

THE EXPERIENCE OF CHILDHOOD MALTREATMENT AND ITS IMPACT
ON PARENTING IN A HIGH-RISK SAMPLE

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Introduction

The impact of child abuse and neglect has been explored by a number of scholars in a number of contexts. Although the exact extent to which adverse childhood experiences impact development, there have been clear links between various forms of maltreatment early in life and later problems. Abuse experienced by children is typically identifiable to one of four categories: physical, sexual, verbal, and non-verbal emotional abuse; while neglect can be classified for the purposes of this study as emotional or physical. While abuse is generally the presence of some negative or harmful stimulus to the child, neglect is conversely considered to be the absence of positive stimuli. It is crucial to note that many survivors of abuse and neglect likely experience many or all of these different forms of maltreatment at some point during their upbringing. Eighty percent of children experiencing abuse will experience at least two of the subtypes, with abuse severity and frequency of Child Protective Services reports being significant predictors of later functioning in children (Manly, Cicchetti, & Barnett, 2008).

There are some concerns regarding retrospective self-reports of experiences of adverse childhood experiences, which may obscure the validity of some results. One such study that reported a substantial rate of false negatives, meaning that individuals did not report something that did happen, while the rate of false positives was very low, indicating that individuals were not likely to say something did happen that did not happen in actuality (Hardt & Rudder, 2004). This same study found that the primary areas of concern regarding validity involve “retrospective reports of details of early experience or on reports of experiences that rely heavily on judgement and interpretation.” Brewin, Andrews, and Gotlib (1993) noted that individuals with current psychopathology are especially vulnerable to false reporting, specifically due to

related general memory impairment and “mood-congruent memory biases”. Naturally, others are also at risk of false reports due to these same purposes, but the effects were exaggerated in populations with disorders. The authors suggest highly structured survey methods that focus on specific acts as indicators of larger constructs as a means of obtaining greater reliability of self-reporting, a method that was employed in the current study. Despite these concerns, retrospective reporting is still considered a valuable, although not fully understood, facet of developmental research.

Even with these questions of reliability, studies have pointed to the following statistics regarding the prevalence of various forms of abuse. Approximately 30 percent of girls and 15 percent of boys experience some form of sexual abuse (Bolen & Scannapieco, 1999). Physical abuse was found to occur at a rate of approximately 22.2 percent for men and 19.5 percent for women (Briere & Elliott, 2003).

With the shockingly high prevalence of abuse in childhood, it is crucial that effects are intimately understood. It should be noted again that many children that experience one form of abuse will also experience other types of abuse, thus determining definitively the impacts of each type of abuse independent from other types is difficult. Furthermore, the long-term impacts of abuse are found across a number of the studies listed below to be aggravated by the severity of abuse and by multiplicity of types of abuse experienced by victims. Following the description of these effects, we will review the impact of childhood maltreatment on later parenting behavior. Next we will identify a gap in the current literature with regards to the impact of abuse on parenting behaviors specifically in a population of mothers who experienced a high-risk pregnancy. Finally, we will present hypotheses regarding this gap in the literature that will be tested in the current study.

Impact of Sexual Abuse

Childhood sexual abuse, or CSA, has been linked to negative long-term physical, emotional, and psychological outcomes. Examples of sexual abuse may include attempted or completed sexual acts involving family members or extra-familial adults, as well as exposure to family or extra-familial adults making sexual comments or having the child touch them (Teicher & Parigger, 2015). Cavanaugh et al. found a link between CSA and difficulties with trust, interpersonal difficulties, self-reported poor relationship decision-making, risky behavior, and sexual problems in women, including traumatic memories, compulsive sexual behavior, and hypo- or hypersexuality (2015). With regards to increased risk for psychopathology, childhood sexual abuse has been linked in a number of studies to increased risk for depression, anxiety disorders, eating disorders, borderline personality disorder, and possibly schizophrenia, although the link between CSA and psychotic disorders are not yet fully understood (Neumann, Houskamp, Pollack, & Briere, 1996; Paolucci, Genuis, & Violato, 2001; Rind, Tromovitch, & Bauserman, 1998; Bailey & Shriver, 1999; Friedman & Tin, 2007). Furthermore, CSA has been linked to a number of negative health impacts including increased likelihood for gastrointestinal issues, chronic pelvic pain, chronic aches and pains, overall poorer cardiovascular health, and obesity (Irish, Kobayashi, & Delahanty, 2010). These are theorized to be linked to sympathetic nervous system disruption as a result of the severe traumatic stress at an early age (Shonkoff, Boyce, & McEwen, 2009). Both physical and sexual abuse with an age of onset before 17 were correlated strongly not only with greater risk for substance-use disorders, but also increased likelihood of interpersonal issues stemming from substance use (Liebschutz et al., 2016).

Impact of Physical Abuse

Physical abuse of children is a controversial subject due to many parents believing corporal punishment to be effective and necessary. The state of Tennessee defines an act constituting child abuse as “knowingly, other than by accidental means [treating] a child under eighteen years of age in such a manner as to inflict injury” (TCA 39-15-401(c), 2010). Although this definition differs state to state, most academic research on the subject relies on constructs independent of legal definition. The current study relies on the Maltreatment and Abuse Chronology of Exposure questionnaire. Respondents answer yes or no, and indicate age ranges in cases of an affirmative response for statements including: “Hit you so hard that it left marks for more than a few minutes,” “Spanked you with an object such as a strap, belt, brush, paddle, rod, etc.,” and “Hit you so hard, or intentionally harmed you in some way, that you received or should have received medical attention.” These questions allow researchers to score objectively the extent to which a child was the victim of physical abuse during childhood (Teicher & Parigger, 2015).

Despite the issues of separating physical abuse from other forms of abuse that are likely to occur alongside the purely physical forms of abuse, physical abuse during childhood has been linked to a number of somatic and psychological symptoms. Some of these symptoms included mild increases in risk for medical diagnoses and medical symptoms (allergies, arthritis, asthma, bronchitis, emphysema, circulation problems, high blood pressure, cardiovascular issues, musculoskeletal problems, and ulcers) when controlling for sex, age, and family background (Springer, Sheridan, Kuo, & Carnes, 2007). With regards to psychological impacts, physical abuse during childhood has been linked to moderately increased risks for thought

disorders/hallucinations, substance use disorders, suicidality, anxiety disorders, later violent behavior, and depression (Read, Agar, Argyle, & Aderhold, 2003; Fergusson & Lynskey, 1997). It is also notably linked to the development of aggression, and negative processing patterns including hostile attributional biases and increased accessing of aggressive responses (Dodge, Pettit, Bates, & Valente, 1995).

Impact of Verbal Abuse

Verbal abuse can be defined as a pattern of behaviors that includes parents swearing at, insulting, or humiliating a child, as well as calling the child names, acting in a way that makes the child feel as if they will be hurt physically, or threatening to leave or abandon the child (Teicher & Parigger, 2015). It has been linked with increased gray matter volume in the superior temporal gyrus, an area that plays a critical role in the processing of language and speech (Tomoda et al., 2011). This same study also found that grey matter volume in this region increased in direct proportion with severity of experienced verbal abuse. Brodmann Area 22 was also found to be impacted by this form of abuse, potentially supporting a link between experienced verbal abuse and later development of Wernicke's aphasia. Interpersonal issues are also common in victims of verbal abuse. Vissing, Straus, Gelles, & Harrop found that children who experienced frequent verbal abuse from parents demonstrated increased physical aggression, delinquency, and interpersonal problems than other children (1991). This trend was found to continue from preschool through high school. Furthermore, this relationship between verbal abuse and aggression, delinquency, and other interpersonal issues was only further strengthened in children who also experienced physical aggression from parents.

Impact of Non-Verbal Emotional Abuse

Non-verbal emotional abuse may include patterns of certain behaviors harmful to a child's emotional development and health. Examples for the purposes of this study include the child being locked in a room, feeling familial financial pressures, or having to shoulder adult responsibilities. It may also include the child feeling like the parent had no time to spend with them, no interest in spending time with them, or the parent was very difficult to please. Keeping important secrets or facts from the child is also an example of this type of abuse (Teicher & Parigger, 2015). This is a relatively distinct and specific construct mostly applicable to the MACE questionnaire used in the present study. It combines a number of facets of maltreatment that have traditionally been ascribed to some of the other subcategories of maltreatment listed here, thus research on the adverse impact of this type of abuse is difficult to find.

Impact of Emotional Neglect

Emotional neglect can be described as a pattern of failing to respond to a child's emotional needs for love and support. It may include either or both parents being emotionally unavailable, not making the child feel loved or important, or not serving as a source of strength and support for the child (Teicher & Parigger, 2015). It is crucial that parents are able to effectively demonstrate and develop social bonds with children so that they are able to develop a competent working model of healthy relationships. With the infant brain developing rapidly during the first few years of life, thus some facets of neurological and cognitive development are highly dependent on proper psychosocial stimulation and interaction during this time. Inadequate care associated with common definitions of emotional neglect has been linked to a number of adverse outcomes including issues with self-concept, difficulties with affect and arousal regulation, inhibited exploration of the environment, and issues with effectively developing and

maintaining peer relationships (Matas, Arend, & Stroufe, 1978; Cicchetti & Beeghly, 1990; Rogosch, Cicchetti, Shields, & Toth, 1995; Lieberman & Pawl, 1990; Sroufe, 1989).

Impact of Physical Neglect

Physical neglect is characterized by one or both parents not providing the physical environment or resources a child needs to thrive. This might include parents or others not being present to care of a child or take him or her to a doctor, a child not having enough to eat, having to wear dirty clothes, or generally not having family members to look out for the child (Teicher & Parigger, 2015). Nutritional deficiencies associated with physical neglect have been found to lead to a number of chronic health conditions including impaired cognitive development, as well as increased risk of cancer and cardiovascular disease (Caballero, 2002). Proper postnatal health care is associated with better physical outcomes and lower chances of sudden infant death syndrome (Ford, Mitchell, & Taylor, 1994). Naturally, lack of care and supervision is also associated with higher rates of child accidental injury and death (Landen, Bauer, & Kohn, 2003; Onwuachi-Sanders, Forjuah, West, & Brooks, 1999). Furthermore, lack of proper care and socialization associated with physical neglect has been linked with some externalizing issues, poor social skills, and problems in school (Bolger, Patterson, Thompson, & Kupersmidt, 1995; Patterson, DeBaryshe, & Ramsey, 1989). Some research relating to physical neglect fails to distinguish it as an independent construct from physical abuse, with it often being described as “maltreatment,” making the specific impact of just physical neglect somewhat difficult to pinpoint.

Parenting and Intergenerational Transmission of Abuse

With the myriad of physical, emotional, interpersonal, behavioral, and psychological impacts related to various forms of abuse, we took a particular interest in the impact of

experienced childhood maltreatment on later parenting behaviors. A great amount of research has discussed the intergenerational transmission of abuse of children, with results generally indicating that victimization is associated with an increased risk of later perpetration. Victims of physical abuse in childhood have been found more likely to commit physical abuse on their own children (Herrenkohl, Herrenkohl, & Toedter, 1983). One study on the subject of CSA found that the rate of victimization for later perpetrators was 35 percent. Furthermore, in this same study, 43 percent of the 96 female subjects had experienced some form of sexual abuse, but only one went on to perpetrate sexual abuse on children (Glasser et al., 2001). Sexual victimization was also found to be a risk factor for committing later acts of physical abuse as well, while experiencing physical abuse did not have a significant link to later perpetration of sexual abuse (Gelles & Straus, 1987). This leaves questions of other means of expressing this trauma in victims who go on to become mothers.

DeLillo and Damashek (2003) reviewed literature to suggest that exposure to CSA may be predictive of a number of other unhealthy parenting behaviors including role-reversal (or parentification), excessively permissive parenting, and a number of issues regarding attitudes towards parenting, decreased parenting self-efficacy, and excessively “black-and-white” views of childrearing that view it as either exclusively negative or positive as opposed to a mix of the two (DeLillo & Damashek, 2003; Chase, 1999; Herman and Hirschman, 1981; Burkett, 1991). Research CSA on later parenting stress found that although there is a possible influence, it could not be determined definitively from other risk-factors like socioeconomic status and psychological factors (Banyard, 1997).

Possible Impacts of High-Risk Pregnancies and Opioid Use

An area that we were not able to find any background in was how history of abuse and neglect impacted parenting behaviors specifically in a population of high-risk pregnancies, including mothers who abused opioids during the pregnancy. The “opioid epidemic,” as it has been referred to by politicians and media sources, is of growing concern in the United States. According to the U.S. Surgeon General’s Report on Alcohol, Drugs, and Health from 2016, 42,249 of the 64,070 overdose deaths in the United States were linked to opioid use (U.S. Department of Health & Human Services). This is a distinctly American problem, as indicated by a statistic from the Centers for Disease Control that describe the rate of opioid use in the United States to be the highest in the world, at a rate of more than double of the next closest country, Canada. This same 2012 report from the CDC also noted the shocking amount of opioid drugs in circulation, with a rate of 82.5 opioid pain reliever prescriptions per 100 people in the United States. Tennessee had the second highest rate in the country in this sample, at an astonishing 142.8 opioid pain reliever prescriptions per 100 people in the state (Paulozzi, Mack, & Hockenberry, 2014).

With this level of opioids in circulation, it is natural that some pregnant women would be are actively using these drugs. The overall rate of women admitted into substance abuse treatment programs remained stable between 1992 and 2012 at 4 percent, but the proportion of these admissions related to opioid abuse increased from 2 percent to 28 percent (Martin, Longinaker, & Terplan, 2015). Maternal opioid abuse is naturally linked with high rates of neonatal abstinence syndrome (NAS), now termed more specifically neonatal opiate withdrawal syndrome (NOWS). Symptomology for NOWS can be separated into a few categories. The first is neurologic excitability, where effected infants may experience tremors, irritability, increased muscle tone, high-pitched crying, wakefulness, and in the most serious of cases, frequent

seizures. The second category of symptoms includes gastrointestinal dysfunction, which may present clinically as poor feeding behaviors, vomiting, diarrhea, and inconsistent weight gain patterns. The final category includes autonomic symptoms such as sweating, fever, and general temperature instability. Severity of symptoms will vary from case to case but is correlated positively with the extent of maternal drug abuse (Hudak & Tan, 2012).

Maternal drug use itself has been found to be associated with experienced sexual abuse. Towers et al. (2018) found that experienced abuse, more so than the mismanagement of chronic pain, precipitated opioid use disorder (OUD) especially in the Appalachia region where the present study was conducted. Of the 192 pregnant women who went through intensive psychosocial background evaluation, 61.5% of the women were found to have a history of abuse that led to OUD, including 40% specifically with sexual abuse, 18% with non-sexual physical abuse, and 4% with only verbal abuse.

It is clear that maternal opioid use puts children at greater risk for physical dysregulation in the time immediately following birth, but studies also show that opioid addicted mothers were also more likely to struggle with parenting and parent-child interaction, including more autonomy-undermining behaviors and less maternal acceptance of the child compared to a control group (Slesnick, Feng, Brakenhoff, & Brigham, 2014).

As the risks and later outcomes for individuals who have been victims of various forms of abuse and neglect have been outlined, as well as the risk-factors of maternal opioid use, it is clear that there is a gap in the research examining the impact of experienced maltreatment on parenting behaviors specifically in a population of mothers who experienced a high-risk pregnancy. This gap is important to address as for a number of reasons. First, it will help us understand to a greater extent the impact of childhood emotional trauma. Second, it will give

some insight on the impact of negative and maladaptive models of parenting witnessed and experienced during childhood and how this can impact later parenting skills. Finally, it addresses a population often neglected in this type of research to determine if there is a mediational role of opioid use and abuse on the aforementioned. Based on an understanding of the current field of research, we predicted that severity of various forms of maltreatment (physical, sexual, verbal, and non-verbal emotional abuse; and physical and emotional neglect), and maltreatment generally, experienced during childhood would correlate positively with increased levels of later parenting stress and correlate negatively with later parenting self-efficacy. We also predict that maternal opioid use and severity will in some way mediate the relationships between experienced maltreatment and parenting stress and self-efficacy.

Methods

Participants and Recruitment

Participants for this study included 35 women from the High-Risk Pregnancy Clinic at a University Medical Center. Although 99 women completed the first set of questionnaires upon recruitment, only the 35 included in this study completed the set of 6-month follow up questionnaires. Women were eligible if they were over 18 years of age, literate in English, in or beyond their second trimester of pregnancy, and currently had a high-risk pregnancy. “High-risk” for the purposes of this study had two main categories: opioid misuse and other (which included any factors other than opioid use that may cause some risk factors for the pregnancy including obesity, multiples in pregnancy, cardiovascular diseases, cardiopulmonary diseases, hypercoagulable diseases, or rheumatologic diseases).

Women were recruited to the study during appointments at the High-Risk Pregnancy Clinic in which a receptionist would ask if she might be interested in taking part in a 30-minute study regarding high-risk pregnancies. If she was interested, a nurse would take the patient to a private examination room in which a research assistant would explain the purpose and procedures of the study, address any questions from the participant, and administer an informed consent form. Following this, the research assistant would administer the questionnaires to the participant, after which the participant would receive a gift certificate as compensation for the time required to complete the questionnaires. Mothers also had the option to opt-in and provide contact information to be a part of the 6-month follow up section of the study.

Mothers who consented to be contacted regarding the follow-up study were contacted in a number of ways. First, each of the mothers was sent a “Congratulations” card following the birth of her child which also thanked her for her previous participation in the study and informing her that she will be contacted soon regarding the follow-up portion of the study. In cases where the Department of Children’s Services had intervened, the mother would instead be sent a “Thank you” card when being informed of the upcoming follow-up portion of the study. When the baby was nearing 6-months of age, the mother would be called to potentially schedule a time and place to meet to be administered the follow-up portion of the study. Mothers who agreed again to participate were given three options with regards to completing the follow-up questionnaires: a research assistant would visit her at her place of residence, a research assistant would meet them in a public location, or the mother could complete questionnaires via the online research and survey system Qualtrics. Mothers who completed the questionnaires via Qualtrics still had to be met in person to collect measures regarding the weight and head circumference of the baby for a separate associated study and to deliver the second gift certificate to compensate

for the time required to complete the follow-up portion of the study. Of the original 99 women recruited for the first portion of the study, 35 completed the follow-up questionnaires. This will be the sample utilized for analysis in this particular study.

Demographics and Measures

Demographics

We collected demographic information on the mothers including marital status, employment, age, socioeconomic status, gestation and race from the University Medical Center the mothers were recruited from. As we did not have access to participant income level, we determined socioeconomic status by determining if the mother was a recipient of Medicaid— a joint state and federal program designed to provide assistance with medical costs to individuals with limited income. All participants in this study received Medicaid, which pregnant women in the state are eligible for if their income lies below 160 percent of the federal poverty level, or less than \$38,800 for a family of four.

Maltreatment

Childhood maltreatment was measured through the administration of the Maltreatment and Abuse Chronology of Exposure (MACE), a 52-item questionnaire developed by Teicher and Parigger to assess the types and severity of experienced maltreatment during childhood (2015). The questionnaire separates maltreatment into 10 subscales: emotional neglect, parental nonverbal emotional abuse, parental physical maltreatment, parental verbal abuse, peer emotional abuse, peer physical bullying, physical neglect, sexual abuse, witnessing interparental violence, and witnessing violence to siblings. The current study will only use six of these subtypes for analyses: emotional neglect, physical neglect, parental physical maltreatment,

parental verbal abuse, sexual abuse, and parental nonverbal emotional abuse. Overall severity of experience maltreatment and multiplicity of abuse subtypes experienced as well as severity of intrafamilial maltreatment (measure of abuse and neglect that occurs within the family, excluding any adverse experiences that may have resulted from peer interactions) are also used for the purposes of the current study. Scale development used item response theory, which uses mathematical models to determine the probability that an answer to any given item is related to an underlying construct. The scale was developed initially from a community study of over 1,000 participants recruited for a “Memories of Childhood” study, which elicited results with high test-retest reliability.

Maternal self-efficacy

Maternal self-efficacy in the current study was measured using Teti and Gelfand’s Maternal Efficacy Questionnaire, or MEQ (1991). This brief 10-item measure assesses maternal efficacy in 9 specific domains (e.g., soothing the baby, getting the baby to pay attention to you, keeping the baby occupied, and knowing what activities the baby will enjoy) as well as a one item that generally assess parenting self-efficacy: “In general how good a mother do you feel you are with your baby?” The MEQ has construct validity that is demonstrated with its significant correlation with perceived lack of parenting competence on a similar measure, the Parenting Stress Index Sense of Competence Scale (Teti & Gelfand, 1991).

Parenting stress

Parenting stress in this study was measured using the Parenting Stress Index Short-Form (PSI-SF), 4th Edition (Abidin, 2012). This shortened version of the original 120 item measure consists of 36 items, is designed to be administered when the child is between 1 month and 12 years of age and includes three subscales: parental distress (PD), parent-child dysfunctional

interaction (PCDI), and difficult child (DC). All three of these subscales combine to form a total stress score. For the parental distress subscale, mothers will respond using a range of strongly disagree to strongly agree for statements including “I feel alone and without friends,” “I don’t enjoy things as I used to,” and “I feel trapped by my responsibilities as a parent.” The parent-child dysfunctional interaction subscale includes statements like the following: “My child doesn’t seem to learn as quickly as most children,” “My child rarely does things for me that make me feel good,” and “I expected to have closer and warmer feelings for my child than I do and this bothers me.” Finally, the difficult child subscale includes statements like, “I feel that my child is very moody and easily upset,” “My child turned out to be more of a problem than I expected,” and “My child generally wakes up in a bad mood.”

Opioid use and severity

Opioid misuse and severity is measured in this study by using urine samples collected from mothers within 30 days of participation in the first set of data collection. Results of these samples would elicit a score between 0 and 3 on an opioid use severity scale. A rating of 0 would be indicative of “non-users” who had no trace of opioids or any other illicit drugs in urine samples (n = 20). A rating of 1 would be assigned for “opioid withdrawal,” in which a woman produced clean urine samples for opioids and other drugs within 30 days, but physicians had previously prescribed buprenorphine, buprenorphine plus naloxone, or methadone – drugs commonly used to treat opioid addiction (n = 1). A rating of 2 was assigned for “prescribed opioid use,” or women who produced a positive urine sample within 30 days for a prescribed buprenorphine, buprenorphine plus naloxone, or methadone, but tested negative for other illicit drugs (n = 8). A rating of three indicated “non-prescribed opioid misuse,” which is indicative of women who produced a positive urine sample for opioids that had not been prescribed to them in

the last 30 days (buprenorphine, buprenorphine plus naloxone, or methadone), or women who produced a urine sample with non-prescribed opioids and who may have tested positive for other illicit drugs ($n = 4$). Mothers were assigned a 4 if they had no opioids present in the urine sample, but the sample did test positive for other illicit drugs ($n=2$). Beyond the severity scale of 0 to 4, we also created a categorical opioid use variable (yes/no). Severity ratings of 0 would be indicative of “no opioid use” in this variable ($n = 20$), while ratings between 1 and 3 are collapsed into “opioid use” in this variable ($n = 13$). Mothers with an opioid use severity ranking of 4 were excluded from this categorical variable.

Data Management

Data entry was conducted through having two separate research assistants enter the data into SPSS separately and independently. The two different entries were then directly compared and discrepancies were identified. Any discrepancies found were addressed by referring back to the original entry in question from the questionnaire packet and the proper value was inserted. Data retrieved from Qualtrics online surveys were de-identified and placed directly into the final data set.

In rare cases where participants responded between two answers on an item, (e.g. circling both 2 and 3 and noting “somewhere between these two”) the response was consistently rounded up to the larger of the values. On the Parenting Stress Index, a few points of missing data were addressed using a method advocated in the manual for the measure - missing points were replaced by the mean of the remaining answered questions for the rest of the questions on the subscale, rounded up to the nearest whole number.

Results

Participant Demographics

Mothers participating in the study ranged from 20 years of age to 34, with a mean of 27.75 years of age. Nine women were married (26%), 5 were in a relationship (14%), and 21 were single (60%). The sample was mostly white (n=28; 80%) with 2 women identifying as Hispanic (6%) and 1 each identifying as black, Middle-Eastern, and biracial (3% each). The race of 2 women was not specified (6%). With regards to employment, 23 of the women were unemployed (66%), 5 were employed part-time (14%), 6 were employed full-time (17%), and 1 participant did not specify (3%). 100% of the women were deemed as having a lower socioeconomic status, which was determined by using the proxy of receipt of Medicaid.

Hypothesis 1 – Increased Severity of Maltreatment Predicts Decreased Maternal Self-Efficacy

No correlation between experienced maltreatment during childhood as measured by the MACE and maternal self-efficacy as measured by the Maternal Self-Efficacy Scale (MEQ) reached significance. The correlations between these are displayed below in Table 1.

Table 1 – Bivariate correlations between Maternal Self-Efficacy Scale scores and experienced maltreatment severity, including subscales

		Intrafamilial maltreatment severity	Total severity summed across subtypes	Number of subtypes of maltreatment	Physical Neglect Severity	Emotional Neglect Severity	Non- Verbal Emotional Abuse Severity	Parental Physical Abuse Severity	Sexual Abuse Severity	Parental Verbal Abuse Severity
Total Stress	Pearson Correlation	-.25	-.15	-.19	-.10	-.10	-.04	-.27	-.08	-.16
	Sig. (2- tailed)	.146	.376	.280	.558	.555	.841	.112	.631	.362

N	35	35	35	35	35	35	35	35	35
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Hypothesis 2 – Increased severity of maltreatment predicts increased parenting stress

No significant correlation was found between parenting stress index total score and total severity of maltreatment or any of the subscales of the MACE. Furthermore, two of the subscales of the parenting stress index (“difficult child” and “parent-child dysfunction”) did not correlate significantly with total severity of maltreatment or any of the subscales of the MACE. However, significant correlations were found between the “parental distress” subscale score and the severity of intrafamilial maltreatment ($r = 0.44$; $p = .009$), total severity of experienced maltreatment summed across subtypes ($r = 0.44$; $p = .008$), number of subtypes of maltreatment experienced ($r = 0.43$; $p = .010$), severity of experienced parental physical abuse ($r = 0.52$; $p = .001$), and experienced parental verbal abuse ($r = 0.41$; $p = .013$). Parental distress did not correlate significantly with the other subtypes of maltreatment (physical neglect, emotional neglect, sexual abuse, and non-verbal emotional abuse). These correlations are displayed below in Table 2.

Table 2 – Bivariate correlations between Parenting Stress Index scores and experienced maltreatment severity, including subscales

		Intrafamilial maltreatment severity	Total severity summed across subtypes	Number of subtypes of maltreatment	Physical Neglect Severity	Emotional Neglect Severity	Parental Physical Abuse Severity	Non-Verbal Emotional Abuse Severity	Parental Verbal Abuse Severity	Sexual Abuse Severity
Parenting Stress Index Total Score	Pearson Correlation	.25	.15	.19	.10	.10	.27	.03	.15	.09
	Sig. (2- tailed)	.151	.384	.284	.575	.563	.122	.875	.383	.623

	N	35	35	35	35	35	35	35	35	35
“Difficult Child” Subscale Score	Pearson Correlation	.03	-.12	-.07	-.04	-.08	-.01	-.18	-.17	-.04
	Sig. (2-tailed)	.878	.503	.712	.813	.645	.970	.299	.508	.816
	N	35	35	35	35	35	35	35	35	35
“Parental Distress” Subscale Score	Pearson Correlation	.44**	.44**	.43**	.21	.32	.52**	.27	.41*	-.19
	Sig. (2-tailed)	.009	.008	.010	.226	.063	.001	.113	.013	.272
	N	35	35	35	35	35	35	35	35	35
“Parent-Child Dysfunctional Interaction” Subscale Score	Pearson Correlation	-.01	-.15	-.09	.01	-.14	-.04	-.15	-.09	-.02
	Sig. (2-tailed)	.965	.406	.608	.958	.421	.805	.387	.627	.914
	N	35	35	35	35	35	35	35	35	35

****.** Correlation is significant at the 0.01 level (2-tailed).

*****. Correlation is significant at the 0.05 level (2-tailed).

Hypothesis 3 – Opioid use severity will mediate the relationship between severity of experienced maltreatment and later parenting stress and parenting self-efficacy

A SPSS macro developed by Preacher and Hayes was used to test for indirect mediational effects of opioid use on the relationship between experienced maltreatment and later parenting stress and self-efficacy (2004). This “INDIRECT” macro is used to predict the extent to which a third variable can be identified as a mechanism or process via which two other variables are related. The macro operates through bootstrapping, or nonparametric testing and retesting that does not make assumptions regarding the shape of the distributions of variables or sampling distribution of the statistic (Efron & Tibshirani, 1993). This method is also particularly effective

in that it does not derive its power from large-sample theory and can be applied more confidently to smaller samples, like the one in this study, with much greater confidence (Bollen & Stine, 1990). For the purposes of statistical interpretation, if a zero does not fall within a 95% confidence interval, it indicates a 95% likelihood that the indirect effect between the two variables is significant. If a zero does fall within the confidence interval, the indirect effect is not statistically significant. We bootstrapped 5,000 re-samples from the current data set per analysis. The first set of analyses demonstrated that there was no significant mediating indirect effect of opioid use severity between experienced maltreatment and maternal self-efficacy score. The results of these analyses are displayed below in Table 3.

Table 3 – Indirect effects of opioid use severity between experienced maltreatment and maternal self-efficacy with 95% confidence for confidence intervals

Dependent Variable	Estimated effect in population using bootstrapping	SE (boot)	Lower limit of confidence interval	Upper limit of confidence interval
Intrafamilial maltreatment severity	.0101	.0608	-.1097	.1510
Total severity summed across subtypes	.0022	.0077	-.0109	.0221
Number of subtypes of maltreatment	.0230	.0613	-.0694	.1869
Physical neglect severity	.0171	.0635	-.0871	.1845
Emotional neglect severity	.0083	.0514	-.0737	.1505
Parental physical abuse severity	-.0016	.0390	-.0720	.0951
Non-verbal emotional abuse severity	.0097	.0574	-.0999	.1464
Parental verbal abuse severity	.0034	.0281	-.0524	.0707
Sexual abuse severity	.0409	.0932	-.1244	.2640

The second set of analyses found that there was no significant mediating indirect effect of opioid use severity between experienced maltreatment and parenting stress index total score. The results of these analyses are displayed in Table 4.

Table 4 – Indirect effects of opioid use severity between experienced maltreatment and parenting stress index total score with 95% confidence for confidence intervals

Dependent Variable	Estimated effect in population using bootstrapping	SE (boot)	Lower limit of confidence interval	Upper limit of confidence interval
Intrafamilial maltreatment severity	.1032	.3085	-.5167	.8087
Total severity summed across subtypes	.0120	.0384	-.0752	.0922
Number of subtypes of maltreatment	.1330	.2988	-.4731	.7891
Physical neglect severity	.0817	.3351	-.6678	.7900
Emotional neglect severity	.0456	.2656	-.5421	.6095
Parental physical abuse severity	-.0079	.2436	-.6733	.3673
Non-verbal emotional abuse severity	.0580	.3174	-.6678	.7089
Parental verbal abuse severity	.0182	.1499	-.3377	.3137
Sexual abuse severity	.1901	.4466	-.6498	1.1738

The third through fifth sets of analyses found that there was no significant mediating indirect effect of opioid use severity between experienced maltreatment and any of the three sub-scores of the parenting stress index (parent/child dysfunctional interaction, difficult child, and parental distress). The results of these analyses are displayed in Table 5.

Table 5 – Indirect effects of opioid use severity between experienced maltreatment and parenting stress index subscores with 95% confidence for confidence intervals (PC_DYSF = Parent child dysfunctional interaction; DC = Difficult child; PAR_DIST = Parental Distress)

Dependent Variable	Estimated effect in population using bootstrapping		SE (boot)		Lower limit of confidence interval		Upper limit of confidence interval	
Intrafamilial maltreatment severity	PC_DYSF	.0522	PC_DYSF	.1056	PC_DYSF	-.1754	PC_DYSF	.2700
	DC	-.0207	DC	.1318	DC	-.3373	DC	.2582
	PAR_DIST	.0717	PAR_DIST	.1865	PAR_DIST	-.3274	PAR_DIST	.4749
Total severity summed across subtypes	PC_DYSF	.0059	PC_DYSF	.0129	PC_DYSF	-.0273	PC_DYSF	.0291
	DC	-.0040	DC	.0153	DC	-.0388	DC	.0277
	PAR_DIST	.0101	PAR_DIST	.0237	PAR_DIST	-.0417	PAR_DIST	.0611
Number of subtypes of maltreatment	PC_DYSF	.0579	PC_DYSF	.0976	PC_DYSF	-.1572	PC_DYSF	.2551
	DC	-.0350	DC	.1250	DC	-.3227	DC	.2078
	PAR_DIST	.1101	PAR_DIST	.1790	PAR_DIST	-.2383	PAR_DIST	.5120
Physical neglect severity	PC_DYSF	.0528	PC_DYSF	.1212	PC_DYSF	-.2092	PC_DYSF	.2956
	DC	-.0251	DC	.1346	DC	-.3103	DC	.2636
	PAR_DIST	.0540	PAR_DIST	.1960	PAR_DIST	-.4295	PAR_DIST	.4092
Emotional neglect severity	PC_DYSF	.0294	PC_DYSF	.0892	PC_DYSF	-.1639	PC_DYSF	.2162
	DC	-.0156	DC	.1090	DC	-.2269	DC	.2333
	PAR_DIST	.0317	PAR_DIST	.1509	PAR_DIST	-.3118	PAR_DIST	.3464
Parental physical abuse severity	PC_DYSF	-.0074	PC_DYSF	.0950	PC_DYSF	-.2825	PC_DYSF	.1215
	DC	.0031	DC	.0945	DC	-.1656	DC	.2434
	PAR_DIST	-.0035	PAR_DIST	.1152	PAR_DIST	-.3544	PAR_DIST	.1516
Non-verbal emotional abuse severity	PC_DYSF	.0385	PC_DYSF	.1102	PC_DYSF	-.2330	PC_DYSF	.2393
	DC	-.0272	DC	.1184	DC	-.2838	DC	.2197
	PAR_DIST	.0467	PAR_DIST	.1851	PAR_DIST	-.3603	PAR_DIST	.4378
Parental verbal abuse severity	PC_DYSF	.0124	PC_DYSF	.0570	PC_DYSF	-.1287	PC_DYSF	.1187
	DC	-.0062	DC	.0643	DC	-.1451	DC	.1347
	PAR_DIST	.0120	PAR_DIST	.0828	PAR_DIST	-.2101	PAR_DIST	.1567
Sexual abuse severity	PC_DYSF	.1036	PC_DYSF	.1754	PC_DYSF	-.1014	PC_DYSF	.5544
	DC	-.0578	DC	.1842	DC	-.4818	DC	.3057
	PAR_DIST	.1396	PAR_DIST	.2303	PAR_DIST	-.2851	PAR_DIST	.6553

Post-Hoc Analyses

Following the completion of the study, we ran correlational analyses to determine the extent to which different subtypes of maltreatment would correlate with each other. A number of statistically significant correlations emerged. Severity of experienced physical neglect correlated significantly with severities of experienced emotional neglect ($r = 0.56$; $p < .001$), physical abuse ($r = 0.35$; $p = .039$), non-verbal emotional abuse ($r = 0.62$; $p < .001$), and sexual abuse ($r = 0.55$; $p = .001$). Emotional neglect severity correlated significantly with severities of physical neglect ($r = 0.56$; $p < .001$), physical abuse ($r = 0.61$; $p < .001$), non-verbal emotional abuse ($r = 0.69$; $p < .001$), verbal abuse ($r = 0.79$, $p < .001$), and sexual abuse ($r = 0.51$; $p = .002$). Physical abuse severity correlated significantly with severities of physical neglect ($r = 0.35$; $p = .039$), emotional neglect ($r = 0.61$; $p < .001$), non-verbal emotional abuse ($r = 0.59$; $p < .001$), and verbal abuse ($r = 0.67$; $p < .001$). Non-verbal emotional abuse severity correlated significantly with severities of physical neglect ($r = 0.62$; $p < .001$), emotional neglect ($r = 0.69$; $p < .001$), physical abuse ($r = 0.59$; $p < .001$), verbal abuse ($r = 0.62$; $p < .001$), and sexual abuse ($r = 0.47$; $p = .004$). Verbal abuse severity correlated significantly with severities of emotional neglect ($r = 0.79$; $p < .001$), physical abuse ($r = 0.67$; $p < .001$), and non-verbal emotional abuse ($r = 0.62$; $p < .001$). Sexual abuse severity correlated significantly with severities of physical neglect ($r = 0.55$; $p = .001$), emotional neglect ($r = 0.51$; $p = .002$), and non-verbal emotional abuse ($r = 0.47$; $p = .004$). These correlations are displayed in Table 6 below.

Table 6 – Bivariate correlations between subtypes of maltreatment

		Physical Neglect Severity	Emotional Neglect Severity	Parental Physical Abuse Severity	Non- Verbal Emotional Abuse Severity	Parental Verbal Abuse Severity	Sexual Abuse Severity
Physical Neglect Severity	Pearson Correlation	1	.56**	.35*	.62**	.32	.55**
	Sig. (2-tailed)		.000	.039	.000	.059	.001
	N	35	35	35	35	35	35
Emotional Neglect Severity	Pearson Correlation	.56**	1	.61**	.69**	.79**	.51**
	Sig. (2-tailed)	.000		.000	.000	.000	.002
	N	35	35	35	35	35	35
Parental Physical Abuse Severity	Pearson Correlation	.35*	.61**	1	.59**	.67**	.29
	Sig. (2-tailed)	.039	.000		.000	.000	.091
	N	35	35	35	35	35	35
Non-Verbal Emotional Abuse Severity	Pearson Correlation	.62**	.69**	.59**	1	.62**	.47**
	Sig. (2-tailed)	.000	.000	.000		.000	.004
	N	35	35	35	35	35	35
Parental Verbal Abuse Severity	Pearson Correlation	.32	.79**	.67**	.62**	1	.30
	Sig. (2-tailed)	.059	.000	.000	.000		.085
	N	35	35	35	35	35	35
Sexual Abuse Severity	Pearson Correlation	.55**	.51**	.29	.47**	.30	1
	Sig. (2-tailed)	.001	.002	.091	.004	.085	
	N	35	35	35	35	35	35

****.** Correlation is significant at the 0.01 level (2-tailed).

***** Correlation is significant at the 0.05 level (2-tailed).

Discussion

Although perhaps impacted by the limited sample size of the present study, there was no significant correlation between experienced maltreatment and later maternal self-efficacy. This may demonstrate that high maternal self-efficacy is resilient to experienced abuse in childhood. Furthermore, mothers may experience a certain level of fulfillment in being able to provide more effective parenting than they were able to experience, protecting against lower maternal self-efficacy. Further research could possibly explore this link.

The only significant correlations with regards to the parenting stress index were positive correlations between the parenting distress subscale of the parenting stress index and total maltreatment score, intrafamilial maltreatment score, number of subtypes of abuse, physical abuse score, and verbal abuse score. This could demonstrate that experiencing abuse and maltreatment during childhood provide for the child a maladaptive working model of what effective parenting looks like. This would cause the positive correlations demonstrated, as the mother who had previously experienced abuse would be less likely to be able to pull from consistently positive and effective parenting strategies experienced during their own childhoods – potentially causing distress when these new mothers find themselves unable to cope effectively or succeed in the difficult task of parenting.

There are perhaps a number of pathways by which childhood adverse experiences could impact later parenting. The first would suggest that growing up in an abusive or neglectful household could have the effect of never exposing a child to effective parenting strategies at an early age. When these children later become parents, they may be unable to confidently refer to effective parenting strategies they witnessed and experienced from their own parents during childhood. An alternative could be that experienced maltreatment during childhood normalizes

maladaptive parenting strategies and includes them in the child's working model of what parenting should be. These harmful parenting strategies when executed in the next generation could elicit negative responses from children and in turn, increased parental stress. Although the current study would support the former model of transmission (based upon the low parent-child dysfunctional interaction subscale score), much more research would have to be done to come to a decisive conclusion.

Although the model of opioid use for this study is limited to three levels of severity, there was no indirect mediating role found between experienced maltreatment during childhood (including each of the subtypes) and later maternal self-efficacy and parenting stress, including the three subscales. Mediational analyses are a much stronger method when there is more variability in the variable selected as the mediator between the independent and dependent variables, and generally significant indirect mediating effects are only present if the original independent and dependent variables are significantly correlated. Based on the current study as it stands, it appears opioid use severity does not mediate the relationships between experienced maltreatment and maternal self-efficacy or experienced maltreatment and parenting stress.

One of the most interesting results of the current study was found during the post-hoc analyses that were made following the completion of the study. Significant correlations were found between a number of the subscales of maltreatment. This would demonstrate that individuals who experienced a certain subtype of maltreatment were also very likely to have experienced the other subtypes of maltreatment it was correlated with; but it also demonstrates that individuals who did not experience the given subtype of maltreatment were very likely to have not experienced the other subtypes of maltreatment it was correlated with. Emotional neglect and non-verbal emotional abuse were both found to be correlated with every other

subtype of maltreatment ($p = .01$). This would indicate that an individual who experiences any other form of abuse or neglect would be very likely to also have experienced to emotional neglect and non-verbal emotional abuse to some extent.

Although there are many more significant correlations within this post-hoc analysis, as shown in Table 6, a particularly interesting takeaway lies in the correlations with the sexual abuse subtype. Sexual abuse scores were found to correlate significantly with physical neglect, emotional neglect, and non-verbal emotional abuse ($p = .01$); however, it did not correlate significantly with either physical or verbal abuse. This would indicate that sexual abuse is more likely to overlap with other more emotional forms of maltreatment, and less likely to overlap with physical or verbal abuse. It is possible that these emotional forms of maltreatment may make sexual abuse more likely. For example, a neglected child may be more vulnerable to be sexually abused as he or she may not be closely monitored and may be left either alone in unsafe situations or left with inappropriate substitute caregivers. Perhaps some sort of emotional distancing or comfort in invoking emotional harm are necessary or are initial steps towards later perpetration of sexual abuse – leading to the significant overlapping in the experiencing of these types of maltreatment. This is an interesting relationship that could be a focus of later research.

Study Limitations and Strengths

One of the primary strengths of the study is its consideration and breakdown of the different subtypes of maltreatment, rather than using a construct that considers neglect or abuse more generally. Other strengths include the use of urine assays to assess the severity of opioid use. Statistically, using a bootstrapping method to assess indirect effects between constructs was also a strength of the study.

This study had a significant limitation in regards to participant attrition rate. Of the original 99 women recruited for the study, only the 35 serving as the sample for this study were able to complete the 6-month follow-up to portion of the study, which included the maternal self-efficacy scale as well as the parenting stress index. This could have been caused by a number of reasons. Some participants simply opted to not be contacted for the follow-up portion of the study following their completion of the initial questionnaires upon recruitment. We also had some trouble effectively contacting the mothers via mail for the 6-month follow up which could be related to changes in address due to income instability, moving into or out of a residence with a significant other, moving into or out of a residence with a family member, or leaving the area. Furthermore, we had trouble reaching some of the mothers by phone which could also be related to changing phone numbers, using the phone number of a significant other or family member, or the mothers selectively choosing to not answer or respond. Some mothers excluded from the sample were done so as a result of their involvement with the Department of Children's Services (DCS), and therefore could not effectively respond to questionnaires regarding the parenting of their new child. Increased involvement with DCS is particularly unique to this population of high-risk pregnancies. The high attrition rate in this study resulted in a relatively small sample size of 35. This likely had some impact in the data analysis and could have resulted in many of the correlations not reaching statistical significance. It would have also been ideal to have included a self-report assessment of opioid use in addition to urine assays to compensate for the short half-life of opioids.

Conclusion

Parenting is an incredibly difficult task that takes a great amount of psychological and social adjustment, especially for women who misuse drugs due to the overlapping in neural circuitry for drug use and parenting – leading to diminished reward and heightened stress in parenting. Disruptions in secure attachment are also possible results of drug use in parenting (Rutherford, Potenza, & Mayes, 2013). Experienced maltreatment in childhood likely also has a large impact on the execution of parenting due to diminished access to functional models of parenting behaviors and lingering emotional trauma from these experiences or through the normalization of a maladaptive model of parenting. Furthermore, maltreatment has a number of other detrimental effects that could interfere with effective parenting more indirectly.

Although the current study demonstrated no significant correlation between experienced maltreatment and maternal self-efficacy and significance between several maltreatment subtypes and only the parental distress subscale of the parenting stress index, further studies might find a greater effect with a significantly larger sample size or a non-high-risk population. Further studies may also want to address comprehensively the impact of various types of maltreatment on parenting skills and effectiveness more generally. Studies that consider the experiencing of multiple subtypes of maltreatment and the chronicity of maltreatment may shed some light on the importance of having experienced quality parenting during childhood.

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