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## Opioid-Involved Overdose Among Male Afghanistan/Iraq-Era U.S. Military Veterans: A Multidimensional Perspective

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### Abstract

**Background**—Mirroring nationwide trends in a broad range of U.S. populations, an alarming number of Afghanistan/Iraq-era U.S. Military veterans have experienced opioid-related overdoses. A growing body of research has examined the proximal behaviors that can precipitate an overdose; considerably less is known about more distal physiological, psychosocial and structural influences on these risk behaviors.

**Objectives**—This study adopts a multidimensional approach to better understand opioid-related overdose among U.S. Military veterans, and seeks to explore not only the proximal behavioral precipitants of overdose events, but also the complex nexus of physiological, psychological, and sociological influences that undergird overdose events.

**Methods**—This qualitative examination is based on interview data from 36 male veterans who were discharged from the military after September 2001 and experienced at least one opioid-related overdose during or after military service. Participants were recruited in New York City during 2014 to share narrative accounts of their overdoses.

**Results**—Veterans' accounts indicate that background experiences, such as self-medication for social and psychological pain, trauma, social alienation and isolation, and histories of illicit drug use, precondition the more immediate factors and behaviors that precipitate overdose (including bingeing on drugs, mixing drugs, naiveté about dosage, and ambivalence about life/death).

**Conclusions**—Findings suggest the need for comprehensive drug safety and overdose education that is sensitive to veterans' physiological, psychological, and sociological conditions. A multidimensional understanding of the distal and proximal overdose risks faced by veterans and other vulnerable groups may help lay a foundation for more inclusive/holistic approaches to overdose prevention and education.

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#### Declaration of Interest

The authors have no conflicts of interest to declare.

## Keywords

Overdose; opioids; physiological; psychological; and social conditions; pain management; self-medication; U.S. military veterans; polysubstance use

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## Introduction

This study adopts a multidimensional approach to better understand factors contributing to opioid-related overdose among a sample of U.S. Military veterans in New York City. This approach draws upon several theoretical models for health research including Engel's Biopsy-chosocial (BPS) perspective (Engel, 1978, 1980), as well as frameworks developed in social and life-course epidemiology (Berkman & Kawachi, 2000; Galea, Nandi, & Vlahov, 2004; Krieger, 2001a, 2001b; Kuh, Ben-Shlomo, Lynch, Hallqvist, & Power, 2003; Trostle, 2004) and Rhodes' risk environment framework (Rhodes, 2002, 2009). The incorporation and consolidation of these frameworks help us conceptualize the ways in which biological/physiological, psychological, interpersonal and social-structural events and circumstances can impact health trajectories and outcomes. Few studies to date have applied this type of multi-faceted theoretical framework to the analysis of overdose risk; one example is McLean's recent qualitative study that examines the high prevalence of opioid overdose in a Pennsylvania city as a function of the poverty, lack of employment opportunities and social isolation resulting from local deindustrialization (2016). The holistic framework we use can help in understanding how overdose influences and precipitates include both behaviors and experiences proximal to the overdose and those more distal to the event. These include an individual's knowledge and expectations related to the specific context in which opioid use is initiated, the perceived value of and motivation for substance use, and understanding (or lack thereof) of the risks involved (Pouget, Bennett, Elliott, Rosenblum, & Britton, 2017a; Pouget, Bennett, Elliott, Wolfson-Stofko, et al., 2017b); Darke, 2003; Green, Heimer, & Grau, 2008; Zinberg, 1984).

## Background

The United States is facing a health crisis of drug overdose driven by the use of prescription opioids (PO) and heroin. Since the late 1990s when patients' rights to effective pain treatment became a mainstay of medical ideology in the U.S. (Quinones, 2015), POs have been widely prescribed among a broad cross-section of the population (Institute of Medicine, 2012; U.S. Army, 2010), leading to markedly increased rates of both medical and nonmedical use. Throughout the U.S. from 1999 to 2013, the drug poisoning fatality rate more than doubled from 6.1 to 13.8 people per 100,000, and the rate of drug poisoning deaths involving opioid analgesics nearly quadrupled from 1.4 to 5.1 people per 100,000 (Li-Hui Chen, 2015).

This epidemic has greatly impacted active-duty military personnel and veterans who have experienced high rates of opioid misuse and overdose (U.S. Army, 2012; Bennett, Elliott, & Golub, 2013; Seal et al., 2012). An analysis of data from the Department of Defense Health Behavior Study suggests a significant increase in past-month prescription drug misuse among active duty service members in 2008 (11.1%) compared to 2002 (1.8%) (Bray et al.,

2010). Additionally, the Army reported that, among active-duty personnel, drug toxicity deaths more than doubled between 2006 and 2011 (U.S. Army, 2012). In fact, veterans experience nearly twice the accidental poisoning mortality rate (19.85 per 100,000) as the general population (10.49 per 100,000) (Bohnert et al., 2011).

Research indicates that veterans' opioid use trajectories can begin with a legitimate opioid prescription for pain management and may progress to abuse, dependence, and even overdose (Bray et al., 2009). Of more than 440,000 veterans receiving opioid painkillers from the Veterans Health Administration (VHA) in 2012, roughly 34% were "chronic users" who had been using opioids for more than 90 days, and almost 64% of those chronic users had a dual pain and mental health diagnosis within a year of first being prescribed opioids (Oliva, 2014). Fifty-five thousand VHA patients were currently diagnosed as having an Opioid Use Disorder in 2012 (Department of Veterans Affairs, 2014).

Although there is research on veterans' opioid overdose risk factors, little has been done specifically with recent Afghanistan/Iraq-era veterans, especially using community-based samples of veterans, many of whom may not be connected to the VA. There are several robust studies that examine pain, opioid prescribing patterns, and risk for overdose among veterans connected to the VA, using large VHA data sets (Bohnert et al., 2013; Zedler et al., 2014; Park et al., 2015), though to our knowledge, few if any examine overdose risk among veterans recruited in the community.

The reasons for opioid use, misuse, and overdose among this population are myriad. Research has indicated that some veterans use substances as a form of self-medication for physical and psychological pain (Andrews, Brewin, Philpott, & Stewart, 2007; Goebel et al., 2011; Institute of Medicine, 2012; U.S. Army, 2012). Mental health concerns, including posttraumatic stress disorder (PTSD) and substance use disorders (SUDs), impact veterans of all eras and have been found to predict accidental and intentional overdose in both veteran and drug-using populations (Bohnert, Roeder, & Ilgen, 2010). Research with non-veteran populations has established that structural factors including poverty, homelessness, or periods of abstinence from opioids due to incarceration, hospitalization or inpatient drug treatment can increase vulnerability for overdose (Binswanger, Blatchford, Mueller, & Stern, 2013; Galea et al., 2003; Hembree et al., 2005; Jones, Mack, & Paulozzi, 2013; Nandi et al., 2006; Rowe et al., 2016). Moreover, interpersonal relationships and events, social supports and life turning points (Cohen, 2008; Elder, 1986; Nagin, Barker, Lacourse, & Tremblay, 2008) can influence opioid-using veterans' substance use practices and behaviors in ways that can contribute to an overdose event (Wawrzyniak et al., 2014).

Furthermore, research is emerging that suggests that some Department of Defense (DoD) and (VHA) efforts to control PO misuse and overdose may have had unintended consequences. By 2010, the DoD and the VHA, as well as the Centers for Disease Control (CDC), adopted more stringent guidelines for prescribing opioid painkillers. Heightened national attention to increased rates of PO misuse and overdose has also led to the implementation of prescription drug monitoring programs (PDMPs) in many states. Facing reduced access to POs from medical sources, some veterans have turned to diverted POs or have transitioned to heroin use/injection because it has become easier to obtain and less

expensive than POs in many contexts (Frank et al., 2015; Harocopos, Goldsamt, Kobrak, Jost, & Clatts, 2009; Lankenau & Walley, 2011; Sherman, Smith, Laney, & Strathdee, 2002). However, the use of heroin, especially when injected, can present additional health consequences including overdose and HIV/HCV transmission. POs obtained from nonmedical drug markets may have been illicitly manufactured (Charatan, 2001), and heroin presents an especially salient risk due to uncertainty about potency, in part due to the increasing risk that any given sample of the drug may be adulterated with fentanyl (Marinetti & Ehlers, 2014; Rudd, Aleshire, Zibbell, & Matthew Gladden, 2016; Larance, Degenhardt, Lintzeris, Winstock, & Mattick, 2011; Passik, Messina, Golsorkhi, & Xie, 2011).

Public health research identifying sociodemographic and behavioral predictors of opioid-involved overdose is becoming more robust (Binswanger et al., 2013; Darke, Williamson, Ross, & Teesson, 2005; Frank et al., 2015; Jones et al., 2013; Rowe et al., 2016; Seal et al., 2001; Warner-Smith, Darke, Lynskey, & Hall, 2001). However, this research, as well as current protocols for identifying and preventing accidental overdose, tends to focus primarily on behavioral risks proximal to overdose events such as nonmedical use of POs (Goebel et al., 2011), concurrent use of multiple CNS depressants including benzodiazepines and alcohol (Park, Saitz, Ganoczy, Ilgen, & Bohnert, 2015), changes in tolerance due to illness or a recent period of opioid abstinence (Britton, Wines, & Conner, 2010), and failure to contact emergency personnel for fear of arrest or loss of benefits (Banta-Green, Beletsky, Schoeppe, Coffin, & Kuszler, 2013; Bennett, Bell, Tomedi, Hulsey, & Kral, 2011). Considerably less is known about the longer-range interplay between biological/physiological and psychosocial factors that can contribute to these risk behaviors.

## Methods

### Recruitment and eligibility criteria

This qualitative analysis draws from interviews conducted in 2014 with 36 veterans living in New York City (NYC). Eligibility criteria included discharge from military service after September 2001 (9/11) and self-report of one or more opioid-involved overdose(s) during or following military service. Participants were recruited through outreach at venues such as veterans' service organizations, clinics, VA hospitals, and by chain-referral. Potential participants were screened in-person by one of two senior investigators (the first two authors) to determine if their overdose was opioid-related. Overdose was defined for participants in terms of common symptoms of over-sedation, such as falling down, being unable to walk, labored breathing, black or blue fingernails or lips, loss of consciousness, having naloxone used on them to restore consciousness, or being taken to an emergency room. Exclusion criteria included severe intoxication or psychological distress that interfered with providing informed consent or participating in the interview, and lack of sufficient knowledge of the specific prescription drugs taken prior to an overdose event to establish that the overdose was in fact opioid-related. Sixty-eight veterans were screened, yielding a total of 50 participants, including 14 who had served in the military during earlier eras and were excluded from this analysis of 36 Afghanistan/Iraq-era veterans. Participants were required to confirm their post-9/11 military service by showing their report of transfer or discharge (DD-214), VA Health Center identification, or veterans' housing identification.

## Semi-structured interviews

In-depth, semi-structured interviews (lasting approximately 90 minutes) were conducted by two senior investigators and were designed to elicit participants' life histories and personal narratives about their most recent overdose. The interview format was flexible to allow participants to highlight areas of importance to them surrounding their overdose; the exact sequence in which open-ended questions were presented varied to allow interviewees to introduce or elaborate on topics of particular relevance to their overdose experience. The larger topical domains addressed were derived from previously validated clinical instruments, including the Current Opioid Misuse Measure (COMM; Butler et al. 2007) and the Screener and Opioid Assessment for Patients with Pain (SOAPP; Akbik et al. 2006) and from components of the biopsychosocial model. Primary domains included: biological (e.g., pain, substance dependence), psychological (e.g., PTSD, depression) and social-structural (e.g., relationships, housing, employment, therapeutic experiences, stigma, physical environment). Other unanticipated domains that emerged while conducting participants' interviews included: contexts of the overdose; drug-use trajectories (initiation, escalation/de-escalation of opioid and other substance use, transitions from POs to heroin, routes of administration); overdose prevention and reversal knowledge (e.g., rescue breathing, naloxone, harm reduction); protective measures utilized and perceptions of overdose vulnerability; seeking help and stigma; and impacts of the overdose experience (e.g., stopped using drugs; sought treatment). Participants provided written informed consent and were compensated \$40 for interview participation. Study activities were approved by the Institutional Review Board at the host institution. All names used are pseudonyms chosen by the participants.

## Analysis

Interviews were digitally audio-recorded, transcribed verbatim and entered into the software program *MAXQDA* (VERBI Software, 2016) for coding and analysis. Transcripts were analyzed using a hybrid deductive and inductive approach informed by the tenets of grounded theory (Charmaz, 2000; Glaser, 1967; Strauss & Corbin, 1990) that aimed to develop a typology of overdose risks and the substance use trajectories that preceded overdose experiences. Drawing on extant literature assessing overdose risks and predictors, the analysis sought to identify immediate precipitants of overdose events (e.g., mixing multiple depressant substances, using more than one's typical amount of POs or heroin) while also tracking the potential for seemingly distal conditions or events (such as a prior traumatic event) to become relevant to an overdose event. Three staff members with qualitative expertise separately coded an initial subset of transcripts, using a preliminary list of *a priori* codes based on topical domains addressed in the interview protocol. The three coders met regularly during this process to discuss emergent themes and the addition of new code categories. *A priori* codes were augmented with *a posteriori* codes by consensus until a final code list was established. The final code list guided the coding and analysis of the remainder of the interviews, a task conducted by the lead and second author.

## Results

### Participant characteristics

Participants (n = 36) were all enlisted males; their mean age was 36 years (range = 24–54 years) and none had college degrees. Forty-four percent (16/36) identified as White, 14% (5/36) as Latino and 42% (15/36) as Black. All but four participants were unstably housed and lived in veterans-specific housing, SROs or subsidized apartments.

Participants were discharged from the military between 2003 and 2012. Slightly over half (53%, 19/36) had served in the Army, the remainder in the Marines (17%, 6/36), Navy (11%, 4/36), Air Force (8%, 3/36) or Coast Guard (8%, 3/36). One participant served in the Navy and then reenlisted in the Army. One-half (18/36) of participants had served in support of Operation Iraqi Freedom (OIF) or Operation New Dawn (OND); the remainder served in support of Operation Enduring Freedom (OEF) or in other support roles (e.g., stateside post-9/11 patrol; Coast Guard domestic drug control support).

Two participants reported an overdose event during their military service – one involving heroin, the other POs – while the remainder experienced an overdose after being discharged from the military. Most participants (83%) had experienced only one overdose at the time of their interview. The 17% (6/36) who had experienced more than one overdose were asked to discuss in detail their most recent overdose, resulting in narrative accounts of 36 discrete events. Sixty-one percent (22/36) of the overdose experiences reported by participants involved heroin. Of these, 64% (14/22) also involved alcohol and 45% (10/22) also involved POs. POs were involved in 56% (20/36) of reported overdoses; 65% (13/20) of these were in combination with alcohol and 50% (10/20) in combination with both benzodiazepines and alcohol. Six (17%) reported overdoses involved cocaine as well as POs and/or heroin. Less than 15% of study participants were aware of naloxone at the time of their interview.

The veterans in our study faced many physiological, psychological and social-structural challenges. One participant identified as HIV-positive. Based on self-reported information, 20 participants (56%) had PTSD, 11 (31%) suffered from depression, 4 endured traumatic brain injury 4 (11%), 7 (19%) experienced serious anxiety, 2 (5.6%) had bipolar disorder, and 5 (14%) reported some other psychological disorder. Iatrogenic initiation of PO use following a prescription for physical pain was a problem that the majority (75%) faced. Common forms of physical pain included back, arm, leg and hip injuries, among other acute and chronic pain issues.

### Overdose narratives and the convergence of distal and proximal conditions

Results are organized in terms of their temporal proximity to overdose events and involve physiological, psychological and socio-structural influences. Those conditions identified as “distal” influences, while not directly implicated in overdose events, can be seen as critically involved in an individual’s progression to high-risk opioid-use behaviors that increase the likelihood of overdose. Those conditions identified as “proximal” influences include only aspects of the immediate contexts surrounding an overdose. For heuristic purposes, key themes common to many overdose events narrated by participants are presented as discrete



conditions, but, as some of the later anecdotes make clear, all overdose events involve an interplay of proximal and distal factors.

### **Distal conditions I: Iatrogenic initiation of opioid use for pain relief and drug naïveté**

Findings indicate that the manner in which veterans learned to use opioids and the forms of constraint and convention built around these early experiences often shaped their subsequent practices and health outcomes. A sizable number of participants (12/36) reported initiating opioid use while in the military, iatrogenically, as a result of injury:

I had a bilateral left and right knee surgery. Afterwards [they] started [to] give me the pain medication for surgery and [I] kind of got hooked on the pain medication for a little while, Vicodin, Percocet. [RW, Army, 26]

For RW and several others, opioid analgesics were at times provided without the customary prescription information, a practice Steve described as commonplace from his perspective:

You hear about it all the time in the military. At the time [of an injury] they give you medicine, nobody explains to you what all it does. Over there mostly they just gave you a little baggy filled with the medicine and say “here you go.” [Steve, Navy, age 37]

As these accounts suggest, for some veterans injured during their service, their initial opioid use was overseen by military doctors and corpsmen in response to injury or other painful medical conditions. Many participants served before opioid use began to rise rapidly during the mid-90s (Compton & Volkow, 2006) and were not provided with drug education that is now offered in all branches of the military. Without a clear understanding of risks and contraindications, some participants continued to use POs even after acute physiological pain had abated, either for recreational purposes or to alleviate other forms of distress or discomfort.

### **Distal conditions II: Self-medication for social and psychological pain**

Self-medicating with POs or heroin, especially after leaving the military, emerged as one of the most dominant themes in participants’ narratives. Participants themselves explicitly used the term as a rationale for their opioid use. For some, the condition being medicated was anxiety:

[Part of my anxiety was] the tight constriction kind of feeling [in my chest]. When I had this pain and I took the Tylenol with codeine or the Vicodin, the pain just disappeared. I felt normal. That was dangerous I guess, because now all the stress or whatever it is and then you are like, “Wait a minute, this anxiety feeling is just gone. This is crazy. What’s going on?” You know, so of course you continue ... [Jon, Marines, age 28]

I also have PTSD and it was also the anti-social behavior, afraid of people. So when I was high [on opioids], I was feeling that I have a chance to talk to people and be friendly without being scared of them. Yeah, social power to communicate with people. Yeah and at the same time it was giving me – it was kind of stability to my PTSD. [Eric, Army, 29]

Participants also reported relief from symptoms of PTSD other than social anxiety:

Yeah, I've suffered a couple of traumatic incidents in Iraq and those incidents never left me. I've carried them with me and the opiate use hopefully did help with that. It numbed me to anything really. [TJ, Army, 24,]

Participants who reported self-medicating did not always express remorse or guilt in relation to this behavior. Some, in fact, described their use of opioids as a way to mitigate the harms associated with internalized stigma and the social and psychological stress of civilian life. Cali, for example, described his attempts to medicate depression with opioids:

The fact is I had some issues going on and I tried to drown the sorrow [with opioids and I overdosed]. An overdose to me is greedy. It's going too hard. It's bugged out. [Cali, Coast Guard, 35]

For Tito, the biggest shock of reintegrating into civilian life in NYC was his perception that there was a stigma to being a veteran and that people were callous and self-absorbed. He reported using opioids to escape:

I get so angry sometimes with people acting so cocky like they are better than anybody. There is no respect for human life here sometimes. And I tell myself, these people don't know what really life is. Unless you witness something [like war] with that crazy big impact on you, you're not going to really understand. But the drugs and everything was just a choice to run away. [Tito, Army, 42]

For Airbrush, the commonplace use of opioids by veterans to cope was described in terms of social alienation and a lack of civilian interest in veterans' plights more generally:

Because nobody really, really, really, really gives a fuck about veterans. So when we get stressed and nobody wants to listen, we'll punch something, argue with somebody, go in the room, take our pill, go to sleep. [Airbrush, Army, 29]

### **Distal conditions III: Transition to heroin use**

Many (22/36) overdoses were related to heroin use. Use of unregulated, adulterated street drugs like heroin is particularly dangerous given the wide variation in potency. For many, the decision to use heroin was grounded in structural conditions—such as the difficulty of “doctor shopping” and receiving POs from multiple doctors after the implementation of a prescription drug monitoring program (PDMP) in New York State—and economic considerations related to limited access and the rising black-market costs of POs. Barber reported how dependence led him to sell his POs and buy heroin:

I have what is called a deteriorating spine. I have two herniated disc[s] that is bulging. They took MRI and X-rays; it shows it. The doctor started prescribing me Percocets. I noticed that going into the second month of using them that I was starting to depend on these Percocets [and wasn't getting enough pills for the pain relief I needed] .... So what I had to do was sell my Percs [and buy heroin]. [Barber, Army, 54]

For others, initiating heroin use was influenced greatly by their peers. Vito and Haiti describe their experiences living in a veterans' shelter where heroin use was widespread:



They sat around the table like, “Come on [use heroin].” ... Misery loves company.  
[Vito, Army, 32]

[When I came back from my last tour], that’s when I started fucking around. That’s what I call it. That’s what I was doing, fucking around with the wrong crowd.  
[Haiti, Army, 35]

### **Proximal conditions surrounding overdose events**

The background conditions discussed above intertwined with a number of proximal overdose risk conditions and behaviors, which ultimately led to an overdose. In this section, we present the salient factors that veterans perceived as directly implicated in their overdoses and how they understood these proximal factors to be related to more distal influences.

#### **Proximal conditions I: Drug naiveté and potency**

As suggested earlier, many participants expressed at least some uncertainty about the dangers of opioids or drug and alcohol combinations involving opioids. For some, their overdose experiences could be directly attributed to a lack of awareness of what they were consuming or even to sheer accident. Eric elaborated on this when he recounted his experience of taking a 60mg tablet of Oxy-Contin when he had no familiarity with the drug or its high-dosage formulations:

I’ve done oxycodone ... 60 milligram, and fucking 30 minutes later I was falling asleep on the sidewalk outside of a bar. And I was standing. I just slumped down. I had no clue what it was going to do to me. I had no idea how strong of a drug it actually is. [Eric, Army, 29]

Kiki reported unwittingly taking a full day’s dosage of his POs at once, by mistake:

I went into the VA hospital. And, first they just gave it to me ... They just told me take four a day. They didn’t tell what sequence I should take. [Kiki, Army, 42]

For Haiti, lack of knowledge about dosing guidelines, combined with peer pressure from a friend who was highly habituated to opioids, resulted in his first of several overdoses:

Somebody hooked me up with a doctor ... and I got me a prescription. It was oxycodone 80 milligram. Something that I guess somebody could tell me they only prescribe that to people that are ready to die or have cancer, or in a fucked up situation. But I have met all these veterans that was taking four 80 milligrams a day. Four times 80 milligrams, it was like nothing to [my friends]. But they told me I should do a whole 80 that night. I went and used the bathroom, and my brother found me with my head on the floor, passed out. [Haiti, Army, 35]

For overdoses involving heroin, participants commonly reported overdosing as a result of the drug’s varying and unpredictable potency:

Yeah, I was sniffing some dope ... And we went to get more. It was more powerful. You can’t use ... milligrams on a bag of dope. You just bought it and you’re meant to taste it [i.e. test its potency with a trial dose], but we just went straight forward.

And it was much stronger dope with less cut. So, that put me straight out. I went straight out. [Calvin, Army, 46]

Once I thought that I was going to die because that heroin was too high, it was too good, too pure. [Juan, Army, 33]

### Proximal conditions II: Route of administration

As illustrated by MJ, novice injectors may have difficulty determining an appropriate dosage when transitioning from intranasal or oral use to injection, as injection is a particularly rapid and efficient mode of administration:

The first time I shot heroin was actually the first time that I had an overdose. My logic was if I sniff three/four bags of heroin, then I guess I'll shoot one bag or two bags. And the first time I did it, I didn't get high because I instantly OD'd. I blacked out, fell out and didn't wake up until probably like 8 or 12 hours later. [MJ, Army, 28]

Smoking POs, as Chino explained, can also produce a more rapid onset and a more intense high for one accustomed to oral or intranasal administration. He recounted how smoking POs for the first time resulted in a frightening experience of respiratory distress and perceived paralysis:

Yeah, I remember one time I took a few Percocets and I smoked one. And I felt like my lungs were collapsing ... I sat there and I held my chest. And I couldn't move. I felt paralyzed. [Chino, Navy, 29]

### Proximal conditions III: Suicidal ideation

Only one participant cited clear suicidal intent as a reason for their overdose. Lou, an Army veteran, spoke somberly of the day he rented a motel room with the intent to end his life through an opioid overdose:

I overdosed on purpose. Actually I was trying to kill myself in some shithole town ... some shithole motel ... I went there just to go kill myself. You know? It's because life put me to a point where I was just like, "Man, is this what life has to offer? I don't think so." I loaded 15 bags [of heroin] into my works and shot it into my arm you know. And the housekeeper found me blue and black on the ground. And I guess I wasn't breathing and all that stuff. I woke up [in the hospital]. They shot me up with Narcan whatever, and woke me up ... My whole body was convulsing and stuff, and my heart was pumping, and I was like "I'm going to die, you guys gave me too much Narcan." [Lou, Marines, 32]

A majority of participants (29/36)—particularly those unstably housed and unemployed at the time of interview—characterized their overdoses as rooted in a general sense of apathy or a desire to escape life circumstances that had become unmanageable:

I'm losing everything. That day, it was a rainy day that one morning, I picked up an eight ball of cocaine and two bundles [of heroin, i.e., 20 bags]. I know that I put in the cooker five bags of heroin and a scoop of cocaine. When I injected it, I don't know what happened. All I heard was, "Are you okay? Are you okay?" That's all I

know. I don't recall getting back to the house. For several days I had no recollection of what happened. [Barber, Army, 54]

As Tito clearly stated, more extreme forms of self-medication can be coupled with a fundamental apathy about the potential for adverse outcomes, including death:

It's like we just don't care. We just don't care because the emptiness is so big that we want to fill it up a bit. [Tito, Army, 42]

### **Discussion: The interplay of distal and proximal influences on overdose**

As the overdose narratives of these NYC veterans illustrate, various background and immediate conditions can interact to increase risk for opioid-related overdose. Many of the proximal conditions and behaviors reported by participants are well-known overdose risk factors—including poly-substance use, heroin's variable and unpredictable potency, and the use of opioids by injection or inhalation, particularly by those accustomed to an oral or intranasal route of administration. However, present findings suggest that a fuller understanding of overdose risk requires consideration of multiple factors and conditions, not just those pharmacologically-related or behaviorally proximal to an overdose event, but within a life-historical perspective (Hammack, 2011; Launer, 1999; Zinberg, 1984). For the veterans interviewed in this study, several common background conditions, such as inadequately treated mental health problems, social distress, and financial concerns in the face of escalating opioid dependence, motivated transitions to heroin and/or injection drug use, thus creating a context for the emergence of behaviors that functioned as direct antecedents of an overdose. Veterans' accounts suggest that overdose events can be influenced by multiple constraints, hardships, and conflicts preceding, during and after military service— involving physiological, psychological, interpersonal and other social domains.

Lack of accurate knowledge about opioids and other drugs emerged as a central theme, both as a background condition and as an immediate precipitant of overdose. For some participants, drug naiveté appeared as a distal factor that contributed to the development of opioid dependence; for others, drug naiveté preconditioned a risky mixing of opioids with alcohol and/or benzodiazepines that ultimately resulted in overdose.

The findings regarding suicidal ideation are particularly noteworthy. Our findings suggest that, with regard to overdose events, suicidal intent might be better understood as part of a continuum of intentionality, rather than as one-half of an “accidental/intentional” dichotomy (Britton, Bohnert, Wines, & Conner, 2012; Heale, Dietze, & Fry, 2003). For some veterans, it appears that apathy, especially when combined with severe physical and/or psychological pain and social isolation, can lead to a “flirting with death” scenario. Accordingly, a rigidly dichotomizing perspective focused on identifying those actively seeking to commit suicide may fail to identify those whose apathy or cavalier attitude towards danger also effectively places them at risk of overdose.

## Limitations and strengths

This study has several limitations that suggest a need for further research aimed toward understanding the complex influences on drug overdose. The findings may be unique to the population of veterans who were discharged after 9/11 and returned to live in NYC and experienced an overdose. Moreover, given the nature of qualitative research which involves small samples and non-probabilistic sampling methods, the findings are not intended to be generalized to the broader veteran population from this or other military eras, suggesting the need for additional cross-sectional, longitudinal and comparative investigations.

Additionally, these data are based on participants' retrospective self-reports of overdose experiences. Overdose experiences lack universal definition and are subject to recall bias. Although women now constitute roughly 15% of the active duty military population and 10% of the veteran population, the study team was unable to locate female veterans from this era of military service who had experienced opioid-related overdose, suggesting that new forms of outreach, potentially involving trained veteran community health workers, may be needed to reach this segment of the population (Davidson et al., 2006; Barber et al., 2008; Chinman et al., 2010). Finally, it is worth noting that although the U.S. veteran population was estimated to be 77% White, not Hispanic in 2016, Whites and Blacks in New York City have comparable rates of veteran status (U.S Department of Veterans Affairs, National Center for Veterans Analysis and Statistics, 2016; U.S. Census Bureau, 2015), similar to the demographic makeup of the current study sample. Bearing these limitations in mind, present findings provide important preliminary information that may help inform clinical and policy initiatives to reduce risks and harms associated with opioid misuse.

## Conclusion

Consistent with emerging research, the results of this qualitative study reinforce the need for more comprehensive and holistic (Carrola & Corbin-Burdick, 2015) understandings of the inter-linked biological, psychological and social precipitants of opioid-involved overdose among the veteran population, and the role of both background and proximal conditions in producing overdose risk. Participants reported a range of background experiences as influencing their opioid use patterns and eventually contributing to their overdose experiences. Therefore, it may be valuable to view overdose risk as emerging from a dynamic process of events over the life-course that leads to and influences proximal conditions relating to veterans' current substance use that can precipitate an overdose.

Among other strategies to help populations at risk, including improving access to substance use and mental health treatment, targeted opioid safety and overdose prevention programs are needed to minimize drug-related harms among the veteran population. Because some veterans do not utilize the VA, community-based outreach programs should be implemented to reach the segment of the veteran population that is disconnected from veterans' services, many of whom are also in need of stable housing, education and meaningful employment.

There is clearly a great need for ongoing drug-related education among veterans. Veterans in this study often initiated opioid use for medical reasons without a full understanding of the nature of the substance being used and its inherent risks. Many participants, however, later

developed an awareness of the analgesic potency and cost-effectiveness of heroin, particularly as POs have become more difficult and/or expensive to acquire. Difficulties accessing care, the stigma of being dependent on opioids, and shame regarding treatment-seeking complicate and constrain veterans' efforts to manage various forms of pain in safe ways. Destigmatizing substance use treatment, particularly in the current era of heightened monitoring and concern regarding the public health crisis of opioid misuse and overdose, is a task that must be undertaken society-wide. At a very basic level, overdose education and naloxone distribution (OEND) programs should be universally available to opioid-using veterans, their peers, and their families. The VA has recently advocated for OEND in all its hospitals (US Department of Veterans Affairs, 2016), but many at-risk veterans do not possess VA benefits and need to be engaged through other channels (Bennett, Elliott, & Golub, 2015). Peer outreach has proved an effective intervention modality for veterans in some contexts, and when conducted by those with first-hand experiences of opioid (mis)use, stands to aid in destigmatizing treatment-seeking and connecting socially marginalized veterans to services, including methadone and buprenorphine treatment and harm reduction programs (Bennett, Elliott, & Golub, 2015; Bennett, Pouget, & Golub, 2015). Increasing evidence also indicates that people who use heroin assume much less risk of overdose when injecting in safe consumption sites where they can be monitored by trained staff after using opioids (Kerr et al., 2004; Kimber et al., 2005; Beletsky et al., 2008; Hathaway & Tousaw, 2008). While some of these important interventions are more practical and politically expedient than others, it is critical that the veteran population be better educated about the risks associated with opioid use and able to access the care and treatment options they choose.

A core aim of this study is to inform efforts to develop and deliver effective programs for preventing opioid misuse and opioid-related overdose among veterans. Identification of the longer-range contexts that shape veterans' risky opioid use and how these contexts can precondition proximal behaviors that may result in an overdose is a dynamic that this study seeks to better understand. Similarly, understanding how veterans themselves conceptualize risk, and draw on social and institutional supports, may allow for greater refinement in future efforts to tailor programmatic interventions, educate veterans on overdose prevention, and assist them in establishing meaningful affiliations with low-threshold services that may serve as protective factors against opioid-related health risks.

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