

OPIOID USE AND BORDERLINE PERSONALITY DISORDER FEATURES: IMPLICATIONS FOR POSTPARTUM MATERNAL SELF-EFFICACY

**A Dissertation Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville**

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December 2023**

ABSTRACT

The current study sought to understand and explore the experiences of pregnant individuals who use opioids as previous research has mainly focused on identifying potential negative implications (Ryan, Marsh, Testa, & Louderman, 2006; Choi & Ryan, 2007; Grella, Needell, Shi, & Hser, 2009; de Bernabe et al., 2004). The initial sample included 178 total participants recruited from a high-risk pregnancy clinic during their pregnancy. Borderline features, approximation of borderline personality disorder (BPD) diagnosis (determined using a cutoff score of self-reported features, Kurt & Morey, 2001), opioid use status in pregnancy, and postpartum opioid use status were evaluated as potential predictors of maternal self-efficacy (MSE), or how confident an individual feels in her role as a mother (Coleman & Karraker, 1997). MSE not only provides valuable information regarding individuals' experience of motherhood but is also potentially modifiable through intervention and is related to parenting success (Wittkowski, Dowling, & Smith, 2016; Albanese, Russo, & Geller, 2019). Given that individuals with BPD and those that use opioids are disproportionately likely to have experienced adverse childhood experiences (ACEs) and because ACEs are negatively associated with MSE (Gannon, Short, LaNoue, Abatemarco, 2021; Treat, Sheffield-Morris, Williamson & Hays-Grudo, 2020), we postulated that borderline features, BPD diagnosis approximation, opioid use during pregnancy, and postpartum opioid use would each individually inversely predict MSE. Additionally, we hypothesized that borderline features and BPD diagnosis approximation would function as moderators of the relationship between opioid use status (during pregnancy and postpartum, respectively) and MSE. However, the study hypotheses were not supported. Of note, the current study included a relatively small sample size and a very high attrition rate (only

54 participants completed follow-up assessments, 30.34% of initial sample) which limited statistical power in the study. Future research with greater resources to increase sample size and reduce attrition (through increased staffing and participant reimbursement) should reevaluate these hypotheses. Additionally, future research should broadly focus on extending the goal of understanding the experiences of individuals using opioids in pregnancy in a manner that honors the complexities and nuances involved in this use while also examining external situational influences that may be at play.

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CHAPTER ONE

INTRODUCTION

Over 10 million people in the United States engaged in non-prescribed opioid use in 2019 (Substance Abuse and Mental Health Services Administration, 2020) and the number of annual opioid-related overdose deaths now exceed those due to automobile accidents (Rudd, Seth, David, & Scholl, 2016). Although these figures illustrate the devastating effects of the opioid epidemic, addressing the opioid crisis has proved to be a difficult task. One factor complicating this process is pervasive stigma against individuals with substance use concerns as this affects both quality of treatment and social support individuals might receive (Adams and Volkow, 2020).

Pregnant people are an especially vulnerable group to stigmatization due to fear regarding the potential implications of opioid use to the fetus (Ait-Daoud, Blevins, Khanna, Sharma, & Holstege, 2017; Johnson, 2019; Sun, 2004). Not only does opioid use in pregnancy present risk of Neonatal Opioid Withdrawal syndrome (NOWS) but various other deleterious outcomes such as preterm birth and increased risk of fetal death (de Bernabe et al., 2004). Difficulties may continue past pregnancy, as parents who use opioids experience significantly higher rates of having Department of Children's Services (DCS) involvement and/or having their child removed from their custody (Ryan et al., 2006; Choi & Ryan, 2007; Grella et al., 2009). While research has been plentiful in highlighting these negative consequences of opioid use in pregnancy, there have been limited efforts to understand the experiences of women in these situations (Springer, Biondi, Frank, & El-Bassel, 2020).

As such, the current study attempted to expand the literature by evaluating how mothers who use opioids experience parenting self-efficacy in the postpartum period as compared with mothers without opioid use concerns. Maternal self-efficacy (MSE), defined as how competent a woman feels in her role as a parent (Coleman & Karraker, 1997), is of interest as it not only speaks to a mother's experience in the parenting role but also is linked with the types of parenting practices used and child behavioral outcomes; thus, MSE carries potential long-term implications (Albanese, Russo, & Geller, 2019; Coleman & Karraker, 1997; Teti & Gelfand, 1991).

Additionally, the current study examined how borderline personality disorder (BPD) features might be related to both opioid use and maternal self-efficacy. BPD is a severe and chronic disorder with criteria including patterns of unstable and intense relationships with shifts between idealization and devaluation of others, unstable self-image, impulsivity in domains that are potentially dangerous to oneself, reactive mood, and chronic feelings of emptiness (American Psychiatric Association, 2013). The prevalence of opioid use among individuals with BPD is higher relative to the general population (Tragesser, Jones, Robinson, Stutler, & Stewart, 2013), and characteristics of this disorder may also predispose these individuals to be particularly vulnerable to parenting efficacy disruptions (Newman, Stevenson, Bergman, and Boyce, 2007).

CHAPTER TWO

LITERATURE REVIEW

Opioid Use in Pregnancy

There is a vital need for research targeted at understanding opioid use in pregnancy, as this represents a growing concern within the US (Stuart et al., 2018). Indeed, rates of opioid use in pregnancy quadrupled between 1999 and 2014 (Haight, Ko, Tong, Bohm, & Callagham, 2018) with estimates increasing from 1.19 to 5.63 cases per 1000 hospital births between 2000 and 2009 (Patrick et al., 2012). When discussing this topic, it is important to note that there are a variety of terms used to describe opioid use including “abuse”, “misuse”, “dependence”, and “addiction” which reflects the various ways opioid use may be experienced. Unfortunately, there has been inconsistent operationalization of these terms throughout the medical field and research literature which has complicated the understanding and study of these different types of use (Smith et al., 2013). In general, “misuse” refers to opioid use in a non-prescribed manner but intended to have therapeutic, but not euphoric, effects; “abuse” generally refers to non-prescribed use for euphoric effect; and “addiction” refers to continued use despite negative personal repercussions (Smith et al., 2013). “Dependence” can be broken down into two terms: “physical dependence” denotes use that would lead to withdrawal symptoms if discontinued and “psychological dependence” is typically used interchangeably with “addiction” (Smith et al., 2013). All of these terms are different than an Opioid Use Disorder (OUD) diagnosis. According to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition, (DSM-5; American Psychiatric Association, 2013) an individual can be given an OUD diagnosis when 2 of the following criteria met are met within a one-year period: tolerance; cravings; continued use

despite known physical or psychological impairment or physical hazard; discontinuation or reduction in social, occupational, recreational activities; failure to perform necessary duties at work, school, or home; excessive time spent in obtaining opioids; failed efforts to reduce use; and/or use of greater or amount or over longer period of time than intended.

Further complicating matters is the distinction between “illicit” and “nonmedical” opioid use. “Illicit” use typically refers to the use of opioids such as heroin that are illegal and “nonmedical” use refers to non-prescribed use of opioids that are legally prescribed such as oxycodone and morphine. Use of the synthetic opioids such as fentanyl can be illicit or nonmedical depending on the context (National Institute on Drug Abuse, 2021). Additionally, when someone struggles with addiction, they may be placed on medication assisted treatment (MAT) medications, also known as opioid agonist treatment, such as buprenorphine or methadone (Madden, 2019). Taking these medications as prescribed is not misuse, though individuals in this category are often targets of study as these MAT medications are opioids (Butler, 2013). While all forms of opioid use are important to study, it is important to acknowledge the variety of potential ways these substances are used and the variety of different descriptive terms. Furthermore, some terms such as “substance abuse” can be stigmatizing as they may imply fault for addiction (Kelly & Westerhoff, 2010). This study will henceforward utilize the term “opioid use” to refer to the wide range of potential manners in which opioids might be used in pregnancy.

Regardless of the type of use, a consistent theme in the lives of women who use opioids appears to be the experience of stigma. In a qualitative study among substance dependent mothers,

women described a pervasive sense of being judged by others including friends, acquaintances, and medical care providers (Fowler, Reid, Minnis, & Day, 2014). Even among women in substance use treatment, significant fear regarding potential Department of Children's Services (DCS) involvement and stigma from healthcare providers was reported (O'Rourke-Suchoff, Sobel, Holland, Perkins, Saia, & Bell, 2020). Adding to the environment of stigma are the various ways substance use during pregnancy have been addressed legally. In the current study's home state of Tennessee, the "Fetal Assault Law" enacted in 2014 allowed for prosecution of women for substance use during pregnancy (Darligton, Compton, & Hutson, 2021). Although this law expired in 2016, it has been reintroduced a number of times and its presence has created a culture of fear leading some women to avoid seeking medical care during pregnancy all together (Darligton, Compton, & Hutson, 2021).

This is especially disappointing considering what is known about the etiology of opioid use. Broadly, there appears to be a high prevalence of adverse childhood experiences (ACEs) among individuals using opioids, including abuse (emotional, physical, and/or sexual), neglect, use of drugs in this home, parental divorce, familial mental illness, and parental incarceration (Gannon et al., 2021, Derefinko et al., 2019, Stein et al. 2017). Oviedo-Joekes et al., 2011, for example, found that 44.6% of people in a sample of individuals in opioid-agonist therapy reported history of physical or sexual abuse. Abuse estimates appear to be even higher when specifically sampling women. Conroy, Degenhardt, Mattick, and Nelson (2009) found that 72% of women who were opioid-dependent reported childhood sexual abuse as compared with 56.3% of matched controls without opioid-dependence concerns. Women with opioid dependence were

statistically more likely to have experienced penetrative abuse, multiple-incident abuse, and have the perpetrator be someone known to them (Conroy et al., 2009). Among a group of people seeking inpatient opioid detoxification, ACE score was inversely associated with age of beginning opioid use and positively related to recent injection drug use and overdose reports (Stein et al., 2017).

Not only does there appear to be high rates of reported abuse, but this is often identified by women who use opioids as a factor contributing to their opioid use. Towers et al. (2018) found that 61% of women being seen in a high-risk pregnancy clinic for opioid use concerns identified childhood abuse as a precipitating factor in their drug use. Similarly, a qualitative study conducted by Spector et al. (2022) with 56 women asked to discuss factors leading to their opioid use found consistent themes of early life trauma including childhood maltreatment, particularly sexual violence and parental substance use (Spector et al, 2022).

Opioid Use and Maternal Self Efficacy (MSE)

ACEs are related to the experience of MSE, as ACE scores were negatively correlated with parental self-efficacy (Treat et al., 2020). The concept of MSE originates from Bandura's (1977) work with self-efficacy within his social learning theory. Bandura postulated that how successful an individual perceives themselves to be at a particular task is influenced by the following domains: their own history of succeeding/ failing in that domain, their experience of witnessing others similar to themselves succeeding/failing in the given domain, messages they have received about their ability to succeed/fail in that domain, and the emotional arousal they experience while engaging in tasks in this domain. He noted that self-efficacy has significant implications for how

the individual performs at tasks in that domain; namely, individuals with higher self-efficacy are expected to persist throughout difficult tasks more often than those with lower self-efficacy. The individual and their environment are understood to have a bidirectional interaction with each other which is a continuous, developmental process (Bandura, 1977).

Over time, the idea of self-efficacy has been applied specifically to the parenting role. Donovan and Leavitt (1989), who evaluated this construct regarding infant attachment, and Cutrona and Troutman (1986), who studied how infant temperament predicted maternal self-efficacy, were among the earliest to apply this construct to the parenting role. The definition of this term has stayed consistent over the years, with it used to represent a sense of competency in the parenting role (Coleman & Karraker, 1997).

Research has demonstrated that MSE is negatively correlated with use of ineffective parenting practices such as corporal punishment, and poorer child outcomes such as behavior problems, poor academic functioning, internalizing disorders, and delay in cognitive development (Albanese et al., 2019; Coleman & Karraker, 1997; Teti & Gelfand, 1991). Furthermore, interventions focused on increasing MSE have proven to be effective, which lends support to Bandura's suggestion that self-efficacy is influenced by malleable factors (Wittkowski et al., 2016). As such, MSE may have a significant impact on parenting practices and child outcomes, and MSE is also likely something that can be improved.

Using Bandura's framework for self-efficacy development, there are several potential mechanisms by which women who use opioids might be at risk for lower self-efficacy in their parenting role. First, opioid use during pregnancy is correlated with several adverse perinatal outcomes, including increased likelihood of preterm birth, lower birth weight, reduced head circumference, and increased incidence of Neonatal Abstinence Syndrome/ Neonatal Opioid Withdrawal Syndrome (NAS/NOWS) (de Bernabe et al., 2004). As noted by Bandura (1977), perception of previous successes and failures likely influences self-efficacy in that domain; thus, women may view these adverse perinatal outcomes as parenting failures, undermining their sense of parenting success before the child even comes home from the hospital.

Furthermore, in a qualitative study among mothers with substance use disorders, women described a pervasive sense of being judged by others including friends, acquaintances, and medical care providers (Fowler et al., 2014). Even among a sample of women using opioids enrolled in a prenatal care program, there were consistent reports of fear regarding potential Department of Children's Services (DCS) involvement and stigma from healthcare providers (O'Rourke-Suchoff et al., 2020). Given the role that messages regarding an individual's ability to succeed in a task play in the development of efficacy in that domain (Bandura, 1977), these negative societal messages regarding women who use opioids might contribute to women who use opioids having poorer self-efficacy.

To date, only one study has been conducted that has evaluated maternal self-efficacy among women who use opioids. Salo et al. (2009) surveyed three participant groups: foster mothers of

children who had been exposed to buprenorphine (prescribed and non-prescribed use) in pregnancy, women who used buprenorphine (prescribed and non-prescribed use) in pregnancy whose children remained in their care, and biological mothers who did not use substances in pregnancy. Drug use was determined through urine assay at birth. They found significant between-group differences in MSE, with non-substance-using biological mothers having the highest reported levels. Foster mothers of children who had prenatal opioid exposure fell in the middle and biological mothers who used opioids had the lowest reported levels of MSE. This finding is important as it not only demonstrates that women who use opioids in pregnancy may be at-risk for having reduced levels of maternal self-efficacy, but it highlights that this is likely not exclusively due to potential differences in demands of children who were exposed to opioids in-utero versus those not exposed to opioids. Previous research has been inconclusive at determining whether there are meaningful differences in behavior of children exposed to opioids that might make them more challenging to parent (Fucile, Gallant, & Patel, 2021). Although it is still unclear what might make biological mothers of children prenatally exposed to opioids more vulnerable to lower self-efficacy than foster mothers of children prenatally exposed to opioids, this research suggests that there is something about opioid use (e.g., stigma, reduced social support, ACEs, etc.) that may play a role.

Despite these strengths, there are a couple of significant limitations of the Salo et al. (2009) study. First, the study utilized a very small sample size. Only 34 women were included in the study and only 7 of the women used opioids. Second, this research was conducted when the children were 3 years old and maternal opioid-use was not assessed at that time, only during

pregnancy. The current study addressed these concerns by attempting to replicate these findings in a larger sample, and by assessing opioid use postpartum in addition to during pregnancy.

Borderline Personality Disorder

According to the DSM-5, a personality disorder is a pattern of behavior and inner experience that differs significantly from social expectations, is inflexible, and causes the individual notable distress (American Psychiatric Association, 2013). The DSM-5 groups personality disorders based on their symptoms; BPD falls in the Cluster B category which is described as “dramatic, emotional, or erratic” (American Psychiatric Association, 2013). As described previously, symptoms of BPD include rapid and extreme mood changes and impairments in how one sees oneself and others (American Psychiatric Association, 2013).

Research suggests that BPD is highly comorbid with OUD even when controlling for the variance explained by symptom overlap between the two disorders (Trull, 2000). A study by Darke, Williamson, Ross, Teeson, and Lynskey (2004) found that 46% of individuals in a sample of people using heroin met criteria for BPD as determined through a structured interview. In the current sample, BPD features are associated with opioid use severity (Kurdziel-Adams et al., 2019).

As is the case with opioid use, childhood maltreatment is frequently cited in the literature as one factor related to BPD (Leichsenring, Leibing, Johannes, Kruse, New, & Leweke, 2011; Ball & Links, 2009; Widom, Czaja, & Paris, 2009). In particular, childhood sexual abuse is consistently reported among individuals with BPD, though estimates seem to vary widely. Depending on the

study, between 30% and 90% of individuals with BPD report a history of childhood sexual abuse (Ball & Links, 2009; Bornovalova, Gratz, Delany-Brumsey, Paulson, & Lejuez., 2006; Carlson, Egeland, & Sroufe, 2009; Golier et al., 2003; Zanarini et al., 2000). There is a significantly positive relationship between the severity of the childhood sexual abuse and severity of BPD symptoms (Zanarini et al., 2000). Additionally, in a study conducted by Yen et al. (2002), individuals with BPD reported higher rates of sexual abuse than any other personality disorder being studied (Obsessive Compulsive Personality Disorder, Avoidant Personality Disorder, Schizotypal Personality Disorder) which was not explained by the higher prevalence of both BPD diagnosis and sexual abuse among women.

BPD and MSE

Like with opioid use, there is limited research on how women with BPD might experience maternal self-efficacy. To date, there only appears to be one quantitative study directly examining this relationship. Newman et al. (2007) studied a group of 14 women who had previously been diagnosed with BPD and 20 controls who were mothers recruited from community with no history of mental health concerns. Through use of a self-report measure, they found a significant difference in reported levels of MSE between the groups. Overall, mothers with BPD reported less efficacy in their parenting role than mothers without BPD. Similarly, Newman et al. (2007) found that mothers with BPD reported less competency, less satisfaction, and more distress in their role as a parent.

The current study extended previous research by examining borderline features rather than diagnosis of BPD. Kurtz and Morey (2001) found that self-reported affective instability, identity

disturbance, presence of negative relationships, and self-harm/impulsivity evaluated along a continuum are highly correlated with a BPD diagnosis as determined through a structured interview and prove to be a meaningful approximation for this disorder. While there are benefits and drawbacks to both approaches, assessing for borderline features rather than diagnoses allows for more simple and rapid identification of these personality characteristics than by using a diagnostic interview. While our goal is to eventually inform future intervention, using a scale of self-reported BPD features allows for more generalizable assessment of such concerns as many women may be unwilling or unable to seek out mental health services/personality assessment. The current study examined borderline features using both a total summation score of self-reported borderline features and through use of a clinical cutoff score that research demonstrated as approximately equivalent to a BPD diagnosis (Trull, 1995).

Opioid use, BPD, and MSE

Despite the high levels of comorbidity between BPD and opioid use (Trull, 2000), no research to date has evaluated how these variables might together inform maternal self-efficacy. This is an important area of research as there is some indication that opioid use and personality disorder in general may interact to increase risk of poor parenting outcomes. In particular, Hans et al. (1999) found that mothers with both opioid use concerns and personality disorder were more likely to have a child removed from their care than women with just opioid use concerns. In the current study we therefore expected that borderline personality features would function as a moderator between opioid use and maternal self-efficacy.

Current Study

The current study built upon previous research suggesting that women with BPD and opioid use disorder, respectively, experience reduced maternal self-efficacy. Previous research in this area has been sparse and no studies to date have evaluated these two constructs together with maternal self-efficacy. This is important due to the high rates of comorbidity between these disorders and due to previous research suggesting both concerns independently have risk for lower efficacy in the parenting role.

Hypotheses

1. Borderline features will predict maternal self-efficacy:
 - a. Total sum of borderline features (sum of affective instability, negative relationships, identity disturbance, and self-harm) self-reported during pregnancy will predict maternal self-efficacy 6-months after birth such that individuals with higher levels of borderline features will be more likely to have lower levels of maternal self-efficacy at 6-months post-partum.
 - b. BPD approximated through use of cutoff score (≥ 38 self-reported borderline features) will predict self-reported maternal self-efficacy 6-months after birth such that individuals above the cutoff score will have lower levels of self-efficacy than those above the cutoff.
2. Opioid use will predict maternal self-efficacy:
 - a. Opioid use (yes/no) during pregnancy will predict maternal self-efficacy postpartum, with women who have engaged in opioid use having lower levels of maternal self-efficacy.

- b. Opioid use (yes/no) 6-months postpartum will be associated with maternal self-efficacy postpartum, with women who have engaged in opioid use having lower levels of maternal self-efficacy.
- 3. Borderline features will moderate relationship between opioid use and maternal self-efficacy.
 - a. Borderline features (sum) will moderate the relationship between opioid use during pregnancy and maternal self-efficacy 6-month after birth such that opioid use will be more predictive of maternal self-efficacy among individuals with higher amounts of borderline features.
 - b. BPD approximation (yes/no above cutoff) will moderate the relationship between opioid use during pregnancy and maternal self-efficacy 6-month after birth such that opioid use will be more predictive of maternal self-efficacy among individuals above the cutoff score of self-reported borderline features.
 - c. BPD approximation (yes/no above cutoff) will moderate the relationship between postpartum opioid use and maternal self-efficacy 6-month after birth such that opioid use will be more predictive of maternal self-efficacy among individuals above the cutoff score of self-reported borderline features.

CHAPTER THREE

METHODS AND MEASURES

Methods

Participants

The initial sample was comprised of pregnant women who were being seen at a high-risk obstetrics clinic at a large Southeastern medical center. Women were eligible to participate at any point in their pregnancy. The mean gestational age at initial participation was 24.64 weeks, with one woman participating at only 8 weeks gestation and one woman participating at 39 weeks gestation. Participants were referred for opioid use and/or medical issues including obesity, multiple gestation, high blood pressure, and heart disease.

Procedure

Time 1. Researchers recruited participants through flyers placed in the clinic waiting room and word of mouth from the clinic physicians working. If a woman expressed an interest in participating in the study, she was brought to a separate room before or after her appointment with her obstetrician/gynecologist (OBGYN) where a research assistant greeted her. The research assistant provided information regarding the nature of the study and obtained her consent to participate. The woman was then given a questionnaire packet to complete and was compensated with a \$25 gift-card for her time.

Time 2. Researchers received some information regarding birth outcomes such as date of birth, birthweight, type of delivery, and APGAR score.

Time 3. Women were contacted approximately 6 months after the birth of their child and were asked whether they would be willing to complete additional surveys for additional compensation. If they were interested, research assistants met the participant at her home or another location of her choosing to review consent and provide additional questionnaire packets. Completion of this part of the study was compensated with a \$50 gift card.

Measures

Opioid Use in Pregnancy

Participants were classified as being part of one of two groups: 1) women who used opioids (referred to the clinic for opioid use in pregnancy) or women who did not use opioids (high-risk medical comparisons) through use of urine screens and prescription information. In order to be classified as someone who used opioids, a participant had to meet the following criteria: have a prescription for opioids used to manage withdrawal symptoms (e.g., buprenorphine) at some point during pregnancy and/or have had a positive opioid urine screen (prescribed and/or non-prescribed) within the 30 days prior to participation. Some women in this group had urine samples positive for other substances as well, such as marijuana or cocaine. Women were included in the non-opioid use comparison group if they were referred to the clinic for reasons not including substance use and did not produce any positive drug screens throughout their pregnancy. This process was used to determine opioid use status (yes/no) during pregnancy.

Opioid Use Postpartum

The Drug Use Disorder Identification Test (DUDIT; Stuart, Moore, Ramsey, & Kahler, 2003), is a 14-item self-report questionnaire that assesses whether an individual has used substances

within the last six months, as well as the extent of this use and whether there are symptoms of dependence. The following categories of drugs are specifically targeted: cannabis, cocaine, hallucinogens, stimulants, sedatives /hypnotics/ anxiolytics, opioids, steroids, and inhalants. Women respond to these statements on either a 0-6 or a 0-4 Likert scale, depending on the question. Possible scores on this measure range from 0-56, which higher scores indicating higher levels of drug use and/or dependence. This measure has been shown to be both reliable ($\alpha=.80$) and valid (Stuart et al., 2008). For the purposes of addressing the current research questions, two additional questions were added to this measure. The first asked participants to indicate whether they were currently taking opioid agonist treatment. The second asked them to indicate what kind of agonist treatment they were using if they endorsed the previous item. Only the DUDIT item asking about non-prescribed opioid use, as well as the two new items, were used to determine postpartum opioid status. Opioid use status was classified as “yes” if the participant endorsed either non-prescribed/illicit use or use of opioid agonist treatment and “no” if no reports of non-prescribed/illicit opioid use or opioid agonist treatment were made.

Borderline Features

Borderline features were assessed during pregnancy using The Personality Inventory-Borderline Features Scale (PAI-BOR; Morey, 1991). There are 24 items on which the women rated their agreement on a scale of 1 to 4. This self-report measure provides scores in four key domains: affective instability, identity problems, negative relationships, and self-harm. Items included statements such as, “My mood can shift quite suddenly” (affective instability), “My attitude about myself changes a lot” (identity problems), “My relationships have been stormy”

(negative relationships), “When I’m upset, I typically do something to hurt myself” (self-harm). Potential raw scores range from 0-72 with higher overall scores indicating higher levels of borderline features. High levels of borderline features are convergent with a diagnoses of BPD (Kurtz & Morey, 1991); furthermore, the PAI-BOR has good test-retest reliability as demonstrated in a study evaluating borderline features among adolescents with a BPD diagnosis (Trull, 1995). In addition to evaluating this construct as a continuous variable (total borderline features and each individual feature separately), the current study also used a clinical cutoff score of ≥ 38 for total borderline features as Trull (1995) found this to be approximately equivalent to a BPD diagnosis.

Maternal Self- Efficacy

Maternal self-efficacy was assessed 6-months postpartum using the Maternal Efficacy Questionnaire (MEQ; Teti & Gelfand, 1991). This is a 10-item Likert scale questionnaire, which assesses the extent to which mothers feel competent in their role as a parent. Items such as, “How good are you at understanding what your baby wants or needs? For example, do you know when your baby needs to be changed or wants to be fed?”, are included. Women indicate their level of agreement from 1 to 4, meaning that the range of possible scores for this measure is 10-40. Higher scores indicate a greater level of self-efficacy in the maternal role. Previous studies have shown this measure to have a high internal consistency ($\alpha=.86$) and concurrent validity ($r=-.75$) (Coleman & Karraker, 1997).

CHAPTER FOUR

RESULTS

Before evaluating the hypotheses, potential differences between the opioid-use and the non-opioid-use group on demographic variables such as maternal age, gestational age at study participation, minority group status, employment status, and relationship status were examined. Group differences were evaluated using *t*-tests for continuous variables (maternal age and gestational age at study participation) and chi-square tests for categorical variables (minority group status, employment status, and relationship status). No significant differences were found between groups for any of these variables. See Table 1. Furthermore, as the attrition rate was quite high (only 30.34% of original participants completed their 6-month follow-up assessments) comparisons were made between participants who did participate in the six-month follow-up versus those who did not in terms of demographic variables. Similarly, no significant group differences were found. See Table 2.

Hypothesis 1

In order to evaluate Hypothesis 1, that women with higher amounts of borderline personality disorder features (reported in pregnancy) would be more likely to have lower amounts of maternal self-efficacy six-months postpartum, borderline personality disorder symptomology was conceptualized as both a categorical variable (yes/no above cutoff >38) and continuous variable (total borderline feature score). First, borderline features (sum score of total features) was entered as an independent variable into a simple linear regression model with maternal self-efficacy entered as a dependent variable. The model was not significant, $R^2=0.02$, $F(1, 49) = 0.988$, $p=0.325$, with borderline features ($t = -.994$, $p = .325$) not being a significant predictor of

postpartum maternal self-efficacy. See Table 3. Another simple linear regression was conducted with borderline personality disorder approximation (yes/no above cutoff) entered as an independent variable and maternal self-efficacy entered as a dependent variable. Similarly, this model was not significant, $R^2=0.009$, $F(1, 49)=0.449$, $p=0.506$ with borderline personality disorder approximation ($t=-.670$, $p=.506$) not being a significant predictor of postpartum maternal self-efficacy. See Table 4. As such, the hypothesis that borderline features would be predictive of post-partum maternal self-efficacy was not supported.

Hypothesis 2

Hypothesis 2 postulated that opioid use during pregnancy (yes/no) and opioid use postpartum (yes/no) would be predictive of postpartum maternal self-efficacy. First, opioid use status during pregnancy was entered as an independent variable in a regression model with maternal self-efficacy entered as a dependent variable. The model was not significant, $R^2=0.003$, $F(1, 50)=0.150$, $p=0.700$. Contrary to what was expected, opioid use status during pregnancy ($t=-.387$, $p=.700$) was not a significant predictor of postpartum maternal self-efficacy. See Table 5. Another model was run with postpartum opioid use status entered as an independent variable and maternal self-efficacy entered as a dependent variable. Similarly, the model was not significant, $R^2=0.005$, $F(1, 46)=0.244$, $p=0.624$. Also contrary to what was expected, postpartum opioid use status ($t=-.494$, $p=.624$) was not a significant predictor of maternal self-efficacy. See Table 6. As such, the hypothesis that opioid use status would be predictive of maternal self-efficacy was not supported.

Hypothesis 3

In order to evaluate the final hypothesis, simultaneous multiple regression was used to determine whether the overall sum of borderline features and BPD approximation (yes/no above cutoff

score) would moderate the relationship between opioid use and maternal self-efficacy, such that the relationship between opioid use status (yes/no) and maternal self-efficacy would be stronger for women higher levels of self-reported borderline features and those above the cutoff for BPD approximation. This was tested with both opioid use status during pregnancy and opioid use status postpartum.

In the first model, opioid use status (yes/no) during pregnancy and borderline features (total sum) were entered as independent variables along with the interaction term opioid use*borderline features. Total maternal self-efficacy score was entered as the dependent variable. Borderline features did not moderate the relationship between opioid use in pregnancy and maternal self-efficacy, as the interaction term was not significant ($F(3,47) = .325, p > .05, \text{adj. } R^2 = -.042, B = -.017, SE_B = .111, \beta = -.106$).

In the second model, postpartum opioid use status (yes/no) and borderline features (total sum) were entered as independent variables along with the interaction term opioid use*borderline features. Total maternal self-efficacy score was entered as the dependent variable. Borderline features did not moderate the relationship between postpartum opioid use and maternal self-efficacy, as the interaction term was not significant ($F(3,43) = 1.125, p > .05, \text{adj. } R^2 = .008, B = -.0174, SE_B = .148, \beta = -.894$).

In the third model, opioid use status (yes/no) during pregnancy and BPD approximation (yes/no) were entered as independent variables along with the interaction term opioid use*BPD. Total

maternal self-efficacy score was entered as the dependent variable. BPD approximation did not moderate the relationship between opioid use in pregnancy and maternal self-efficacy, as the interaction term was not significant ($F(3,47) = .325$, $p > .05$, adj. $R^2 = -.042$, $B = 1.557$, $SE_B = 2.123$, $\beta = .235$).

In the final model, postpartum opioid use status (yes/no) and BPD approximation (yes/no) were entered as independent variables along with the interaction term opioid use*BPD. Total maternal self-efficacy score was entered as the dependent variable. BPD approximation did not moderate the relationship between postpartum opioid use and maternal self-efficacy, as the interaction term was not significant ($F(3,43) = .804$, $p > .05$, adj. $R^2 = -.033$, $B = .653$, $SE_B = 1.743$, $\beta = .095$). In sum, the hypotheses that borderline personality features and BPD approximation would moderate the relationship between opioid use status and maternal self-efficacy were not supported.

CHAPTER FIVE

DISCUSSION

The current study attempted to explore the experiences of women who use opioids during pregnancy. As substance use is highly comorbid with BPD, borderline personality disorder traits were examined in conjunction with opioid use status, in regard to postpartum maternal self-efficacy. Previous research in this area has been sparse and no studies to date have evaluated these two constructs together with maternal self-efficacy, which is important as research suggests both concerns (opioid use and borderline personality disorder) independently may have risk for lower efficacy in the parenting role (Salo et al., 2009; Newman et al., 2007).

Interpretation and Meaning of Findings

Several hypotheses were evaluated. First, sum of total self-reported borderline features and BPD approximation (cutoff score applied to self-reported borderline features) were examined as possible predictors of MSE. Second, opioid use status during pregnancy (determined using medical records) and postpartum (determined through self-report) were evaluated as possible predictors of MSE. Lastly, borderline features and BPD approximation were examined as potential moderators between opioid use status and MSE. We did not find support for any of these hypotheses as no significant group difference were found in terms of MSE. MSE values were essentially equivalent between women who used opioids in pregnancy and controls. Specifically, women who used opioids in pregnancy had a mean MSE score of 37.188 (SD=3.126) and controls had a score of 37.550 (SD=3.531). Similarly, women above the BPD approximation cutoff had an average MSE score of 36.960 (SD= 3.506) and women below this cutoff had an average MSE value of 37.577 (SD=3.062). These findings suggest no group

differences in terms of MSE for women who use opioids in pregnancy versus controls.

Similarly, MSE did not vary by level of reported borderline features or by BPD approximation status. Borderline features and BPD approximation status did not act as a moderator between opioid use status and MSE levels.

Strengths and Limitations

A significant strength of the current study was the attempt to try to understand the experiences of a highly stigmatized group of people. As mentioned previously, women who use opioids in pregnancy experience this stigma at a variety of levels including in healthcare, social, and even legal levels (Fowler et al., 2014, O'Rourke-Suchoff et al., 2020). These individuals are particularly difficult to recruit and can have very high attrition, likely due to a combination of the effects of this stigma and increased burden in their daily lives as they disproportionately live in poverty and may have less social support (Metz, Brown, Martins, & Palamar, 2018; Cooper, Campbell, Larance, Murnion, & Nielson, 2018). To date, most research with this population has strictly evaluated potential adverse pregnancy and birth outcomes as the result of opioid use but have not examined the experiences of these individuals while they navigate this likely stressful time. Even studies which have followed up after birth have mostly focused on prevalence of children being removed from the home or other negative outcomes, rather than what it is like for these individuals to navigate the role of parenthood (Springer et al., 2020).

Having a high medical risk comparison group (consisting of women who had high risk pregnancies for medical reasons such as obesity, multiple gestation, diabetes and high blood pressure) allowed for the risks of opioid use to be evaluated above those simply imposed due to

having a high-risk pregnancy. Additionally, this study utilized self-report measures in order to conceptualize borderline personality symptoms dimensionally which likely allowed a better understanding of this disorder in the general population. As access to adequate mental health services/ diagnosis can be limited, many people may have characteristics of this disorder or even meet full criteria without officially having received a diagnosis (Dhaliwal, Danzig, & Fineberg, 2020). Furthermore, providing a self-report measure allowed for this construct to be evaluated on a continuum and categorically (yes/no above the cutoff score of borderline features) which allowed us to examine potential effects of subclinical elevations in these features.

A significant limitation of the current study is the relatively small sample size and high attrition rate. Although 178 participants were included at Time 1 of the study, only 54 participants completed the assessment at six months postpartum. While there were no statistically significant differences in terms of demographic variables between the individuals who completed follow up and those who did not, it is possible that group differences exist on other unmeasured variables, perhaps in terms of stress levels or other factors that might be related to maternal self-efficacy. In addition, the small sample size reduced statistical power to detect group differences.

There were other limitations due to the way in which the study was constructed. Although working with high medical risk controls allowed us to assess for factors that might be specific to opioid use versus high-risk pregnancy in general, it also may have reduced our ability to notice difference between pregnant women using opioids versus pregnant women in general as our comparison group is not normative of the population.

Additionally, the opioid use group was very diverse in terms of style of opioid use, encompassing women strictly using opioid agonist treatment (e.g., buprenorphine or methadone), women using a combination of opioid agonist treatment and other opioids (e.g., heroin, fentanyl, morphine), and women exclusively using non-prescribed opioids (e.g., heroin, fentanyl, morphine). Further complicating matters, there was variability within the strictly opioid agonist group, as some women tapered completely off this at some point in their pregnancy, some reduced their use but did not completely taper off, some increased their dosage as their pregnancy progressed, and some maintained consistent doses. The pregnancy clinic where the study took place was unique in that women were allowed the option to taper off opioid agonist treatment during their pregnancy if they wished to, which is an option many pregnancy clinics do not offer. As a variety of different experiences of opioid use in pregnancy were captured in the study, the ability to examine potential subgroup differences related to maternal self-efficacy was reduced. For example, it is possible that women using illicit opioids may be more vulnerable to reduced maternal self-efficacy than women exclusively using agonist treatment during pregnancy, which we would not have been able to detect with the current study.

There was also a notable selection bias in that all women included in our study were seeking prenatal care, which is not true of all pregnant individuals. Particularly amongst the opioid use group, only including individuals receiving medical care throughout pregnancy is likely not representative of this population as these individuals have disproportionately lower rates of receiving prenatal care than the general population (Schempf & Strobino, 2009). Pregnant women using opioids who receive prenatal care may have more social support, less fear of criminalization and stigma, and more resources than their counterparts who do not receive prenatal care.

Furthermore, the mixed measurement of opioid use, which included use of medical records in pregnancy and self-report postpartum, may have been a limitation. Although there is mixed evidence of the utility of urine assays and research to suggest that they are not necessarily more valid than self-report, differences are often found between these measurement strategies (Yonkers, Howell, Gotman, & Rounsaville, 2011; Ondersma et al., 2019). As such, using different measurement tools at different time points is likely not ideal.

Use of the Personality Assessment Inventory Borderline Features scale allowed for the assessment of both borderline features and use of an approximation of Borderline Personality Disorder diagnosis through a cutoff score. While research by Trull (1995) supports the use of this cutoff score, this may not be ideal as Morey (1991), the scale's creator, noted that elevations across all domains (affective instability, identity problems, negative relationships, and self-harm) is necessary for diagnosis as elevations in these individual domains may be present in other disorders. It is possible that someone may score above the cutoff value without displaying these consistent elevations across subscales. Additionally, the Personality Disorder Inventory complete measure contains validity measures which were not included in the subsection utilized in this study, which may also limit ability to make inferences about diagnoses.

Another limitation is that MSE was only assessed at one time point. MSE appears to naturally ebb and flow throughout the postpartum period which was not able to be captured in the current model (Leahy-Warren, McCarthy, 2011; Zheng, Morrell, & Watts, 2018; Fulton, Mastergeorge, Steele, & Hansen, 2012; Law et al., 2019). To adequately understand individuals' experience of

MSE, assessment at multiple time points is likely necessary. This may even include anticipatory MSE during pregnancy.

Lastly, of note the sample was homogenous in terms of demographic variables, particularly race and financial status. Participants were almost exclusively white, and they all received Medicaid (which reflects low socio-economic status). While there were no differences between groups in terms of these variables (women using opioids versus those with high-risk pregnancies for other reasons and women above the cutoff for BPD and those below it), this likely limited the generalizability of the findings. Additionally, while we did not find any group differences in terms of relationship status (single vs. married vs. divorced vs. dating), when this category was collapsed to just compare whether participants were currently married or not, group differences emerged. This was not controlled for in the statistical analyses, which represents a limitation.

Future Research and Considerations

Future research should continue to examine the experiences women who use opioids during pregnancy face during pregnancy and after birth. The current study should be replicated with a larger, more diverse sample and with resolution of some of the study construction problems noted above. For example, particular kinds of opioid use may be studied individually (e.g., illicit use, opioid agonist therapy) and alternative measurement strategies for BPD and opioid use status may be considered. Given that this is such a difficult population to follow, likely due to social factors at play (e.g., stigma, low socioeconomic status, low social support), researchers should also be mindful of the intentionality, effort, and resources that will be necessary to reduce attrition. Future researchers should be well-equipped to compensate participants and should also ensure sufficient

staffing to be able to vigorously pursue research participants at follow-up. Significant care should be placed in building trust amongst participants as this could augment valid reporting and reduce attrition. Future researchers may consider recruiting participants outside of the hospital setting to avoid being perceived as aligned with medical care providers and following up with participants more frequently so trust can be built. Ideally, researchers may also be able to provide case management and other resources such as cell phone access, which often appeared to be a barrier to study participation amongst participants.

Longitudinal research would be ideal due to the nuances of many of the factors being evaluated. While we expected opioid use status to be predictive of MSE, it is also possible that MSE and opioid use status are related bidirectionally. Opioid use may be a mechanism to escape pain, including pain resulting from negative self-evaluations or strong self-criticism. As such, an individual who feels as if they are doing very poorly in the parenting role may be more likely to engage in opioid use. Furthermore, a bidirectional relationship may also exist between opioid use and many mental health diagnoses, including BPD. BPD traits and first incidence of substance use are often seen in the early adolescent years, which makes disentanglement of directionality particularly difficult (Carpenter, Wood, & Trull, 2015).

Additionally, research may be extended to also include father and other parental figures. Much research in the past has focused on mothers, as they often bear the burden of not only parenting responsibilities but also judgement and blame when adverse parenting outcomes occur (McBride-Chang, Jacklin, and Reynolds, 1992). Research repeatedly focusing exclusively on mothers likely reinforces these trends, so the role and impact of other parents should also be noted and evaluated.

This tendency to blame mothers, especially as it related to opioid use in pregnancy, is especially disappointing given what is known about the etiology of opioid use. People who use opioids have high incidence of adverse childhood experience (ACEs); for example, a study of opioid-dependent women found that 72% had experienced childhood sexual abuse which was statistically significant when compared with controls (Conroy et al., 2009). Another strategy to potentially reduce further stigma would be to directly evaluate the role ACEs may have in the experience of maternal self-efficacy.

Altogether, opioid use in pregnancy is a complex issue and future researchers should take care to acknowledge the nuances. Researchers should be conscious of maintaining compassion and understanding while exploring ways to better support these individuals in the future. This work is incredibly valuable as it has the potential to bring more resources to an often-neglected group of individuals. With rates of opioid use continuing to rise, more and more families are experiencing disruption from opioid use during pregnancy and postpartum. As such, research in this area is likely to have a transgenerational impact.

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APPENDIX

Table 1. Demographic Information of Women Using Opioids During Pregnancy vs. Comparisons

		Opioid-use group <i>n</i> = 35	Control group <i>n</i> = 21	Opioid Use vs. Control Group
Variable		M(<i>SD</i>)	M(<i>SD</i>)	<i>t</i>
Participant age		29.28 (5.23)	27.04 (5.14)	-1.564
Gestational age (study)		24.00 (7.79)	25.06 (7.67)	-0.490
		%	%	χ^2
Race/Ethnicity				3.943
	<i>White</i>	88.2%	81%	
	<i>Black</i>	2.9%	0%	
	<i>Hispanic/ Latina</i>	2.9%	0%	
	<i>Not specified</i>	5.9%	19.1%	
Employment Status	<i>Unemployed</i>	70.6%	66.7%	2.287
	<i>Full-time</i>	26.5%	28.6%	
	<i>Part-Time</i>	2.9%	0%	
	<i>Not Specified</i>	0%	4.8%	
Medicaid		100%	100%	0
Relationship Status				2.601
	<i>Single</i>	50 %	19 %	
	<i>Dating</i>	5.9 %	9.5%	
	<i>Married</i>	35.3%	19%	
	<i>Divorced</i>	5.9%	9.5%	
	<i>Not Specified</i>	2.9%	4.8%	

All p values >0.05

Table 2. Demographic Information Grouped by Follow Up Participation Status

Variable		Participated in follow up <i>n</i> = 54	Did not participate in Follow Up <i>n</i> = 124	Participated in follow up vs did not
		M(SD)	M(SD)	<i>t</i>
Participant age		28.00 (5.34)	27.06 (4.51)	-1.199
Gestational age (study)		24.41 (7.53)	28.45 (7.09)	3.314
		%	%	χ^2
Race/Ethnicity				8.299
	<i>White</i>	83.33%	77.42%	
	<i>Black</i>	1.85%	5.65%	
	<i>Biracial</i>	0%	3.23%	
	<i>Middle Eastern</i>	0%	0.81%	
	<i>Hispanic/ Latina</i>	1.85%	1.61%	
	<i>Not specified</i>	12.96%	11.29%	
Employment Status	<i>Unemployed</i>	64.81%	70.16%	3.717
	<i>Employed</i>	29.63%	18.55%	
	<i>Student</i>	0%	.81%	
	<i>Not Specified</i>	5.56%	10.48%	
Medicaid		100%	100%	0
Relationship Status				4.103
	<i>Married</i>	24.07%	18.55 %	
	<i>Single</i>	53.70 %	57.26%	
	<i>Divorced</i>	0%	5.65%	
	<i>Other</i>	11.11%	10.48%	
	<i>Not Specified</i>	11.11%	8.06%	

All p values >0.05

Table 3. Regression Coefficients of Borderline Features Sum on Maternal Self-Efficacy, n=51

Variable	<i>B</i> (SE)	β	$R^2(adj.)$	F (df)
Borderline Features	-.052 (.052)	-.141	.020 (.000)	.988 (1,49)

p>.05

Note: Borderline features refers to features of Borderline Personality Disorder

Table 4. Regression Coefficients of BPD Approximation on Maternal Self-Efficacy, n=51

Variable	<i>B</i> (SE)	β	$R^2(adj.)$	F (df)
BPD approximation status	-.617 (.921)	-.095	.009 (-.011)	.449 (1,49)

p>.05

Note: BPD refers to Borderline Personality Disorder

Table 5. Regression Coefficients of Opioid Use Status During Pregnancy on Maternal Self-Efficacy, n=52

Variable	<i>B</i> (SE)	β	$R^2(adj.)$	F (df)
Opioid Use (Pregnancy)	-.362 (.937)	-.055	.003 (-.017)	.150 (1,50)

p>.05

Table 6. Regression Coefficients of Postpartum Opioid Use Status on Maternal Self-Efficacy, n=48

Variable	<i>B</i> (SE)	β	R^2 (<i>adj.</i>)	F (df)
Opioid Use (Postpartum)	-.570 (1.155)	-.073	.005 (-.016)	.244 (1,46)

p>.05

VITA

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