

Pre-Pregnancy Binge Drinking and Maternal Mental Health: 2016-2019 Update

Background

Healthy People 2030 has a national objective of achieving 92.2% alcohol abstinence during pregnancy.¹ Previous research has examined factors that may inform clinical screening and interventions. For example, women who drink during pregnancy may do so because they do not yet know they are pregnant.^{2,3,4}

Binge drinking, defined for women as four or more drinks over a short time, has serious risks. Health problems associated with binge drinking among the maternal and infant population include unintended pregnancy, poor pregnancy outcomes, sudden infant death syndrome, and fetal alcohol spectrum disorders.⁵ Moreover, some research indicates that binge drinking is associated with more frequently reported poor mental health days⁶ while binge drinking before pregnancy is related to maternal mental health outcomes.^{2,7}

This report focuses on the relationship between maternal mental health and preconception binge drinking among Oklahoma mothers. A general demographic profile of the mothers who binge drink is included for insights into populations that may be of increased risk.

Methods

This analysis used Phase 8 Oklahoma PRAMS data from 2016 to 2019. The PRAMS sampling frame includes a subset of birth certificate data; it provides estimates of maternal behaviors and experiences before, during, and shortly after pregnancy. Prevalence rates and 95% confidence intervals (C.I.) were calculated. Associations were tested using the Cochran-Mantel-Haenszel Chi-Square (x2) Test. All analysis was done using SAS callable SUDAAN. Variables were considered significant at $p < 0.05$. Data weighting procedures and detailed methodology are described elsewhere.⁸

Results from the 2013 PRAMSgram *Pre-pregnancy Binge Drinking and Postpartum Depression*, which used Phase 6 Oklahoma PRAMS data from 2009-2010, are included for comparative purposes where applicable. For Phase 8, of the 11,410 mothers surveyed between 2016 and 2019, 6,182 responded, which yielded a weighted response rate of 56.1%. Mothers responded to the question, "During the 3 months before you got pregnant, how many times did you drink 4 alcoholic drinks or more in a 2-hour time span?"

Response choices were: 6 or more times, 4 to 5 times, 2 to 3 times, 1 time, I didn't have 4 drinks or more in a 2-hour time span.

OKLAHOMA FACTS

From 2016-2019,
27.5% of mothers reported binge drinking at least 1x in the 3 months before pregnancy

From 2016-2019, prevalence of depression 3 months before pregnancy & during pregnancy was significantly higher among mothers who binge drank compared to those who did not

(**24.6%** vs **17.7%** before;
22.7% vs **16.5%** during)

The prevalence of binge drinking among mothers who experienced postpartum depression decreased from **24.1%** in 2009-2010 to **18.8%** in 2016-2019

The prevalence of mothers who engaged in binge drinking & experienced the stressor of "someone close to me had a problem with drinking or drugs" increased from **28.2%** in 2009-2010 to **36.6%** in 2016-2019



The binge drinking question changed slightly from the Phase 6 to Phase 8 survey (from “During the 3 months before you got pregnant, how many times did you drink 4 alcoholic drinks or more in one sitting? A sitting is a two hour time span.”), which may have affected mothers’ interpretation. Response options remained the same across phases. In addition, respondents were asked about stressors during the 12 months before their new baby was born, depression before or during pregnancy, and depression symptoms after pregnancy.

Results

Table 1 shows the comparison of the distribution of mothers who binge drank in 2009-2010 and 2016-2019. According to 2009-2010 data, binge drinking was most common among mothers with greater than a high school (HS) education. Other characteristics were not statistically significant by binge drinking status. The 2016-2019 data indicate that binge drinking was most common among mothers who were 20-29 years old, Non-Hispanic (NH) White, and those with lower annual household incomes. Differences in educational attainment levels and area of residence were not statistically significant by binge drinking status.

Table 1: Oklahoma Mothers Who Reported Binge Drinking in the 3 Months Before Pregnancy, Oklahoma PRAMS

Characteristics	Binge Drinking 2009-2010 Rate	Binge Drinking 2016-2019 Rate
Age		
<20 yrs	11.6%	5.5%*
20-29 yrs	67.2%	64.1%*
≥30 yrs	21.2%	30.4%*
Race & Hispanic Origin		
NH-White	72.4%	63.0%*
NH-Black	5.7%	6.0%*
NH-American Indian	9.4%	10.8%*
NH-Other	12.4%	10.2%*
Hispanic	7.0%	10.0%*
Annual Household Income		
< \$24,001	(Not included due to differences in income measurement between Phases 6 & 8)	40.9%*
\$24,001 - \$48,000		20.5%*
\$48,001 - \$73,000		14.3%*
> \$73,000		24.1%*
Education		
<HS	20.1%*	11.1%
HS	33.5%*	25.3%
>HS	46.4%*	63.6%
Area of Residence		
Urban	(Not included in the 2013 PRAMSgram analysis)	63.3%
Rural		36.7%

*Significant for binge drinking versus non-binge drinking at $p < 0.05$

Figure 1 shows that from 2016-2019, 27.5% of mothers reported binge drinking at least once in the 3 months before pregnancy. This is a decrease from 2009-2010, when 46.8% of mothers reported binge drinking during the 3 months before pregnancy.⁹

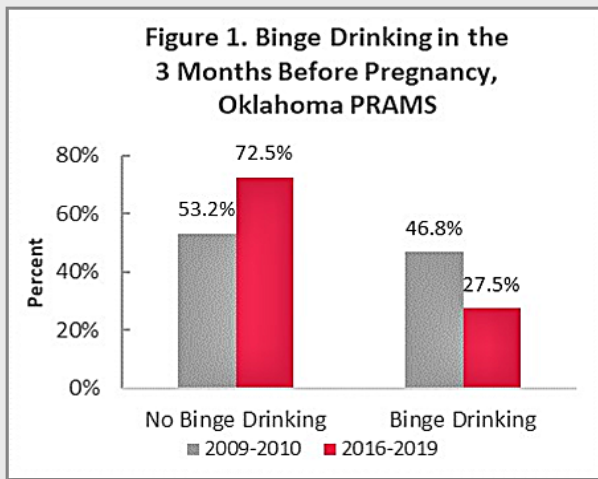
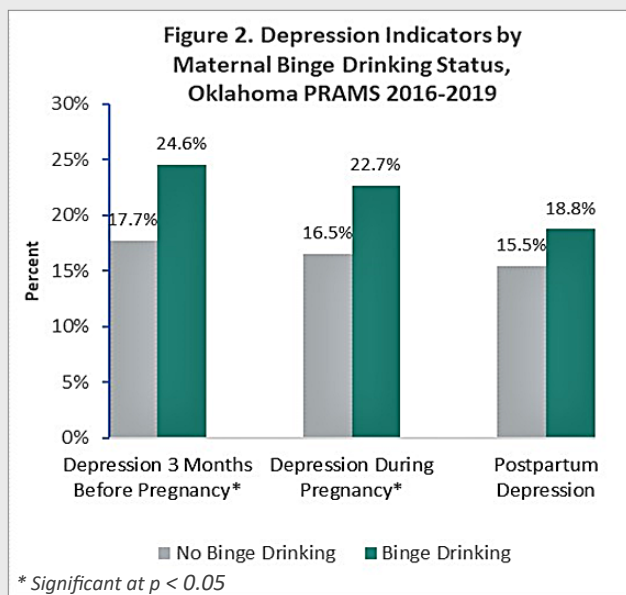


Figure 2 highlights the 2016-2019 prevalence of self-reported depression and depression symptoms among mothers who engaged in binge drinking before pregnancy.

Prevalence of depression 3 months before pregnancy and during pregnancy from 2016-2019 was significantly higher among mothers who binge drank compared to those who did not (24.6% vs. 17.7% before pregnancy; 22.7% vs. 16.5% during pregnancy). Mothers reporting postpartum depression symptoms had no significant differences in the prevalence of binge drinking during this period.



The prevalence of binge drinking among mothers who experienced postpartum depression decreased from 24.1% in 2009-2010 (data not shown) to 18.8% in 2016-2019.

The prevalence of binge drinking among mothers from 2016-2019 who experienced stressors in the 12 months before their baby was born is in **Table 2**.

Stressor	Binge Drinking Rate
Husband, partner, or I went to jail*	42.6%
Someone close to me had a problem with drinking or drugs*	36.6%
Husband/partner did not want pregnancy*	36.4%
Separation or divorce*	36.1%
Apart from husband/partner due to military or work	33.5%
Problems paying bills*	33.0%
Argued with husband/partner more than usual*	32.8%
I lost my job	32.3%
Moved*	31.1%
Husband/partner lost job	30.6%
Close family member hospitalized	29.9%
Someone close passed away	29.1%

*Significant at $p < 0.05$

PRAMS data from 2009-2010 showed the prevalence of binge drinking was lowest among mothers who reported experiencing no stressors before their baby was born (13.8%, data not shown). The prevalence of mothers who engaged in binge drinking and experienced the stressor of “someone close to me had a problem with drinking or drugs” increased from 28.2% in 2009-2010 to 36.6% in 2016-2019 (2009-2010 data not shown).

Limitations

Data were self-reported, which is subject to recall or social desirability bias, and may have contributed to an underreporting of alcohol consumption. Moreover, the binge drinking question changed slightly from the Phase 6 to Phase 8 survey, which may have affected mothers’ interpretation. The authors did not verify depression through medical records but relied on self-reporting.

Discussion

This study showed the association between binge drinking and other factors such as depression symptoms, and stressors. Research shows that many women do not know they are pregnant until nearly six weeks gestation.^{10,11} This is an important consideration when discussing binge drinking 3 months before pregnancy and underscores the need for thorough preconception counseling on risk behaviors such as alcohol use.

From 2016-2019 at the time of pregnancy, around 1 in 3 mothers who binge drank had an unintended pregnancy; approximately 1 in 5 mothers were unsure if they wanted to be pregnant or not.¹² Women who have unintended pregnancies or are unsure if they want pregnancy and engage in binge drinking may not have enough of an alcohol abstinence period between binge drinking and conception to negate harmful effects, leading to pregnancies exposed to alcohol. Therefore, all women need to be as healthy as possible before pregnancy and avoid alcohol overuse.

Stress, anxiety, traumatic events, and depression are all related to binge drinking.^{6,13} Within this study, a high percentage of mothers who engaged in binge drinking reported experience with the criminal justice system, having someone close with a drinking or drug problem, having a partner who did not want the pregnancy, or going through separation or divorce. The literature supports that these types of general life stressors can be related to binge drinking.¹⁴

Additionally, although there has been a decrease from 2009-2010 to 2016-2019 among Oklahoma mothers who binge drink 3 months before pregnancy, the distribution of binge drinking among certain populations remained high. Alcohol use as a coping mechanism for dealing with difficult circumstances, including general life stress, exposure to disasters, experiencing maltreatment in childhood, and stress may explain these rates.¹³

Recommendations

Recommendations include the following:^{9,15,16}

- Support community and state efforts to reinforce abstinence from alcohol while trying to become pregnant, as well as during pregnancy.
- Increase public awareness on the harmful effects of alcohol use before and during pregnancy on infant health.
- Health care providers, including behavioral health professionals, should inquire routinely about alcohol consumption by women of childbearing age and advise them not to drink during pregnancy.
- Provide more treatment opportunities for women with substance abuse and mental health disorders before, during, and after pregnancy.
- Health care providers should explore and be familiar with multidisciplinary interventions, including access to behavioral health professionals and alcohol treatment services.
- Promote universal depression screening for women of childbearing age, with particular attention to postpartum women and women with a history of alcohol misuse.
- Educate health care providers to view every interaction with a female or male of reproductive age as an opportunity for preconception health counseling.

Conclusion

There is a need for comprehensive approaches to reduce alcohol use and binge drinking. There also needs to be more investigation into the interaction of psychosocial factors on binge drinking at different levels among women (e.g., individual, situational, environmental).¹³ SBIRT (Screening, Brief Intervention, and Referral to Treatment) is one approach used in Oklahoma to identify and prevent alcohol abuse and dependence and can be used in the maternity care context.¹⁷

This study lends support to the need for alcohol screening and cessation services before pregnancy as an overall part of preconception health. It also suggests the need for providers to identify and address the psychosocial needs of women of childbearing age.

The Pregnancy Risk Assessment Monitoring System (PRAMS) is an ongoing, population-based study designed to collect information about maternal behaviors and experiences before, during, and after pregnancy.

Monthly, PRAMS sampled between 200 to 250 recent mothers taken from the Oklahoma live birth registry. Mothers were mailed up to 3 questionnaires in either English or Spanish seeking their participation. Follow-up phone interviews for non-respondents were conducted.

A systematic stratified sampling design was used to yield sample sizes sufficient to generate population estimates for groups considered at risk for adverse pregnancy outcomes. Information included in the birth registry was used to develop analysis weights that adjust for probability of selection and non-response.

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