HHS Public Access

Author manuscript

Int J Drug Policy. Author manuscript; available in PMC 2020 December 01.

Published in final edited form as:

Int J Drug Policy. 2019 December ; 74: 76–83. doi:10.1016/j.drugpo.2019.09.003.

*"Everything is not right anymore"*Buprenorphine experiences in an era of illicit fentanyl

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Abstract

Background: Conducted in the Dayton Metropolitan area of Southwestern Ohio, this qualitative study explores the self-treatment practices of people who use illicit opioids (PWUIO) amidst the new risk environment produced by illicit, non-pharmaceutical fentanyl (NPF). We explore local perceptions of the presence of NPF in the Dayton area, and how this has both positively and negatively impacted practices of non-prescribed buprenorphine use among PWUIO.

Methods: This study analyzes qualitative data from 63 interviews conducted between October 2018 and June 2019. Participants were selected from a larger longitudinal study on non-prescribed buprenorphine use among individuals with opioid use disorder. Qualitative interviews were

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Declarations of interest

none.

transcribed in their entirety, and their transcriptions were analyzed using NVivo software, drawing on a mix of thematic and inductive coding.

Results: Interview respondents ranged from 19 to 70 years old, with a mean age of 38.9 years. 54% of them were male, and 85.7% identified as non-Hispanic White. 98.4% of the sample had used heroin, and 93.7% of the sample reported use of NPF. Participants agreed NPF dominated the illicit opioids market in the area, and was perceived as both dangerous and desirable. The domination of NPF and associated overdose experiences prompted some to seek positive change and initiate self-treatment with non-prescribed buprenorphine. For others, NPF sabotaged established practices of harm reduction, as unanticipated experiences of precipitated withdrawals prompted some participants to give up non-prescribed buprenorphine use as a tactic of self-treatment.

Discussion: The changing nature of heroin/NPF necessarily gives rise to new beliefs surrounding self-treatment attempts, treatment seeking behaviors, and harm reduction practices. While buprenorphine treatment continues to offer promising results for treating opioid use disorders, it is urgent to reconsider how the unpredictable biochemical mixture of NPFs circulating on the streets today may impact the initiation and success of treatment.

Keywords

buprenorphine; fentanyl; illicit fentanyl; non-pharmaceutical fentanyl; non-prescribed buprenorphine; qualitative analysis; self-treatment

Introduction

Illicit, non-pharmaceutical fentanyl and fentanyl analogues (henceforth referred to as NPF)—have largely come to replace heroin in many parts of the United States. While fentanyl, a Schedule II synthetic opioid, is used frequently as a highly potent anesthetic in medical settings, the current flood of NPF on the illicit drug market is rarely a case of pharmaceutical diversion (CDC 2015; Marinetti & Ehlers 2014). Rather, new sources of NPF are originating largely from China and Mexico (DEA 2018), and are arriving directly into the illicit US drug market without the need for prescription. NPFs are typically unpredictable in both their strength and composition (Armenian, Vo, Barr-Walker & Lynch 2018). The shift from heroin to NPF has had diverse impacts on the understandings and practices of people who use illicit opioids (PWUIO), who must adapt to new risks emerging from changes in the chemical composition of their drugs (Carroll, Marshall, Rich, & Green 2017; Ciccarone, Ondocsin & Mars 2017; Goldman et al. 2019).

The biochemical risks incurred by illicit opioids do not occur in isolation, but rather are shaped by local structural factors that create a risk environment unique to time and place (Rhodes 2002). In the Dayton metro area of southwestern Ohio, as in much of the Midwestern U.S., drug sales and use fill social and economic gaps left by a declining industrial sector (McLean 2015; Quiñones 2015). The greater Dayton metropolitan area, home to a population of approximately 800,000 people (U.S. Census Bureau 2017), once hosted a great number of manufacturing jobs in the auto and related industries, at one point holding the record for the highest per-capita number of patents (Millsap 2018). But in recent

decades the region has followed a larger pattern of post-industrial decline, with illicit drug sales and use seeping into the gaps left by receding industry and urban blight.

In Dayton, the dominance of opioids, and particularly NPF, is palpable. Billboards advertising drug treatments dot I-70 and I-75—the two key U.S. drug trafficking routes that intersect on Dayton's perimeter. This region has been hit by all three incarnations of what Ciccarone (2019) has called a "triple-wave epidemic" of opioid use—first pills, then heroin, and now NPF (ODH 2018). At the time that this study was conducted, NPF had come to saturate the local opioid market (Daniulaityte, Carlson, Juhascik, Strayer, & Sizemore 2019a). Here, as in other regions east of the Mississippi River, powder heroin has been more prevalent than tar, making adulteration or substitution with NPF more seamless (Ciccarone 2017; Mars, Ondocsin, & Ciccarone 2018; Zoorob 2019).

Dayton, the urban hub of Montgomery County, has been particularly hard hit by NPF-related overdoses. In 2017, Montgomery County had the highest per capita overdose mortality rate in the state of Ohio, with 521 overdoses, at an age-adjusted rate of 95.24 per 100,000 (Rossen, Bastian, Warner, Khan, & Chong 2019). About 90% of all fatal overdose cases in the area tested positive for NPFs (Daniulaityte et al. 2017; Daniulaityte et al. 2019b). Further, the number of unintentional overdose death cases testing positive for NPFs increased by 377% between the end of 2015 and the beginning of 2017. Local toxicology reports noted a shift towards increased diversification of fentanyl analogues, such as the highly potent synthetic opioid carfentanil, which appeared in 29.7% of the toxicology reports of overdose deaths during that same time period (Daniulaityte et al. 2019b).

Recent studies demonstrate that PWUIO are increasingly cognizant of the presence of fentanyl in the drug supply (Ciccarone et al. 2017; McLean, Monnat, Rigg, Sterner, & Verdery 2019; Stein, Kenney, Anderson & Bailey 2019). This knowledge may prompt some individuals to seek formal treatment (Carroll et al. 2017; Cicero, Ellis, & Kasper 2017), or further develop indigenous or lay strategies to mitigate NPF-related harms (Goldman et al. 2019; Rouhani, Park, Morales, Green, & Sherman 2019). These include practices such as visually scrutinizing or tasting their drugs before injecting (Carroll et al. 2017), beginning consumption episodes with "tester shots" (Mars, Ondocsin & Ciccarone 2018); and even the use of fentanyl testing strips prior to opioid use (Peiper et al 2019). Building on this growing literature, we aim to address a yet-unexplored aspect of indigenous harm reduction practices (Friedman et al. 2006) in an era of NPF: the impacts of NPF on use of non-prescribed buprenorphine among individuals with opioid use disorder (OUD).

Buprenorphine, a semi-synthetic opioid, is a partial mu-opioid receptor agonist and kappa-opioid receptor antagonist that is approved by the US Food and Drug Administration (FDA) for use in the treatment of opioid use disorder. Because of its partial agonist properties, buprenorphine is considered to have a lower non-medical use potential and a better safety profile in terms of overdose risk, compared to the full mu agonist methadone (Johnson, Strain, & Amass 2003). Beyond its growing prevalence as a prescribed medication used to treat OUD (Arfken, Johanson, di Menza, & Schuster 2010; Stein et al. 2012), recent research has begun to demonstrate that in the U.S. non-prescribed buprenorphine has also become an indigenous strategy for mitigating the risks and harms associated with OUD (Bazazi, Yokell,

Fu, Rich, & Zaller 2011; Daniulaityte, Falk, & Carlson 2012; Gwin Mitchell et al. 2009; McLean & Kavanaugh 2019; Schuman-Olivier et al. 2010). In Rhode Island, for instance, Carroll, Rich, and Green (2018) found that non-prescribed buprenorphine among PWUIO was almost never used euphorically, but rather as a form of self-treatment often tied to future treatment-seeking behaviors. In Baltimore, Monico et al. (2015) also found that illicit buprenorphine usage often preceded entry to formal treatment, suggesting that buprenorphine diversion worked as an important tactic of harm reduction for individuals not yet ready or able to seek formal treatment for OUD. In a qualitative study among PWUIO in New York City, Allen and Harocopos (2016) noted that diverted buprenorphine was used as an emergency or back-up measure to ease withdrawal symptoms when other opioids were not available. Our research has shown that more frequent use of non-prescribed buprenorphine was associated with a decreased risk of overdose (Carlson, Daniulaityte, Silverstein, Nahhas, & Martins 2019; Daniulaityte et al *in press*), suggesting that use of non-prescribed buprenorphine may indeed be a life-saving tactic of harm reduction.

As a growing body of evidence demonstrates increased interest among PWUIOs in buprenorphine treatment (Yarborough et al. 2016), anecdotal evidence also suggests that the changing chemical composition of an NPF-dominant opioid supply may be impacting the role of buprenorphine in treating OUD. For instance, Bisaga, in a commentary published in *Addiction* (2019), notes concern among treatment providers who report that NPF users undergoing buprenorphine induction experience more frequent instances of precipitated withdrawal. This, in turn, may lessen patient confidence in the effectiveness of buprenorphine treatment (Walsh & Eisenberg 2003). As buprenorphine treatment providers scramble to respond to new challenges faced by the growing domination of NPF, it will be important to better understand how informal self-treatment practices with non-prescribed buprenorphine are also impacted.

In this paper, we explore this question qualitatively. The overall aim of this study is to explore experiences, beliefs, and attitudes of PWUIO who have attempted self-treatment with buprenorphine in an era of non-prescribed fentanyl and fentanyl analogue use. We discuss local perceptions of the dominance of NPF in the Miami Valley area, and how this has both positively and negatively impacted practices of non-prescribed buprenorphine use among PWUIO.

Methods

The qualitative interviews analyzed in this article form part of a longitudinal study entitled “A Natural History Study of Buprenorphine Diversion, Self-Treatment, and Use of Drug Abuse Treatment Services” investigating non-prescribed buprenorphine use among individuals with moderate or severe opioid use disorder (Daniulaityte et al. *in press*). To be eligible for this study, participants had to be at least 18 years of age, live in the Dayton, OH metropolitan area, meet the DSM-5 criteria for moderate-severe opioid use disorder, and self-report use of non-prescribed buprenorphine within the last six months. The study was approved by the Wright State University and Columbia University IRBs.

Baseline structured questionnaires were administered to 357 eligible participants between May 2017 and October 2018, and ongoing structured follow-up assessments are being conducted every six months for a period of two years. Baseline data were analyzed using Latent Class Analysis (LCA) to identify three discreet classes characterized by distinct patterns of non-prescribed buprenorphine and other opioid use (Table 1) (Daniulaityte et al.*in press*). LCA analysis results were used to select a qualitative subsample aimed at contextualizing longitudinal quantitative data and patterns of opioid use. 63 participants were selected for qualitative interviews to proportionally represent three LCA classes, as shown in Table 1. The selection represented the sociodemographic characteristics of the broader sample, although non-whites were slightly over-sampled. Due to its small size, we chose to proportionally oversample LCA Class 3 in the qualitative sample to obtain a complete range of experiences in this group (see Table 1). Although participation in the qualitative interviews was optional, no participants declined to participate.

Qualitative data collection began in October 2018 and was completed in June 2019, anywhere between three months to two years after structured baseline data were collected. Participants' experiences varied over the course of the study, as some individuals who were heavy heroin/fentanyl users at baseline entered into an extended period of recovery afterwards, while others began using drugs after treatment episodes documented at baseline. In-depth qualitative interviews with individuals who participated in prior structured assessments provided rich opportunities to discuss and contextualize changes in drug use practices and trajectories in the context of shifting drug markets and increasing dominance of NPFs.

Qualitative interviews lasted between 60 and 90 minutes, and participants were compensated with $40 check or WalMart gift card. The interview protocol contained broad biographical questions about the individual's opioid use history and health consequences resulting from drug use (such as those related to overdose experience and drug-related infections) as well as more detailed questions about experiences with both formal and informal (self-) treatment with non-prescribed buprenorphine. All interviews were conducted by the lead author in a private field office. Interviews were digitally recorded in their totality and then transcribed by trained graduate research assistants. Transcription accuracy was verified by the lead author, who conducted the interviews and completed qualitative coding and analysis. To protect confidentiality, all participant names used in this manuscript are pseudonyms.

Transcribed interviews were uploaded to NVivo software (Version 11, QSR International, Melbourne, Australia) for coding. The coding process began thematically, with the lead author coding an initial set of eight interviews using nodes such as fentanyl, overdose, formal treatment, buprenorphine, and harm-reduction, drawn from the interview protocol. While coding this initial set of interviews, the lead author added emergent, in-vivo topics to the codebook, and this initial set of interviews were recoded until a satisfactory coda schema was reached. The remaining 55 interviews were then coded using this schema. Once coding was completed, the lead author analyzed data from relevant nodes, pulling out emergent and overlapping themes in a modified version of grounded analysis (Glaser & Strauss 1967) that teased out beliefs and practices that emerged when discussing themes such as overdose,

buprenorphine use, and other key topics. All coding was done by the lead author, and discussed with co-authors throughout the analytic process.

Results

Study participants

Interview respondents ranged from 19 to 70 years old, with a mean age of 38.9 years. 54% of them were male, and 85.7% identified as non-Hispanic White (Table 2). Only one of the 63 participants had never tried heroin or NPF—he was a long-term user of non-prescribed pharmaceutical opioids. Only three other participants claimed to have never knowingly tried NPF—in these cases because they primarily sought out pharmaceutical opioids or had transitioned away from heavy heroin use when NPF came on the scene. The remainder of participants either sought NPF or believed that it was in the drugs that they used even if they did not seek it intentionally.

85.7% of the sample had participated, at some point, in buprenorphine-based treatment. This includes inpatient treatment where buprenorphine was given as part of a detoxification regime, outpatient OUD treatment where buprenorphine was prescribed along with the provision of therapy/counseling, and, in a smaller number of cases, buprenorphine treatment though a prescribing doctor alone, without a therapist/counselor.

Nearly all participants reported that they had used non-prescribed buprenorphine to self-treat withdrawal symptoms or as part of an attempt to quit using opioids. In some cases, self-treatment with NPB was a backup strategy when the individual could not find pain pills, heroin, or NPF. Jim, a 37-year old male, describes how he used it to help manage his chaotic drug use:

> I would never like, set myself up for the next day because I was, I always had it in my mind, well this is gonna' be my last time getting high, you know? So, I never planned for the next day. But then when the next day happened, sometimes I would need Suboxone (buprenorphine and naloxone) to get well in order to function.

In other cases, self-treatment was associated with a prolonged period of abstinence from other opioids due to a self-directed regime of maintenance with non-prescribed buprenorphine. Indeed, the majority (55, or 87.3%) of participants reported having using non-prescribed buprenorphine with an intention to quit heroin/NPF or other opioid use during periods when they were not enrolled in formal treatment (as will be discussed more thoroughly in this section). A few individuals indicated that they also had used non-prescribed buprenorphine for its euphoric effects (or to get high), or, in one case, to treat physical pain not due to opioid withdrawal symptoms.

NPF in the Dayton area: Dominant, desired, and dangerous

Participants described the local market for illicit opioids to be bountiful. Amanda, a 23-year old Dayton native who has injected illicit opioids for eight years, noted that, "It's everywhere. You can drive through [busy street in Dayton] and I've almost gotten into wrecks from dope boys trying to chase me down to give me testers. It's crazy."

While heroin use has been prevalent in Dayton for decades, participants agreed that NPF made up the majority of the current opioid supply. Allie, who at 25 has nearly a decade of illicit opioid use under her belt, eulogized the decline of heroin:

> Any dope that you get on these streets is going to be fentanyl or at least contaminated with it. I had to go to Washington State to get heroin. They don't have that around here—it's gone. Say goodbye, it's gone.

Some participants, like Shawn, 53, were unhappy about this change. "What's so messed up about the fentanyl now is that they put it in everything," he noted, "Everything is not right anymore." Many participants described a greater anxiety in their drug use as fentanyl began to adulterate or replace heroin. 36-year old Zack, for instance, recalled that:

> People were asking me if I had tried fentanyl and I didn't want to touch it with everyone dropping like flies. I was scared to even do regular heroin because I didn't know the difference or what it looked like. I wanted to quit. I was scared, you know?

Nevertheless, many found themselves seeking out NPF for its greater potency, asking for it by name or by slang such as "fetty," "fent," or "fetty wop". Although his first experience with fentanyl was a near-overdose, Tony, 55, enjoyed the high, and began to actively seek out fentanyl by name from local dealers:

T You have guys that strictly sell fentanyl. They're not gonna' sell nothing but fentanyl. Then you got guys who strictly sell heroin but they're getting out that because ain't nobody wanting that anymore. You still have people out there who won't buy the fentanyl, they want the heroin. But they're mixing that shit together now so you're getting it anyway. You're getting it anyway

SMS So, you started looking for the fentanyl?

T Fentanyl. I didn't want nothing but that.

NPF came to be desired by people who had sought its potency, or when what was sold as heroin could no longer "get them well". 31-year old Amber, who has been using opioids since she was a teenager, noted that:

> It used to be that I would never touch fentanyl because it was stronger but now I prefer it. Whether I realized it or not I was doing it when it first came out so then my body got used to that.

Similarly, Gigi, a 55-year old currently in recovery after nearly four decades of illicit opioid use, recalled the transition in her preference from heroin to NPF:

G See my sons liked the fentanyl but I always preferred the actual heroin. It got to the point to where you couldn't always find heroin but you could find the fentanyl. Yeah, I remember.

SMS Would you or your sons ask for the fentanyl by name?

G Yeah

SMS What would you ask for?

G "You got that fetty?"

SMS What made you start asking for the fentanyl?

G Because we knew that the fentanyl would… would get us all high and well. With the heroin, you don't always know because some people would cut it to the point that it was no good.

Despite its desirability, study participants still noted its danger, commenting on the new risk environments produced by changes in the drug supply. Indeed, many initially learned of NPF when they began to experience overdoses despite decades of carefully calibrated drug use practices. Gigi, who began using heroin as a teenager, did not overdose until she was 50 years old, shortly after NPF came on the scene. Similarly, DeWayne, 47, recalled the arrival of NPF and his concurrent first overdose in the following manner:

DW I was getting all of these phone calls that people I knew were dying. I actually experienced it… I go to my dealer's house and I notice that his product is white and powdery and isn't brown now. So, I do it, and I wake up an hour later. Not knowing (…) I guess I went to McDonalds. The lady that was in there was a nurse I guess and thought I was having a seizure. So, I woke up in the hospital.

SMS. Was that your first overdose?

DW That was my first overdose.

SMS. In the 18 years that you did heroin you had never overdosed?

DW Never.

NPFs and buprenorphine experiences: Instigating positive change

For many PWUIO in the Dayton area, the growing prevalence NPF not only created new risk environments, but also motivated new practices of self-treatment and treatment seeking behaviors. Notably, some participants responded to NPF-related risks by initiating non-prescribed buprenorphine use to manage their opioid usage. In some cases, these episodes of self-treatment led to more long-term recovery episodes, often supported later on through enrollment in formal treatment. 54-year old Dee, for instance, began using opioids at the age of 25. Three years prior to our interview, however, she was forced to calculate new risk factors in her drug use due to the arrival of potent NPF-type drugs such as carfentanil on the local drug scene:

> I just got sick of it and that fentanyl came out and they were talking about how one drop of it can kill an 8,000-pound elephant [refers to carfentanil which is often called elephant tranquilizer on the streets] and (…) I wondered how people could shoot dope knowing that could happen. So, I was done.

In 2015, Dee began to self-treat her OUD with non-prescribed buprenorphine. She referred to the buprenorphine that she bought off the street as “the magic beans” for its capacity to treat her withdrawals and ease her cravings for opioids, which she now feared would contain NPF. Her positive experiences with buprenorphine self-treatment motivated her to enter, for the first time, into an intensive outpatient drug treatment program.

Unlike Dee, 36-year old Ed was initially not scared off by the arrival of NPF. With a self-proclaimed high tolerance for opioids, Ed used NPF regularly, injecting multiple times a day while holding down jobs in food service. In 2017, however, after fifteen years of intravenous opioid use without a single overdose, Ed overdosed twice in a span of six months. He attributes both overdoses to carfentanil. Ed claims that his ex-wife, ever in search of a more powerful high, purportedly sought out carfentanil without his knowledge, leading to his overdose:

> The last time I ODed, she knew that the guy had carfentanil and that’s what she wanted. She sent me there to buy it and I did it and I just fell over. I didn’t know it was carfentanil or I wouldn’t have done it. I pushed it in and three seconds later I fell over. She kept me alive for a little bit with CPR before they finally called for help.

According to Ed, after being revived by “14 doses of Narcan”, he decided it was time to quit[1]. “Eventually I just thought that I couldn’t do it anymore,” he noted. “It’ll end up killing me.” While he once felt confident in his ability to manage risks of NPF use, the unpredictable strength of fentanyl analogues such as carfentanil motivated Ed to stop using opioids. Since he lacked insurance at the time of his last overdose, he began this process by self-treating his OUD with non-prescribed buprenorphine. Once he had stabilized himself, he enrolled in a public insurance program, and transferred to a formal buprenorphine-based treatment program covered under his insurance plan.

Dee and Ed drew on a local practice of self-treatment with non-prescribed buprenorphine to help mitigate the risk posed by NPF during periods when they were without health insurance. But non-prescribed buprenorphine use was not only for the uninsured. Others explained that non-prescribed buprenorphine use allowed them to “prep” for treatment and test the water before fully committing to the formal treatment program. Some also explained that they preferred to suffer through the initial period of detoxification in a more private setting. Renée, 41, describes one such instance:

> (E)very time I would get high, I would fall out. Well, they were leaving me. So, I would wake up and my shirt would be wet from where they had thrown water in my face and they put my cell phone beside me and I would have like, 20, 25 missed calls from them trying to see if I was gonna’ wake up. And my cousin actually was going to [Outpatient Treatment Center], and I called her and I basically told her like, I’m gonna’ die if something doesn’t change. I’m gonna’ die. I keep falling out

[1]Ed reported that it took 14 doses of Narcan to revive him. While this number seems exceptionally high, overdose from highly-potent NPFs will likely require higher doses of Narcan to reverse them (see Gill, Kelly, & Henderson 2019; Moss & Carlo 2019). Further, the notion that it took multiple doses of Narcan to reverse his overdose is important to Ed’s recovery narrative—it was a moment of realization that instigated positive change in his life.

> and these fools are leaving me. And she asked me if I had any money on me, and I told her I had probably enough to get on the bus. She told me to get all my shit, get on the bus, and I met her out on the Bob Evans on [Street Name] and she gave me some cigarettes, the rest of her bus pass, a couple Subs [Suboxone]. I went to the shelter, the next day I went to [Treatment Center]. They set me up for an assessment the next day. They called the lady from sober living to come talk to me. She told me once I did my assessment, to come back down to the one [Treatment Center] on [Street Name] and have them call her and she'd come pick me up. And that's what I did.

SMS. Did you take the Subs before going into [Treatment Center] to transition yourself off?

R. Yeah.

SMS. So you gave yourself a pre-, you did pre-treatment before going in?

R. Yeah because I didn't want to be at sober living and be sick and be using around some girls who were trying to stay clean. I didn't want to do that.

NPFs and buprenorphine experiences: Sabotaging self-treatment

While the use of non-prescribed buprenorphine helped some participants adjust to a new risk environment, others found that established practices of harm reduction and self-treatment with non-prescribed buprenorphine were challenged by the takeover of NPF. Gaia, a 32-year old woman who had injected heroin (and later NPF) for nearly ten years, was a prime example. "I'm going to tell you this," she began "Suboxone *does not work* with fentanyl." Despite several successful past self-treatment episodes with buprenorphine, Gaia's most recent attempt was disastrous. Her boyfriend Jay related the story of their recent joint attempt at self-treatment:

> I was almost 72 hours into withdrawal…and I took it [Suboxone] and it made me… I couldn't believe it. Cuz I don't puke or get diarrhea, I don't have that happen ever…But immediately—Bam! Not even five minutes after I took it I was dripping sweat. It felt like water had just gotten dumped all over me, I'm puking and it's coming out every end.

Clinical recommendations advise that individuals take their first dose of buprenorphine after they begin to feel substantial withdrawal symptoms—generally between 12–24 hours after last using heroin (Johnson et al. 2003; Walsh & Eisenberg 2003). Our study participants were well informed about the proper induction procedures based on their prior extensive experiences with non-prescribed and/or prescribed buprenorphine use. Thus, many of them found it alarming to experience precipitated withdrawal after waiting such an extended period of time. This experience was not only traumatic, but also caused some participants, such as Jay and Gaia, to change their practices of harm reduction. Jay ceased to carry an "emergency" dose of buprenorphine, giving the following explanation:

> I always kept one [Suboxone] in my wallet in case I was sick let's put it that way. I only quit doing that when the fentanyl came out and realized what would happen and I never messed with them again.

Similarly, Allie, 25, who has used heroin/fentanyl for nearly ten years and has attempted self-treatment “a million times,” had recently become dismayed by the reaction incurred when she attempted to self-treat her fentanyl OUD with buprenorphine:

SMS Did you ever use Suboxone before fentanyl? When it was just heroin?

A Mhm

SMS Do you notice any differences in how well the Suboxone works for heroin versus how it works for fentanyl?

A Yes, for me it sends me into precipitated withdrawals every fucking time that I try to get off of fentanyl. Then I have these Sub doctors telling me that it’s not real and it’s like, go fucking ask the people that are buying it off the streets. It is real! I waited 80 hours. I was in a detox and after 80 hours they gave me a Suboxone and it still put me into precipitated.

Despite Allie’s frustrations attempting to self-treat with buprenorphine, she asserted that these challenges were due to the specific interaction of buprenorphine and NPF. At the time of her interview, Allie had recently returned from a few months visiting a friend in Washington State, where she reported use of tar heroin, rather than the NPF she had used in Ohio. Preparing to head back to Dayton, she bought non-prescribed buprenorphine and embarked on a cross-country road trip. She reported successfully treating withdrawal symptoms from her heroin use without incurring any of the precipitated withdrawals that she had experienced when regularly using NPF in the Dayton area. As she described it, “we’ve had Subs with us every time that we’ve driven and we’ve driven across the country probably three times.”

When Allie returned to Dayton, she enrolled in an outpatient treatment program, where she received a prescription for buprenorphine. However, she began using NPF almost immediately. She did not trust the buprenorphine to help her manage her OUD now that she had transitioned back from heroin to NPF, and she sold off all of her prescription to support her NPF habit.

Seeking alternatives

After experiencing precipitated withdrawal from attempts at self-treatment with buprenorphine, many participants changed their beliefs and practices surrounding self-treatment and treatment-seeking. Shane, a 46-year old with years of experience working as a counselor in drug treatment facilities, spoke of his recent instance of self-treatment modification:

> I got started [using NPF again] when I was playing music and I had been using for a while and wanted to get off so I had gotten some Subutex [buprenorphine] from a friend. I waited about 16 hours when I started feeling the withdrawal symptoms and took half of one and oh man. 15 minutes later I was in precipitated withdrawal. I couldn’t sit still, I had really bad GI upset, was dry heaving… it was horrible.

Six months after this experience, Shane attempted self-treatment again, this time using both non-prescribed buprenorphine and kratom, a medicinal plant that is used as a remedy to

mitigate opioid withdrawal (Boyer, Babu, Adkins, McCurdy, & Halpern 2008; Coe, Pillitteri, Sembower, Gerlach, & Henningfield 2019):

> The last time I wanted to quit on my own I got some kratom. I took like, 9 grams- I have a little digital scale so I would mix eight or nine grams in chocolate milk because it tastes terrible. I would just chug it and I take two or three doses a day to help minimize withdrawal symptoms until I got to about 72 hours and then I would take a little bit of Subutex for about a week and be done.

In anticipation of precipitated withdrawal, Shane was able to modify his self-treatment protocol. He used kratom to help endure a longer waiting period before self-inducing buprenorphine treatment with Subutex he purchased off the street.

Participants such as Jay and Gaia, however, were more definitively impacted by the reactions incurred by their attempts at treating their NPF use with non-prescribed buprenorphine. In response, they sought out new forms of treatment. Both decided to enroll in methadone-based treatment, where they have successfully transitioned off of heroin/NPF. Although Jay resented the daily dosing schedule mandated by the methadone clinic, he understood it to be his most viable option since, in his words, “Suboxone is not the answer to fentanyl.” Gaia, his partner, elaborated:

> (Y)ou have to be clean four or five days before you can even take the Suboxone. So you’re sick four or five days and it’s like, it’s not, no. It’s like you can’t do it…, I tried it a couple of times and I just couldn’t do it. But methadone, methadone you can take, methadone works with the fentanyl. You can take methadone and you can, you know, you can take it and you’re not gonna, it doesn’t make you sicker, it makes you better. So, methadone is, does work with the fentanyl.

Discussion

As illicit, non-pharmaceutical fentanyl and fentanyl analogues (NPF) come to adulterate or replace heroin in the US opioid supply, much attention has been given to the impacts of its unpredictable potency and correspondent overdose rate. Through the process of adulteration and distribution, NPFs come to vary in potency, and are often characterized by random “hot spots” of concentrated drug resulting from inconsistent mixing practices (DEA 2018). Because of the unpredictable strength of NPFs, people who use—and particularly inject—drugs must now anticipate unpredictable outcomes. The changing nature of heroin/NPF necessarily gives rise to new beliefs surrounding self-treatment attempts, treatment seeking behaviors, and harm reduction practices.

This study highlights how the growing dominance of NPF intersects with practices of non-prescribed buprenorphine use among PWUIO. Among this sample, NPF has been, in some instances, an instigator of positive change. Dee and Ed began to self-treat their OUD with non-prescribed buprenorphine when they grew afraid of dying from an overdose. Both entered formal treatment and received prescriptions for buprenorphine after extended self-treatment episodes, supporting a growing body of evidence suggesting that non-prescribed buprenorphine use may positively influence treatment engagement (Cunningham, Roose, Starrels, Giovanniello, & Sohler 2013; Monico et al. 2015).

In Dayton, however, the intersections of NPF and non-prescribed buprenorphine have also challenged established self-treatment and harm reduction practices, as well as treatment seeking behaviors. Individuals like Allie, Jay, Gaia, and others in our sample feel that they can no longer look to non-prescribed buprenorphine as a self-treatment or harm reduction strategy. After experiences of precipitated withdrawals challenged their accumulated knowledge on self-treatment with NPB, they concluded that buprenorphine products did not work with NPF. When seeking treatment, all three opted instead for outpatient treatment with methadone. This is worrying, as methadone treatment programs are often sparsely populated or non-existent in many areas of the US. Further, if these behaviors become common in areas of high NPF prevalence, it may encourage experimentation with other self-treatment modalities, such as kratom, that could introduce new health risks or contribute to a delay in seeking more effective and supervised treatment options.

Our findings have added potential for impact to the clinical treatment field, specifically approaches to buprenorphine induction. Current buprenorphine induction guidelines recommend the patient be in at least mild opioid withdrawal (Clinical Opioid Withdrawal Scale/COWS score of at least 8–10) before starting buprenorphine. However, pharmaceutical-grade fentanyl is highly potent with high receptor affinity and may stay in the body longer than the other opioids, such as heroin (Zagorski 2018; see also Baselt 2011 for comparative elimination half-lives of heroin and fentanyl). Illicitly supplied fentanyl analogues likely have similar properties. As such, in October 2018, a recent buprenorphine training event advised that if illicit fentanyl use is suspected, the clinician should wait until the patient is in at least moderate opioid withdrawal (COWS scores of at least 13–15) before starting buprenorphine (Zagorski 2018). This approach is akin to that of when switching from methadone pharmacotherapy to buprenorphine pharmacotherapy. Another induction modification that might also be considered by practitioners working in an area of high NPF prevalence is a modified Zurich or Bernese method, utilizing microdoses of buprenorphine while tapering fentanyl (Hämmig et al. 2016; Mars, Rosenblum, & Ciccarone 2019). In order to better understand the experiences of people like Allie, Jay, and Gaia, further research on the varying potency, dosage, half-lives, and purity/chemical makeup of illicitly supplied fentanyl analogues, and the impact upon buprenorphine induction protocols is urgently needed.

While buprenorphine treatment continues to offer profound and promising results for treating OUD, it is urgent to reconsider how the unpredictable biochemical mix of opioids circulating on the streets today may impact the initiation and success of treatment. Although NPFs may complicate buprenorphine induction by triggering unanticipated instances of precipitated withdrawal, we have no evidence that this impacts the long-term ineffectiveness of buprenorphine treatment. Thus, providers may want to consider warning patients in advance that they may experience a period of precipitated withdrawals, but that this is not indictive of the ineffectiveness of the treatment. Further, providers should have added psychosocial resources in place to enable patients to progress from mild to moderate withdrawal before starting buprenorphine induction. Rumors of incurring precipitated withdrawal might discourage patients from seeking treatment, which could prove life threatening. We suggest that treatment centers and harm reduction services dialogue openly

with both patients and staff/prescribers about the unpredictable contents of NPF, and how this might affect established practices of harm-reduction and buprenorphine induction.

One limitation of this study is that it draws on self-reporting from PWUIO, and lacks certain toxicological and clinical data to characterize the instances of precipitated withdrawal incurred by self-treatment with non-prescribed buprenorphine. For instance, we do not have the toxicological data to confirm use of NPFs that linked to precipitated withdrawal experiences, nor do we have precise COWS rating of the subjects who self-treated. However, it is important to remember that lay beliefs and experiences are highly valued among PWUIO (Mars et al. 2015), and unanticipated experiences with precipitated withdrawal may influence the harm reduction, self-treatment, and treatment-seeking behaviors of others.

An additional limitation of this study is that the sample is small and not randomly selected, and thus may not be generalizable to larger populations of PWUIO or those in locales with different representing different demographics or treatment resources. Our research was conducted in an area of high NPF prevalence, and may not be representative in areas where heroin continues to be available or dominant, or there are lower amounts of potent fentanyl analogues such as carfentanil. The theoretical framework of a risk environment (Rhodes 2002) is key here, as we aim to show how public health and harm reduction challenges are deeply connected to time and place. The experiences of PWUIO in the Dayton area may serve as a warning call regarding NPF and its impact on buprenorphine-related experiences.

The spike in NPF-related overdoses has garnered much attention in the news media. However, this study demonstrates additional dimensions posed by NPF to a local risk environment. The stories of some participants in our study demonstrate that the lethally potent character of NPF may be motivating some individuals to seek treatment, but it is even more urgent to consider the experiences of those who are not yet ready, and may be experimenting with indigenous harm reduction practices. Our study supports a growing body of research demonstrating that non-prescribed buprenorphine is used most commonly among PWUIO as a harm reduction tactic. However, we encourage more open and upfront dialogue and more research about the potential consequences of these practices as new forms of NPF hit the streets.

Acknowledgements:

We want to thank our participants for sharing their stories with us, as well as research assistants Angela Zaragoza, Kara Schaefer, Avery Moeller, and Kylie Getz for their dedicated work on this project. The lead author would also like to thank Nick Kawa for feedback on an early draft of the paper.

Funding Source:

This work was supported by the National Institutes of Health/National Institute on Drug Abuse: R01 DA040811 (Daniulaityte, PI). The funding source had no further role in the study design, in the collection, analysis and interpretation of the data, in the writing of the report, or in the decision to submit the paper for publication. The contents do not necessarily represent the views of the Department of Veterans Affairs or the United States Government.

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Table 1:

Characteristics of the Qualitative Subsample Selection (n=63) Based on the LCA Classes Identified in the Larger Baseline Sample

LCA Class		Size of LCA Classes (Full sample, N=357)	Number of participants from each LCA class represented in qualitative subsample (N=63)	Percentage of LCA Class represented in qualitative subsample	Gender representation by LCA class in qualitative subsample	Ethnicity representation by LCA class in qualitative subsample
1	**Heavy Heroin/Fentanyl, Low Non-Prescribed Buprenorphine (NPB) Use**	216	33	15.3%	17 Male	27 non-Hispanic White
					16 Female	6 non-White
2	**More Use of Formal Treatment, Low NPB Use**	105	17	16.2%	9 Male	15 non-Hispanic White
					8 Female	2 non-White
3	**Intense NPB Use, Less Formal Treatment**	35	13	37.1%	8 Male	12 non-Hispanic White
					5 Female	1 non-White

Table 2.

Characteristics of Qualitative Subsample (N=63)

Socio-demographic and Drug Use Characteristics		Number	Percent
Gender	Male	34	54%
	Female	29	46%
Age	Years (Mean, Standard Deviation)	38.9	10.6
Ethnic Identity	Non-Hispanic White	54	85.7
	African-American	8	12.7%
	Hispanic	1	1.6%
Education	Less than secondary school	14	22.2%
	Secondary school degree or equivalent	17	27%
	Some college or tech school	24	38.1%
	Completed postsecondary degree	8	12.7%
Housing	Own or rent place	24	38.1%
	Staying at someone else's home	29	46%
	Halfway house or group home	4	6.3%
	Shelter	3	4.8%
	Abandoned building	1	1.6%
	Streets	1	1.6%
	Sober living facility	1	1.6%
Work situation	Employed full time	8	12.7%
	Employed part time	13	20.6%
	Unemployed	30	47.6%
	Unemployed due to disability	10	15.9%
	Retired	1	1.6%
	Full-time student	1	1.6%
Ever used heroin?	Yes	62	98.4%
	No	1	1.6%
Ever (knowingly) used non-pharmaceutical fentanyl?	Yes	59	93.7%
	No	4	6.3%
Ever attended buprenorphine treatment?	Yes	54	85.7%
	No	9	14.3%
Ever used NPB to help quit heroin/NPF/pain pill use?	Yes	55	87.3%
	No	8	12.7%