Opioid Use and Treatment Among Pregnant Women

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Abstract

Women who misuse opioids during pregnancy are at risk for a variety of pregnancy-related complications. Further complicating this risk, pregnant women with opioid use disorder (OUD) also require medication-assisted treatment (MAT) to wean off opioids without causing harm to their fetus. The purpose of this study is to explore the association between opioid misuse and its treatment among pregnant women. Data for this secondary analysis came from the National Survey on Drug Use and Health (NSDUH), a cross-sectional study reflective of the population of the United States of America. A Pearson chi-square test identified: 1) the association between pregnancy status and self-identified need for treatment of prescription pain reliever misuse in the past year; and 2) the association between pregnancy status and past or current treatment for prescription pain relievers. Additionally, a bivariate logistic regression was used to assess the relationship between the self-identified need for treatment and past or current treatment. Among pregnant females, 0.90% (n=5) reported a self-identified need for treatment for prescription pain reliever misuse in the past 12 months compared to 0.32% (n=93) of non-pregnant females. Additionally, 26 (0.72%) of pregnant females reported past or current treatment for prescription pain relievers compared to 402 (0.37%) of non-pregnant females. In bivariate regressions, pregnant females were more likely to self-identify need for treatment (Adjusted Odds Ratio [aOR]=2.80; 95% Confidence Interval [CI]: 1.14-6.93), and they were more likely to receive treatment (aOR=1.95; 95% CI: 1.31-2.90) than non-pregnant females. These results suggest that pregnant women may understand the risks of opioid use during pregnancy and the benefits of MAT. Further research needs to be conducted to identify if this increase in treatment is due to better screening, better access to treatment, or fewer legal consequences for reporting opioid use during pregnancy.

Opioid Use and Treatment Among Pregnant Women

In their 1996 Budget Plan, Purdue Pharma established a goal to increase strong opioid prescription sales by 10% (Kaiser Family Foundation [KFF], 2018). The same year they introduced the new drug Oxycontin, an opioid pain reliever thought to be less addictive because of its slow-release properties (Cicero et al., 2005), and throughout the following years they spent millions annually on marketing (Zee, 2009). Only several years later, data collected by the Researched Abuse, Diversion, and Addiction-Related Survey (RADARS) demonstrated that Oxycontin was the leading drug of abuse in nearly 60% of reporting zip codes (Cicero et al., 2005), revealing Oxycontin to be a much more addictive than originally thought. This high rate of addiction was likely attributable to the previously set marketing goals. This aggressive push by Purdue Pharma became the fuel for the fire we refer to as the opioid epidemic.

From 1999 to 2015 the number of opioids prescribed in the United States increased from 180 morphine milligram equivalents (MME) per person prescribed in 1999 up to 640 MME per person prescribed in 2015 (CDC, 2017). This surge in the prescribing rate of opioids is theorized to be one of the primary causes of the current opioid epidemic. Although not everyone who is prescribed an opioid pain reliever becomes addicted, it is thought that addiction to prescription pain relievers leads to addiction to other opioids such as heroin and fentanyl, with an estimated 80% of heroin users first misusing a prescription pain reliever (National Institute on Drug Abuse [NIDA], 2015).

The effects of the opioid epidemic are widespread with impacts at the personal level, such as disturbed family dynamics, to impacts at the structural level, such as heavy burdens on healthcare. One of its primary effects is a steady increase in overdose deaths over the past 20

years. According to the National Institute on Drug Abuse, the overall number of deaths attributable to opioid overdose increased from less than 10,000 deaths per year in 1999 to more than 49,000 deaths per year in 2019 (KFF, 2022). Although overall opioid overdose deaths remain highest in males, the percentage of women dying from opioid overdoses has increased. In 1999, 34% of total opioid overdose deaths were among women, however, by 2019, this number had risen to 44% of total opioid overdose deaths (KFF, 2022). Compared to men, women have also been found to be more likely to have an opioid prescription with one study observing that 6.4% of women use a prescription opioid while the rate was only 4.9% among men (Goetz et al., 2021).

The higher rates of prescription opioid use among women are of notable concern because women become addicted to opioids more quickly than men and have a harder time quitting (Goetz et al., 2021), a finding which may be explained by women experiencing more acute and chronic pain relative to men. Furthermore, this is especially concerning for women of childbearing age (16-49 years). While not all women of childbearing age seek to become pregnant, the risk associated with using opioids while pregnant is high and the effects on the baby can be severe. One such side effect is neonatal abstinence syndrome (NAS), defined as a "withdrawal syndrome that can occur in newborns exposed to certain substances, such as opioids, during pregnancy" (CDC, 2021). Alongside the rise in prescription opioid use, the incidence of NAS has increased nearly 300% between 1999 and 2013 (CDC, 2017). This is of particular concern as, along with symptoms present immediately after birth, there are downstream neurodevelopmental challenges that are observed in babies affected by NAS alongside a general increase in morbidity and mortality (Anbalagan & Mendez, 2021).

Even among those ceasing use of opioids during pregnancy there is continued risk to the health of the fetus. Because of the fragility of the fetus during pregnancy, withdrawal from substance use during this key period of development can be dangerous, sometimes leading to miscarriage. Continued use of opioids during pregnancy, however, can also lead to lifelong complications for the baby. Although it can be hard to determine what lifelong complications are caused specifically by opioid use during pregnancy, multiple studies have observed that opioid-exposed infants have poor neurodevelopmental and cognitive outcomes (Anbalagan & Mandez, 2021). Thus, cessation of opioid use during pregnancy is best undertaken via medication assisted therapy (Tran et al., 2017), consisting of treatment with either buprenorphine or methadone. Although methadone used to be the standard of treatment, buprenorphine has been shown to decrease treatment time for the mother, decrease medication needed for the infant in the treatment of NAS, and decrease hospitalization time for neonates (Tran et al., 2017). Despite treatment being available for opioid use disorder during pregnancy, most women do not receive it due to several different causes, including legal implications surrounding admission of substance use during pregnancy, lack of universal screening for substance use, lack of provider knowledge about treatment options, and lack of accessibility to treatment (Tran et al., 2017).

The primary goal of this study is to analyze the number of pregnant women who misuse opioids and to determine both their views on treatment as well as if they are actually receiving treatment. Using these results, we will compare opioid use and treatment in the pregnant female population to opioid use and treatment in the nonpregnant female population. Lastly, we will propose several areas for further research.

Methods

Study Population

Data for this secondary data analysis came from the National Survey on Drug Use and Health (NSDUH), a cross-sectional study reflective of the population of the United States of America, including citizens in the United States and D.C. 12 years or older and excluding citizens who are institutionalized or unhoused. The Federal government has been conducting face-to-face interviews in respondents' homes since 1971, collecting information regarding use of tobacco, alcohol, and drugs as well as information regarding general health and mental health conditions.

Data from 2015 to 2019 were used to examine trends over time. The questionnaire was partially altered in 2015 to improve the quality of data. To avoid any issues with comparability to data before 2015 and to ensure the highest quality of the data, only data from 2015 onward was used. Although more recent data from 2020 is available, these data were excluded due to circumstances during the COVID-19 pandemic which skewed data collection and reporting.

The analytic sample included females ages 12 or older. All those who responded to questions regarding opioid use and pregnancy were included in the sample. For the purposes of analysis, data were aggregated across all study years and models were adjusted for year of data collection.

Measures

Demographic information was self-reported, including age and education. Age was recoded in the NSDUH data to include the following categories: *12-17 years, 18-25 years, 26-24 years,* and *35 years and older.* Education was also recoded in the NSDUH data to include the

following categories: *less than high school, high school graduate, some college/associate, college graduate,* and *current students*. See Table 1 for demographic characteristics.

Opioid Dependence or Abuse

Opioid dependence or abuse was determined based on the criteria for dependence and abuse in the DSM-IV. The definition of opioid abuse or dependence included those who are either dependent on or abuse heroin and those who are either dependent on or abuse pain relievers. Abuse was determined with a positive response to three of the six following criteria:

- "spent a great deal of time over a period of a month getting, using, or getting over the effects of the substance"
- "unable to keep set limits on substance use or used more often than intended"
- "needed to use substance more than before to get desired effects or noticed that using the same amount had less effect than before"
- "unable to cut down or stop using the substance every time he or she tried or wanted to"
- "continued to use substance even though it was causing problems with emotions, nerves, mental health, or physical problems"
- "reduced or gave up participation in important activities due to substance use"

Furthermore, dependence was defined using these six criteria plus an additional seventh criteria related to withdrawal symptoms. Like abuse, dependence was defined as a positive response to three of the seven criteria.

Prescription Pain Reliever Misuse

A part of opioid misuse is prescription pain reliever misuse. NSDUH defines prescription pain reliever misuse as using prescription pain relievers in a way not directed by a doctor. This could be using prescription pain relievers "without a prescription of their own, in greater

amounts, more often, or longer than you were told to take it, or any other way a doctor did not direct you to use it". Participants were asked "have you ever, even once, used any prescription pain reliever in any way a doctor did not direct you to use it?"

Opioid Misuse

Past opioid misuse was recoded to determine both past month and past year opioid misuse. Participants who answered yes to using heroin or to using prescription opioids in a way that was not directed by a doctor and indicated this misuse was in the last month were recoded as answering "*yes*" to misusing opioids in the past month. Likewise, participants who answered yes to heroin use or prescription pain reliever misuse and indicated that it was used within the past year were recoded as answering "*yes"* to misusing opioids in the past year.

Treatment

Participants self-reported whether they needed treatment or counseling for the use of prescription pain relievers in the past 12 months (NDTXYRPNR). Treatment was either "*needed*" or "*not needed*" with "*needed*" including all those who answered "*yes*" to needing treatment. "*Needed"* also included those who were logically assigned "*yes*" and those who had received treatment for drug or alcohol use in the past 12 months (TXYRRECVD). Those who did not need treatment included those who answered "*no*" to needing treatment, were logically assigned "*no*", and those who never used drugs or alcohol. This variable was used to look at self-identified need for treatment, regardless of whether treatment for opioid misuse was received.

Participants were subsequently asked whether their last treatment sought was for use of prescription pain relievers. They were asked, "the last time you entered treatment, did you receive treatment or counseling for your use of prescription pain relievers?" Secondarily, "Are you currently receiving treatment or counseling for your use of prescription pain relievers?"

"*Yes*" included those who answered "*yes*" to either of those questions and those who "*yes*" was logically assigned to. "*No/unknown*" included those who answered "*no*" to either of those questions, those who never used prescription pain relievers, those who never used drugs or alcohol, those who didn't know, or those who refused to answer. This variable was used to determine actual treatment received. Using these two treatment variables, we were able to compare those who identified a need for treatment and those who actually received treatment.

Data Analysis

Using Excel software, a Pearson chi-square test was run to identify an association between pregnancy status, including only those who reported being pregnant at the time of the survey, and the self-identified need for treatment for prescription pain reliever misuse in the past year. Additionally, another Pearson chi-square test looked for an association between pregnant women and actual past or current treatment for prescription pain relievers. Finally, a bivariable logistic regression was used to assess the relationship between the self-identified need for treatment for prescription pain reliever misuse in the past year and past or current treatment for the misuse of prescription pain relievers.

Results

Between 2015 and 2019, there were 133,507 females between the ages of 12 and 44 who completed the NSDUH survey. Demographics can be found in Table 1 below.

Of the females who respond to this survey, 2.7% (n=3,657) were pregnant and 0.96% (n=35) of these reported misusing opioids in the past month while 5.5% (n=202) reported misuse of opioids within the last 12 months. Further, 1.1% (n=39) of pregnant females reported opioid dependence or abuse in the past year. This is proportionate to the number of nonpregnant females who reported opioid misuse compared to those who reported opioid dependence or abuse (5.1%

vs. 0.92%). Among all women, only 0.33% (n=98) reported needing treatment for the use of prescription pain relievers in the past 12 months. However, 0.9% of pregnant females reported a self-identified need for treatment for use of prescription pain relievers in the past 12 months compared to 0.32% of non-pregnant females indicating a significant association (p=0.019) between pregnancy and a self-identified need for treatment.

Additionally, there is a significant association (p=0.001) between pregnancy and past or current treatment with 0.72% (n=26) of pregnant females reporting past or current treatment for prescription pain relievers compared to 0.37% (n=402) of non-pregnant females. Finally, pregnant females were more likely to self-identify need for treatment (aOR=2.8; 95% CI: 1.14-6.93), and they were more likely to receive treatment (aOR=1.95; 95% CI: 1.31-2.9), than non-pregnant female.

Table 1

Demographics of Females in the Analytic Sample, The National Survey on Drug Use and Health, 2015-2019

	Not Pregnant		**Pregnant**		**Total**		
Variable	n	%	n	%	n	%	P
Year of data collection							0.032
2015	22614	20.6	791	21.6	23405	21.0	
2016	22092	20.1	732	20.0	22824	20.1	
2017	21718	19.8	737	20.2	22455	20.0	
2018	21622	19.7	746	20.4	22368	19.7	
2019	21804	19.9	651	17.8	22455	20.0	
Age Category							< .001

12-17 years	33100	30.1	117	3.2	33217	29.0	
18-25 years	34266	31.2	1713	46.8	35979	31.7	
26-34 years	22201	20.2	1457	39.8	23658	21.0	
35 or older	20283	18.5	370	10.1	20653	18.2	
Education							< .001
Less than high school	8639	7.9	504	13.8	9143	8.1	
High school graduate	18138	16.5	983	26.9	19121	16.9	
Some college/Associate	28991	26.4	1102	30.1	30093	26.5	
College Graduate	20982	19.1	951	26.0	21933	19.3	
Current students	33100	30.1	117	3.2	33217	29.3	
Opioid past month misuse							0.006
Did not misuse in past month	108179	98.5	3622	99.0	111801	98.5	
Misused in the past month	1671	1.5	35	1.0	1706	1.5	
Opioid past year misuse							0.205
Did not misuse in the past year	104296	94.9	3455	94.5	107751	94.9	
Misused in the past year	5554	5.1	202	5.5	5756	5.1	
Opioid dependence or abuse in past year							0.374
No	108836	99.1	3618	98.9	112454	99.1	
Yes	1014	0.9	39	1.1	1053	0.9	

Need treatment for use of prescription pain relievers in past 12 months							0.019
Not needed	29074	99.7	557	99.1	29631	99.7	
Needed	93	0.3	5	0.9	98	0.3	
Received past or current treatment for pain relievers							0.001
No/unknown	109448	99.6	3631	99.2	112079	99.6	
Yes	402	0.4	26	0.7	428	0.4	

Discussion

This study of opioid use disorder among pregnant women used a publicly available dataset to observe not only the rates of opioid use among pregnant women, but also the likelihood of treatment for pregnant women compared to non-pregnant women. Overall, no statistically significant differences were observed in the prevalence of opioid use between pregnant and non-pregnant females. However, looking at self-identified need for treatment, more pregnant women reported a need for treatment relative to nonpregnant women. Additionally, pregnant women received treatment for opioid use more frequently than nonpregnant women. These results suggest an awareness of the risks of opioid use during pregnancy and an understanding of the benefits of MAT.

According to the Substance Abuse and Mental Health Services Administration (SAMHSA, 2020), 3.3% of women aged twelve or older reported misuse of opioids in 2019.

Results of this study show that 5.1% of women aged 12 to 44 misused opioids in the past year. This suggests that women of childbearing age may be more likely to misuse opioids than women of all ages. One study done in 2017 using the NSDUH data from 2007 to 2012 indicated that 0.9% of pregnant females reported opioid misuse in the past month (Smith & Lipari, 2017). This is comparable to the average from 2015 to 2019 with 0.96% of pregnant women reporting misuse of opioids in the past month. According to data from the CDC, 2.9% of pregnant women reported misuse of prescription opioids during pregnancy in 2019 (Ko et al., 2020) compared to the 1.0% of pregnant females reporting misuse in the past month observed in this study.

Like the findings in this study, previous research by Ko et al. (2020) reported that a higher number of pregnant females who misused prescription opioids reported wanting or needing to cut down or stop using compared to pregnant females who used a prescription opioid as prescribed by a healthcare provider. The findings that more pregnant women reported needing treatment for prescription pain relievers than non-pregnant women align with those previous findings and support the idea that women generally understand there are risks associated with opioid use during pregnancy. Furthermore, like our findings that pregnant women were more likely to receive treatment for prescription pain relievers, previous evidence using the Treatment Episode Data Set from SAMHSA also reported a greater proportion of medication assisted treatment planned for pregnant females admitted for treatment compared to nonpregnant females (Smith & Lipari, 2017). More research could be done to study what kind of treatment pregnant women are receiving when admitted.

Limitations

There are several limitations associated with this study. Because all variables were self-reported survey responses, there exists the potential that responses were not reported accurately due to unintentional and intentional misrepresentation of responses. With this study particularly, there is concern for misrepresentation because of the sensitive nature of the subject of opioid misuse and abuse, especially during pregnancy. Respondents may have felt pressure to respond in a certain manner because of the stigma related to the topic. Additionally, data from NSDUH are cross-sectional and provide only a snapshot of data at a certain point in time. Longitudinal data would have provided the opportunity to study these variables throughout time. Finally, one other limitation with these data is that respondents were not directly asked about opioid use during pregnancy, only about using during the past month and the past year.

Conclusions

In summary, the proportion of pregnant women using opioids is not more than that of the general population of women. Overall, both fewer women of childbearing age and fewer pregnant women reported misusing opioids than previously demonstrated in research. Looking at treatment, there were more pregnant women who self-identified need for treatment and more that reported receiving treatment. Further research could be done to determine different factors related to why they received treatment; was there a personal motivation for treatment, did a healthcare provider screen for opioid use disorder and recommended treatment, or was there someone else in their life who encouraged treatment? Another factor to study would be who paid for treatment. Previous research identifies cost as a barrier to receiving treatment, therefore, it could be an important factor to study for those who did receive treatment. This could have important impacts on where funding for treatment is allocated. Overall, the results are

encouraging, supporting that there may have been improvement in access to treatment, however, there are still strides to be made when it comes to providing MAT treatment to all pregnant women with opioid use disorder.

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