Harm Reduction Approach to Increasing Self-reported Safe Medication Storage Among Pregnant and Parenting People Receiving Opioid Use Disorder Treatment

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Abstract:	Objectives: The expansion of access to buprenorphine-naloxone (BUP-NAL) for the treatment of opioid use disorder (OUD) is critical to combat the overdose crisis. Evidence is lacking to guide providers on how to best promote BUP-NAL medication safety for their patients. This study assessed: 1) the current medication storage practices among a sample of pregnant and parenting people receiving BUP-NAL for OUD; 2) the feasibility and acceptability of providing a lockbox for safe medication storage. Methods: Pregnant and/or parenting patients receiving sublingual BUP-NAL in an outpatient OUD clinic were recruited between June and November 2021. Participants completed a baseline survey, received a lockbox, and a follow-up survey three to eight weeks later. The primary outcome of current self-reported safe medication storage practice was defined by storing BUP-NAL in a locked/latched place ‘almost always’ or ‘always’ on the baseline survey. Outcomes were analyzed using simple proportions. Results: 63 participants completed the baseline survey, and 50 completed the follow-up survey. Baseline survey results indicated that only a quarter of patients (26.6%) were practicing safe BUP-NAL medication storage practices. At follow up, 93.6% of patients were using the lockbox provided by the study, 93.4% reported being satisfied with the lockbox, and most participants (89.3%) reported safe BUP-NAL medication storage practices. Conclusion: Many pregnant and parenting patients with OUD receiving BUP-NAL do not store their medications safely. The provision of a lockbox as part of OUD treatment is a feasible, acceptable, and potentially effective harm reduction intervention.

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Methods: Pregnant and/or parenting patients receiving sublingual BUP-NAL in an outpatient OUD clinic were recruited between June and November 2021. Participants completed a baseline survey, received a lockbox, and a follow-up survey three to eight weeks later. The primary outcome of current self-reported safe medication storage practice was defined by storing BUP-NAL in a locked/latched place 'almost always' or 'always' on the baseline survey. Outcomes were analyzed using simple proportions.

Results: 63 participants completed the baseline survey, and 50 completed the follow-up survey. Baseline survey results indicated that only a quarter of patients (26.6%) were practicing safe BUP-NAL medication storage practices. At follow up, 93.6% of patients were using the lockbox provided by the study, 93.4% reported being satisfied with the lockbox, and most participants (89.3%) reported safe BUP-NAL medication storage practices.

Conclusion: Many pregnant and parenting patients with OUD receiving BUP-NAL do not store their medications safely. The provision of a lockbox as part of OUD treatment is a feasible, acceptable, and potentially effective harm reduction intervention.

Introduction

Overdose is a leading cause of death, including during pregnancy and postpartum.[1,2] Medications for opioid use disorder (MOUD) reduce overdose risk, facilitate recovery, and are safe and cost-effective.[3,4] Buprenorphine-Naloxone (BUP-NAL) is increasingly utilized for the treatment of opioid use disorder (OUD) during pregnancy. Its office-based administration[5,6] allows for flexibility (e.g., transportation, childcare) and can reduce the stigma associated with seeking addiction treatment which is amplified during pregnancy and parenting.[7]

Despite its advantages, having BUP-NAL at home poses risks. First, patients risk losing or having it stolen, leading to interruptions in MOUD continuity and increasing overdose risk. Second, having MOUD at home puts others at risk for unintentional ingestions. Drug poisonings are a major cause of morbidity and mortality among children and adolescents, [8,9] especially children under 5 years old with a maternal history of substance use disorder.[10] Safe medication storage is an important preventative practice that could reduce these risks of lost, stolen, or unintentional ingestion of medications. Previous studies have investigated medication storage practices in patients receiving methadone[11,12] and in individuals prescribed opioids for pain.[13,14] However, to our knowledge, the prevalence of safe medication practices and the subsequent impact of providing a lockbox to improve safe medication storage in pregnant and parenting individuals patients receiving MOUD has not been investigated.

One approach to promote safe medication storage is providing a locked or latched place, such as a lockbox. This approach was utilized for caregivers in a pediatric emergency department, resulting in a 86% increase in safe medication storage.[14] No study has reported on the need for

nor the feasibility of interventions to increase safe medication storage among patients receiving MOUD. The primary aim of our study was to assess the prevalence of safe medication storage practices among a sample of pregnant and parenting people receiving BUP-NAL in an outpatient OUD treatment clinic. Our secondary aim was to assess the feasibility and acceptability of providing a lockbox for safe medication storage.

METHODS

Study sample

A convenience sample of pregnant and parenting people from an outpatient addiction clinic completed two surveys between June and November 2021. Participants were English-speaking and at least 18 years old, diagnosed with OUD, identified as cisgender woman or transgender man, currently taking sublingual BUP-NAL and had at least one child < 18 years of age living in the home. Exclusion criteria included: living in or moving to a group home, dependening on others for medication adherence, or having a significant cognitive or psychiatric impairment. Participants were recruited from a research registry and when presenting for a clinic appointment.

Study procedures

After informed consent, participants completed a baseline survey, received a lockbox, then completed a follow-up survey three to eight weeks later (Supplemental Digital Content 1). Surveys took 10 minutes, and participants were compensated. The sample size of 50 follow-up survey completers for this exploratory study was pre-determined based on prior literature

assessing medication safety practices in other clinical samples.[15] This study was approved by the Virginia Commonwealth University IRB (HM20022004).

Outcome measures

The primary outcome of current self-reported safe medication storage practices was defined by storing BUP-NAL in a locked/latched place 'almost always' or 'always' as self-reported on the baseline survey.[15] The secondary outcomes, assessed on the follow-up survey, were (1) feasibility of providing a lockbox for medication storage as defined by answering 'yes' to using the lockbox provided by the study and (2) acceptability as defined by being 'very satisfied' or 'somewhat satisfied' with the lockbox. Two groups (safe medication storage and non-safe medication storage) were created based on the primary outcome.

Analysis

Descriptive analyses were performed using JMP® 16, SAS Institute Inc., Cary, NC, USA. Comparisons between the two groups were assessed using chi-squared and Student t-tests.

RESULTS

63 participants completed the baseline survey, and 50 completed the follow-up survey. Table 1 describes participant demographics. Participants were on average 31.07 (±4.81) years old; 38.1% identified as Black race, and 23.4% were currently pregnant. Most participants (78.1%) cared for 1 to 3 children in their home in the past three months. Over half (56.3%) had experienced intimate partner violence, and 12.5% had experienced homelessness in the past three months.

Common locations (Supplemental Digital Content 2) for storing medications prior to receipt of lock box among participants not reporting safe storage included: unlocked purse (23.1%), bathroom cabinet (19.2%), keeping them on their dresser (13.5%) and in an unlocked drawer (7.7%). Almost three quarters (73.4%) were not practicing safe medication storage (Figure 1); most (84.6%) reported the primary reason for not doing so as not having a place that latches/locks. Overall, more than 50% reported being 'somewhat dissatisfied' or 'dissatisfied' with their current medication storage methods, and almost half (44.4%) reported worrying about a child getting access to their medication. The majority (64%) reported that, if given a free lockbox, they would store their medications in it.

After provision of the lockbox (Supplemental Digital Content 3), follow-up survey results (median follow-up 34 days) indicated high feasibility and acceptability of the lockbox (Figure 1). Almost all (93.6%) participants used the lockbox, and 93.4% reported being 'very satisfied' or 'somewhat satisfied' with it. The proportion practicing safe medication storage was much higher at follow-up than at baseline (89.3% vs. 26.6%) (Figure 1). Most participants (79.5%) reported using the lockbox to store their medication "always," and 91.5% reported that having a lockbox from this study improved their ability to store their medication in a locked/latched place all the time.

DISCUSSION

In a sample of pregnant and parenting people receiving BUP-NAL in an outpatient OUD clinic, few patients reported practicing safe medication storage, largely due to not having a locked or latched location. In this pilot study, participants were provided a lockbox, and follow-up results

indicated high feasibility and acceptability of this preventative practice. Results indicate that safe medication storage is a priority for pregnant and parenting patients in OUD treatment, and provision of a lockbox with MOUD could meet this need.

Prior research from chronic pain clinics has elucidated how patients commonly do not store their opioid medications safely.[15] Webb at al. found that only 4% of caregivers presenting to an urban pediatric emergency department reported safe medication storage practices, with almost 40% stating that their main barrier to doing so was not having a locked or latched place.[14] Our study findings indicate how these low utilization rates of safe medication storage practices extend into an OUD treatment clinical population.

Our study findings also demonstrated high feasibility and acceptability of providing a lockbox for patients receiving BUP-NAL, similar to prior work not specific to an OUD population.[14,15] At follow-up, most of our pregnant and parenting participants reported storing their medications safely, compared to only a quarter before being provided the lockbox. These preliminary findings demonstrate the need for additional research in OUD treatment settings to guide incorporation of evidence-based harm reduction interventions, such as those focused on safe storage of prescribed medications and non-prescribed substances.[16-18]

Our findings should be interpreted in the context of study limitations. We relied on self-report for our outcomes, leading to social desirability bias. Generalizability is limited, given our single site. Lastly, the sample size represents a subset of our clinic; findings should be interpreted as preliminary.

CONCLUSIONS

Nationwide, efforts to increase utilization of BUP-NAL are underway to combat the overdose crisis. In our sample of pregnant and parenting people with OUD, the majority were not practicing safe medication storage. We found the provision of a free lockbox to be a feasible and acceptable preventative practice to promote safe medication storage in this unique patient population. In line with a harm reductionist approach, further investigation of person-centered interventions to optimize medication safety in MOUD samples is warranted.

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232 **Table 1:** Demographic, psychosocial, and clinical characteristics for study sample of pregnant
233 and parenting people receiving buprenorphine for OUD, by baseline medication safety practices

	Total N (%) (N=63)	Safe Medication Storage N (%) (N=17)	Non-Safe Medication storage N (%) (N=46)	p - value
Age (Mean ±SD)	31.07 (4.81)	30.76 (6.18)	31.20 (4.28)	0.77
Race				0.15
Black	24 (38.09)	9 (52.94)	15 (32.61)	
White	39 (61.90)	8 (47.05)	31 (67.39)	
Ethnicity				0.55
Hispanic/Latinx	2 (3.17)	0 (0.00)	2 (4.35)	
Non-Hispanic/ Latinx	61 (96.83)	17 (100.00)	44 (95.65)	
Single marital status	24 (37.50)	9 (52.94)	15 (31.91)	0.15
Education				0.46
High school education	52 (82.54)	13 (76.47)	39 (84.78)	
More than high school education	11 (17.46)	4 (23.53)	7 (15.22)	
Current Living Situation				0.30
Alone	2 (3.17)	1 (5.88)	1 (2.17)	
With sexual partner and children	51 (80.95)	15 (88.24)	36 (78.26)	
With parents/family/friends	10 (15.87)	1 (5.88)	9 (19.57)	
Length of time on BUP-NAL				0.76
≤1 year	29 (46.03)	7 (41.18)	22 (47.83)	
>1 year	34 (53.97)	10 (58.82)	24 (52.17)	
Mental health comorbidity	60 (93.75)	17 (100)	43 (91.49)	0.56
*Homeless in the past 3 months	6 (9.38)	1 (5.88)	5 (10.64)	1.0
**Intimate partner violence in the past 3 months	36 (56.3)	8 (47.06)	28 (59.57)	0.3

234 ***** Homelessness was defined by self-reporting 'yes' to living on the street, in a shelter, in a single
235 room occupancy hotel or in a car in the past three months.
236 **Scoring greater than 10 on the Hurt, Insult, Threaten and Scream: (HITS) Tool for Intimate
237 Partner Violence Screening.
238

Figure 1: Feasibility and acceptability of providing a lockbox for medication storage to pregnant and parenting patients with OUD receiving BUP-NAL (n=50)
1A: Feasibility of lockbox provision

1B: Acceptability of lockbox provision

1C: Safe medication storage practices by participants before reception of lockbox

1D: Unsafe medication storage practices by participants after reception of lockbox .