamics and Opioid Expertise; 2) Uncertain Supply, Composition, Source; 3) Balancing Polysubstance Use; and 4) Emotional Pain.

*Finding 1: Social Dynamics and Opioid Expertise*

Participants in the study averaged 24.5 years of experience with illicit opioid use (Table 1), and many were highly experienced with overdose risk reduction. However, drawing from a lay expertise perspective, we found that participants’ expertise surrounding opioid use, or at times the *performance* of expertise, when in the context of social dynamics between PWID, could be linked to overdose experiences. Participants wanted to demonstrate their *opioid expertise*, which we define as the experience, knowledge, tolerance, and self-control an individual had with opioids and over their body. Opioid expertise is a sense of expertise and responsibility involved in both consuming opioids and understanding one’s personal limits. In the quotes below, we show that to PWID, overdose occurrences were at odds with the opioid expertise necessary to be an active opioid user.

When describing the specific factors that contributed to overdoses, participants commonly used terms like greed and stupidity. According to Participant A, a man in his thirties who told us he has witnessed over two dozen overdoses in his life:

Interviewer (I): Looking back, what were factors that contributed to the person overdosing?

Participant A: Greed ... They were told that they were pretty high, and ‘Let’s put that shot away till later’ and they didn’t want to. They wanted to do it right then and there, and it was just too much for them at one time. They found out, they found out.

According to another participant, a man in his early fifties, overdoses were due to “stupidity”, referring to willfully overestimating opioid tolerance. In the scenario he described, his associate used too much heroin, despite warnings:

Interviewer: What do you think contributes to an overdose?

Participant B: Stupidity. Last overdose I saw, we told them it’s really strong heroin. So, what did he do? He did the whole half gram. Popped like a cherry, and went right down.

References to concepts like greed and stupidity stemmed from a perception that the person who overdosed knew the risks, or should have known the risks, but made the decision to use anyway. The insinuation is that the person who overdosed lacked the opioid expertise to avoid a harmful outcome.

Relatedly, some participants indicated that people who overdosed wanted to “keep up”, pointing to social pressure to use even if it was beyond one’s limit. *Keeping up* is a social dynamic that was linked to opioid expertise, because it meant possessing or projecting a sense of expertise and mastery over opioid use. Keeping up, as a way to perform opioid expertise, was important for status or acceptance among PWID. For example, in the following quote, a man in his thirties described his roommate’s overdose:

Participant C: I think that [my roommate who overdosed] was overconfident with his tolerance and I think he was trying to show off that he could keep up with whoever ... but he hadn’t done [heroin] for a while ... he only used a couple times before that particular time ... Most drug users don’t want somebody else doing more than them. It’s a weird thing but ... Either you wanna do more, or you wanna keep up with everyone else.

In describing what actions he takes to avoid overdose, another

participant, Participant D, reported that he does not practice keeping up to “show off”: “Be alert of my body. How much you can take, and how much you can’t take. Don’t do it just to show off on people. Shoot. I don’t show off for nobody.”

In these examples, Participants C and D described the social value of having or projecting opioid expertise through the action of keeping up, which can potentially lead to the use of more opioids or use of opioids in a riskier way. Therefore, although opioid expertise can be a protective factor by virtue of possessing in-depth experience and knowledge, these quotes also suggest that actions or aspirations to project expertise, social status, and mastery over opioid use (and one’s own body) can unfold in within social dynamics to increase opioid overdose risk.

### *Finding 2: uncertain supply, composition, source*

Structural factors, which were largely outside the individual’s immediate control, characterized many participants’ descriptions of overdose. Participants reported that factors on the supply side – specifically the quality, composition, and source of heroin and opioids – contributed to their overdoses. We characterize these factors as structural vulnerabilities in part because technologies and resources exist that can help PWID use more safely (e.g. safe injection facilities, technologies determine the composition of street drugs), but these are largely inaccessible by PWID due to factors stemming from the criminalization of drug use.

Some participants had an unknown batch of heroin, or an unfamiliar supplier or dealer on the day they overdosed. Participant E, a man in his twenties, had an overdose after using a new source of heroin that was “purer” – more potent – than he expected. He injected the same quantity as usual but explained that his overdose experience “was the luck of the draw, you get something you’re not used to.” He continued:

Participant E: I think it was the quality of the stuff we used. It was much stronger than other things that we had used and I think it was just too pure, it didn’t have enough cut in it or something.

Participant F, a man in his fifties, reported that the heroin from which he experienced an overdose was from a new, unknown batch. Like the participant above, he attributed his overdose to the inability to know the composition of the heroin he used:

I: What was different that day [of the overdose] than other days that you used?

Participant F: ... It wasn’t unusual, but just maybe too much... the one [batch] was really, really powerful than the other one ... it was probably a new batch ... [the dealer] said it was.

I: Had you been doing anything else?

F: No, I don’t think nothing else that night. I wasn’t drinking, I was doing nothing.

Both participants’ overdoses were reversed when naloxone was administered – to E by a paramedic and to F by a roommate.

Overdose events related to uncertain supply have amplified since fentanyl, a synthetic opioid fifty times stronger than most street heroin, has been increasingly common in the United States and in San Francisco. Several participants reported fentanyl as a factor that contributed to their recent overdoses. Some participants reported purposefully seeking out fentanyl to use but ultimately being unable to manage the effects. In some cases (N = 3/40), participants described a very troubling situation in which the drug supplier or other person uses fentanyl or another strong opioid to deliberately cause an overdose. These “hot shots”, as participants referred to them, were emblematic of the highly vulnerable risk environments participants occupied, in which overdose and death could be caused even malevolently. According to Participant G, a man in his fifties with a history of using injection drugs in New York, Chicago, and San Francisco:

Participant G: The risk is that you can be greedy, you can get hot

shot.

I: What does that mean?

Participant G: Hot shot is where, you know, the dealer either is extremely mad at you and you ain’t paid your bill ... something that’s just a little bit more than what he said it is, which is the purity. Which is not very likely but, you know, it does happen, I’ve seen it happen.

I: You have? So it’s like retribution of some kind.

Participant G: Yes, kill this [person], basically. Or strychnine where people cut it with other [substances].

These participants underscore the unpredictability and risk of illegal opioid use stemming from the supply side of an unregulated market. In this context, PWID who practice safe injecting or harm reduction are still at serious risk of opioid overdose due to the lack of ability to accurately ascertain the composition of street heroin at the time of use.

### *Finding 3: balancing polysubstance use*

Like prior studies have indicated (Riley et al., 2016), participants in this study reported that using other substances along with opioids was a major contributing factor in their overdoses. In this study, the most common substances participants reported combining with opioids were alcohol, benzodiazepines, methamphetamines, and cocaine. It was common for participants to describe using other substances at the same time, or shortly before or after, using opioids.

Drawing from the lay expertise theories, two key aspects related to polysubstance use emerged from the interviews that provide insight into the complexity of managing the effects of multiple substances. First, participants reported having expertise and knowledge of their own limits when combining drugs and alcohol with opioids. For example, Participant H, a man in his twenties with chronic pain, suggested he knows what combination and quantity of drugs he tolerates. He described his overdose as a “miscalculation”:

Participant H: It was a combination of heroin and morphine and speed. And, yeah, I didn’t calculate it quite right. Next thing I know, [my acquaintance] is leaning over me ... shaking me ... I just think that I calculated the mixture wrong. I probably miscalculated how strong the dope was and how much there was left of morphine.

Participant I, who is a man in his fifties, also described his expertise with polysubstance use. He was aware of his limits and the substances he could use. To him, the public health messages that warned people of the dangers of using drugs/alcohol with opioids did not ring true to his personal experiences. He regularly used alcohol when opioids were unavailable and described himself as “living proof” that alcohol can be used with opioids, in contrast to the medical advice his physicians have routinely given him:

Participant I: My basic thing is morphine. I’ve always kind of thought of fentanyl as kind a treat that goes along with it. You know what I mean? The combination of the two. Especially if I’m doing them both, I try to do less. Less is more. And then adding alcohol into the mix ... There are a million physicians that will tell you never to mix alcohol and opiates. Well, you know what? I’m here. Living proof that maybe in small quantities it’s kind of a cool combination. But that said, I realize that alcohol antagonizes opiates and vice-versa. If I weren’t doing any opiates at all I would probably go through something like ... a half pint of bourbon a day.

The quote above from Participant I indicates he combined alcohol and opioids as substitutions (opioids instead of bourbon), in addition to using substances in combination (morphine and fentanyl). This points to a second aspect of polysubstance use- the non-additive risk relationship between opioids, other substances, and overdose. Most research exploring risk factors for overdose indicate that a combination of opioids and other substances amplify overdose risk, suggesting that

greater levels of polysubstance use increases overdose risk. Polysubstance use was commonly reported by the study participants, however the ways alcohol/drugs were combined were not always necessarily additive, and risk was not always linear. For example, Participant J, a woman in her sixties, described that one rationale for using other drugs or alcohol was the motivation to reduce heroin or opioid use, by switching or swapping her primary substance. Yet she was also aware that the process of attempting to reduce opioid use by using crack cocaine potentially increased her risk of opioid overdose by decreasing tolerance:

Participant J: With me, first and foremost, if I smoke a lot of crack, I'm gonna overdose on my methadone dose. Because I'm gonna bring my tolerance down so low because I'm not taking my methadone.

This finding underscores the complexity involved in participants' lived expertise. Polysubstance use was a matter of delicate balance, planning, and calculation – and at times miscalculations – not necessarily the linear, compounding risk as it is often framed.

#### Finding 4: emotional pain

Participants reported that emotional pain (e.g. depression, thoughts of suicide), which frequently stemmed from their structural vulnerability, factored into overdose experiences. One person, Participant K, is a young man who illustrates how depression is linked to overdose. He describes using drugs in a vacant lot with a friend who was homeless over the holidays, who was struggling to keep his family together:

Participant K: It was around December, a couple days before Christmas. We were all doing [drugs], and he just became unresponsive. He looked like he already had a little bit much. I knew from just listening to him and the things that he was talking about - his girlfriend and kids and stuff - that he might've been a little depressed. And sure enough, he loaded up, and he became unresponsive ... I understand the feeling because I went through some stuff like that myself. When I was going through something last time, and I tried mixing [drugs] during my overdose ... When I was depressed, I had to use in order to just try to stay high and forget.

Traumas - past and current - and loneliness due to the loss of a significant relationship were focal points of participants' narratives. Participant A, introduced above, reported surviving up to a dozen personal overdose experiences. He described that most recently, a desire to escape or manage his chronic depression was the factor that led to his overuse of fentanyl:

I: What do you think led up to that overdose? What was different than other times?

Participant A: ... I wasn't paying attention to how much I was doing. I was doing a lot because I was trying to get away from ... I was going through a depression. I was just trying to get away from my thought process, and I just didn't wanna think. And I just took too much.

Several participants also described a relationship between depression and intentional opioid overdose. Participant L is a woman in her fifties with extensive harm reduction experience. She described mental health issues like ongoing depression as a primary contributing factor to overdose. However, she was clear that resulting overdoses are not necessarily consciously intentional, alluding to the complexity in ascertaining intentionality in overdose:

I: What do you think contributes to an overdose?

Participant L: Well, I think your mental health can. I didn't feel that way, so personally mine was totally, totally accidental. I was looking to have fun.

I: Like an intentional overdose?

Participant L: No ... maybe subconsciously intentional. Like, if

you're depressed and you just get into that ... I've seen a lot of people get into that rut where they just use all the time because they're depressed, and I think that's dangerous.

Another participant, Participant M, is a man in his thirties who was homeless for several years. He experienced three overdoses himself and witnessed four others. Like the example above, he echoes the internal battles surrounding intentionality around overdoses, particularly in the face of major structural vulnerabilities:

Participant M: For some people, [overdose] can be done intentionally ... depression, and not caring about yourself. I have a desire to live, but I've been on the streets for eight years. And it gets really miserable sometimes. You know, sometimes I think I wouldn't mind not being around no more. But then like, I couldn't do that. I wouldn't do it on purpose. I can't see myself doing it.

Participant N, a man in his late thirties, had just witnessed an overdose the day prior to his interview. He described major struggles with opioid use and has been in and out of jail and treatment on account of substance use several times. Reflecting back on hardships in his life, he described his recent overdose about a year prior, which he experienced alone in a single-resident occupancy hotel room:

I: Looking back on that event, what do you think contributed to your overdose?

Participant N: Having a poor self-esteem. You know, it makes me want to try more drugs, and I don't like life sometimes. I think that life is too hard for me, and I want to commit suicide and die sometimes. But not all the time. Sometimes life is good. Sometimes life is bad.

For these participants, the structural vulnerabilities they faced in everyday life, created pain and suffering so deeply profound, it blurred the desire to live or die.

## Discussion

We examined the firsthand opioid overdose accounts of PWID. Four themes that characterized how participants described their overdose experiences were 1) Social Dynamics and Opioid Expertise; 2) Uncertain Supply, Composition, Source; 3) Balancing Polysubstance Use; and 4) Emotional Pain.

Two interrelated social theories – structural vulnerability and lay expertise theories - frame our interpretation and analysis of findings. These frameworks allow the data to be interpreted in a way that acknowledges the power differences, positionality, inequalities, and, simultaneously, the strengths that situate the experiences of PWID everyday in a systematic way. In the first finding, participants described opioid overdoses using terms like greed and stupidity. Terms like these, when examined independently, reinforce the negative impressions many people have about PWID. But when viewed through a structural vulnerability and lay expertise framework, participants' language can be recognized as a strategy to express their *opioid expertise* in the context of surviving as a long time substance user. It is a way to practice or project one's advanced knowledge and experience with opioid use. The concept of opioid expertise is corroborated by studies that indicate older and more experienced PWID consider themselves at less risk of an opioid overdose (Rowe, Santos, Behar, & Coffin, 2016). Through a structural vulnerability framework, opioid expertise may also be recognized as a strategy to manage stigma. The stigma faced by PWID is not only interactional or personal, such as negative reactions from strangers or loved ones, it is also institutionalized through policies that discriminate against PWID in housing, health care and other arenas. In this context of interpersonal and institutional stigma, opioid expertise is a useful, rational social construct participants use to combat or counteract the stigma they face.

The factors that systematically shaped opioid overdose risk were

largely structural factors situated at the social, environmental, and policy levels - outside of a given individual's immediate control. For example many participants described incarceration and homelessness in their narratives, both of which are major risk factors for opioid overdose (Kinner et al., 2012; Linton, Celentano, Kirk, & Mehta, 2013). The emotional pain described by PWID reverberated from the structural vulnerabilities faced by them and those they love. Illness, death, separation, and persistent stress resulting from their experiences with poverty and drug use were driving themes in their overdose narratives. Uncertainties on the supply side of the street opioid market (supply, composition, source) were also prominent in overdose narratives. The purity and quality of heroin sold in the US fluctuate based on global supply factors (Ciccarone, 2009), and the increase of synthetic fentanyl throughout the country has been strongly implicated in the rise in overdose deaths (Seth, Scholl, Rudd, & Bacon, 2018). PWID do not have the technology, information, and resources to navigate this changing landscape and accurately ascertain what is in the opioids they use. There is a need to develop and strengthen public health strategies that address structural vulnerabilities in the battle against opioid overdose, such as supply issues, criminalization of substance use, and substance use stigmas that influence the way PWID are treated interpersonally and in institutions. By drawing our attention to structural areas of improvement, we shift the focus of overdose intervention from correcting individual actions or behaviors to correcting the resources, policies, and environments that frame overdose events.

This underscores the importance of the expertise of PWID in the identification of other structural areas and solutions. Many of the PWID who we interviewed had in-depth knowledge about opioid risks, having used opioids in some cases for decades. There is much to be gained through greater recognition of the expertise of PWID, both to combat the stigma faced by PWID and to learn about and bolster grassroots overdose prevention strategies. Clinicians, public health practitioners, and policy makers can partner with drug-using and recovery communities to not only better understand their lived experiences with opioids, but to support local, grassroots strategies to reduce overdoses.

Novel and innovative strategies to combating overdose already exist and are occurring everyday by PWID, many of which are organized and spearheaded by people who use drugs. In France, PWID have developed peer support groups to spread awareness of health policies and harm reduction skills, and even enhance them through the practical knowledge accumulated through their life experiences (Jauffret-Roustide, 2009). In San Francisco, naloxone was initially promoted and distributed by advocates for people who use drugs in the wake of the overdose crisis (Rowe, Wheeler, Jones, Yeh, & Coffin, 2018) and is now widely utilized throughout the country as a crucial intervention against overdoses. At the grassroots level, PWID and advocates have utilized color reagent fentanyl test strip technologies to detect fentanyl in street heroin. This technology, which was originally developed for forensic use, has been repurposed in several cities by PWID for fentanyl overdose prevention. There are concerns about unintended consequences due to false-positives, but fentanyl test strips have gained the support from the public health community as another tool in the fight against overdose death (Krieger et al., 2018; Peiper et al., 2019). It has also been reported that unsanctioned supervised injection sites have been operated by health and social services workers and advocates in partnership with PWID (Kral & Davidson, 2017). In the absence of sanctioned, legal spaces, these unsanctioned sites are operated at a grassroots level by advocates and PWID to provide overdose prevention such as medical attention, naloxone and to reduce the potential for unsafe disposal of needles. Public health practitioners can partner with PWID and draw on their knowledge and needs to develop opioid overdose prevention interventions like these. However, there are major barriers to the success of such interventions. Recently in the US, the Justice Department has stated that those who operate safe injection facilities are subject to criminal enforcement (Rosenstein, 2018), and in October of 2018, the Governor of California vetoed AB-186, a bill that would

sanction safe injection sites, stating the sites are “all carrot and no stick” (Brown, 2018).

Using theories of lay expertise, this study also highlights the tensions involved when there is conflict between different forms of expertise. As other studies have shown (e.g., Miller, 2005) the professional expertise of health providers can be at odds with the everyday lay expertise of PWID. This is significant because it reveals a dissonance between participants' experiences and the public health messages they hear. The challenge for public health practitioners is that messages (e.g. mixing drugs increases overdose risk) may fall on deaf ears due to its invalidation by the personal experiences of PWID themselves. Nevertheless, more nuanced and relevant evidence-based approaches about the risks of polysubstance use are unavailable.

One aspect of opioid overdose that is challenging to characterize is the relationship between emotional pain and overdose (Bohnert, Roeder, & Ilgen, 2010). The close relationship between chronic pain management and opioid overdose has received attention and research, but emotional pain has been less examined. In this study, participants linked their emotional pain to the structural vulnerability they faced. By and large, the participants in the present study reported a strong desire to live and thrive, but there is also evidence that some people use drugs such as opioids to end their lives. Intentionality is difficult to ascertain given the underlying mental health issues, loss, and suffering experienced by PWID. In an emergency room study in Australia, people who survived an overdose reported a wide range of responses to questions about intentionality (Buykx, Ritter, Loxley, & Dietze, 2012). “Subconsciously intentional”, as one participant described it, is a way to understand a dimension of the tension involved when prolonged substance use and mental health issues interplay, which is amplified in the context of structural vulnerability. More research is needed examining the relationship between structural vulnerability, emotional pain, and overdose.

This study, which aims to contribute to the representation of the lived experiences of PWID, has limitations. Many participants were recruited from a syringe exchange program in San Francisco, and their perspectives do not represent all people who experience opioid overdose, nor do they represent PWID who are not accessing services. Their experiences may not be relevant to people who use prescription opioid medications for chronic pain management. Another limitation is that the data used in this study were retrospectively analyzed from an unconventional source - motivational interviewing counseling sessions. The original REBOOT study was designed as an overdose prevention intervention, not to explicitly investigate factors that contribute to overdose. Although unconventional, these data provided a rare glimpse into people's firsthand descriptions of opioid overdose experiences, and we found them worthwhile to analyze despite their limitations.

The accounts described in this paper shed light on what is often a private or personal event and allow us to recognize the potential dissonance between lived experiences and public health interventions and messaging. The expertise of PWID, drawn through the recognition of their agency and personal experiences, is a valuable resource to informing successful opioid overdose prevention and treatment.

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