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Publication Date

2023-12-01

DOI

10.1016/j.josat.2023.209083

Peer reviewed

HHS Public Access

Author manuscript

J Subst Use Addict Treat. Author manuscript; available in PMC 2024 December 01.

Published in final edited form as:

J Subst Use Addict Treat. 2023 December ; 155: 209083. doi:10.1016/j.josat.2023.209083.

Buprenorphine use and setting type among reproductive-aged women self-reporting nonmedical prescription opioid use☆

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Abstract

Introduction: Screening for opioid misuse and treatment for opioid use disorder are critical for reducing morbidity and mortality. We sought to understand the extent of self-reported past 30-day buprenorphine use in various settings among women of reproductive age with self-reported nonmedical prescription opioid use being assessed for substance use problems.

Methods: The study collected data from individuals being assessed for substance use problems using the Addiction Severity Index–Multimedia Version in 2018–2020. We stratified the sample of 10,196 women ages 12–55 self-reporting past 30-day nonmedical prescription opioid use by buprenorphine use and setting type. We categorized setting types as: buprenorphine in specialty addiction treatment, buprenorphine in office-based opioid treatment, and diverted buprenorphine. We included each woman's first intake assessment during the study period. The study assessed number of buprenorphine products, reasons for using buprenorphine, and sources

☆*Disclaimer:*The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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CRediT authorship contribution statement

Carla L. DeSisto: Conceptualization, Methodology, Formal analysis, Writing – original draft. **Mishka Terplan:** Conceptualization, Writing – review & editing. **Akadia Kacha-Ochana:** Software, Writing – review & editing. **Jody L. Green:** Resources, Writing – review & editing. **Trisha Mueller:** Writing – review & editing. **Shanna Cox:** Writing – review & editing. **Jean Y. Ko:** Conceptualization, Writing – review & editing, Supervision.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.josat.2023.209083.

Declaration of competing interest

The authors report no relationships that could be construed as a conflict of interest.

of buprenorphine procurement. The study calculated frequency of reasons for using buprenorphine to treat opioid use disorder outside of a doctor-managed treatment, overall and by race/ethnicity.

Results: Overall, 25.5 % of the sample used buprenorphine in specialty addiction treatment, 6.1 % used buprenorphine prescribed in office-based treatment, 21.7 % used diverted buprenorphine, and 46.7 % reported no buprenorphine use during the past 30 days. Among women who reported using buprenorphine to treat opioid use disorder, but not as part of a doctor-managed treatment, 72.3 % could not find a provider or get into a treatment program, 21.8 % did not want to be part of a program or see a provider, and 6.0 % reported both; a higher proportion of American Indian/Alaska Native women (92.1 %) reported that they could not find a provider or get into a treatment program versus non-Hispanic White (78.0 %), non-Hispanic Black (76.0 %), and Hispanic (75.0 %) women.

Conclusions: Appropriate screening for nonmedical prescription opioid use to assess need for treatment with medication for opioid use disorder is important for all women of reproductive age. Our data highlight opportunities to improve treatment program accessibility and availability and support the need to increase equitable access for all women.

Keywords

Nonmedical prescription opioid use; Women; Self-reported; Buprenorphine

1. Introduction

The prevalence of nonmedical prescription opioid use has increased during the past two decades, although the amount of opioids prescribed in the United States has been decreasing since 2012 (Back et al., 2010; Blanco et al., 2007; Guy et al., 2019; Parsells Kelly et al., 2008). Nonmedical prescription opioid use is associated with a number of medical consequences, such as unintentional overdose (Calcaterra et al., 2013; Mattson et al., 2021). Although not all women of reproductive age become pregnant, misuse of prescription opioids during pregnancy increases risks of adverse maternal and neonatal outcomes, such as maternal death and neonatal abstinence syndrome (Ecker et al., 2019; Maeda et al., 2014; S. W. Patrick et al., 2015; Stephen W. Patrick et al., 2012).

Screening for nonmedical prescription opioid use or opioid use disorder (OUD) and treatment with medication for opioid use disorder (MOUD), the standard of care, are critical for reducing morbidity and mortality (Substance Abuse and Mental Health Services Administration, 2021a, 2021b). MOUD is more effective at reducing overdose and serious opioid-related acute care use, compared with other management (e.g., inpatient detoxification or residential services) or receiving no treatment (Vakkalanka et al., 2021; Wakeman et al., 2020). Although MOUD is available through the specialty addiction treatment system (including opioid treatment programs) and via buprenorphine prescribing in office-based opioid treatment (OBOT), most people with OUD receive no treatment (Substance Abuse and Mental Health Services Administration, 2020). Among those receiving care within the specialty addiction treatment system, less than half of OUD admissions receive MOUD (Krawczyk et al., 2017). Striking gender differences exist in MOUD utilization and in the availability and continuation of treatment, with women

generally having less utilization than other genders (Back et al., 2010; Greenfield et al., 2007; Guerrero et al., 2021; Marsh et al., 2021; Martin et al., 2020). Documented barriers to accessing OUD treatment among women of reproductive age include economic barriers (e.g., high out-of-pocket costs for treatment and lack of insurance acceptance among clinicians) (Stephen W. Patrick et al., 2020), social stigma, co-occurring mental health disorders, and lack of child care (Greenfield et al., 2007). Further, racial and ethnic disparities exist in use of MOUD (Andraka-Christou, 2021). Black and Hispanic women are less likely to report receipt of any treatment compared to White women (Martin et al., 2020). In general, Black people with OUD are less likely to receive buprenorphine compared to White people with OUD after accounting for payment method, sex, and age (Lagisetty et al., 2019). This difference may be in part due to access; one study found that counties with highly segregated White communities had more facilities to provide buprenorphine per capita, whereas counties with highly segregated African American communities had more facilities to provide methadone per capita (Goedel et al., 2020). Commercial buprenorphine distribution has risen the most in neighborhoods with higher percentages of White residents (Schuler et al., 2021). Although no single medication has been endorsed by the American Society of Addiction Medicine as the preferred first-line treatment (Kampman & Jarvis, 2015), notable differences exist in the social and historical contexts of the development, regulation, and implementation of buprenorphine and methadone (Goedel et al., 2020).

Buprenorphine diversion, or use outside of an established physician-patient relationship (Cicero et al., 2018), is classified by the US Drug Enforcement Agency as illicit use (Drug Enforcement Administration, 2019). Use of diverted buprenorphine (Cicero et al., 2018; Simpson et al., 2019) may reflect gaps between MOUD need and treatment access (Chilcoat et al., 2019). Several studies have identified motivation for non–prescribed buprenorphine use, including the management of withdrawal symptoms and self-treatment of OUD (S. F. Butler et al., 2020; Carroll et al., 2018; Chilcoat et al., 2019; Smith et al., 2020), but have not focused on women of reproductive age. We sought to understand the extent of self-reported past 30-day buprenorphine use in various treatment settings among women of reproductive age with self-reported nonmedical prescription opioid use being assessed for substance use problems. Additionally, we sought to assess whether racial/ethnic disparities were present and to describe social, medical, and legal circumstances and reasons for using buprenorphine.

2. Materials and methods

The study team collected data using the Addiction Severity Index-–Multimedia Version (ASI-MV), an instrument from the National Addictions Vigilance Intervention and Prevention Program (NAVIPPRO, Integrated Behavioral Health, Inflexxion, Irvine, CA, USA). NAVIPPRO is a comprehensive risk management system for prescription opioids and other Schedule II or III therapeutic agents; it includes surveillance (Kacha-Ochana et al., 2022), signal detection and verification processes, and prevention and intervention strategies (Stephen F. Butler et al., 2008). The ASI-MV is a validated, self-administered, computerized structured clinical assessment tool that collects data from individuals being assessed for substance use problems, primarily for the purpose of clinical treatment planning and triage (S. F. Butler et al., 2001; Stephen F. Butler et al., 2008). This assessment, which is currently

web-based, is based on the Addiction Severity Index (ASI), a standard clinical assessment designed for use on admission to drug and alcohol treatment with established reliability and validity (S. F. Butler et al., 2001; McLellan et al., 1992).

The ASI-MV collects data from a national network of substance abuse treatment centers (Stephen F. Butler et al., 2008). This analysis includes data from 340 locations across 35 states[1] throughout the United States collected from January 2018 through December 2020. Sites can use the ASI-MV at intake, discharge, or follow-up, which allows for repeat assessments of the same individual. Although all data were de-identified, each individual and location are assigned unique identification numbers. This analysis included each individual's first intake assessment during the study period.

The population of interest for this analysis was women of reproductive age (12–55 years) with self-reported past 30-day nonmedical prescription opioid use (Supplemental Fig. 1). We excluded men and individuals who self-identified as transgender. The study defined "use as prescribed" as: 1) having a current pain problem and taking a prescribed opioid medication for pain in the past 30 days; 2) obtaining the medication only from one's own prescription; and 3) no use of the medication via an alternate route of administration (e.g., injection of a medication prescribed for oral use) (Stephen F. Butler et al., 2008). The study assigned nonmedical use of prescriptions opioids if any response indicated any "use not as prescribed." Nonmedical use was also assigned if a respondent indicated having used the prescription opioid medication "not in a way prescribed by your doctor, that is, for the way it makes you feel and not for pain relief." The study excluded ten women from the analysis because their only reported nonmedical use of a prescription opioid was either methadone or buprenorphine and this analysis was primarily interested in the population of women using other prescription opioids not as prescribed.

We stratified the sample by self-reported past 30-day buprenorphine use and setting type into four mutually exclusive categories: buprenorphine use in specialty addiction treatment, buprenorphine use in OBOT, diverted buprenorphine use, and no buprenorphine use (Supplemental Fig. 1).

The study assessed past 30-day buprenorphine use by formulation and brand name. The ASI-MV asks respondents about their past 30-day use of each of several different types of buprenorphine: generic buprenorphine without naloxone tablets, generic buprenorphine with naloxone tablets, Suboxone film, Zubsolv tablets, Bunavail film, BEL-BUCA film, other buprenorphine/naloxone tablet, and other buprenorphine without naloxone. We excluded use of transdermal buprenorphine from this analysis because it is exclusively used for pain management and not approved for OUD treatment. Women who reported zero days of buprenorphine use in the past 30 days were categorized as having no buprenorphine use.

Among women with at least one day of buprenorphine use in the past 30 days, we assessed buprenorphine receipt in specialty addiction treatment, based on the question: "How many days have you received treatment as part of an official medication-assisted therapy (MAT)

[1]Included states: AK, AR, CA, CO, DE, FL, GA, HI, IA, IN, KY, LA, MA, MD, ME, MI, MO, NC, NE, NH, NJ, NM, OH, OK, OR, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY

program such as a methadone maintenance program, buprenorphine or Suboxone treatment, or Vivitrol or naltrexone treatment for alcohol or drugs in the past 30 days?" The study considered women who responded 1–30 days to have received buprenorphine in specialty addiction treatment.

Among women with at least one day of buprenorphine use in the past 30 days, but zero days of buprenorphine use in specialty addiction treatment, we examined sources of procurement. Women who reported using at least one type of buprenorphine "only as part of a doctor run treatment for opioid addiction" (hereafter referred to as "only as part of a doctor run treatment for OUD") were considered to use buprenorphine in OBOT. Women who reported using buprenorphine, but with no responses indicating use as part of a doctor-managed treatment (i.e., were using buprenorphine for any other reason), were categorized as using diverted buprenorphine.

The ASI-MV contains a rich set of questions to assess an individual's social, medical, psychiatric, and legal circumstances. The study used responses to a structured set of questions to assess psychiatric severity rating (McLellan et al., 1992). Frequencies of each characteristic were calculated overall and stratified by buprenorphine use and setting type. Pearson chi-squared tests assessed for differences by the four categories of buprenorphine use and setting type.

Among women with any reported buprenorphine use, the number of buprenorphine products, reasons for using buprenorphine, and sources of buprenorphine procurement were assessed and stratified by treatment setting, using the same categories as previously noted, excluding the group with no buprenorphine use. Pearson chi-squared tests assessed for differences in the distribution of characteristics by the three categories of buprenorphine setting type.

Among a subset of 1071 women who reported using any buprenorphine product to treat addiction, but not as part of a doctor-managed treatment for OUD, the frequencies of the reasons for this were calculated overall and by race/ethnicity. Because women could report more than one type of buprenorphine use, this subanalysis included any women who had used buprenorphine in the past 30 days and who stated that at least one type of buprenorphine was used to treat addiction but not as part of a doctor-managed treatment for OUD, and was therefore independent of the categories used previously.

The study team used SAS Version 9.4 (SAS Institute, Cary, NC) for all data management and analyses. The Centers for Disease Control and Prevention (CDC) reviewed this activity and the study was conducted consistent with applicable federal law and CDC policy.[2]

3. Results

Overall, the study population of women of reproductive age with self-reported nonmedical use of prescription opioid products in the past 30 days (n = 10,196) included 2599 women (25.5 %) who reported using buprenorphine in specialty addiction treatment, 619 women

[2]See e.g., 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq.

(6.1 %) who reported using at least one buprenorphine product prescribed in OBOT, 2212 women (21.7 %) who were categorized as using diverted buprenorphine, and 4766 women (46.7 %) who reported no buprenorphine use in the past 30 days. Among the women who reported using buprenorphine in specialty addiction treatment, 51.3 % (n = 1334) reported receiving their treatment on all 30 of the past 30 days (data not shown).

The majority of women with self-reported nonmedical use of prescription opioid products in the past 30 days in this study were aged 25–44 years and non-Hispanic White (Table 1). However, non-Hispanic Black, Hispanic, and American Indian/Alaska Native (AI/AN) women had a higher proportion in the group with no buprenorphine use in the past 30 days (9.4 %, 8.6 %, and 3.4 %, respectively, compared to representing 6.2 %, 7.3 %, and 2.9 % of the overall study population). Most women had at least a high school diploma and half were single (never married). More than 40 % of women were publicly insured (e.g., Medicaid/Medicare insurance); this ranged from about 37 % for women using buprenorphine in OBOT or diverted buprenorphine to 45 % for women receiving buprenorphine in specialty addiction treatment. More than 50 % were employed at least part time (data not shown). Overall, 66.6 % lived in the South, 20.4 % lived in the Midwest, 10.4 % lived in the West, and 2.6 % lived in the Northeast Census region (data not shown).

About two-thirds of women lived in a private home or apartment; however, nearly 19 % overall did not have a stable living arrangement (Table 2). One-quarter of women (25.8 %) using diverted buprenorphine did not have a stable living arrangement. The majority of women (87.0 %) did not report living with anyone who uses nonprescribed drugs or misuses prescription drugs. Overall, about 93 % of the sample was not pregnant at the time of their assessment; pregnant women had a higher proportion in the group that reported receiving buprenorphine in specialty addiction treatment in the past 30 days (5.7 %, compared to 4.1 % of the overall study population). Most women in this study had a moderate or severe psychiatric severity rating, one-third were on probation or parole, and one-third ever had a child taken away because of a child protective order or other legal proceeding. Prior drug treatment was common, with 65 % reporting at least one episode; however, only 56.8 % of women with no buprenorphine use reported prior drug treatment. About 60 % of women had no history of overdose in which someone else's help was needed; 66 % of women with no buprenorphine use reported no previous overdoses in which someone else's help was needed. More than half of women had a history of emotional (75.8 %), physical (68.0 %), or sexual abuse (53.6 %).

Among the 5430 women who reported any buprenorphine use in the past 30 days, most (73.3 %) reported using only one type of buprenorphine (Table 3). However, a greater proportion of women who received buprenorphine in specialty addiction treatment reported using only one type of buprenorphine (78.7 %) compared to women using buprenorphine prescribed in OBOT (67.5 %) and women using diverted buprenorphine (68.5 %). The most common reason for using buprenorphine was to ease/avoid withdrawals; although this was the reason for 31.8 % of women overall, it was the reason for 42.7 % of the women using diverted buprenorphine. Nearly 29 % of women using diverted buprenorphine reported using buprenorphine when they were unable to obtain their drug of choice, compared to 16.5 % of women overall. Women using diverted buprenorphine were more likely to report using

buprenorphine to self-treat bodily pain (23.4 %, compared to 14.9 % overall), get high (20.1 %, compared to 11.2 % overall), alter their mood (11.1 %, compared to 6.5 % overall), and treat psychological or emotional symptoms (9.2 %, compared to 6.4 % overall) ($p < 0.0001$ for all).

The majority of women who used buprenorphine in the past 30 days reported receiving their own prescription for buprenorphine from one doctor (58.5 %; Table 3). A higher proportion of women categorized as using diverted buprenorphine reported obtaining their buprenorphine from family, a friend, or a dealer. Very few women in this study reported writing or buying a fake prescription, buying the buprenorphine online without a doctor's visit, or stealing buprenorphine.

Among the 1071 women who reported using any buprenorphine product to treat addiction, but not as part of a doctor-managed treatment for OUD, 72.3 % reported they could not find a provider or get into a treatment program only, 21.8 % reported they did not want to be part of a program or see a provider only, and 6.0 % reported both (Supplemental Fig. 2). When further stratified by race/ethnicity, 92.1 % of the 38 AI/AN women reported they could not find a provider or get into a treatment program, compared to 78.0 % of the 897 non-Hispanic White women, 76.0 % of the 25 non-Hispanic Black women, and 75.0 % of the 56 Hispanic women (Fig. 1).

4. Discussion

These data are used to describe past 30-day buprenorphine utilization among a sample of reproductive-age women self-reporting past 30-day nonmedical prescription opioid use who were being assessed for substance use problems. Only roughly 30 % of women of reproductive age with nonmedical prescription opioid use reported treatment with buprenorphine in either specialty addiction services or OBOT, almost half reported no buprenorphine use, and one-fifth used diverted buprenorphine. Of those women who reported using any buprenorphine product to treat addiction, but not as part of a doctor-managed treatment for OUD, the majority said this was primarily because they could not find a provider or get into a treatment program.

Nearly 40 % of our sample had one or more overdoses in the past in which someone else's help was needed, and two-thirds had sought treatment before, reflective of a population with treatment familiarity and some prior contact with the health care system. These factors were less common in the group with no buprenorphine use in the last 30 days. However, less than half of the women in our study received treatment with buprenorphine in either specialty addiction treatment or OBOT, reflecting a possible gap between treatment need and receipt. Numerous interrelated barriers to receiving MOUD have been documented, including financial, regulatory, geographic, attitudinal, and logistic barriers (Sharma et al., 2017). Although the number of clinicians with waivers to prescribe buprenorphine more than doubled from December 2017 to July 2020, more than half of small and remote rural counties lacked one of these clinicians (Andrilla & Patterson, 2021). In addition to these barriers to finding a provider who can prescribe buprenorphine, patients may face additional financial barriers to treatment related to health insurance coverage of treatment

and providers accepting insurance (Bachireddy & Terplan, 2021; Stephen W. Patrick et al., 2020).

Nearly 6 % of the sample reported use of buprenorphine in office-based treatment, highlighting the role the primary-care setting may have. Screening and brief interventions implemented in primary-care settings, including general medicine, obstetrics and gynecologic services, and pediatric and adolescent medicine practices are effective for reducing problem substance use among women, including pregnant women (Humeniuk et al., 2012). Treating OUD in primary-care settings is cost effective, improves outcomes, and is highly acceptable to patients (Buresh et al., 2021). However, in a 2017 survey of obstetrician-gynecologists, less than a quarter of respondents reported feeling prepared to prescribe MOUD to pregnant patients with OUD (Ko et al., 2019). Although there has been significant effort to improve access to treatment and continuity of care for pregnant women and their infants (Centers for Disease Control and Prevention, 2021; Centers for Medicare & Medicaid, 2023; Substance Abuse and Mental Health Services Administration, 2016), a recent study found that fewer than 2 % of obstetrician-gynecologists who accept Medicaid are able to prescribe buprenorphine, and they are disproportionately located in suburban counties (Nguemeni Tiako et al., 2020).

>70 % of all women who reported using buprenorphine to treat addiction, but not as part of a doctor-managed treatment for OUD, did so because they could not find a provider or get into a treatment program. While concerns exist for misuse of buprenorphine treatment among individuals with OUD, the prevalence has not changed statistically from 2015 to 2019 (Han et al., 2021). Higher frequency of nonprescribed buprenorphine has been associated with lower overdoses (Williams et al., 2022) and treatment discontinuation after initiation among adult populations with OUD (Carlson et al., 2020). Our findings add context to previous studies that evaluated reasons for nonprescribed buprenorphine use among the adult population with opioid use disorder in Ohio (Silverstein et al., 2020) and Pennsylvania (McLean & Kavanaugh, 2019). In addition to perceived demands of formal buprenorphine treatment (Silverstein et al., 2020), respondents cited lack of treatment availability (McLean & Kavanaugh, 2019).

However, 92 % of AI/AN women who reported using buprenorphine, but not as part of a doctor-managed treatment for OUD, reported they could not find a provider or get into a treatment program. The AI/AN populations have high rates of prescription opioid misuse and deaths involving opioids (Scholl et al., 2018; Substance Abuse and Mental Health Services Administration, 2020). A recent study found only 40 % of AI/AN clients in specialty OUD care receive medication treatment and only 22 % of specialty treatment facilities serving AI/AN clients offer either methadone or buprenorphine (Krawczyk et al., 2021). A 2017 National Institute on Drug Abuse meeting about the acceptability and uptake of MOUD among AI/AN persons, which included AI/AN community members and AI/AN and non-AI/AN providers and researchers, concluded that it is necessary to integrate medications into AI/AN healing approaches and frameworks, while also working to overcome systemic barriers such as limited availability of and high turnover of skilled providers and distance to treatment facilities (Venner et al., 2018).

We also found that a higher proportion of non-Hispanic Black, Hispanic, and AI/AN women were in the group with no buprenorphine use in the previous 30 days, compared to the overall study population. Research has described racial and ethnic disparities in the use of MOUD (Andraka-Christou, 2021), including differential access to buprenorphine prescribers by neighborhood (Hansen et al., 2013), differential rates of buprenorphine prescription receipt by race/ethnicity (Lagisetty et al., 2019), and differential use of MOUD during pregnancy by race/ethnicity (Schiff et al., 2020). Much of the communication around the opioid crisis has focused on the way it has affected non-Hispanic White communities (Andraka-Christou, 2021; James & Jordan, 2018). Although opioid-related overdose death rates are higher among non-Hispanic White populations than other racial and ethnic groups, non-Hispanic Black populations are experiencing much steeper increases in rates of drug overdose deaths involving synthetic opioids compared to other racial and ethnic groups (Spencer et al., 2018). The field needs strategies to increase equitable access to MOUD.

In our study, women who reported no buprenorphine use had higher psychiatric severity ratings than the women who were receiving buprenorphine prescribed in either specialty addition treatment or OBOT settings. A higher proportion of women using diverted buprenorphine reported using buprenorphine to treat psychological or emotional symptoms than women receiving buprenorphine prescribed in specialty addiction treatment or OBOT. Data from the National Survey on Drug Use and Health shows that about 60 % of individuals with OUD have a mental illness, and approximately 70 % of females with OUD have a mental illness (Novak et al., 2019). Women with major depressive episodes and/or anxiety disorders are significantly more likely to suffer from substance use and substance use disorders than their counterparts without these conditions (Zhou et al., 2019). Mental health services are recommended in combination with MOUD (Substance Abuse and Mental Health Services Administration, 2021a, 2021b). Integrating MOUD and mental health services in settings frequently visited by women of reproductive age may increase uptake of combined treatment (Zhou et al., 2019).

Many of the women in our study were involved in the criminal justice system, including being on probation or parole and ever having their children taken away because of legal proceedings. This finding may in part be because 23 states and the District of Columbia consider substance use during pregnancy to be child abuse (Guttmacher Institute, 2021). Further, stigma is a considerable barrier to accessing treatment among adults with OUD who live with children (Feder et al., 2018). Incorporating into the criminal justice system screening for substance use and mental health conditions and offering or referring to treatment for substance use disorder and mental health services, as has been done in the juvenile justice system (Belenko et al., 2017), may be a strategy to reduce morbidity and mortality among women of reproductive age. A coordinated and collaborative approach may be needed to meet the complex needs of women involved with the criminal justice system, including screening and treatment while in custody as well as continuity of care upon release.

These data provide a detailed examination of social factors of women with nonmedical opioid use and their past 30-day utilization of buprenorphine at the time of their first assessment, which is not available in other large datasets focused on substance use or

treatment. Additionally, these data allowed us to examine previous overdoses, engagement in treatment, and involvement in criminal justice system, which are also not typically available variables.

4.1. Limitations

The findings in this report are subject to several limitations. First, ASI-MV data are self-reported and subject to recall, reporting, and social desirability biases. Second, to be included in our analysis, women had to self-report nonmedical use of prescription opioids. However, we do not know how many met criteria for opioid use disorder (American Psychiatric Association, 2013). Third, because the study had no specific question in the ASI-MV to address buprenorphine diversion, women categorized as using diverted buprenorphine may have been miscategorized. Fourth, although ASI-MV captures data from a geographically diverse set of states and treatment programs, it is a convenience sample. Geographic and site participation changes over time and the network is not formally designed to be nationally representative. Thus, our results may not be generalizable to all women of reproductive age assessed for substance use disorder treatment or with nonmedical prescription opioid use. Notably, MOUD receipt varies by US region (Krawczyk, Jent, et al., 2022; Krawczyk, Rivera, et al., 2022), and our sample was not uniformly distributed across the country. Fifth, although women in this study were being assessed for substance use problems, ASI-MV is used by the National Guard, public benefits offices, the criminal justice system, and others who purchase the assessment product. Therefore, our analysis may include some women who were not seeking substance use disorder treatment, and it is unclear how many women this affects. Sixth, the study collected insurance status data with Medicaid and Medicare combined. Additionally, about one-third of women had their insurer categorized as “Other” in the data, which may mask additional patterns by insurance status in our analysis. Information about AI/AN access to care via the Indian Health Service (IHS) and non-IHS areas was unavailable; although IHS is not a health insurance provider, it is part of the federal government responsible for delivering health care to AI/AN (U.S. Department of Health and Human Services, 2022). Seventh, this analysis includes only an individual’s first intake assessment during the study period. Although this helped to prevent including duplicate women, we may not have captured nonmedical prescription opioid use that developed after the first intake assessment or changes in buprenorphine use or treatment over time. Further, some of these women may have been previously assessed outside of our study period or in a different assessment system. We were unable to assess why the women who reported using buprenorphine in specialty addiction treatment or OBOT in the past 30-days completed intake assessments (e.g., changing treatment providers). Eighth, in our examination of number of buprenorphine products used in the past 30 days, we were unable to distinguish between women taking more than one product at the same time and women taking more than one product during the past 30 days but at different times (e.g., changing products in the past 30 days). Ninth, we were unable to assess the same list of variables related to diverted methadone, as these are not part of the ASI-MV. Tenth, due to small cell sizes, Asian/Pacific Islander women had to be included in the “Another race/ethnicity” group. We acknowledge heterogeneity within the race/ethnicity groups included in this analysis but were unable to disaggregate the data

further. Finally, we do not have data on whether the women in our study ultimately received appropriate treatment for their nonmedical prescription opioid use.

5. Conclusion

In conclusion, among persons who completed a structured clinical assessment tool that collects data from individuals being assessed for substance use problems, we found that more than one-fifth of women of reproductive age with nonmedical use of prescription opioids used diverted buprenorphine (i.e., any use not as part of a doctor-managed treatment), and almost half had not used buprenorphine in the previous 30 days. We described important racial/ethnic disparities. Specifically, a higher proportion of non-Hispanic Black, Hispanic, and AI/AN women reported no buprenorphine use in the past 30 days. Further, while >70 % of women who reported using any buprenorphine product to treat addiction, but not as part of a doctor-managed treatment for OUD, said this was primarily because they could not find a provider or get into a treatment program, this was reported among >90 % of AI/AN women. Appropriate screening for nonmedical prescription opioid use to assess need for treatment with MOUD is important for all women of reproductive age. Our data highlight opportunities to improve treatment program accessibility and availability and support the need to increase equitable access for all women.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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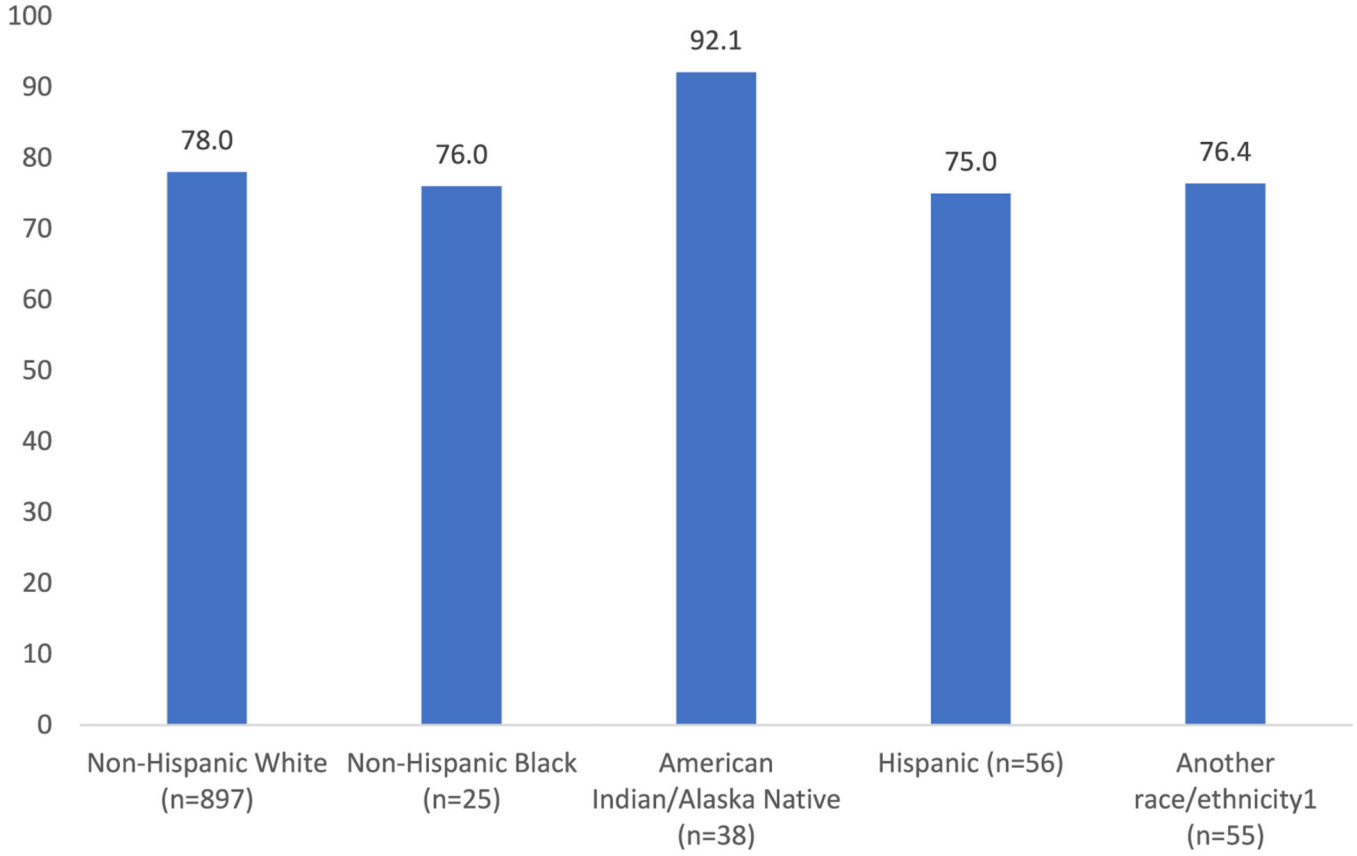

Fig. 1.

Percentage of women who reported using buprenorphine to treat addiction, but not as part of a doctor-managed treatment for addiction, because they could not find a provider or get into a treatment program, by race/ethnicity, National Addictions Vigilance Intervention and Prevention Program, 2018–2020 (n = 1071) [1]This group includes Asian/Pacific Islander women due to very small cell sizes.

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Table 1

Characteristics of women of reproductive age with self-reported past 30-day nonmedical prescription opioid use, stratified by past 30-day buprenorphine use and setting type, National Addictions Vigilance Intervention and Prevention Program, 2018–2020.

	Overall (*n* = 10,196) Frequency (%)	**Buprenorphine in specialty addiction treatment[a] (*n* = 2599) Frequency (%)**	**OBOT[b] (*n* = 619) Frequency (%)**	**Diverted buprenorphine[c] (*n* = 2212) Frequency (%)**	**No buprenorphine[d] (*n* = 4766) Frequency (%)**	***p*-value**
Total	10,196 (100)	2599 (25.5)	619 (6.1)	2212 (21.7)	4766 (46.7)	–
Age group (years)						<0.0001
12–17	17 (0.2)	3 (0.1)	1 (0.2)	0 (0.0)	13 (0.3)	
18–24	1293 (12.7)	270 (10.4)	69 (11.1)	341 (15.4)	613 (12.9)	
25–34	4882 (47.9)	1274 (49.0)	296 (47.8)	1108 (50.1)	2204 (46.2)	
35–44	2894 (28.4)	780 (30.0)	188 (30.4)	600 (27.1)	1326 (27.8)	
45–55	1110 (10.9)	272 (10.5)	65 (10.5)	163 (7.4)	610 (12.8)	
Race/ethnicity						<0.0001
Non-Hispanic White	8064 (79.1)	2179 (83.8)	510 (82.4)	1854 (83.8)	3521 (73.9)	
Non-Hispanic Black	631 (6.2)	91 (3.5)	23 (3.7)	71 (3.2)	446 (9.4)	
American Indian/Alaska Native	297 (2.9)	55 (2.1)	11 (1.8)	69 (3.1)	162 (3.4)	
Asian/Pacific Islander	23 (0.2)	6 (0.2)	2 (0.3)	6 (0.3)	9 (0.2)	
Hispanic	744 (7.3)	165 (6.3)	51 (8.2)	117 (5.3)	411 (8.6)	
Another race/ethnicity	437 (4.3)	103 (4.0)	22 (3.6)	95 (4.3)	217 (4.6)	
Education						<0.0001
Less than high school	2491 (24.4)	606 (23.3)	129 (20.8)	541 (24.5)	1215 (25.5)	
High school diploma/GED	4204 (41.2)	1026 (39.5)	270 (43.6)	991 (44.8)	1917 (40.2)	
Some college, < Bachelor’s degree	2912 (28.6)	827 (31.8)	178 (28.8)	583 (26.4)	1324 (27.8)	
Bachelor’s degree or more	316 (3.1)	83 (3.2)	18 (2.9)	43 (1.9)	172 (3.6)	
Missing	16 (0.2)	2 (0.1)	2 (0.3)	0 (0.0)	12 (0.3)	
Marital status						0.0011
Married or living as married	2338 (22.9)	695 (26.7)	136 (22.0)	451 (20.4)	1056 (22.2)	
Divorced or separated	2386 (23.4)	578 (22.2)	133 (21.5)	517 (23.4)	1158 (24.3)	
Widowed	247 (2.4)	66 (2.5)	14 (2.3)	47 (2.1)	120 (2.5)	
Single (never married)	5097 (50.0)	1229 (47.3)	321 (51.9)	1172 (53.0)	2375 (49.8)	

	Overall (*n* = 10,196) Frequency (%)	Buprenorphine in specialty addiction treatment[a] (*n* = 2599) Frequency (%)	OBOT[b] (*n* = 619) Frequency (%)	Diverted buprenorphine[c] (*n* = 2212) Frequency (%)	No buprenorphine[d] (*n* = 4766) Frequency (%)	*p*-value
Missing	128 (1.3)	31 (1.2)	15 (2.4)	25 (1.1)	57 (1.2)	
Insurance						<0.0001
Medicaid/Medicare	4307 (42.2)	1173 (45.1)	230 (37.2)	806 (36.4)	2098 (44.0)	
Commercial	162 (1.6)	57 (2.2)	13 (2.1)	23 (1.0)	69 (1.4)	
Self-pay	1585 (15.5)	530 (20.4)	89 (14.4)	204 (9.2)	762 (16.0)	
Uninsured/exhausted benefits	708 (6.9)	144 (5.5)	55 (8.9)	204 (9.2)	305 (6.4)	
Other	3355 (32.9)	683 (26.3)	232 (37.5)	957 (43.3)	1483 (31.1)	
Missing	79 (0.8)	12 (0.5)	0 (0.0)	18 (0.8)	49 (1.0)	

Abbreviations: office-based opioid treatment (OBOT).

[a]Women who reported using buprenorphine as part of an official medication-assisted therapy program one or more days in the past 30 days.

[b]Women who did not report using buprenorphine as part of an official medication-assisted therapy program but who reported using at least one type of buprenorphine only as part of a doctor-managed treatment for opioid addiction in the past 30 days.

[c]Women who reported using buprenorphine to treat addiction, but not as part of a doctor-managed treatment for opioid addiction, in the past 30 days.

[d]Women who did not report any buprenorphine use in the past 30 days.

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Table 2

Summary of social, medical, and legal circumstances of women of reproductive age with self-reported past 30-day nonmedical prescription opioid use, stratified by past 30-day buprenorphine use and setting type, National Addictions Vigilance Intervention and Prevention Program, 2018–2020.

	Overall (n = 10,196) Frequency (%)	Buprenorphine in specialty addiction treatment[a] (n = 2599) Frequency (%)	OBOT[b] (n = 619) Frequency (%)	Diverted buprenorphine[c] (n = 2212) Frequency (%)	No buprenorphine[d] (n = 4766) Frequency (%)	p-value
Current living situation						<0.0001
Halfway house	362 (3.6)	114 (4.4)	30 (4.8)	88 (4.0)	130 (2.7)	
Supervised living facility	787 (7.7)	232 (8.9)	45 (7.3)	181 (8.2)	329 (6.9)	
Prison or jail	135 (1.3)	20 (0.8)	8 (1.3)	37 (1.7)	70 (1.5)	
Hospital	28 (0.3)	11 (0.4)	2 (0.3)	3 (0.1)	12 (0.3)	
Private home or apartment	6836 (67.0)	1859 (71.5)	391 (63.2)	1305 (59.0)	3281 (68.8)	
No stable living arrangement	1894 (18.6)	339 (13.0)	126 (20.4)	571 (25.8)	858 (18.0)	
Missing	154 (1.5)	24 (0.9)	17 (2.7)	27 (1.2)	86 (1.8)	
Live with anyone who uses non-prescribed drugs or misuses prescription drugs						<0.0001
No	8869 (87.0)	2292 (88.2)	529 (85.5)	1815 (82.1)	4233 (88.8)	
Yes	1143 (11.2)	263 (10.1)	67 (10.8)	351 (15.9)	462 (9.7)	
Missing	184 (1.8)	44 (1.7)	23 (3.7)	46 (2.1)	71 (1.5)	
Pregnancy status						0.0012
Not pregnant	9515 (93.3)	2390 (92.0)	579 (93.5)	2080 (94.0)	4466 (93.7)	
Pregnant	414 (4.1)	147 (5.7)	25 (4.0)	76 (3.4)	166 (3.5)	
Unsure if pregnant	262 (2.6)	62 (2.4)	14 (2.3)	55 (2.5)	131 (2.7)	
Missing pregnancy info	5 (0.0)	0 (0)	1 (0.2)	1 (0.0)	3 (0.1)	
Psychiatric severity rating						<0.0001
No problem	1423 (14.0)	350 (13.5)	94 (15.2)	228 (10.3)	751 (15.8)	
Slight problem	1902 (18.7)	571 (22.0)	127 (20.5)	372 (16.8)	832 (17.5)	
Moderate problem	2623 (25.7)	719 (27.7)	144 (23.3)	588 (26.6)	1172 (24.6)	
Severe problem	3335 (32.7)	790 (30.4)	190 (30.7)	805 (36.4)	1550 (32.5)	
Extreme problem	644 (6.3)	120 (4.6)	29 (4.7)	158 (7.1)	337 (7.1)	
Missing	269 (2.6)	49 (1.9)	35 (5.7)	61 (2.8)	124 (2.6)	
On probation or parole						<0.0001

	Overall (n = 10,196) Frequency (%)	Buprenorphine in specialty addiction treatment[a] (n = 2599) Frequency (%)	OBOT[b] (n = 619) Frequency (%)	Diverted buprenorphine[c] (n = 2212) Frequency (%)	No buprenorphine[d] (n = 4766) Frequency (%)	p-value
No	6823 (66.9)	1835 (70.6)	380 (61.4)	1346 (60.8)	3262 (68.4)	
Yes	3340 (32.8)	763 (29.4)	233 (37.6)	853 (38.6)	1491 (31.3)	
Missing	33 (0.3)	1 (0.0)	6 (1.0)	13 (0.6)	13 (0.3)	
Children ever removed[e]						<0.0001
No	4796 (47.0)	1279 (49.2)	298 (48.1)	906 (41.0)	2313 (48.5)	
Yes	3282 (32.2)	831 (32.0)	196 (31.7)	796 (36.0)	1459 (30.6)	
Not applicable	1797 (17.6)	427 (16.4)	100 (16.2)	418 (18.9)	852 (17.9)	
Not sure/missing	255 (2.5)	55 (2.1)	14 (2.3)	70 (3.2)	116 (2.4)	
Number of past overdoses where needed someone else's help						<0.0001
0	6209 (60.9)	1508 (58.0)	341(55.1)	1207 (54.6)	3153 (66.2)	
1 or more	3849 (37.8)	1077 (41.4)	258 (41.7)	973 (44.0)	1541 (32.3)	
Missing	138 (1.4)	14 (0.5)	20 (3.2)	32 (1.4)	72 (1.5)	
Number of times entered drug treatment						<0.0001
0	3518 (34.5)	559 (21.5)	176 (28.4)	775 (35.0)	2008 (42.1)	
1 or more	6581 (64.5)	2034 (78.3)	428 (69.1)	1413 (63.9)	2706 (56.8)	
Missing	97 (1.0)	6 (0.2)	15 (2.4)	24 (1.1)	52 (1.1)	
Days outpatient substance use treatment attendance in past 30 days						<0.0001
0	7186 (70.5)	1322 (50.9)	461 (74.5)	1804 (81.6)	3599 (75.5)	
1 or more	2364 (23.2)	1059 (40.7)	111 (17.9)	283 (12.8)	911 (19.1)	
Missing	646 (6.3)	218 (8.4)	47 (7.6)	125 (5.7)	256 (5.4)	
Emotional abuse ever						<0.0001
No	2147 (21.1)	513 (19.7)	156 (25.2)	399 (18.0)	1079 (22.6)	
Yes	7726 (75.8)	2035 (78.3)	427 (69.0)	1723 (77.9)	3541 (74.3)	
Not sure/missing	323 (3.2)	51 (2.0)	36 (5.8)	90 (4.1)	146 (3.1)	
Physical abuse ever						<0.0001
No	2985 (29.3)	772 (29.7)	214 (34.6)	562 (25.4)	1437 (30.2)	
Yes	6930 (68.0)	1776 (68.3)	377 (60.9)	1581 (71.5)	3196 (67.1)	
Not sure/missing	281 (2.8)	51 (2.0)	28 (4.5)	69 (3.1)	133 (2.8)	

	Overall (n = 10,196) Frequency (%)	Buprenorphine in specialty addiction treatment[a] (n = 2599) Frequency (%)	OBOT[b] (n = 619) Frequency (%)	Diverted buprenorphine[c] (n = 2212) Frequency (%)	No buprenorphine[d] (n = 4766) Frequency (%)	p-value
Sexual abuse ever						<0.0001
No	4396 (43.1)	1122 (43.2)	269 (43.5)	911 (41.2)	2094 (43.9)	
Yes	5470 (53.6)	1415 (54.4)	315 (50.9)	1213 (54.8)	2527 (53.0)	
Not sure/missing	330 (3.2)	62 (2.4)	35 (5.7)	88 (4.0)	145 (3.0)	

Abbreviations: office-based opioid treatment (OBOT).

[a]Women who reported using buprenorphine as part of an official medication-assisted therapy program one or more days in the past 30 days.

[b]Women who did not report using buprenorphine as part of an official medication-assisted therapy program but who reported using at least one type of buprenorphine only as part of a doctor-managed treatment for opioid addiction in the past 30 days.

[c]Women who reported using buprenorphine to treat addiction, but not as part of a doctor-managed treatment for opioid addiction, in the past 30 days.

[d]Women who did not report any buprenorphine use in the past 30 days.

[e]This question was asked as, “Have any of your children ever been taken away from you because of a child protective order or other legal proceeding?”

Table 3

Number of buprenorphine products used, reasons for using buprenorphine, and sources of buprenorphine among women of reproductive age with self-reported past 30-day nonmedical prescription opioid use and buprenorphine use in past 30 days, stratified by setting of past 30-day buprenorphine use, National Addictions Vigilance Intervention and Prevention Program, 2018–2020.

	Overall (*n* = 5430) Frequency (%)	**Buprenorphine in specialty addiction treatment[a] (n = 2599) Frequency (%)**	**OBOT[b] (n = 619) Frequency (%)**	**Diverted buprenorphine[c] (n = 2212) Frequency (%)**	**p-value**
Number of buprenorphine products used in past 30 days					<0.0001
1	3979 (73.3)	2045 (78.7)	418 (67.5)	1516 (68.5)	
2	908 (16.7)	366 (14.1)	121 (19.5)	421 (19.0)	
3	325 (6.0)	116 (4.5)	44 (7.1)	165 (7.5)	
4 or more	218 (4.0)	72 (2.8)	36 (5.8)	110 (5.0)	
Reasons for using buprenorphine[d]					
To treat bodily pain at the direction of a doctor	441 (8.1)	256 (9.9)	79 (12.8)	106 (4.8)	<0.0001
To self-treat bodily pain	808 (14.9)	220 (8.5)	71 (11.5)	517 (23.4)	<0.0001
To ease/avoid withdrawals	1729 (31.8)	622 (23.9)	163 (26.3)	944 (42.7)	<0.0001
To taper/wean myself off other drugs	865 (15.9)	328 (12.6)	91 (14.7)	446 (20.2)	<0.0001
To take a break from other drugs	379 (7.0)	105 (4.0)	49 (7.9)	225 (10.2)	<0.0001
To hold me over during work/social events	341 (6.3)	99 (3.8)	46 (7.4)	196 (8.9)	<0.0001
When unable to obtain drug of choice	897 (16.5)	191 (7.4)	66 (10.7)	640 (28.9)	<0.0001
To treat psychological or emotional symptoms	350 (6.4)	106 (4.1)	41 (6.6)	203 (9.2)	<0.0001
To get high	610 (11.2)	117 (4.5)	49 (7.9)	444 (20.1)	<0.0001
To alter my mood	353 (6.5)	75 (2.9)	33 (5.3)	245 (11.1)	<0.0001
Sources of buprenorphine procurement[d]					
My own prescription from one doctor	3179 (58.5)	2304 (88.7)	575 (92.9)	300 (13.6)	<0.0001
My own prescription from several doctors	74 (1.4)	43 (1.7)	16 (2.6)	15 (0.7)	0.0003
Bought it online without a doctor's visit	19 (0.3)	8 (0.3)	4 (0.7)	7 (0.3)	0.4145
Bought it from family or friend	1160 (21.4)	268 (10.3)	98 (15.8)	794 (35.9)	<0.0001
Bought it from a dealer (a known seller)	1193 (22.0)	313 (12.0)	99 (16.0)	781 (35.3)	<0.0001
Wrote or bought a fake prescription	14 (0.3)	5 (0.2)	4 (0.7)	5 (0.2)	0.1256
Stole them	116 (2.1)	33 (1.3)	18 (2.9)	65 (2.9)	<0.0001
Traded for it	412 (7.6)	91 (3.5)	50 (8.1)	271 (12.3)	<0.0001

	Overall (*n* = 5430) Frequency (%)	Buprenorphine in specialty addiction treatment[a] (n = 2599) Frequency (%)	OBOT[b] (n = 619) Frequency (%)	Diverted buprenorphine[c] (n = 2212) Frequency (%)	p-value
Given to me by family or friend	1180 (21.7)	289 (11.1)	100 (16.2)	791 (35.8)	<0.0001

Abbreviations: office-based opioid treatment (OBOT).

[a]Women who reported using buprenorphine as part of an official medication-assisted therapy program one or more days in the past 30 days.

[b]Women who did not report receiving using buprenorphine as part of an official medication-assisted therapy program but who reported using at least one type of buprenorphine only as part of a doctor-managed treatment for opioid addiction in the past 30 days.

[c]Women who reported using buprenorphine to treat addiction, but not as part of a doctor-managed treatment for opioid addiction, in the past 30 days.

[d]Not mutually exclusive.