


Residential substance use treatment outcomes for pregnant and postpartum women: Distinct patterns for women enrolled before versus during the COVID-19 pandemic

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Abstract

Introduction: Substance use among pregnant and postpartum women (PPW) is a serious public health concern. The COVID-19 pandemic has exacerbated substance use among the general population including pregnant women, and disrupted operations for substance use treatment centers. Little is known about the outcomes of substance use treatment for PPW before and during the COVID-19 pandemic.

Method: Data from a longitudinal program evaluation were analyzed to examine outcomes among 136 PPW participating in a residential SUD treatment program, and to explore differences in treatment outcomes for women who enrolled in services before versus during the COVID-19 pandemic. Analyses were used to test the significance of change from treatment intake to 6-month post-intake on assessments of substance use, mental health symptoms, and functioning collected to evaluate the Healthy Families Program (HFP), a comprehensive program for PPW located within a gender-specific SUD treatment facility in the United States.

Results: Results indicated that from treatment intake to follow-up assessment, clients self-reported statistically significant improvements in family functioning and daily functioning as well as reduced days of substance use. Notably, the rate of treatment intakes declined during the COVID-19 pandemic. In separate analyses by subgroup, mental health indicators showed improvements only for clients engaged in treatment before the COVID-19 pandemic and not for clients served during the COVID-19 pandemic, but substance use decreased significantly for both pre-pandemic and pandemic enrollees.

Conclusion: Specialized treatment considerations and implications for PPW are discussed, including a need for added emphasis on co-occurring mental health symptoms and family system stress during a pandemic, and the role of nurses in identifying and addressing these concerns. Additionally, potential relapse prevention efforts during COVID-19 for PPW with substance use disorders are examined.

Clinical Relevance: The present research continues to highlight the importance of specialized treatment programming for PPW with SUDs as well as the potential need

for additional recovery support mechanisms to be utilized during the COVID-19 pandemic.

KEYWORDS

COVID-19, pregnant women, substance use disorders, substance use treatment

INTRODUCTION

Substance use rates among pregnant women continue to rise (Center for Behavioral Health Statistics and Quality, 2018). In 2019, approximately 7.2 million women had a substance use disorder (SUD). In the same year, over 500,000 pregnant women reported using illicit drugs, tobacco, or alcohol (Center for Behavioral Health Statistics and Quality, 2021). Substance use disorders among pregnant women increase health risks for mother and child (Prince & Ayers, 2022). Adding to the complexity of SUDs among pregnant women is the development of COVID-19. From January 2020 to May 2021 it is estimated that over 94,000 pregnant women contracted COVID-19 (CDC, 2020). Substance use rates have increased during the pandemic for pregnant and postpartum women (PPW) (Barbosa-Leiker et al., 2021). Whether or not they actually contract COVID-19, isolation and increased stressors as a result of the pandemic and associated closures and restrictions further complicate substance use patterns and treatment outcomes for PPW. Thus, more research is needed on how to best support the treatment of PPW with SUDs during COVID-19.

Substance use among PPW and COVID-19

While the risk of developing an SUD during pregnancy is lower than for non-pregnant women (McHughes et al., 2014), women of reproductive age can be at a heightened risk of developing a SUD, resulting in added health risk should they become pregnant (Forray, 2016). In recent years, opioid use has increased by four times among pregnant women (CDC, 2018). The health consequences of substance use for PPW and their children have been well-documented and include preterm birth, miscarriage, and infant mortality; as well as long-term effects on children associated with impaired cognitive and behavioral functioning (Forray, 2016). Co-occurring mental health and SUDs are also present during peripartum and postpartum and impact outcomes for PPW and their children (Chang, 2020; Forray, 2016; Milligan et al., 2010). Additionally, for pregnant women the development and maintenance of substance use influences daily living experiences (Stone, 2015), as well as family functioning and parenting skills (Lander et al., 2013; Mayes & Truman, 2002; Milligan et al., 2010; Niccols et al., 2012).

The onset of the COVID-19 pandemic has further complicated substance use and recovery for PPW with SUDs. Stressors from COVID-19 can disrupt biological, social, and psychological

functioning during pregnancy (Diamond et al., 2020). Substances have been identified as a coping mechanism for COVID-19 stressors among individuals (Bartel et al., 2020; Czeisler et al., 2020); and PPW are no exception. Research indicates a relationship between an increase in marijuana and tobacco use and COVID-19 stress among pregnant women (Kar et al., 2021). For women, the pandemic may exacerbate pre-COVID-19 pregnancy stressors such as mental health-related symptoms (e.g., depression, anxiety) and ultimately lead to increased substance use to cope with the compounding pandemic stress. Smith et al., (2021) found that pregnant women's mental health prior to COVID-19 predicted substance use during the pandemic, and overall rates of depression and substance use were increased during COVID-19.

Substance use treatment for PPW

Although there are SUDs among PPW, specialized substance use treatment for PPW addressing their specific health risks and barriers is rare. In fact, only 19 states offer substance use treatment targeted for the complex needs of pregnant women (Guttmacher Institute, 2021). The detrimental effects of SUDs for mothers and their children, as well as the limited specialized treatment options in conjunction with other systemic barriers to treatment—including lack of childcare, and fear of punitive measures for PPW with SUDs (Guttmacher Institute, 2021)—highlight how important it is for systems of care to focus on how to best meet the needs of PPW with SUDs. COVID-19 added to the complexity of accessing and engaging in treatment for those with SUDs (Pagano et al., 2021). Research has indicated that various facets of residential treatment have been negatively affected by COVID-19 including treatment initiation, retention, and community re-entry (Pagano et al., 2021). Thus, there is a need to examine the impact of COVID-19 for PPW with SUDs enrolled in specialized residential treatment, in order to examine potential ways to improve outcomes for PPW and their families. As such, the Healthy Families Program (HFP), funded by the US Substance Abuse and Mental Health Services Administration/Center for Substance Abuse Treatment (SAMHSA/CSAT), was developed in an effort to expand and enhance access to treatment and recovery support services for PPW, their children, and families. The HFP was first implemented prior to the COVID-19 pandemic and continued after the COVID-19 pandemic began to impact the community, providing an opportunity to compare outcomes for women who enrolled in treatment before versus during the pandemic.

Present study

The goal of the present study was to examine changes over time across substance use, mental health, daily living, and family functioning/support for PPW enrolled in the federally funded, HFP residential treatment program. Additionally, we examined differences in client enrollment rates and outcomes for women who began treatment pre and during the pandemic. It was hypothesized that participation in the treatment program would result in: (1) reduced substance use, (2) reduced mental health symptoms, (3) improved daily living, and (4) improved family functioning. Likewise, we hypothesized that outcomes would be more positive for PPW enrolling in services before compared to during the COVID-19 pandemic.

METHOD

Study design

Upon University Institutional Review Board (IRB) approval, a longitudinal study design was employed to examine outcomes among PPW participating in a residential SUD treatment program, and to examine differences in treatment outcomes within subgroups of women who enrolled in treatment before the COVID-19 pandemic and those who enrolled during the pandemic. Analyses examined intake and 6-month post-intake evaluation data from the Healthy Families Program (HFP), a comprehensive program for PPW located within a gender-specific SUD treatment facility in the United States.

Healthy families program (HFP)

The Healthy Families Program (HFP) was built from existing treatment that offered trauma-informed, culturally competent, and strengths-oriented family-centered residential and outpatient treatment services for PPW who suffer from substance use disorders, and their minor children. The HFP was developed to enhance existing programming to provide gender-focused, family-centered comprehensive and collaborative residential prevention, treatment and recovery support services to pregnant and postpartum women (PPW) who have substance use disorders (SUDs) and/or co-occurring disorders (CODs), their children, and families, including fathers/partners. The HFP was designed to meet two primary goals; (1) Expand service provider capacity for PPW treatment services, and (2) Enhance services for PPW, their children, and family members. HFP program elements included parenting classes, case management services directed toward outreach and engagement for PPW, as well as access to medication for opioid use disorder (MOUD) and health services. The HFP also focused on therapeutic services for children and families.

Participants

Inclusion criteria for the present analyses consisted of pregnant and postpartum women with substance use disorders who were seeking treatment at a gender specific, residential substance use treatment center from February 2018 to June 2021.

In total, 136 women enrolled into the program during this time period. The mean age was 29.8 (SD = 5) ranging from 18 to 40. Participants could select more than one race category to describe themselves. Overall, 41.2% of women enrolled identified as African American, 49.3% as white; $N = 5$ identified more than one racial category as applicable, 5 did not select a race, and 3 identified as American Indian. On a separate Ethnicity item, two participants reported that they were Hispanic. Ninety women (66.2%) were pregnant at the time of intake interview.

Procedure

Outcome evaluation data were collected using self-report measures. The original protocol was to collect data via face-to-face or telephone interview. Since the onset of the COVID-19 pandemic and consequent travel and meeting restrictions for university employees, all interviews were conducted by telephone.

After a client was enrolled into the HFP, they completed the informed consent and began the intake interview. Subsequent interviews were conducted at 6-month post-intake, and at discharge from services. Prior to follow-up interviews, evaluation staff reached out to clients and to treatment staff to confirm or update contact information. Each interview was approximately 30 minutes.

Measures

Outcomes for HFP were assessed using a federal performance measure, along with a set of additional tools selected to track site-specific project objectives. Items and measures used to test hypotheses across the life of the project to date, and before versus after the onset of the COVID-19 pandemic, were as follows:

Substance use

Government Performance and Results Act (GPRA) data collection tool (SAMHSA, 2017). This instrument captures self-reported substance use as well as participant demographics, and other federal outcome domains. The current analyses focused on self-reported recent use of alcohol and illegal drugs; participants were asked to report the number of days they used these substances out of the past 30. If a participant reported illegal drug use, follow-up questions addressed past 30-day use of specific drugs as well as route of administration. This measure is

the required outcome tool for all grant recipients, and is the basis for federal reporting on substance use before and after receipt of services funded by SAMHSA/CSAT among participants nationwide. There are no internal consistency statistics for the substance use section of the measure as these are simply single-item behavioral self-reports on recent use of substances. As shown in Table 1, self-reported days of use correlate positively with depression and trauma scores, and negatively with daily individual and family functioning, in line with what we would expect from accurate substance use reporting.

Mental health

Center for Epidemiological Studies-Depression (CES-D; Radloff, 1977) questionnaire, consisting of 20 items describing depression symptoms (e.g., poor appetite; feeling like a failure) or thoughts/feelings contraindicative of depression (e.g., feeling happy) (Cronbach's $\alpha = 0.85-0.90$), is supported by long-established evidence of convergent and criterion validity (i.e., correlation with other depression measures and clinical ratings of depression to establish criterion validity; Radloff, 1977). The measure's reliability and validity as an assessment of symptom severity have been supported since initial scale development in a variety of general and clinical populations, including substance use treatment populations, for which CES-D overall scores and change in scores over time predict treatment outcome (discharge from residential treatment; Morris, et al., 2020). Participants rated the frequency of these thoughts/feelings in the past 7 days on a 4-point scale (0 = zero out of the past 7 days to 3 = 5 to 7 days; positive thoughts feelings are reverse coded for scoring). Participants' scores ranged from 0 to 60, with higher scores indicating greater experiences of depressive symptoms ($\alpha = 0.94$ for the current sample indicating internal consistency reliability in our sample; see Table 1).

PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 1993), Civilian Version, a 17-item self-report of PTSD symptoms based on DSM-V

criteria. Participants rated the extent to which, in the past month, they were bothered by symptoms associated with PTSD (e.g., disturbing dreams or disturbing memories associated with a stressful event; physical reactions such as heart pounding or trouble breathing, etc.) on a Likert scale from 1 ("not at all") to 5 ("extremely"). The original PCL-5 has strong internal consistency ($\alpha = 0.94$) and test-retest reliability ($r = 0.82$) as well as criterion validity supported by its diagnostic accuracy (Blanchard et al., 1996), and convergent and divergent validity (correlation with other trauma measures and distinction from measures of different psychiatric symptoms; Ruggiero, Del Ben, Scotti, & Rabalais, 2003). The measure has been used and determined to be reliable and valid as an outcome tool for substance using populations (Harpaz-Rotem, Rosenheck, & Desai, 2011). It has high internal consistency reliability in our sample ($\alpha = 0.95$; see Table 1).

Daily living

The Daily Living Activities Scale (DLA-20; Scott & Presmanes, 2001) Alcohol-Drug version measures the impact of substance and mental health on daily functioning in the last 30 days. The scale is comprised of 20 questions, each addressing a domain relevant to overall functioning (e.g., dress/grooming; family relations; managing money) or recovery from substance use (e.g., abstaining from drug use). Items are rated from 1 (the individual never engages in positive functioning in the domain) to 7 (always engages in positive functioning), so that a higher average score indicates better functioning. The measure was determined to have good inter-rater and internal consistency reliability, as well as criterion validity (supported by ability to distinguish substance use clients according to their level of care; Scott & Presmanes, 2001). The DLA-20 has high internal consistency reliability in our sample (Cronbach's $\alpha = 0.90$).

TABLE 1 Days of illegal drug use in the past 30, depression and trauma symptoms, daily functioning, and family functioning at intake: Correlations and descriptive statistics

Variables	1	2	3	4	5
1. Days illegal drug use/past 30 (N = 135)	–				
2. Depression symptoms (CES-D; N = 131)	0.31***	–			
3. Trauma symptoms (PCL; N = 134)	0.27**	0.74***	–		
4. Daily functioning (DLA-20; N = 124)	-0.39***	-0.47***	-0.48***	–	
5. Family functioning (PFS Family subscale; N = 135)	-0.22*	-0.33***	-0.32***	0.30***	–
M	7.10	21.56	38.02	89.85	4.14
SD	9.17	16.18	16.73	7.99	1.83
Range	0-30	0-57	17-85	50-103	1-7
α	n/a ^a	0.94	0.95	0.90	0.91

Note: Ns for each measure reflect women with complete data on all items.

^aMeasure is a single item, days of illegal drug use in the past 30; internal consistency not calculated.

* $p < 0.05$.; ** $p < 0.01$.; *** $p < 0.001$.

Family functioning

Protective Factors Survey (Counts et al., 2010), is a 20-item self-report measure that assesses the endorsement of attitudes, knowledge, and behaviors that are known to be protective against child abuse or neglect (CA/N) (Cronbach's $\alpha = 0.76$ – 0.89); including a Family Functioning/Resiliency subscale (Cronbach's $\alpha = 0.89$). On that subscale, participants rated the frequency of interactions and habits indicating positive family functioning using Likert-scale items (e.g., "In my family we talk about problems") on a scale of 1 ("Never") to 7 ("Always"). The PFS was determined to have good criterion validity as it was positively associated with protective factors against child abuse (e.g., adaptive coping, positive reframing) and negatively with risk factors (e.g., depression, stress, maladaptive coping; Counts et al., 2010). The measure has been used with families involved in the child welfare system due to substance use (e.g., Yoon et al., 2021). The family functioning/resiliency scale has good internal consistency in the current sample (Cronbach's $\alpha = 0.91$; see Table 1).

Data analysis

We first obtained descriptive statistics on client baseline characteristics, as well as average monthly enrollment prior to and during the COVID-19 pandemic. We classified enrollment in the HFP before March 1, 2020 as "pre-COVID pandemic," and enrollment on or after March 1, 2020 as "during pandemic" (meaning after the start of the COVID-19 pandemic). Closures, travel restrictions, and social distancing requirements associated with the pandemic did not begin until mid-March 2020, but any women who enrolled in HFP services at the beginning of March would have been impacted by the pandemic during their first 2 weeks of treatment.

Following the client characteristics and enrollment rates, we conducted data analyses organized around the four hypotheses listed above. For each outcome variable we examined change in mean scores using a repeated-measures *t*-test of the significance of change from intake to 6 months after intake. As these were exploratory analyses, we also conducted separate repeated-measures *t*-tests for each outcome within pandemic enrollment subgroups.

RESULTS

Baseline characteristics

At intake, 9.6% of women reported any alcohol use in the past 30 days on the GPRA tool, while 56% reported illegal drug use. Specific illegal drugs reported by >10% of women during the 30 days prior to intake included heroin (24%), marijuana (23%), Cocaine (17%), Fentanyl (14%), and Methamphetamine (13%). In total, $N = 103$ (76%) of women reported some lifetime violence

or trauma. Women reporting trauma history at intake also scored significantly higher on the PCL trauma symptom measure ($M = 42.1$, $SD = 16.1$) compared to those reporting no trauma history ($M = 24.8$, $SD = 11.0$), $t(72.5)$, equal variances not assumed) = -6.8 , $p < 0.001$. Additionally, on the CES-D depression assessment, 60.3% of scores in our overall intake sample fell into the range indicating possible clinical depression.

Rates of enrollment before versus during the COVID-19 pandemic

Based on our classification of pandemic enrollment occurring on or after March 1 2020, the "pandemic" time period covered in this paper is briefer (total of 16 months) than the "pre-pandemic" period (29 months). Similarly, the number of women enrolled in HFP is lower for the pandemic period ($N = 29$ women) compared to pre-pandemic ($N = 107$ women). Even accounting for the differing lengths of pre- versus pandemic periods, however, the average monthly rate of enrollment was markedly higher before the pandemic (107 clients/29 months = approximately 3.7 enrolled per month) than after it began (29 clients/16 months = approximately 1.8 enrolled per month).

Bivariates

Bivariate correlations among key outcome measures at baseline (substance use, depression and trauma symptoms, overall functioning, and family functioning) are displayed in Table 1. Among the sample, more substance use in the past 30 days was significantly related to higher depression ($r = 0.31$; $p < 0.001$), higher trauma symptoms ($r = 0.27$; $p < 0.01$), lower daily functioning ($r = -0.39$; $p < 0.001$), as well as lower family functioning ($r = -0.22$; $p < 0.05$).

Outcomes

Reduced substance use (H1)

Because relatively few HFP clients report past 30-day alcohol use (mean days/30 < 1), our test of H1 focused on the significance of change from intake to 6-month post-intake in days (out of the past 30) of illegal drug use reported by clients. The repeated-measures *t*-test for life of the project to date ($N = 78$ matched pairs) indicates days of use decreased from intake ($M = 7.7$ days, $SD = 9.1$) to 6 months post-intake ($M = 0.99$ days, $SD = 4.1$), and this change was significant, $t(77) = 6.3$, $p < 0.001$, $d = 0.71$. Mean intake and 6-month days of use by pandemic period are shown in Table 2. Days of illegal substance use declined significantly for clients regardless of whether they began services before ($t[65] = 5.7$, $p < 0.001$, $d = 0.70$) or after ($t[11] = 2.6$, $p < 0.05$, $d = 0.76$) the start of the COVID-19 pandemic.

TABLE 2 Intake to 6-month change on outcome variables within pandemic subgroups

Outcomes	Intake pre-pandemic				Intake during pandemic			
	Intake M (SD)	6-Mo. M (SD)	t (df)	Significance (effect size)	Intake M (SD)	6-Mo. M (SD)	t (df)	Significance (effect size)
Drug days	7.98 (9.3)	1.15 (4.5)	5.7 (65)	$p < 0.001$ ($d = 0.70$)	6.42 (8.3)	0.08 (0.3)	2.6 (11)	$p < 0.05$ ($d = 0.76$)
CES-D	20.91 (16.2)	11.49 (15.7)	3.7 (52)	$p < 0.001$ ($d = 0.51$)	20.00 (19.5)	17.18 (20.4)	0.4 (10)	$p = 0.67$, n.s. ($d = 0.13$)
PCL	36.71 (17.4)	30.29 (13.3)	2.6 (55)	$p < 0.05$ ($d = 0.35$)	35.72 (16.9)	33.45 (15.3)	0.5 (10)	$p = 0.65$, n.s. ($d = 0.14$)
DLA-20	89.98 (6.7)	95.02 (5.4)	-5.0 (45)	$p < 0.001$ ($d = -0.73$)	90.09 (7.0)	94.09 (3.8)	-2.4 (10)	$p < 0.05$ ($d = -0.74$)
PFS-Family	4.11 (1.7)	5.05 (1.3)	-4.2 (55)	$p < 0.001$ ($d = -0.56$)	4.88 (2.0)	4.83 (1.7)	0.1 (11)	$p = 0.89$, n.s. ($d = 0.04$)

Note: CES-D is the Center for Epidemiologic Studies-Depression scale. PCL is the Post Traumatic Symptom Disorder Checklist. DLA-20 is Daily Living Assessment-20. The PFS-Family is the Protective Factors Survey-Family Functioning.

Reduced mental health symptoms (H2)

Self-reported depression symptoms on the CES-D ($N = 64$ matched pairs) decreased from intake ($M = 20.7$, $SD = 16.6$) to 6 months post-intake ($M = 12.5$, $SD = 16.5$), and this change was significant, $t(63) = 3.5$, $p < 0.001$, $d = 0.44$. Mean intake and 6-month CES-D scores by pandemic period are shown in Table 2. Separate repeated-measures t -tests within subgroups indicated significant reduction in symptoms for the pre-pandemic ($t[52] = 3.7$, $p < 0.001$, $d = 0.51$) but not the pandemic group ($t[10] = 0.4$, $p = 0.67$, $d = 0.13$).

Similarly, self-reported trauma symptoms on the PCL ($N = 67$ matched pairs) decreased significantly from intake ($M = 36.5$, $SD = 17.3$) to 6 months post-intake ($M = 30.8$, $SD = 13.5$), $t(66) = 5.7$, $p < 0.05$, $d = 0.32$. In line with the pattern observed for the CES-D, separate repeated-measures t -tests within COVID subgroups indicated significant reduction in symptoms for the pre-pandemic ($t(55) = 2.6$, $p < 0.05$, $d = 0.35$) but not the pandemic group ($t[10] = 0.5$, $p = 0.66$, $d = 0.14$; see Table 2 for means by pandemic period).

Improved daily functioning (H3)

Across all participants enrolled to date, daily functioning as assessed by the DLA-20 ($N = 57$ matched scores) improved significantly from intake ($M = 90.0$, $SD = 6.7$) to 6-month post-intake ($M = 94.8$, $SD = 5.1$), $t(56) = -5.6$, $p < 0.001$, $d = -0.74$. As shown in Table 2 and indicated by separate repeated-measures t -tests, DLA-20 scores improved after participating in the program for clients who enrolled prior to the COVID-19 pandemic ($t[45] = -4.9$, $p < 0.001$, $d = -0.73$) and those who enrolled during the pandemic ($t[10] = -2.4$, $p < 0.05$, $d = -0.74$).

Increased family functioning (H4)

Finally, the predicted increase in family functioning was examined using the Family Functioning/Resiliency subscale from the PFS. For the full sample, scores on this scale increased and the increase was statistically significant (intake $M = 4.2$, $SD = 1.8$; 6-month $M = 5.0$, $SD = 1.4$; $t[67] = -3.9$, $p < 0.001$, $d = -0.47$). Mean intake and 6-month Functioning/Resiliency scores by pandemic period are shown

in Table 2; similar to mental health symptoms, separate t -tests within COVID pandemic subgroups indicated significant increase in Family Functioning/Resiliency among women who enrolled prior to the pandemic ($t(55) = -4.2$, $p < 0.001$, $d = -0.56$) but not those who enrolled during pandemic ($t[11] = 0.1$, $p = 0.89$, $d = 0.04$).

DISCUSSION

At the time of enrollment in the HFP, women reported experiencing serious challenges to their wellbeing associated with substance use and the experiences of trauma. Overall, the data supported the hypotheses of reduced substance use, and improved mental health, daily functioning, and family functioning for PPW. Across all participants, days of illegal drug use and psychiatric symptoms of depression and post-traumatic stress disorder were lower 6 months after intake compared to intake assessment while daily and family functioning scores also improved over time. We also tested the significance of change on outcome measures among women who began the program prior to the onset of the COVID-19 pandemic and associated stressors such as risk of illness and travel/social distancing restrictions, and within the subgroup of women who began services during the COVID-19 pandemic. The monthly rate of intakes slowed during the pandemic, and outcome data suggest that positive outcomes for substance use and daily functioning were robust both before and after the pandemic onset, while significant changes on other outcomes related to depression, trauma symptoms, and family functioning were more apparent before than during the pandemic. The present research continues to highlight the importance of specialized treatment for PPW with SUDs (Chou et al., 2020) as integral to reducing substance use and improving daily functioning among women.

Because substance use among PPW is complex, multifaceted coordinated systems of care are integral to PPW achieving recovery. Nurses have been at the frontline of developing protocols and processes for navigating substance use and health services (Leahy and Caverly, 2022). Thus, nurses are well-positioned to assess for substance use and begin the process of coordinating multiple systems of for PPW with SUDs, ensuring that women receive comprehensive treatment that addresses co-occurring disorders

(McKeever et al., 2014). Similar to the medical home model which utilizes a patient-centered, comprehensive care network (Stange et al., 2010), the HFP was part of a larger treatment system that focused on providing majority of services onsite and carefully coordinating offsite services for the women and her child(ren). For example, case managers assisted with scheduling perinatal health appointments for the women. Coordinating multiple aspects of care for PPW included care for children addressing mental health, physical health and case management needs, was necessary to ensure support for the family system. Additional attentiveness should be given to providing “warm handoffs” to increase the likelihood of attending appointments for PPW. Especially for PPW, where there remains fear of being reported to authorities and losing child custody (Meyer et al., 2019; Stone, 2015); coordinated care that allows for women to meet service providers and begin building rapport can be highly influential in engaging in treatment (Andrews et al., 2018; Lander et al., 2013).

Nurses have played an integral role in providing substance use and behavioral health services to those during the COVID-19 pandemic (Leahy & Caverly, 2022). Considering the impact of COVID-19 on PPW with SUDs is important as national trends indicated a rise in substance use during COVID-19. Specifically, 2020 had the largest number of fatal drug overdoses compared to any single year in U.S. history (NIDA, 2021). In the data reported here, mental health related to depression and anxiety symptoms did not significantly improve from intake to 6-month follow-up for participants who entered treatment during the pandemic, while there was a significant reduction in depression and trauma symptoms for women who entered treatment pre-COVID 19. Our findings align with previous research (Smith et al., 2021) that highlights the increase in depression among PPW with SUDs during the pandemic. The current data also indicated a lower treatment enrollment rate during the pandemic, consistent with prior literature that indicated barriers to accessing SUD treatment during COVID-19 (Pagano et al., 2021). Increased stressors related to pandemic including isolation, lack of childcare options, restricted access to perinatal healthcare and SUD treatment modalities may all be contributors to increased depression and trauma symptoms. Treatment efforts for PPW should continue to focus on addressing trauma assessment and treatment associated with the pandemic including loss, fear, and isolation. Recent research also supports the use of online recovery services specific to women, that may continue to be beneficial during the pandemic and beyond by increasing accessibility to treatment and promoting anonymity, if desired (Miller et al., 2021). Virtual gender-specific groups may address the impact of COVID-19 on mental and physical health as well as family functioning for PPW with SUDs.

The pandemic has introduced major barriers to achieving SUD outcomes across all treatment populations, including PPW; these barriers ultimately impact not only the individual in treatment but also the entire family unit. Prime et al., (2020) emphasize that the pandemic posed a major threat to the health of children and families due to the social disruption which included financial insecurity,

caregiving burden, and confinement-related stress. These factors can be strongly detrimental to PPW, adding to the barriers that create limitations to successful recovery. There is still not a total depiction of the impact of the pandemic on family dynamics, but what is translated in many statistics is the rise of anxiety about family stress (Prime et al., 2020). It is evident that the continued success of PPW for SUD's includes understanding the effects of the current barriers or limitations that include the COVID-19 pandemic factors. The detrimental impact of COVID-19 among PPW is not exclusive to mental health symptoms. The present study indicated that PPW with SUDs who enrolled in treatment during the pandemic did not report significant change in family functioning. Studies have shown the adverse effects of SUD's on the family system; including emotional and economic burden, relationship distress and dissatisfaction, family instability, and effects on parents (Daley, 2013). Because the whole family is impacted by SUDs, it is important that the family as a whole play an integral role in recovery (Brakenhoff & Slesnick, 2015). Bradshaw et al., (2021) highlight the importance of having available resources for the family members that promote recovery in the individual. In addition, other studies have shown that providing the family with support, resources, and even treatments can aid in personal recovery (Andrews et al., 2018; Ashley et al., 2003; Louw, 2018). McKeever et al., (2014) highlight the multitude of ways nurses can support the recovering of PPW with SUDs including ongoing substance use and treatment education for women *and* their families. The role of family, and family functioning has also been linked to treatment engagement for PPW with SUDs (Andrews et al., 2018; Ashley et al., 2003; Louw, 2018; Meyer et al., 2019; Murnan & Ferber, 2021). Thus, treatment considerations for PPW with SUDs should continue to focus on the whole family system, particularly during times of added stress on family systems such as a global pandemic.

Given the longevity of the COVID-19 pandemic, examining substances as a coping mechanism and identification of alternative coping skills is imperative for recovery and relapse prevention. Relapse prevention is a priority SUD treatment (SAMHSA, 2020). Results of the present evaluation and past studies (Smith et al., 2021) indicate mental health symptoms related to anxiety and depression are increasing among PPW with SUDs during COVID-19, a more focused effort from treatment centers may be needed to support women with co-occurring mental illness. Relapse prevention efforts may also include focusing on the collective trauma of COVID-19. This may include increased efforts to identify resilience factors among PPW, addressing the impact of COVID-19 on mental and physical health, and the development of skills that can be applied post-treatment to support sustaining recovery. Consideration should also be given to multitude of stressors among treatment centers experience during the COVID-19 pandemic. Many treatment centers experienced challenges in the delivery of services that required adaptation and flexibility including the transition to telehealth (Lin et al., 2021). Research has indicated that providing support is integral for SUD treatment providers, including additional training as well as sanitary supplies and personal protective equipment (Lin et al., 2021).

Limitations and future research

There are a number of limitations to the data and analyses reported here. Data were collected for a services grant performance evaluation, not as part of a controlled trial, so there was no comparison group. Therefore, we cannot draw conclusions about causal relationships between participating in the HFP and outcomes. In addition, due to reduced enrollment of new clients during the pandemic, the pre-pandemic and pandemic group sizes were unequal. Analysis of change from intake to follow-up had less statistical power within the pandemic versus the pre-pandemic group, and this cannot be ruled out as a partial explanation for non-significant findings on some outcomes among those who began services during the pandemic. More analysis is needed of evaluation data from additional treatment programs—including larger-scale and/or more controlled evaluations—to strengthen conclusions that may be drawn about the pandemic's impact on outcomes. However, the patterns observed in the current data are suggestive of the challenges faced by treatment providers working to meet the needs of clients who experience substance use disorders during a global pandemic.

CLINICAL RESOURCES

1. Clinical Guidance for Treating Pregnant and Parenting Women With Opioid Use Disorder and Their Infants. HHS Publication No. (SMA) 18–5054. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2018. <https://store.samhsa.gov/sites/default/files/d7/priv/sma18-5054.pdf>
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3. NIDA: Substance Use in Women Research Report Substance Use While Pregnant and Breastfeeding. <https://nida.nih.gov/publications/research-reports/substance-use-in-women/substance-use-while-pregnant-breastfeeding>
4. NIDA: Research Report substance Use in Women Research Report Sex and Gender Differences in Substance USE. <https://nida.nih.gov/publications/research-reports/substance-use-in-women/sex-gender-differences-in-substance-use>

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CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

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