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Association of Pregnancy Intentions with Substance Use During Early Pregnancy

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Abstract

Objectives: The goal of this study was to evaluate the association between pregnancy intentions and substance use in early pregnancy among pregnant women receiving prenatal care in a large, integrated healthcare system.

Methods: The sample comprised 29,787 Kaiser Permanente Northern California pregnant women (12.1% aged <25, 36.4% non-Hispanic White) screened for prenatal substance use in 2018 via a self-reported questionnaire and urine toxicology test given as part of standard prenatal care (at ~8 weeks gestation). Multivariable logistic regression models tested for associations of pregnancy intentions with prenatal substance use (any use and specific substances) by self-report and/or a positive urine toxicology test.

Results: Adjusting for covariates, women with an unintended pregnancy (23.9% of the sample) had higher odds of any prenatal substance use than women with an intended pregnancy (28.8% vs. 16.1%; adjusted odds ratio [aOR]=1.80, 95% confidence interval [CI]:1.67–1.93). Having an unintended pregnancy was also associated with higher odds of using alcohol (14.4% vs.10.4%; aOR=1.73, 95% CI:1.59–1.89), cannabis (15.6% vs. 5.6%; aOR=1.91, 95% CI:1.73–2.11), nicotine (3.8% vs. 1.3%; aOR=2.33, 95% CI:1.92–2.82), pain medication (2.3% vs. 1.2%; aOR=1.64, 95% CI:1.32–2.03), and stimulants (0.8% vs. 0.3%; aOR=1.85, 95% CI:1.23–2.79) early in pregnancy.

Discussion: Having an unintended pregnancy was associated with higher odds of substance use during early pregnancy. Connecting women of reproductive age with health education about pregnancy prevention and recognition of early signs of pregnancy, effective contraception, and

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early screening and interventions for prenatal substance use may help to reduce prenatal substance use and its associated consequences.

Keywords

Prenatal; substance use; pregnancy intentions; health care; screening

Prenatal substance use is an important public health issue with significant potential harms for mothers and their offspring.^{1–3} Women not intending to get pregnant may be particularly at risk for prenatal substance use prior to recognition of pregnancy, as they are less likely to recognize early pregnancy signs and more likely to enter prenatal care late than women with intended pregnancies.⁴ Further, relative to women who do not report drug use prior to pregnancy, those who do are less likely to report contraception use and less likely to think that they could get pregnant at the time of conception.⁵

Prior research indicates that having an unintended pregnancy is associated with greater odds of self-reported cigarette smoking, illicit drug use, and alcohol use during pregnancy^{4–9}; however, most studies are limited to retrospectively self-reported substance use and pregnancy intentions after delivery.

We use data from a large integrated healthcare system with universal screening for prenatal substance use by self-report and urine toxicology testing to examine the relation between pregnancy intentions and substance use during early pregnancy. Findings will improve understanding of how pregnancy intentions relate to early prenatal substance use and can be used to develop tailored interventions for women across the lifecourse, focused on both reproductive planning and risky substance use.

METHODS

Kaiser Permanente Northern California (KPNC) is a nonprofit healthcare delivery system serving >4 million racially and ethnically diverse patients representative of the northern California population. Of 56,471 pregnancies in 2018, 50,037 (88.6%) were screened for prenatal substance use via the self-administered questionnaire. All pregnancies with a 2018 questionnaire completed in the first trimester of pregnancy (at ~8 weeks gestation) with valid responses for the substances of interest were considered for inclusion (N=44,661). Of those pregnancies, 4,468 (10.0%) without a urine toxicology test, 10,151 (22.7%) missing data on pregnancy intentions, and 255 (0.6%) second pregnancies in 2018 were excluded. Those excluded were similar to those included on socio-demographics and clinical characteristics; all effect sizes for the magnitude of association (possible range: 0.0–1.0) between study inclusion and socio-demographic factors or clinical characteristics were 0.03. The final sample included N=29,787 women. The KPNC IRB approved this study and waived consent.

Pregnancy intentions were assessed at the first prenatal visit and included: intended (“wanting to get pregnant”) and unintended (“wanting to get pregnant, but not at this time,” or “not wanting to get pregnant at all”).

Early prenatal substance use included: 1) any self-reported use of alcohol, nicotine, cannabis, pain medication, or stimulants (cocaine/crack or methamphetamine) “since pregnancy” on the self-administered prenatal screening questionnaire, and/or: 2) a confirmed positive universal urine toxicology test for ethanol, cannabis, opiates, or stimulants (cocaine, amphetamine/methamphetamines). The self-reported pain medication question only included prescription opioid pain medication examples (“Vicodin, Norco, Oxycontin, Percocet, Codeine, etc.”); “yes” responses that indicated only use of over-the-counter pain medications in free-text comments were recoded as “no” (n=30, 0.1%). Gestational age at screening was dichotomized (< 8 or 8–12 weeks).

ICD-10 codes were used to define substance use and depressive or anxiety disorders in the year prior to pregnancy (see Table 1).

Socio-demographics included age, self-reported race/ethnicity, self-reported living situation (with partner/baby’s father or not), Medicaid status, and census-based median neighborhood household income. Parity was based on the patient’s obstetric history for the pregnancy in which they were screened. All data were extracted from the electronic health record.

The adjusted odds ratios (aOR) and 95% confidence intervals (CI) of prenatal substance use (any, type, and number used (0, 1, 2, or 3) by pregnancy intentions were estimated using logistic regression. All analyses were performed in SAS 9.4.

RESULTS

The sample (N=29,787) was 36.4% non-Hispanic White, 12.1% were aged <25, 46.4% were nulliparous (Table 1), and the average median neighborhood household income was \$73,242. Women with unintended (23.9%) versus intended pregnancies were younger, with lower incomes, more likely to be African-American or Hispanic (versus non-Hispanic White), and have a past-year depressive, anxiety, or substance use disorder, and less likely to live with partner/baby’s father or receive screening < 8 weeks of gestation (Table 1).

In multivariable logistic regression analyses, women with unintended versus intended pregnancies had greater odds of prenatal use of cannabis (aOR=1.91,95%CI:1.73–2.11), alcohol (aOR=1.73,95%CI:1.59–1.89), nicotine (aOR=2.33,95%CI:1.92–2.82), pain medication (aOR=1.64,95%CI:1.32–2.03), stimulants (aOR=1.85,95%CI:1.23–2.79), any substance (aOR=1.80,95%CI:1.67–1.93) (Figure 1), and 1 (aOR=1.65,95%CI:1.53–1.78), 2 (aOR=2.56,95%CI:2.18–3.01), and 3 substances (aOR=3.84,95%CI:2.74–5.37).

DISCUSSION

Our study of women universally screened for substance use and pregnancy intentions in standard prenatal care found that unintended pregnancies were associated with higher odds of substance use during early pregnancy. Results support prior research,^{4–9} and add novel data showing the strength of the association increases with number of substances used and varies by substance type, with the strongest associations found for prenatal nicotine, cannabis and stimulant use.

Similar to prior research, women with unplanned pregnancies an unplanned versus planned pregnancy had lower socio-economic status,^{10,11} were younger, less likely to live with a partner/child's father, and more likely to have a past-year depressive, anxiety, or substance use disorder. Results indicate that unplanned pregnancies occur in the context of additional socio-economic and psychosocial risk factors and suggest that they may reflect more complex and less stable life circumstances that could contribute to greater prenatal substance use. Further, pregnancy intentions were associated with substance use during early pregnancy even after adjusting for socio-economic and psychosocial factors. While women's emotional reaction to the pregnancy can be positive or negative regardless of intention^{12,13}, greater prenatal substance use among women with an unintended pregnancy could reflect an attempt to cope with an unplanned pregnancy.

Women with unplanned pregnancies are less likely to recognize early pregnancy signs⁴ and were screened later in pregnancy, indicating they entered prenatal care later. To the extent that greater prenatal substance use reflects substance use prior to pregnancy recognition, providing women of reproductive age with tools to prevent unwanted pregnancies and education about recognizing signs of early pregnancy may help to prevent prenatal substance use.

Study strengths include assessment of pregnancy intentions and substance use during pregnancy rather than after delivery, and a combination of self-report and urine toxicology data via universal screening during prenatal care. However, the screening occurs at the first prenatal visit, does not reflect continued substance use, we cannot determine whether prenatal substance use occurred before versus after pregnancy recognition, and findings may not generalize to the uninsured. Women with an early pregnancy loss or abortion prior to seeking prenatal care are not included, and women may be reluctant to self-report an unintended pregnancy during prenatal care, thus, the number of unintended pregnancies is likely underestimated. Finally, urine toxicology data were not available for nicotine, we are unable to determine whether stimulants and pain medications were prescribed, and self-reported pain medication may include some over-the-counter pain medications.

CONCLUSIONS

Women with unintended pregnancies seeking prenatal care have elevated odds of using substances during early pregnancy. Linking women of reproductive age with contraception services and reproductive health education about pregnancy prevention and recognition of early pregnancy signs may help reduce prenatal substance use. Further, prenatal substance use often reflects continued use from before pregnancy and early screening and referral for addiction treatment when needed can improve the health of mothers and their children.^{14–15} Future longitudinal studies can inform prevention and intervention strategies to reduce prenatal substance use.

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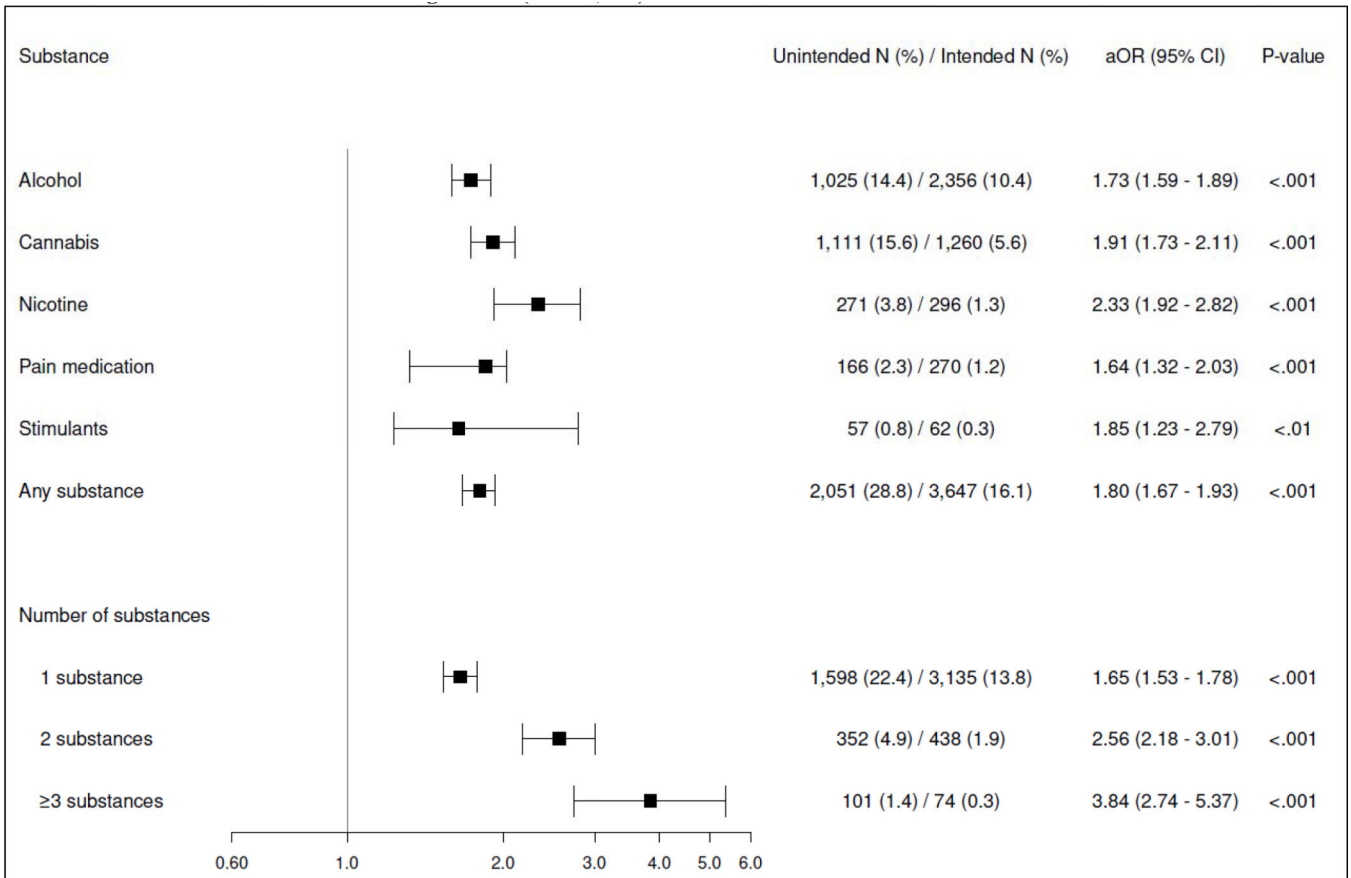


Figure 1. Prevalence and Adjusted Odds Ratios (aOR) with 95% Confidence Intervals (CI) for Substance Use During Pregnancy for Women with Unintended vs. Intended Pregnancies (N = 29,787)

Notes. Cannabis, nicotine, pain medication, stimulants, and any substance use aORs reflect results from separate multivariable logistic regression models. The aORs for 1, 2, or 3 substances were from a multivariable logistic regression model (reference = no substances). All models were adjusted for parity, age, race/ethnicity, median household income, Medicaid, depressive or anxiety disorder in the year before pregnancy, substance use disorder in the year before pregnancy, currently living with partner/baby’s father, and whether prenatal screening occurred within 8 weeks of gestation. Stimulants were significant at <.01, all other analyses were significant at p<.001. Median household income was imputed with median value for the cohort for 38 pregnancies (0.1%). Missing data on whether a woman was living with partner/baby’s father for 577 pregnancies (1.9%) were included as a separate category in analyses.

Characteristics of 29,787 Women in Kaiser Permanente Northern California (KPNC), 2018, Overall and by Pregnancy Intentions

Table 1.

Characteristics	Total N=29,787			Intended N=22,664 (76.1%)			Unintended N=7,123 (23.9%)		
	N (%) ^a	N (%) ^a	N (%) ^a	N (%) ^a	N (%) ^a	N (%) ^a	N (%) ^a	N (%) ^a	P-value
Age (years)									<.0001
<25	3,611 (12.1)	1,763 (7.8)	1,848 (25.9)						
25–34	18,699 (62.8)	14,809 (65.3)	3,890 (54.6)						
>34	7,477 (25.1)	6,092 (26.9)	1,385 (19.4)						
Race/ethnicity									<.0001
Asian/Pacific Islander	7,849 (26.4)	6,425 (28.3)	1,424 (20.0)						
African-American	1,913 (6.4)	1,048 (4.6)	865 (12.1)						
Hispanic	7,861 (26.4)	5,319 (23.5)	2,542 (35.7)						
Other ^b	1,310 (4.4)	994 (4.4)	316 (4.4)						
Non-Hispanic White	10,854 (36.4)	8,878 (39.2)	1,976 (27.7)						<.0001
Median household income (\$) ^c									
< 50,783	7,438 (25.0)	5,189 (22.9)	2,249 (31.6)						
50,783 – 69,286	7,436 (25.0)	5,584 (24.6)	1,862 (26.0)						
69,287 – 91,544	7,440 (25.0)	5,816 (25.7)	1,624 (22.8)						
> 91,544	7,435 (25.0)	6,049 (26.7)	1,386 (19.5)						
Medicaid	2,067 (6.9)	1,166 (5.1)	901 (12.6)						<.0001
Parity									<0.01
Nulliparous	13,811 (46.4)	10,614 (46.8)	3,197 (44.9)						
Parous	15,976 (53.6)	12,050 (53.2)	3,926 (55.1)						
Depressive or anxiety disorder ^d	4,039 (13.6)	2,760 (12.2)	1,279 (18.0)						<.0001
Substance use disorder ^e	790 (2.7)	444 (2.0)	346 (4.9)						<.0001
Living with partner/baby's father ^f									<.0001
Yes	26,565 (90.9)	21,210 (95.5)	5,355 (76.4)						
No	2,645 (9.1)	989 (4.5)	1,656 (23.6)						
Timing of Prenatal substance use screening									

Characteristics	Total N=29,787		Intended N=22,664 (76.1%)		Unintended N=7,123 (23.9%)		P-value
	N (%) ^d	N (%) ^d	N (%) ^d	N (%) ^d	N (%) ^d	N (%) ^d	
Median # of weeks gestation (IQR)	8.0 (2.0)	8.0 (2.0)	8.0 (2.0)	8.0 (3.0)	8.0 (3.0)	<.0001	
% within 8 weeks gestation	17,550 (58.9)	13,919 (61.4)	13,919 (61.4)	3,631 (51.0)	3,631 (51.0)	<.0001	
Prenatal substance use							
Alcohol	3,381 (11.4)	2,356 (10.4)	2,356 (10.4)	1,025 (14.4)	1,025 (14.4)	<.0001	
Cannabis	2,371 (8.0)	1,260 (5.6)	1,260 (5.6)	1,111 (15.6)	1,111 (15.6)	<.0001	
Nicotine	567 (1.9)	296 (1.3)	296 (1.3)	271 (3.8)	271 (3.8)	<.0001	
Pain medication	436 (1.5)	270 (1.2)	270 (1.2)	166 (2.3)	166 (2.3)	<.0001	
Stimulants	119 (0.4)	62 (0.3)	62 (0.3)	57 (0.8)	57 (0.8)	<.0001	
Any substance	5,698 (19.1)	3,647 (16.1)	3,647 (16.1)	2,051 (28.8)	2,051 (28.8)	<.0001	
Number of prenatal substances							
0	24,089 (80.9)	19,017 (83.9)	19,017 (83.9)	5,072 (71.2)	5,072 (71.2)	<.0001	
1	4,733 (15.9)	3,135 (13.8)	3,135 (13.8)	1,598 (22.4)	1,598 (22.4)	<.0001	
2	790 (2.6)	438 (1.9)	438 (1.9)	352 (4.9)	352 (4.9)	<.0001	
3	175 (0.6)	74 (0.3)	74 (0.3)	101 (1.4)	101 (1.4)	<.0001	

Notes.

^aPercentages may not add to 100 due to rounding to 0.1 percent.

^bIncludes women with Other, Unknown or Multiracial race/ethnicity.

^cMedian household income was missing for 38 pregnancies (0.1%), imputed with median value for the cohort.

^dICD-10 diagnoses in the year prior to pregnancy: F32.*, F33.*, F34.1, F41.*, F42.*, F43.*, F43.0, excluding F32.5, F33.42.

^eICD-10 diagnoses in the year prior to pregnancy: F10.*-F19.*, excluding "in remission" codes.

^fMissing data for 577 pregnancies (1.9%), included as a separate category in analyses (result not shown).

^gIQR = interquartile range.