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### Violence And Postpartum Drug Abstinence Among Substance-Using Mothers

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Violence and Postpartum Drug Abstinence among Substance-Using Mothers

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2019

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Social and Behavioral Sciences

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## **Abstract**

**Background:** Substance use during pregnancy can have numerous detrimental effects on maternal and infant health. This knowledge contributes to high rates of abstinence during pregnancy, but pregnant women with substance use disorders are at high risk for relapse postpartum. Experiences of violence can have a substantial impact on the behavioral and mental health of women; its compounded consequences with those of substance use can lead to a population vulnerable to drug relapse and other negative health effects. The objective of this study was to examine the association between experiences of violence and drug abstinence at delivery and postpartum.

**Methods:** Data were collected as part of a longitudinal randomized control trial observing the effects of cognitive behavioral therapy on maternal outcomes among pregnant women with substance use disorder. Pregnant women (n=152) were recruited from Yale New Haven Hospital and Bridgeport hospital between 2006 and 2012 and completed surveys at intake and 3 months postpartum. Logistic regression was used to examine associations between experiences of violence, sociodemographic characteristics, and rates of abstinence at delivery and at 3 months postpartum.

**Results:** Of the 152 total participants, approximately 84% achieved abstinence at delivery and 24% achieved abstinence at 3 months postpartum. Black participants had significantly lower odds than white participants of achieving abstinence at delivery (OR: 0.33, CI: 0.09, 1.21) and 3 months postpartum (OR: 0.34, CI: 0.09, 1.27). Having ever experienced violence was not associated with drug abstinence at either time point assessed.

Conclusion: Drug abstinence during pregnancy and postpartum is a crucial indicator of maternal, fetal, and infant health. Further research is warranted to identify key factors that can contribute to prolonged drug abstinence among pregnant women and new mothers in order to tailor effective intervention efforts toward continuous abstinence for this population.

Key words: pregnancy; motherhood; drug abstinence; relapse; violence; Social and Behavioral Sciences

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## Introduction

Substance use disorder is an increasing public health concern in the United States (Schulden *et al.*, 2009). In 2012, approximately 22.2 million individuals in the United States – approximately 7% of the population - were identified as having a substance dependence or substance use disorder (Substance Abuse and Mental Health Services Administration, 2013). Though men have previously been shown to have higher rates of substance use, the gap in rates of substance use disorder between genders has declined (Greenfield *et al.*, 2010, Abuse, 2018).

There are numerous gender and sex differences in the factors that lead to the initiation and maintenance of illicit substance use in the United States (Brady & Randall, 1999, Greenfield *et al.*, 2010). Differences in use between genders is associated with biological differences in addiction mechanisms and tolerance, as well as social and gender roles for men and women (National Institute on Drug Abuse, 2018). Women may be more likely to experience craving, relapse, and addiction with smaller amounts of substance compared to men and are more likely to face societal scrutiny and judgment than men (Abuse, 2018, Brady Randall, 1999).

As prevalence of substance use disorder among women has increased, rates of substance use during pregnancy and at delivery have likewise risen (National Institute on Drug Abuse, 2018). Estimates suggest that approximately 16% of pregnant women in 2012 reported smoking cigarettes in the past month, while about 6% of pregnant women reported using illicit substances in the past month (Substance Abuse and Mental Health Services Administration, 2013). Substance use disorder during pregnancy can lead to multiple negative outcomes including lack of prenatal care engagement, infant withdrawal and resulting complications, and

higher rates of infectious disease (Wong *et al.*, 2011). Drug abstinence tends to increase during pregnancy potentially as a result of knowledge, education, and social understanding of its detrimental effects, particularly on infant health (Bailey *et al.*, 2008). However, likelihood of substance use relapse increases after delivery, an unfortunate phenomenon during a critical attachment time period for maternal child bonding and time of highest infant need and care but also of high maternal stress levels and need for family and healthcare support (Forray, 2016, Suchman *et al.*, 2005). Further research is warranted to better understand lifetime conditions and factors associated with maintaining abstinence postpartum.

Violence against women is also known to be a substantial public health concern in the United States with over 30% of women reporting having experienced violence at some point in their lifetime (Breiding *et al.*, 2010, Montgomery *et al.*, 2015). Women who have experienced violence, in conjunction with those who have substance use disorders, comprise a critical group subject to the compounding and combined effects of violence and substance use especially in these circumstances' associations with each other. For example, recent findings by Reed and colleagues (2015) highlight the lasting impact of experiences of violence on South African women's drug use outcomes; rates of abstinence were significantly lower for participants who had experienced violence (Reed *et al.*, 2015). There have been few studies on the impact of violence against women on rates of drug abstinence and relapse among pregnant women with substance use disorders to corroborate or challenge these findings. Additionally, previous research on risk factors associated with relapse among pregnant and postpartum women is primarily limited to single rather than multiple substance use, which limits the generalizability

and applicability of results to a broader substance-using population as it is relatively uncommon for someone to just use one substance.

This study's objective is to examine the association between experiences of violence and drug abstinence at delivery and postpartum among pregnant women with substance use disorders. Developing a better understanding of factors associated with achieving and maintaining abstinence during and after pregnancy can be highly beneficial in creating interventions to improve fetal, infant, and maternal health outcomes.

## **Methods**

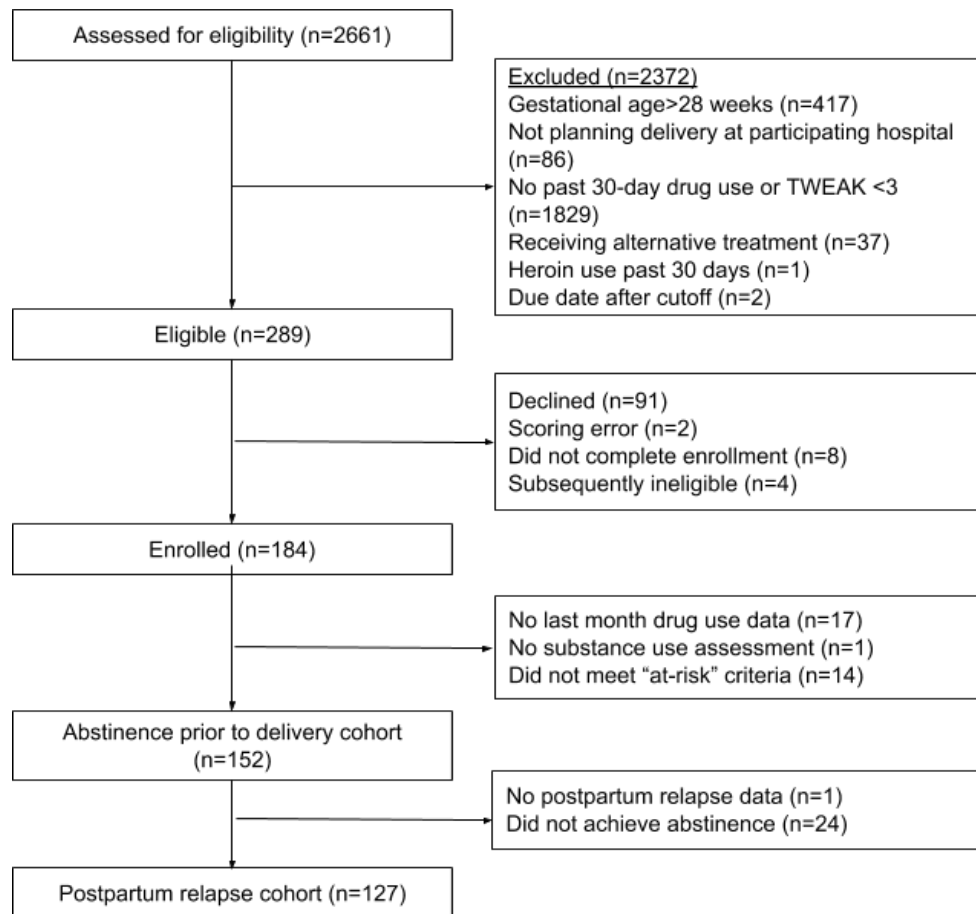
### *Procedure*

This study is a secondary analysis of data collected as part of a large-scale and multicenter randomized control trial assessing the effectiveness of a motivational enhancement and cognitive skills training therapy combined behavioral treatment. Participants in this Psychosocial Research to Improve Drug Treatment in Pregnancy (PRIDE-P) were assigned to motivational enhancement therapy (MET) with cognitive behavioral therapy (CBT) or brief advice (BA) delivered by a specialized provider. The outcome of interest for the PRIDE-P study was a decrease in use of psychoactive substances among pregnant women who were substance dependent or using.

Between 2006 and 2012, participants were recruited at Yale New Haven Hospital (YNHH) Women's Center in New Haven, CT and Bridgeport Hospital Ob/Gyn Primary Care Clinic in

Bridgeport, CT, and were eligible if they were age 16 or older, currently pregnant, and active users of one or more substances during pregnancy as determined at intake by the Addiction Severity index and medical testing (Yonkers *et al.*, 2012). Participants must have been able to speak English or Spanish to communicate with clinicians, accessible for follow-up (i.e. provide 3 familial contacts, not have pending legal cases that may lead to incarceration), able to give informed consent, and eligible for outpatient treatment. Participants must not have been currently engaged with any form of substance use treatment, including medication assisted treatment or psychological treatment. Patients (n=2661) at these healthcare centers were assessed for eligibility by inclusion criteria. One hundred and fifty-two participants total were assessed, consented, and enrolled as the experimental cohort, and 127 participants achieved abstinence at delivery and were included in studies of relapse postpartum (Forray *et al.*, 2015) (Figure 1).

Figure 1 Study cohort flow and development (Forray *et al.*, 2015)



All participants completed a survey interview administered by a trained research assistant (RA) upon intake to the study, at 3 months postpartum, at 12 months postpartum, and at 24 months postpartum. Each questionnaire is a compilation of screening scales covering a variety of topics, such as demographic information, Addiction Severity Index, Structured Clinical Interview for DSM-IV, HIV Risk Behavior Scale, The Inventory of Depressive Symptomology, and other independent questions regarding family dynamics and relationships, pregnancy complications, and other specific information (McLellan *et al.*, 1992, First *et al.*, 2007, Ward *et al.*, 1990, Rush *et al.*, 1986, 1996). A breath test for alcohol was administered and a urine sample was collected when possible contingent on catheter placement in each participant; catheter placement

prevented urine sample collection. Participants were offered unlimited therapy sessions through pregnancy and 2 sessions postpartum following assessment and participation in the study. Sessions were randomly selected and reviewed for agreement with Yale Adherence and Competence System (Carroll *et al.*, 2000). The analyses for this study use data collected at intake and 3-months postpartum.

### *Measures*

#### *Primary outcome: Complete abstinence at 3-months postpartum*

Abstinence was defined as complete abstinence from all substances at the 3-month follow-up time point, as measured by self-report and medical screening. For this study, a lack of abstinence was characterized as relapse; through actively identifying the outcome of interest as abstinence, we simultaneously assessed relapse rates at delivery and 3-months postpartum.

#### *Primary predictors: Violence*

Participants' experiences of violence were assessed through questionnaire items asking if they had ever been raped, molested, physically assaulted, hit, kicked, slapped, or threatened at any point in the past separately. If a participant reported ever experiencing any of these acts of violence, they were characterized as a victim of violence.

#### *Control variables*

Analyses controlled for sociodemographic factors and health behaviors linked to substance use relapse or experiences of violence in previous research. Covariates included maternal age (<20,

20-34, >=35), race/ethnicity (White, Black, Hispanic/Other), education (less than high school, high school, more than high school), and relationship status (married/living with partner, not married or cohabitating). Analyses also controlled for study condition assignment of CBT or BA.

### *Statistical Analysis*

Descriptive characteristics of the participants overall and those who were abstinent at delivery were analyzed using chi square tests. Bivariate logistic regression models were used to analyze the association between sociodemographic characteristics, any experiences of violence in the past, and drug abstinence at delivery and 3-months postpartum. Variables associated with abstinence at less than 0.10 significance level were analyzed in a multivariable logistic regression model for each time point. All data analyses and dataset construction were conducted in SAS Version 9.4.

### **Results**

Table 1 provides descriptive information regarding the sample overall as well as by experience of violence. Approximately half of sample is between the age of 20 and 34 (52.4%), with about 30% being below 20 years old and about 20% being 35 years old or higher. The majority identified as black (55.0%), 22% as White, and 26% as Hispanic or other race/ethnicity. Approximately one-third of participants had less than a high school level of education (33.6%), 38% had a high school degree or equivalent, and 29% had more than a 12<sup>th</sup> grade education. Thirty-five percent the sample were married or cohabitating with a spouse or partner. At intake, 29% of women used cigarettes, 23% used alcohol, 35% used marijuana, and 30% used cocaine. Approximately 65% of participants reported having ever experienced violence. There

were no significant differences in the sociodemographic characteristics of women who had experience violence versus those who had not.

Table 1 Sample characteristics, n (%)

		Violence <sup>a</sup>	
	Overall <sup>a</sup> (n=152)	Experienced Violence (n=94)	Did not Experience Violence (n=55)
Age			
<20	42 (28.2)	24 (25.5)	18 (32.7)
20-34	78 (52.4)	49 (52.13)	29 (52.7)
35≤	29 (19.5)	21 (22.3)	8 (14.6)
Race			
White	33 (22.2)	23 (24.5)	10 (18.2)
Black	82 (55.0)	51 (54.3)	31 (56.4)
Hispanic/other	34 (22.8)	20 (21.3)	14 (25.5)
Education			
Less Than High School	50 (33.6)	33 (35.1)	17 (30.9)
High School	56 (37.6)	29 (30.9)	27 (49.1)
More Than High School	43 (28.9)	32 (34.0)	11 (20.0)
Marital Status			
Married/Living with Partner	53 (35.1)	30 (31.9)	23 (40.4)
Not Married or Cohabiting	98 (64.9)	64 (68.1)	34 (59.7)
Substance Use at Intake <sup>b</sup>			
Cigarettes	83 (28.7)	54 (28.0)	29 (30.2)
Alcohol	75 (23.0)	49 (25.4)	26 (27.1)

Marijuana	101 (35.0)	67 (34.7)	34 (35.4)
Cocaine	30 (10.4)	32 (11.9)	7 (7.3)
Treatment Group			
BA	76 (51.0)	47 (50.0)	29 (52.7)
CBT	73 (49.0)	47 (50.0)	26 (47.3)
Abstinent at delivery			
Yes	126 (83.4)	82 (87.2)	44 (77.2)
No	25 (16.6)	12 (12.8)	13 (22.8)
Abstinent 3 months postpartum			
Yes	35 (24.1)	19 (21.4)	16 (28.6)
No	110 (75.9)	70 (78.7)	40 (71.4)

<sup>a</sup>Numbers may not sum to total due to missing data

<sup>b</sup>Women may be using multiple substances, numbers may add up to more than total

Of the 152 participants enrolled in the study cohort, 127 (83.6%) achieved abstinence at delivery, and 36 (23.7%) achieved abstinence through 3 months postpartum. Table 2 shows the logistic regression results. Compared to White participants, Black women had significantly lower odds of being abstinent at delivery (OR: 0.33, CI:0.09, 1.21). No other characteristics assessed were associated with abstinence at delivery. In bivariate analyses, Hispanic/other participants had a significantly greater likelihood of being abstinent at 3 months postpartum than those who were White (OR: 3.19, CI:1.04, 9.83), while being married or living with a partner was associated with decreased odds of being abstinent at 3 months postpartum compared to not being married or cohabitating at a 0.05 significant level (OR: 0.39, CI:0.16, 0.97). At a 0.10 significance level, women who had higher than a high school degree had a

lower likelihood than those who had high school or lower to achieve abstinence at 3 months postpartum and women in the CBT treatment group of the PRIDE-P study were more likely than those assigned to the BA group to achieve abstinence at 3 months postpartum (OR: 0.34, CI:0.12, 0.98; OR: 2.00, CI:0.93, 4.31). In a multivariate model, only race remained independently associated with abstinence at 3-months postpartum; black women had decreased odds of achieving abstinence at 3-months postpartum compared to white women (OR: 0.34, CI: 0.09, 1.27).

Table 2 Associations of violence and variables with abstinence at delivery and at 3 months postpartum

	Achieved Abstinence at delivery (n=127)		Achieved Abstinence at 3 months postpartum (n=36)	
	OR (95% CI)		OR (95% CI)	
	Unadjusted	Adjusted	Unadjusted	Adjusted
Violence				
Experienced Violence	2.02 (0.85, 4.80)	--	0.68 (0.31, 1.47)	--
Did not Experience Violence	1.00	--	1.00	--
Age				
<20	1.00	--	1.00	--
20-34	1.07 (0.39, 2.96)	--	0.84 (0.35, 2.02)	--
35≤	0.93 (0.27, 3.29)	--	1.07 (0.37, 3.12)	--
Race				
White	1.00	--	1.00	--
Black	0.33 (0.09, 1.21)*		1.08 (0.38, 3.08)	0.34 (0.09, 1.27)*
Hispanic/other	1.65 (0.26, 10.56)		3.19 (1.04, 9.83)*	1.69 (0.25, 11.42)

Education				
Less Than High School	1.00	--	1.00	--
High School	0.73 (0.26, 2.09)	--	0.60 (0.26, 1.41)	0.76 (0.25, 2.30)
More Than High School	0.82 (0.26, 2.55)	—	0.34 ** (0.12, 0.98)	0.95 (0.28, 3.27)
Marital Status				
Married/Living with Partner	1.17 (0.47, 2.91)	--	0.39 (0.16, 0.97)*	1.11 (0.43, 2.87)
Not Married or Cohabiting	1.00	--	1.00	--
Treatment Group				
BA	1.00	--	1.00	--
CBT	1.40 (0.58, 3.39)	--	2.00 (0.93, 4.31)**	1.37 (0.54, 3.48)

\*p<0.05

\*\*p<0.1

## Discussion

This study illuminated rates of abstinence among pregnant women and new mothers who entered pregnancy with substance use disorders. A large portion of women achieved abstinence by delivery (84%). However only a small proportion (27%) were abstinent by 3 months postpartum demonstrating the need for additional support to prevent relapse for new mothers. Factors associated with new, particularly first-time motherhood, such as extreme fatigue, constant demands of their infant, and loss of personal time and space, can contribute to stress and lower rates of abstinence following delivery (McVeigh 1997). This study's findings suggest that black women are less likely to be abstinent at delivery and 3 months postpartum compared to white women. These rates may be a result of varying access to prenatal care as well as the contribution of community support postpartum by race in New Haven (Wright *et al* 2012).

This study has numerous limitations that may have affected the findings. Firstly, the measurement of experienced violence includes any single experience of violence at any point in the participants' lives; the severity and timing of the experience could minimize its impact on drug abstinence and relapse rates later in life. Additionally, the grouping of different experiences of violence into one variable to describe these experiences, such as getting hit or slapped and being raped or molested, is problematic due to vast differences in the severity of violence and its longitudinal impact of physical and mental health. This study's outcome of continued abstinence may be impacted by different combinations of substances used at a time; for example, women who used alcohol were more likely to achieve abstinence at delivery than

women who used cigarettes. Future studies should account for the type of substance use disorder women are experiencing at intake. Power to detect significant differences may have been limited by the study's small sample size. Also, the sample of women in this cohort received clinical care in New Haven, CT and Bridgeport, CT; therefore, conclusions may not be generalizable to populations that vary in demographics, culture, and access to substance use treatment and other healthcare resources. Another limitation of this study is that this preliminary analysis did not include common psychosocial variables, such as depressive symptoms or post-traumatic stress disorder (PTSD), that are prevalent among pregnant women and may influence drug abstinence and relapse in this population. Future analyses should include a broader range of covariates associated with maternal substance use outcomes. Lastly, data were not available about patients who were eligible but excluded from the study due to missing data or for declining to participate. There may be systematic differences between them and those who were included that may contribute to higher risk of relapse and inability to achieve or maintain drug abstinence at delivery and at postpartum time points (Figure 1).

Nonetheless, this study extends previous work done with these data and outcomes of drug abstinence and other factors of interest such as contraceptive use (Loree *et al* 2018). Further research into this topic is highly warranted in addition to replication studies with larger datasets. Future studies should identify and examine other factors that have a substantial impact on the rate of continuous drug abstinence to benefit maternal, fetal, and infant health outcomes. These studies can be used to adapt intervention efforts and clinical practice to populations and socioeconomic conditions of greatest need.

## References

- Abuse, N. I. o. D. (National Institute of Drug Abuse) (2018). Substance Use in Women. *drugabuse.gov*.
- Bailey JA, H. K., Hawkins JD, Catalano RF, and Abbott RD. (2008). Men's and Women's Patterns of Substance Use Around Pregnancy. *Birth*, 35(1), 50-59.
- Breiding MJ, C. J., and Black MC. (2014). Intimate Partner Violence in the United States — 2010. *Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention*.
- Brooke EE, M. A., Hughes J, Wang J, Haley D, Soto-Torres L, Chege W, Justman J, Kuo I, Golin C, Frew P, Mannheimer S, and Hodder S. (2015). Violence Against Women in Selected Areas of the United States. *American Journal of Public Health*, 105(10), 2156-2166.
- CL, B. K. a. R. (1999). Gender Difference in Substance Use Disorders. *Addictive Disorders*, 22(2), 241-252.
- First MB, W. J., Spitzer RL, and Gibbon M. (2007). Structured Clinical Interview for DSM-IV Axis I Disorders (SCID). *New York: Biometrics Research, New York State Psychiatric Institute*.
- Forray. (2016). Substance use during pregnancy. *F1000Research*, 5(887), 1-9.
- Forray A, M. B., Lin H, Ruger JP, and Yonkers KA, & Ariadna Forray, B. M., Haiqun Lin, Jennifer Prah Ruger, Kimberly A. Yonkers. (2015). Perinatal substance use: A prospective evaluation of abstinence and relapse. *Drug and Alcohol Dependence*, 150, 147-155.
- Greenfield SF, B. S., Lawson K, and Brady KT. (2010). Substance Abuse in Women. *Psychiatr Clin North Am*, 33(2), 339-355.
- Loree AM, G. A., Ruger JP, and Yonkers KA. (2018). Postpartum Contraceptive use and Rapid Repeat Pregnancy Among Women who use Substances. *Subst Use Misuse*, 53(1), 162-169.
- McLellan AT, K. H., Metzger D, Peters R, Smith I, Grissom G, Pettinati H, and Argeriou M. (1992). The Fifth Edition of the Addiction Severity Index. *Journal of Substance Abuse Treatment*, 9(3), 199-213.
- Mcveigh. (1997). Motherhood Experiences from the Perspective of First-Time Mothers. *Clinical Nursing Research*, 6(4), 335-348.
- Reed E, M. B., Novak SP, Browne FA, and Wechsberg WM. (2015). Experiences of Violence and Association with Decreased Drug Abstinence Among Women in Cape Town, South Africa. *AIDS Behav.*, 19(1), 192-198.
- Rush JA, C. T., Reimitz PE. The Inventory of Depressive Symptomatology (IDS): Clinician (IDS-C) and Self-Report (IDS-SR) ratings of depressive symptoms. *International Journal of Methods in Psychiatric Research*, 9(2), 45-59.
- Schulden JD, T. Y., and Compton WM. (2009). Substance Abuse in the United States: Findings From Recent Epidemiologic Studies. *Current Psychiatry Reports*, 11(5), 353-359.
- Substance Abuse and Mental Health Services Administration, C. f. B. H. S. a. Q., US Department of Health and Human Services. (2013). Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings. *NSDUH Series H-46, HHS Publication No. (SMA) 13-4795*.

- Suchman NE, M. T., Slade A, Luther SS. (2005). How Early Bonding, Depression, Illicit Drug Use, and Perceived Support Work Together to Influence Drug-Dependent Mothers' Caregiving. *American Journal of Orthopsychiatry*, 75(3), 431-445.
- Ward J, D. S., and Hall W. (1990). The HIV Risk-Taking Behaviour Scale (HRBS) Manual *National Drug and Alcohol Research Centre*(Technical Report Number 10).
- Wong S, O. A., and Kahan M. (2011). Substance Use in Pregnancy. *Journal of Obstetrics and Gynaecology Canada*, 33(4), 367-384.
- Wright TE, S. R., Fombonne E, Stephenson J and Haning WF. (2012). Implementation and evaluation of a harm-reduction model for clinical care of substance using pregnant women. *Harm Reduction Journal*, 9(5).
- Yonkers KA, F. A., Howell HB, Gotman N, Kershaw T, Rounsaville BJ, and Carroll KM. (2012). Motivational enhancement therapy coupled with cognitive behavioral therapy versus brief advice: a randomized trial for treatment of hazardous substance use in pregnancy and after delivery. *General Hospital Psychiatry*, 34(5), 439-449.