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## Reddit discussions about buprenorphine associated precipitated withdrawal in the era of fentanyl

Anthony Spadaro<sup>a</sup>, Abeer Sarker<sup>b</sup>, Whitney Hogg-Bremer<sup>b</sup>, Jennifer S. Love<sup>c</sup>, Nicole O'Donnell<sup>a</sup>, Lewis S. Nelson<sup>d</sup>, Jeanmarie Perrone<sup>a</sup>

<sup>a</sup>Department of Emergency Medicine, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA, USA

<sup>b</sup>Department of Biomedical Informatics, School of Medicine, Emory University, Atlanta, GA, USA

<sup>c</sup>Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, 1 Gustave L. Levy Place, New York, NY, USA

<sup>d</sup>Department of Emergency Medicine, Rutgers University, Newark, NJ, USA

### Abstract

**Background:** Induction of buprenorphine, an evidence-based treatment for opioid use disorder (OUD), has been reported to be difficult for people with heavy use of fentanyl, the most prevalent opioid in many areas of the country. In this population, precipitated opioid withdrawal (POW) may occur even after individuals have completed a period of opioid abstinence prior to induction. Our objective was to study potential associations between fentanyl, buprenorphine induction, and POW, using social media data.

**Methods:** This is a mixed methods study of data from seven opioid-related forums (subreddits) on Reddit. We retrieved publicly available data from the subreddits *via* an application programming interface, and applied natural language processing to identify subsets of posts relevant to buprenorphine induction, POW, and fentanyl and analogs (F&A). We computed mention frequencies for keywords/phrases of interest specified by our medical toxicology experts. We further conducted manual, qualitative, and thematic analyses of automatically identified posts to characterize the information presented.

**Results:** In 267,136 retrieved posts, substantial increases in mentions of F&A (3 in 2013 to 3870 in 2020) and POW (2 in 2012 to 332 in 2020) were observed. F&A mentions from 2013 to 2021 were strongly correlated with mentions of POW (Spearman's  $\rho$ : 0.882;  $p$  = .0016), and mentions of the *Bernese method* (BM), a microdosing induction strategy (Spearman's  $\rho$ : 0.917;  $p$  = .0005). Manual review of 384 POW- and 106 BM-mentioning posts revealed that common discussion

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CONTACT Anthony Spadaro [Anthony.Spadaro@penncmedicine.upenn.edu](mailto:Anthony.Spadaro@penncmedicine.upenn.edu) Department of Emergency Medicine, Perelman School of Medicine, Hospital of the University of Pennsylvania, 3400 Spruce Street, Philadelphia, PA 19104, USA.

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themes included “*specific triggers of POW*” (55.1%), “*buprenorphine dosing strategies*” (38.2%) and “*experiences of OUD*” (36.1%). Many reported experiencing POW despite prolonged opioid abstinence periods, and recommended induction *via* microdosing, including specifically *via* the BM.

**Conclusions:** Reddit subscribers often associate POW with F&A use and describe self-managed buprenorphine induction strategies involving microdosing to avoid POW. Further objective studies in patients with fentanyl use and OUD initiating buprenorphine are needed to corroborate these findings.

### Keywords

Social media; opioid use disorder; precipitated opioid withdrawal; bernese method; buprenorphine; fentanyl; microdosing; qualitative research

## 1. Background

Buprenorphine (Suboxone<sup>®</sup>, a combination of buprenorphine and naloxone) is an effective, evidence-based treatment for patients with opioid use disorder (OUD) [1]. Buprenorphine has unique pharmacologic properties: it is a partial mu-opioid receptor agonist and has very high affinity for the mu-opioid receptor [2]. Therefore, to avoid buprenorphine from displacing lower affinity, full agonist opioids (e.g., heroin) from the opioid receptor and causing withdrawal, patients seeking buprenorphine treatment must wait until they start experiencing withdrawal before initiating standard dosing regimens [2]. If buprenorphine is initiated prior to withdrawal onset, it can displace residual opioids, causing an uncomfortable and sometimes severe acute withdrawal syndrome known as precipitated opioid withdrawal (POW) [3]. POW has been defined as an increase in the Clinical Opiate Withdrawal Scale (COWS), which measures the signs and symptoms of opioid withdrawal, of 6 or more while initiating buprenorphine [4]. Fear of POW poses a barrier to both clinicians and patients to buprenorphine initiation [5].

Multiple recently published reports suggest that POW can occur even after waiting the recommended amount of time in patients with a history of heavy fentanyl use [3,5]. It has been proposed that this phenomenon may occur due to the high lipophilicity of fentanyl, resulting in a long tail of elimination after chronic use [6]. One study showed that in patients with OUD and chronic fentanyl use, urinary metabolites of fentanyl could be detected 2–3 weeks after last use when hospitalized in a treatment program [7]. Additional risk of severe POW could be related to the dose or length of use of full opioid agonist used prior to buprenorphine induction, time interval to receiving buprenorphine, and other comorbid medical and psychiatric conditions that alter metabolism of opioids or symptoms of POW [3,6]. One potential alternative approach to avoid POW is microdosing, which involves overlapping induction of buprenorphine in very small escalating doses while still using full agonist opioids. The “Bernese Method” is one such method, although several different regimens have been described in the medical literature [2,6,8,9]. While the literature on this subject is growing, many people with OUD have discovered these methods through their own lived experiences [10].

The primary aim of this study was to describe how people with OUD are exploring and sharing information about the relationship between fentanyl use and POW and about emerging buprenorphine initiation methods to avoid precipitated withdrawal. Since it is difficult to obtain a large cohort of people with OUD in whom to study their buprenorphine initiation experiences, we utilized public social media data from Reddit [11]. Reddit is one of the most popular and fastest growing social networks, with over 430 million monthly active subscribers (in comparison, Twitter has ~390 million monthly active subscribers) [12]. Reddit allows subscribers to remain completely anonymous if they desire, making it a hub for discussion on stigmatized or sensitive topics [13,14]. Consequently, there is a considerable amount of self-reported information on this social network on substance use disorder (SUD), including OUD, and a number of recent studies on the topic have utilized Reddit data [15–17]. We designed this study to be primarily data-driven, as opposed to hypothesis-driven, and hypotheses were generated and refined iteratively based on exploration of the data. The specific research questions that we proposed to answer *via* the analyses described in this study are as follows:

1. What is the association between fentanyl and posts about POW?
2. What are the common themes in Reddit discussions regarding POW?
3. Is there an association with precipitated withdrawal and length of time since last opioid use, by type of opioid used
4. What are the microdosing strategies used by people with OUD on Reddit?

## 2. Methods

### 2.1. Data collection

Seven opioid-related subreddits on Reddit were selected for data analysis (*r/fentanyl*, *r/heroin*, *r/microdosing*, *r/opiates*, *r/OpiatesRecovery*, *r/OurOverUsedVeins* and *r/suboxone*). We selected these subreddits based on consensus among the authors regarding their relevance after previewing several subreddits for thematic content and total number of posts. The number of subscribers for each of these subreddits and their inception years are provided in Table A1 of the Supplementary material. We excluded other potentially relevant subreddits because they focused on a wider range of substances (e.g., *r/Drugs*) or were primarily dedicated to recreational use and experimentation (e.g., *r/DrugNerds*).

From the chosen subreddits, we collected all the posts that were publicly available and were retrievable *via* the PRAW Python application programming interface (API) for Reddit [17]. We searched for mentions of “precipitated withdrawal” and “Bernese method” within the retrieved posts from the subreddits. The “Bernese method” was selected as search term as it is a widely described buprenorphine microdosing strategy in the medical literature, and had much more specificity than “microdosing” which was found to contain many posts about recreational use and experimentation unrelated to OUD and buprenorphine. We extracted posts that mentioned these phrases for further manual analysis. The iterative, data-driven strategy of data retrieval, filtering, and analysis is depicted as a flow diagram in Figure 1.

## 2.2. Analyses of distribution of terms and posts

Initial statistical analysis included applying natural language processing (NLP) for computing the total number of posts retrieved and total number of mentions of “precipitated withdrawal”, “Bernese method”, and of “fentanyl” or respective lexical variants and analogs (e.g., carfentanil). Analogs of relevance were chosen by consensus of experts with experience in toxicology and NLP (ASa and JP). Texts from the subreddits were lowercased prior to searching and no other preprocessing of text was performed. Counts were grouped by year to evaluate for observable popularity trends. We used an automatic tool to generate lexical variants, including misspellings, and manually added variants that were not lexically similar but often used in the subreddits (see Table A2 of Supplementary material for all lexical variants) [18].

## 2.3. Thematic analysis

Two toxicology experts (JL and JP) reviewed a small sample of posts, 40 posts or 8.1% of total posts analyzed, to identify relevant categories into which the posts could be classified. Categories were developed using a modified grounded theory approach [19,20]. Some candidate themes were collapsed if they were too similar, making it difficult to ascertain if a given post belonged to one or the other. Themes that were too generic and could be described by combinations of the other themes were eliminated. This iterative process generated eight themes/categories, and one additional category (other/none of the above) for posts that could not be labeled. Table 1 presents the themes and their definitions.

The domain experts also prepared a guidebook to drive the coding of a larger sample of posts (see Table A3 in the Supplementary material for sample posts). The coding process was a multi-label classification—each post could be assigned one or many codes. Posts that did not meet the criteria for any theme were labeled as “other/none of the above”.

**2.3.1. Association between fentanyl and POW**—To better understand the association between fentanyl and POW, we reviewed all 490 posts retrieved for the thematic analysis and attempted to identify time intervals between the last opioid use and buprenorphine use, and the opioids that were associated with these time intervals. Posts that were unrelated to OUD, did not include specific timing intervals, or did not specifically mention that POW was experienced were excluded. A subset of 41 posts were included.

We noted all the opioids mentioned within the reviewed posts and if the specific opioid used prior to buprenorphine was not mentioned, it was categorized as “unknown”. The time intervals, between last opioid use and buprenorphine use, which resulted in POW, were compared for different opioids.

**2.3.2. Self management strategies**—We applied NLP to curate a set of posts that were likely to contain all the relevant details about microdosing regimens, and we manually reviewed these curated posts. Guided by the toxicologists (JP, LN, JL) in this study, we developed NLP expressions to detect patterns in texts that indicated the presence of (i) an opioid (e.g., “*suboxone*”, “*subs*”, “*fent*”), (ii) a dosage (e.g., “*1 mg*”, “*0.5mg*”), and (iii) a duration (e.g., “*each day*”, “*12 hrs*”, “*week*”). To detect the opioids, we used their

generic names, trade names, street names and automatically generated misspellings. To detect dosages and durations, we applied regular expressions. The expressions and spelling variants are provided in Table A4 of the Supplementary material. Only posts that matched all three of the abovementioned types of expressions were manually reviewed to identify if they were referring to buprenorphine-related microdosing and understand the regimens described.

### 3. Results

#### 3.1. Distribution of terms, posts and users

We retrieved 267,136 posts from the seven subreddits. Consistent with the growth in popularity of Reddit, the number of posts increased significantly over time. The first post was from May 19, 2012 and the last post was from April 23, 2021 (i.e., the date when the data was collected). Among the years for which we had full data, 2020 had the highest number of posts: 113,901 in 2020, compared to 245 posts in 2012. 43,986 posts were collected in less than four months of 2021. Similarly, the total number of people posting in these subreddits steadily increased over time: 21,286 unique users posted in 2020 and 10,174 users posted in less than the first four months of 2021. Full distributions of posts and users per year are shown in Figures A1 and A2 of the Supplementary material.

The total number of mentions of fentanyl and analogs, POW, and the Bernese method have also steadily increased. The number of posts mentioning fentanyl and analogs increased from 3 in 2013 to 3870 in 2020, and 2917 in less than four months in 2021. The number of posts mentioning POW increased from 2 in 2012 to 332 in 2020. As depicted in Figure 2, for fentanyl and analogs, mentions were relatively rare before 2017 and steadily increased. POW mentions appeared in 2018, with large increases in later years. We did not find any mentions of the “Bernese method” before 2018 and it is the only expression that has a higher mention count within the first four months of 2021 compared to all of 2020. In Figure 2, the values for the year 2021 are estimates based on the number of days of the year up to the date of collection (i.e., April 23). Spearman correlation between “precipitated withdrawal” and “fentanyl/analog” yearly mentions was 0.882 ( $p = .0016$ ) and between “fentanyl/analog” and “Bernese method” yearly mentions was 0.917 ( $p = .0005$ ) from 2013 to 2021.

#### 3.2. Thematic coding results

We manually coded 384 posts mentioning “precipitated withdrawal” and 106 posts mentioning “Bernese method”. Table 2 presents the distribution of codes assigned to each set of posts. Among posts about POW, the most common theme was *specific triggers of POW* (232 posts; 60.4%), followed by *buprenorphine dosing strategies* (140 posts; 36.5%) posts, and *experiences of opioid use disorder* (134 posts; 34.9%). Among posts about the Bernese method, the most common theme was *buprenorphine dosing strategies* (47 posts; 44.3%), followed closely by *experience of opioid use disorder* (43 posts; 40.6%), and *specific triggers of POW* (38 posts; 35.8%). 36 (34.0%) posts recommended the Bernese method without any further context. Two hundred and thirty-five (61.2%) posts mentioning POW and 67 (63.2%) posts mentioning the Bernese method referred to personal experiences. One hundred and twenty-one (31.5%) precipitated withdrawal posts and 40 (37.7%) Bernese method posts referred to fentanyl or analogs. Many posts discussed taking

adjuncts such as kratom, benzodiazepines, or loperamide as a strategy to help prolong the period of abstinence before taking buprenorphine. Overall, posts contained detailed descriptions of first-hand experiences with fentanyl, discussions of complex pharmacology topics, and the desire to seek alternatives for the treatment of their OUD or avoiding POW. Further examples of the quotes that illustrate themes that emerged from the quotes can be found in Table A3 (Supplementary material).

### 3.3. Time to precipitated opioid withdrawal

Figure 3 summarizes the durations between last opioid use and buprenorphine initiation that led to POW. We found 25 posts that referred to fentanyl or its analogs and specified the durations, 13 posts that specified durations but did not explicitly mention which opioid caused it, and 3 posts that attributed POW to heroin. The boxplots show that the durations for fentanyl vary considerably, with the median being 40 h. The longest abstinence duration after which a Reddit subscriber expressed experiencing precipitated withdrawal was 168 h (7 days). The durations were considerably shorter for heroin (median: 16 h; max: 20 h) and similar for the unknown category, which most likely included fentanyl. The reported time intervals between last fentanyl use to buprenorphine initiation that led to POW were compared with the reported intervals for heroin using the Wilcoxon ranked sum test. The intervals for fentanyl were found to be statistically significantly longer ( $p = .02$ ) despite the small number of posts mentioning heroin.

### 3.4. Bernese method microdosing strategies

Only 11 posts matched all three types of NLP patterns for an opioid, a dosage, and a duration to detect posts describing microdosing strategies. Some posts that matched the patterns partially lacked complete details about the microdosing strategies. For example, some posts referred to sources on the Internet for details about the specific microdosing regimens. For posts that contained sufficient details, we extracted and summarized relevant details. A sample of summarized strategies is presented in Table 3. The strategies extracted had a range of initial buprenorphine dosing ranging from 0.125 mg to 1 mg, and gradually increased over a “few day” to 8 days.

## 4. Discussion

In this study, we analyzed anonymous posts from the social media platform Reddit to characterize specific aspects of the current opioid crisis. In our study, an association was observed between the increasing number of posts about fentanyl and the number of posts about POW. This association adds to other evidence that buprenorphine initiation might present unexpected challenges in the era of fentanyl [3]. We employed NLP methods to evaluate shared experiences by people with OUD about buprenorphine initiation strategies in the era of rising fentanyl prevalence. Few published studies have reported on the contemporary experiences and challenges of people with OUD, specifically those focusing on people who use fentanyl and seek to initiate buprenorphine. Recent studies have suggested that people with OUD seeking treatment are often thwarted by POW despite self-reported abstinence periods of up to 96 h [3,10]. Because of its emphasis on anonymity,



Reddit affords researchers the opportunity to explore unexpected effects of the changing opioid supply that might not be apparent at the individual patient level [11].

This study adds to the body of literature focusing on the intersection of social media and OUD by using NLP to uncover discussions about a phenomenon, POW, associated with buprenorphine initiation in those with chronic fentanyl use. Similar to Graves et al., this study draws from the experiences of patients with OUD, to address POW risks and evolving buprenorphine initiation strategies [16]. We found numerous anecdotal reports of buprenorphine microdosing strategies specifically to avoid POW. Our finding of multiple dosing regimens of buprenorphine microdosing (Table 3) is comparable to the multiple different dosing regimens described in recent case reports [2,3,8,9]. For the regimens we found that specified the time duration of microdosing initiation, the range was from 5 to 8 days, comparable to existing medical literature [2,3,8]. While Klaire et al. describe a strategy for an in-hospital rapid up-titration of buprenorphine in 3 days, an Emergency Department based study by Moe et al. had a 7-day protocol [8,9].

The large increase in posts mentioning fentanyl starting in 2016 is corroborated by reports of increases in fentanyl related overdose fatalities starting in 2015 and continuing today [10,21–23]. While forensic toxicologic data of post-mortem samples may lag behind actual changes in the opioid supply, social media may offer an opportunity to proactively surveil the drug supply based on the experiences that people with OUD voluntarily share [11,23,24]. Using Reddit data, we found that POW-related posts increased in parallel with increasing fentanyl-related posts over the studied timeframe, providing additional evidence that changes to the drug supply may impact rates of adverse outcomes such as POW.

We also found that the median time from last fentanyl use to buprenorphine initiation among people who experienced POW was 40 h. This suggests that many patients are potentially at risk of POW after much longer periods of abstinence than the 12–24 h recommended with conventional buprenorphine induction in non-fentanyl use populations [2,9]. A qualitative study by Silverstein *et al.* (2019) of participants with OUD described multiple instances of participants who used fentanyl and developed POW while initiating buprenorphine, making them less likely to participate in buprenorphine therapy [10]. Participants described experiencing POW up to 72 h from last opioid use, which is consistent with the range of posts we found (Figure 3) [10]. In our time interval analysis, we found that people who used fentanyl experienced POW after a statistically significant longer abstinence period compared to people who used heroin. Interestingly, there were many more posts in the fentanyl group compared to the heroin group, which may reflect an increased incidence of developing POW in this group or a higher prevalence of fentanyl use among Reddit subscribers. Further research should characterize the toxicokinetics of fentanyl in people with OUD, as this has important clinical implications for clinicians treating these patients in an algorithmic approach to buprenorphine induction.

There are several limitations to this study. Reddit users have been reported to be majority male, younger, and non-Hispanic white, compared to the general population of the United States, and may not reflect a representative sample of people with OUD [17]. Although several subreddits were searched in order to find relevant posts, some subreddits were

excluded for low relevance to the research question, however these subreddits could still contain some posts about POW that could be different from the analyzed posts in systematic ways causing selection bias. The search strategy for microdosing buprenorphine focused on posts related to the “Bernese method”, could have also lead to missing important posts about alternative microdosing strategies. Additionally a temporal association between increased posts about fentanyl and POW could be related to various other factors such as temporal changes in how OUD is being treated or increasing usage of buprenorphine over other medications to treat OUD. Another limitation to the temporal association of posts about fentanyl and POW was having incomplete data for 2021 due to collecting the data part way through the year, although the trends appeared to continue that year, the estimate could be inaccurate. Additionally, people who experience negative outcomes could be more likely to post about them on social media, exaggerating the risk of POW. Another limitation to this study is that the geographic locations of posts were not available to evaluate if the locations of the people making these posts corresponded to areas of high fentanyl prevalence. As the exact composition of the opioid supply may not be known to people with OUD, variable fentanyl prevalence and the presence or absence many different fentanyl analogues could impact the development of POW.

## 5. Conclusion

This study found that Reddit discussions about POW increased in a similar timeframe as Reddit posts about fentanyl. Posts related to POW discussed the experiences of people with OUD and several themes emerged that are of importance to clinicians who treat these patients. Many posts discussed strategies to avoid POW with buprenorphine inductions. A subset of posts described microdosing, or the Bernese method, as a strategy to avoid POW. The challenges of initiating buprenorphine need to be evaluated in the context of the prevalence of fentanyl in the drug supply so that clinicians can optimize treatment initiation with buprenorphine, as the fear of POW may lead to patients avoiding care for OUD. In the future, objective studies in patients with fentanyl use and OUD initiating buprenorphine are needed to corroborate the findings reported in this paper.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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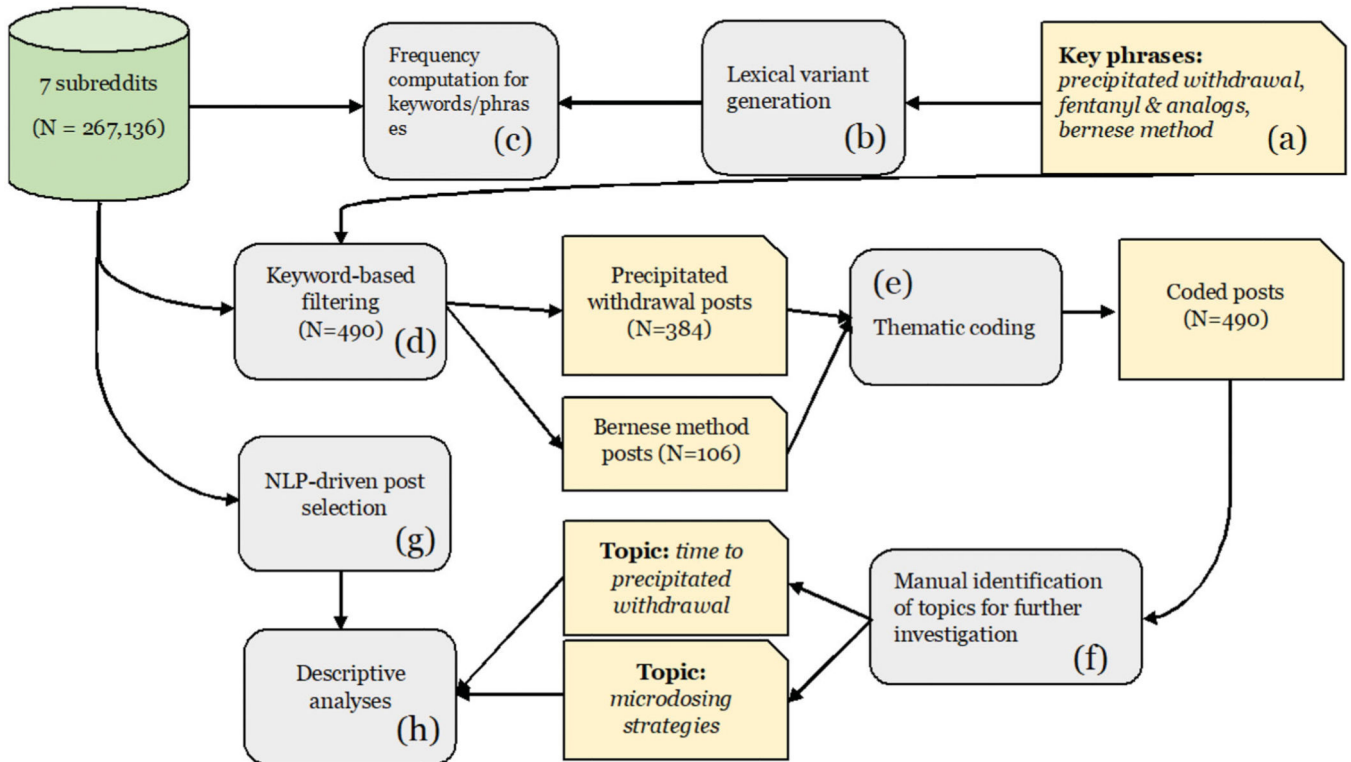
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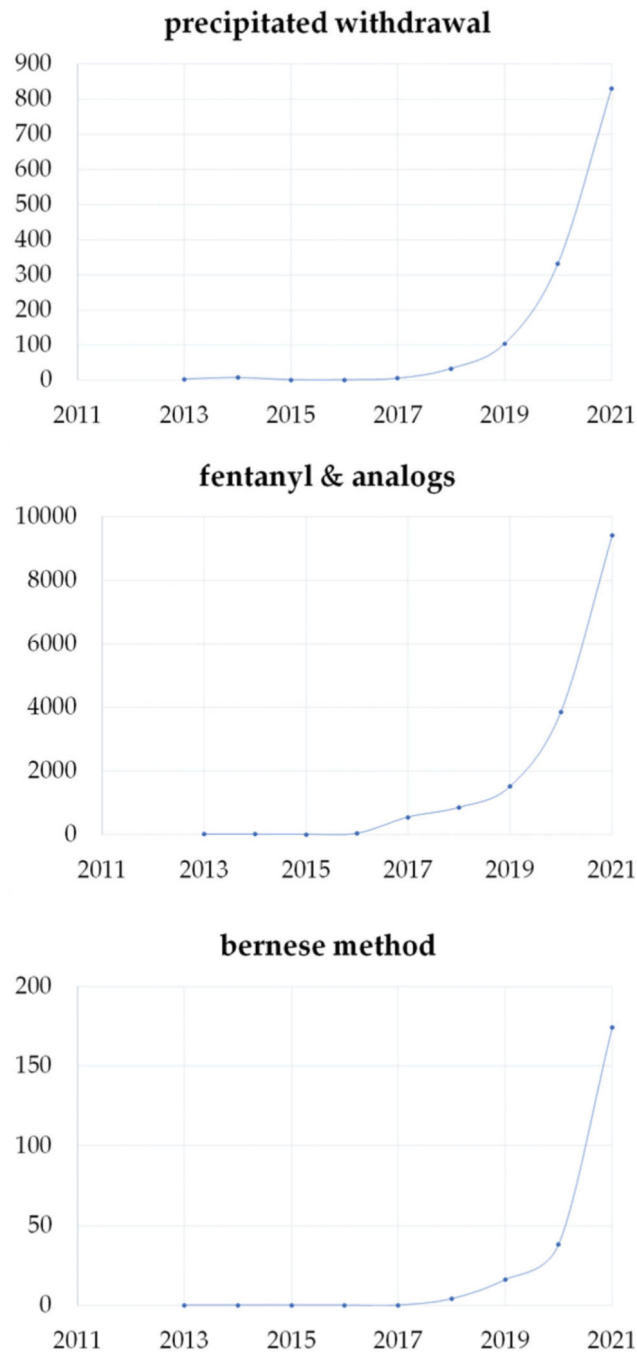
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**HIGHLIGHTS**

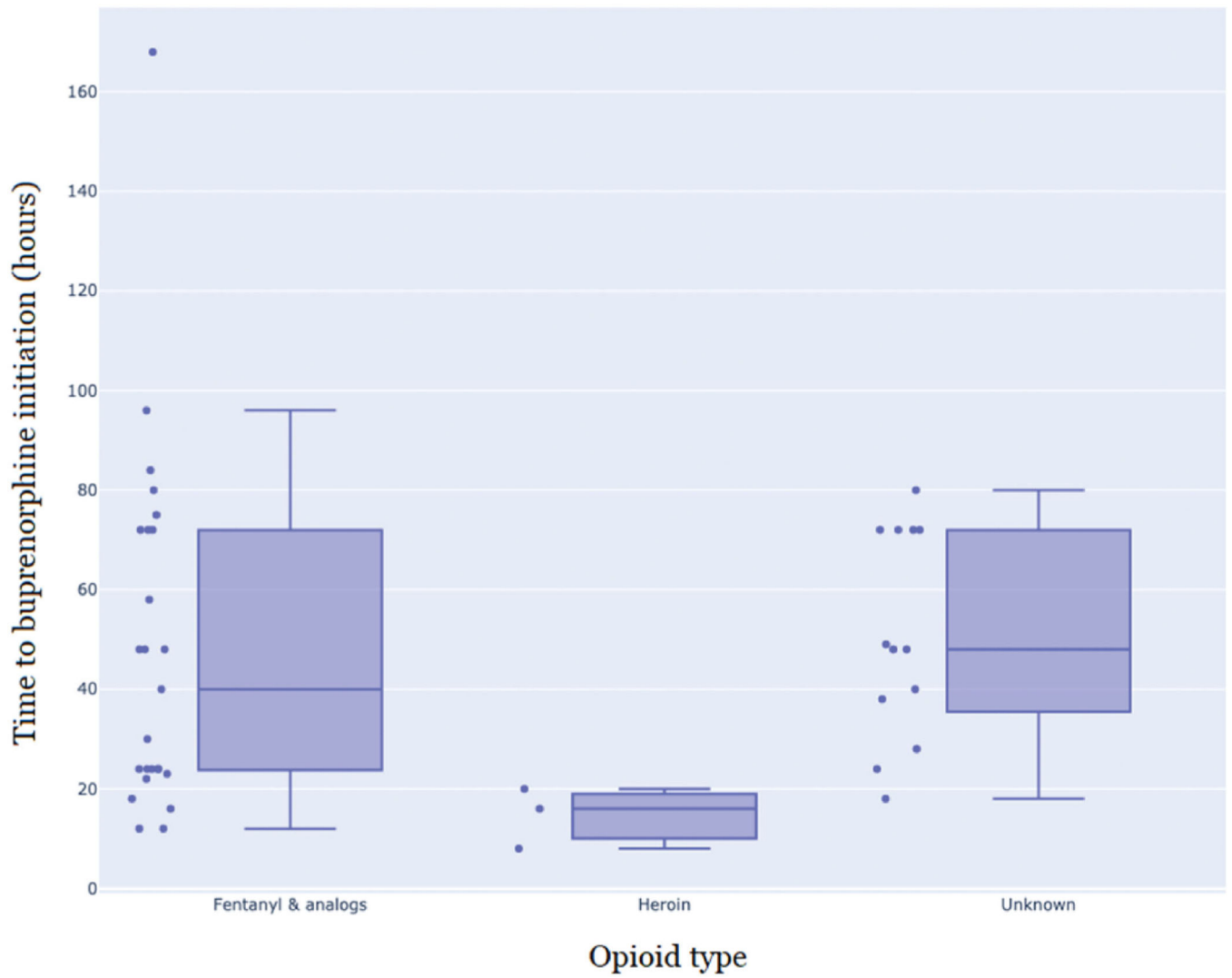
- Increase in mentions of precipitated opioid withdrawal (POW) on Reddit from 2012 to 2021 was associated with the increase in fentanyl and analog mentions.
- Experiences of precipitated opioid withdrawal (POW) were described by individuals despite reporting prolonged periods of abstinence compared to standard buprenorphine induction protocols.
- People with Opioid Use Disorder (OUD) on Reddit are using and recommending microdosing strategies with buprenorphine to avoid POW.
- People who used fentanyl report experiencing POW following statistically longer periods of abstinence than people who use heroin.



**Figure 1.** Flow diagram illustrating the extraction, analyses, and steps included in this study, along with the number of posts included where relevant. Starting with a set of predetermined key phrases (a), we generated their lexical variants (b) and computed their frequencies in data from the seven included subreddits (c). Posts about *precipitated withdrawal* and *Bernese method* were filtered (d) and manually coded for themes (e). Topics of interest were discovered during the manual coding (f) and natural language processing methods were applied to retrieve more posts related to the topics (g). Descriptive analyses were performed on the retrieved posts (h). NLP: natural language processing.



**Figure 2.** Yearly distributions of mentions of precipitated withdrawal (top), fentanyl and analogs (middle), and Bernese method (bottom) within our chosen six subreddits. Counts of distinct lexical variants are aggregated. For 2021, the values presented are estimates based on the number of days that had elapsed up to the day of collection (April 23; 113 days). The true count is multiplied by the fraction  $\frac{365}{113}$ .



**Figure 3.** Boxplots showing the distributions of time between last opioid use to buprenorphine initiation that led to precipitated withdrawal for *fentanyl & analogs*, *heroin* and *unspecified opioids*.

**Table 1.**

Codes for manual characterization, their definitions. Examples are provided in Table A3 of the Supplementary material.

Code	Definition
Non-Opioid Treatment of POW	Discussion of use of kratom, LSD, loperamide, ondansetron, mushrooms, clonidine to manage withdrawal symptoms
Avoidance and Fear of POW	Discussion of how precipitated withdrawal might be worse than regular withdrawal
Buprenorphine dosing Strategies	Discussion specific milligram and frequency of Buprenorphine doses
Specific Triggers of POW	Discussion of specific experiences of POW, for example having POW X amount of hours after last use
Personal Experience with buprenorphine microdosing strategies	Discussion of positive or negative experiences with microdosing, beyond specific recommendations for dosages
Experience of Opioid Use Disorder	Discussion of use of fentanyl, heroin, oral opioids, prior remission of OUD
Buprenorphine pharmacology	Discussion of buprenorphine pharmacology such as partial agonist activity and naloxone component of suboxone
Fentanyl Pharmacology	Discussion of fentanyl pharmacology such as lipophilicity and length of action
Other/none of the above	Posts that cannot be categorized into any of the above themes



**Table 2.**

Distribution of manually-assigned codes in the sample of *precipitated withdrawal* and *Bernese method* reviewed.

Code	Distribution in <i>precipitated withdrawal posts</i> (n = 384)	Distribution in <i>Bernese method posts</i> (n = 106)
Non-Opioid Treatment of POW	26 [6.7%]	14 [13.2%]
Avoidance and Fear of POW	77 [20.0%]	10 [9.4%]
Buprenorphine dosing Strategies	140 [36.5%]	47 [44.3%]
Specific Triggers of POW	232 [60.4%]	38 [35.8%]
Personal Experience with Buprenorphine microdosing strategies	14 [3.6%]	33 [31.1%]
Experience of Opioid Use Disorder	134 [34.9%]	43 [40.6%]
Buprenorphine pharmacology	60 [15.6%]	12 [11.3%]
Fentanyl Pharmacology	32 [8.3%]	7 [6.6%]
Other/None of the above	32 [8.3%]	0 [0%]
Recommendation of Bernese Method without further context	0 [0%]	36 [34.0%]

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**Table 3.**

Buprenorphine microdosing regimens discussed on subreddits.

Dosing regimen	Total duration described
Day 1 & 2: 0.5 mg buprenorphine	6 days
Day 3 & 4: 1 mg buprenorphine	
Day 5 & 6: 2 mg buprenorphine	
Start with 0.5 mg and increase [to full dose] over ~ 5 days	5 days
Start with 0.25 mg and increase slowly [to full dose] over the next few days	Unspecified
Day 1: 0.125 mg	Unspecified
Day 2: 0.15 mg	
Day 3: 0.2 mg	
Increase gradually	
Day 1: 0.25 mg × 4	Unspecified
Day 2: 0.5 mg × 4	
Increase proportionally until prescribed dose of Suboxone®; continue opioid use in the meantime.	
Increase [from 1 mg] to 8 mg in 8 days	8 days
Wait until standard opioid withdrawal becomes too difficult to tolerate and then take a small dose (0.5 mg) of buprenorphine. If precipitated withdrawal starts, take opioid. Increase Suboxone® and lower opioid over time gradually.	Unspecified
Day 1: 0.5 mg buprenorphine while continuing fentanyl use	6 days
Day 2: 1 mg × 2	
Day 3: 2 mg × 2	
Day 4: 4 mg × 2	
Day 5: 8 mg × 2	
Day 6: 8 mg × 2, but without opioid/fentanyl/oxycodone	
Day 1: 0.5 mg × 2 (AM/PM); use fentanyl after Suboxone® dose, just enough to feel okay.	6 days
Day 2: 1 mg × 2 (AM/PM); same amount of fentanyl as day 1.	
Day 3: 2 mg × 2 (AM/PM); only use fentanyl if feeling sick and do not use extra fentanyl.	
Day 4: 4 mg AM; no fentanyl	
Day 5: no Suboxone® and no fentanyl	
Day 6: 4 mg Suboxone®; no fentanyl	
Wait as long as possible after fentanyl use until withdrawal starts. Then take 1 mg Suboxone®. Use fentanyl if precipitated withdrawal occurs. Follow this routine for a week, 2 times a day, while slowly increasing Suboxone® dose.	7 days
Day 1: 0.5 mg buprenorphine in the morning; wait half an hour before using opioid again. Repeat same routine in the evening.	Unspecified
Day 2: 1 mg × 2 (morning/evening); lower dose of opioid. Repeat method by increasing buprenorphine and reducing opioid amounts over time.	