Substance Abusing Mothers with a History of Childhood Abuse and Their Children's Depressive Symptoms: The Efficacy of Family Therapy

Qiong Wu^{1,2} and Natasha Slesnick²

¹Department of Family and Child Sciences, College of Human Sciences, Florida State University. Address: 322 Sandels Building, 120 Convocation Way, Tallahassee, FL 32306.

²Department of Human Sciences, The Ohio State University. Address: Campbell Hall Room 135, 1787 Neil Ave., Columbus, OH 43210.

Abstract

The current study examined the associations among maternal history of childhood abuse, substance use and depressive symptoms and the change of children's depressive symptoms in therapy. Mothers (N=183) were randomly assigned into either a family or an individual treatment condition. Mothers were assessed for their childhood abuse retrospectively, baseline depressive symptoms and substance use, whereas their children's depressive symptoms were measured five times during 1.5 years. Maternal childhood abuse was associated with a slower decline in child depressive symptoms through elevated maternal depressive symptoms, only in individual treatment. Maternal substance use further moderated this mediation pathway. This study supports the efficacy of family therapy in protecting children of mothers with a substance use disorder and a history of childhood abuse.

Keywords

depression; substance abuse; maternal childhood abuse; children/adolescents; family therapy efficacy; RCT

Maternal history of childhood abuse is related to elevated psychiatric symptoms, such as depression and PTSD, and also higher risk for adverse outcomes among the survivor's children (Juul et al., 2016; Oh et al., 2016). This suggests patterns of intergenerational transmission of psychosocial risk (e.g., Choi et al., 2017; Fredland et al., 2015). Among women reporting a history of childhood abuse, rates of substance use problems are higher than among nonabused women (Polusny & Follette, 1995), which conveys additional risk to their children (Dixon et al., 2005). Given the significant psychosocial risks among these children, research efforts on the efficacy of family therapy for mothers and their children are highly needed. The current study investigated the effects of family systems therapy on the

Correspondence concerning this article should be addressed to Qiong Wu, Department of Family and Child Sciences, College of Human Sciences, Florida State University. Address: 322 Sandels Building, 120 Convocation Way, Tallahassee, FL 32306. qwu3@fsu.edu.

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relations among maternal history of childhood abuse, different drugs of use, and mother and child depressive symptoms.

Family Systems Therapy with Mothers and Their Children

Maternal history of childhood abuse can increase the risk of adverse child outcomes, including lower bonding with mothers, emotional and behavioral problems, and depression (Choi et al., 2017; Claridge et al., 2015; Fredland et al., 2015). Recent studies suggest that maternal depression serves as an underlying mechanism of this intergenerational transmission of psychosocial risk (e.g., Choi et al., 2017; Fredland et al., 2015). That is, traumatic experiences appear related to poor emotional functioning and mood disorders in mothers (Choi et al., 2017; Cloitre et al., 2005), which may exhaust the resources that mothers have for parenting, and increase parenting stress and tension in mother-child relationships (Oh et al., 2016; Juul et al., 2016). Supporting this, research shows that maternal depression is related to low mother-child relationship quality and a slower recovery of children's depression in treatment (Claridge et al., 2015; Eckshtain et al., 2017).

Given that maternal history of childhood abuse is associated with increased stress in the mother-child relationship and child depression, including these children in family therapy to enhance healthy mother-child interaction has been recommended (Thomas & Zimmer-Gembeck, 2011). Family systems therapy addresses mother-child communication patterns using a systemic model, providing opportunities for mothers to reflect on how their personal history affects parenting practices and to practice alternative, adaptive ways of interacting with their children (Chaffin et al., 2004). In this way, family therapy can reduce distress in children. Meta-analyses report high levels of effectiveness of family systems interventions with depressed children and adolescents (Carr, 2009). Inclusion of children in family therapy with their mother can also reduce depression and improve abstinence in mothers, and thus further prevent intergenerational transmission of psychosocial risk in children (Slesnick & Zhang, 2016). However, very few studies have tested the efficacy of treatment including non-treatment seeking children with their treatment-seeking mothers.

Role of Substance Use

When maternal childhood abuse history occurs with mental health or substance use problems, additional risks to children are observed beyond maternal history of childhood abuse alone (Dixon et al., 2005). From a family systems perspective, maternal substance use is not only directly associated with adverse child outcomes, but also modifies the levels of how maternal parenting is associated with child mental health, through influencing mother-child interactions (Hogan, 1998; Rowe, 2012). It is thus reasonable to expect that the level of maternal substance use can modulate the association between maternal risk factors and child outcomes, as substance use may indicate an important aspect of a mother's mental health, which is associated with being present and engaged in her parenting behaviors (e.g., Eiden & Leonard, 1996; Newcomb, Huba, & Bentler, 1983). Supporting this, infant insecure attachment was found to be related to maternal depression only in children with heavy drinking parents (Eiden & Leonard, 1996). Eiden and Leonard (1996) suggest that light alcohol use may alleviate parenting stress and maintain healthy mother-child bond, whereas

heavy drinking may be related to harsh and neglectful parenting putting mother-child functioning at additional risk. However, most of the current literature tends to explore the direct effect of maternal substance use for their children, without exploring how substance use serves as an add-on risk factor to maternal depression and functions to affect mother-child well-being from a family systems perspective.

Mother's drug of choice shows differential associations with children's well-being (e.g., Hogan, 1998; Slesnick, Feng, Brakenhoff, & Brigham, 2014). Mothers using alcohol are more irritable and are more likely to physically abuse their children than mothers using other drugs (Dube et al., 2001; Hogan, 1998). Mothers using cocaine tend to be neglectful towards their children and withdrawal from interaction compared to mothers who use other drugs (Mayes et al., 1997). Mothers using opioids report higher levels of acceptance towards their children than mothers using alcohol or cocaine (Slesnick et al., 2014). Less is known about how marijuana use in mothers is related to their children's depression, though it is suggested that children of mothers using marijuana function better compared to those whose mothers use other drugs (Hogan, 1998), as marijuana use may alleviate mothers' traumatic symptoms and depression (Belendiuk et al., 2015). However, current research is still limited in examining how different drugs of abuse may moderate the link between maternal and child depression.

The Current Study

Understanding how family therapy can modify the pathway from trauma in one generation to unsatisfactory improvement in treatment in the next generation - as mediated by maternal depressive symptoms - is important. However, although the relations between maternal childhood abuse and mother-child functioning are well established (e.g., Choi et al., 2017; Fredland et al., 2015; Juul et al., 2016), empirical studies on intervention efforts are few (Claridge et al., 2015). Prior studies also tend to assess children's functioning only at one time point, without examining changes over time (e.g., Choi et al., 2017; Fredland et al., 2015). This is especially important in the context of treatment, as researchers and interventionists seek information on the maintenance of treatment effects in order to fully evaluate the power of their intervention. Additionally, prior studies have primarily focused on a general population of abused women without examination of the effect of substance use on the mother-child relationship. This is a significant oversight as the comorbidity of substance use disorders and depression is high (41%–49% as reported in the National Comorbidity Survey Replication; Kessler et al., 2003).

This study utilized data from a randomized clinical trial in which the primary outcomes focused on maternal substance use outcomes. Overall, mothers receiving the Ecologically-Based Family Therapy (EBFT; Slesnick & Prestopnik, 2005) with their child reduced their substance use behaviors quicker than mothers receiving the individual therapy intervention (Slesnick & Zhang, 2016). As a family systems therapy, EBFT recognizes that substance use and associated individual and family problems as interrelated systems, and targets dysfunctional family interactions to decrease the occurrence and maintenance of problem behaviors (Slesnick & Zhang, 2016). It was originally developed to intervene with substance using adolescents who had run away from home and their families (Slesnick & Prestopnik,

2005, 2009). EBFT has been rated as a promising evidence-based practice by the National Institute of Justice and as a supported evidence-based practice by the California Evidence-Based Clearinghouse.

The current study provides new information on the efficacy of EBFT on changes in child depressive symptoms during and after treatment, as mediated by maternal depressive symptoms. Treatment conditions were expected to moderate the mediation path; maternal depressive symptoms were expected to mediate the relation between maternal history of abuse and the change in child depressive symptoms only in the individual treatment group. Second, maternal frequency of substance use was expected to moderate the link between maternal depressive symptoms and the change in child depressive symptoms in both the family and the individual treatment groups, thus further moderating the mediating path from maternal childhood abuse to the change in child depressive symptoms through maternal depressive symptoms (Figure 1a). This moderated mediation was expected to differ according to maternal use of different types of substances. Specifically, the strength of the mediation path (maternal childhood abuse - maternal depressive symptoms - the change in child depressive symptoms) would attenuate if mothers used less “hard” drugs such as marijuana, whereas it would intensify under the condition of frequent maternal use of alcohol or hard drugs such as cocaine and opioids.

METHOD

Participants

A total of 183 mother-child pairs were included in the current study. Mothers were recruited from a treatment center for substance abuse in a large Midwestern city. Eligible criteria for mothers for the current study included (1) meeting diagnostic criteria for an alcohol or drug use disorder as defined by DSM-IV, (2) seeking outpatient treatment for substance use, and (3) having a biological child in the age range between 8 and 16 years.

Mothers' age ranged from 22 to 54 years ($M = 33.9$), and their children were between 8 and 16 years ($M = 11.54$; 48.1% female). Over half (53.6%) of the mothers were White, 42.6% were African American and 3.8% were other races. Among the mothers, 45.8% were married or in a romantic relationship, 32.8% were single/never married, 8.2% were separated but still married, and 13.1% were divorced or widowed. Mothers reported the annual family income, of which 26.8% of the families were in the category of 0-\$5000, 33.3% were in \$5001-\$15,000, 21.3% were in \$15,001-\$30,000, 8.7% were in \$30,001-\$45,000, and 9.3% were in \$45,001 or above. Most mothers reported polydrug use at baseline (75.9%), whereas the percentages of mothers using a single drug were 9.8%, 1.6%, 1.1%, and 11.5% for alcohol, marijuana, cocaine, and opioids, respectively. Among 135 (73.8%) mothers who used alcohol, the percentages of mothers using marijuana, cocaine, and opioids were 64.4%, 33.3%, and 36.3%, respectively. One-hundred-and-five (57.4%) mothers reported using marijuana, among whom 30.5% and 47.6% reported cocaine and opioid use, respectively. Finally, among 62 mothers who used cocaine, 48.4% of them also reported opioid use.

Procedure

Mothers were screened for eligibility at the community treatment center. Eligible mothers were asked for parental permission to contact the target child to discuss their interest in the study. After receiving both maternal consent and child assent, mothers and their child filled out the baseline questionnaires. Then all families were randomly assigned to either (1) Ecologically-Based Family Therapy (EBFT) conducted by a systemically trained marriage and family therapist (123 families) or (2) Women's Health Education (WHE) (60 families). Both treatments were completed within 6 months post-baseline. Families were followed up at 3-, 6-, 12- and 18-months post-baseline. Each assessment lasted about 90 minutes, where a \$75 gift card was given to the mothers and a \$40 gift card for their children. This study was approved by the university's Institutional Review Board.

Treatment Interventions

Grounded in the Social Ecological Model (Bronfenbrenner 1979), Ecologically-Based Family Therapy (EBFT) conceptualizes substance use as an indicator of larger familial problems, and aims at improving dysfunctional family interactions to lower the onset and maintenance of symptoms, with a systemic approach. The EBFT also incorporates skill training from a cognitive behavioral approach, to improve beliefs, coping, and communication skills. Family members learn and practice new problem-solving skills, thus improving communication skills of individual family members and functioning of the entire family. EBFT is offered for 12 sessions. About a third (36%) of all families had more than one child in therapy, with an average of 1.3 children per mother. For details about EBFT, including the therapy model and therapist training, please refer to the primary outcome paper of the larger study (Slesnick & Zhang, 2016; Cully, Wu, & Slesnick, 2018; the supplemental material).

Women's Health Education (WHE) is a manualized individual intervention (Miller et al. 1998). It is offered for 12 sessions, focusing on helping mothers understand the woman's body, human sexual behavior, pregnancy and childbirth, STD's, and AIDS. WHE provides comparable therapist attention and expectancy of benefits, such as decreasing PTSD symptoms among females seeking treatment for substance use (Hien et al., 2009). However, WHE is not a family systems intervention; nor did children attend WHE sessions.

Participants in the EBFT condition completed more sessions ($M_{EBFT} = 6.44$, $SD_{EBFT} = 4.73$; $M_{WHE} = 3.00$, $SD_{WHE} = 4.49$; $t(181) = 4.69$, $p < .001$), and were more likely to finish all treatment sessions (EBFT 30.9%, WHE 15.0%; $\chi^2(1) = 5.34$, $p = .02$). Participants who completed all sessions tended to have older children than those who did not ($t(181) = 2.06$, $p = 0.04$). Meanwhile, therapists received ongoing supervision, and independent treatment fidelity coding ensured implementation quality and adherence to the intervention protocol. Based on the treatment manual and the protocol (Slesnick & Prestopnik, 2005), codes were developed for the EBFT intervention. Adherence, the occurrence of the procedure during the session, and competence, the quality of the procedure, were assessed. EBFT fidelity was rated on 10 procedures, and sample items were "Did the therapist use relational comments? If yes, how effectively?" and "Did the therapist reframe/relabel family members' comments? If yes, how effectively?" The procedure was rated as zero if not happening in the session; or

it was rated on a 7-point Likert scale (1=very poorly, 7=exceptional) for the therapists' effectiveness on the procedure. Using these coding schemes, a fifth of the audio recordings of sessions were coded by two independent coders, who were trained and supervised in the EBFT intervention. Discrepancies in coding were resolved as coding progresses, and an 80% inter-rater reliability among the codes was maintained all through the study. The adherence was good; on average, an EBFT session included 8.12 procedures, out of 10 potential procedures (SD = .94, range 6–10). The competence was also satisfactory; the average rating was 5.71 out of 7 (SD = .59, range 4–7). Inter-rater reliability for adherence was kappa = .97, and for competence was ICC = .84.

Measures

Maternal history of childhood abuse was measured using a demographic questionnaire at baseline. Mothers were asked whether prior to the age of 18 years anyone ever touched them sexually in a way that made them feel uncomfortable, hurt, or was against their will. Similarly, mothers were asked whether prior to age of 18 years anyone ever hurt them physically enough to leave marks or bruises or burns. Over half of mothers reported physical (62.8%) or sexual (50.6%) abuse. Their responses were combined into experiencing abuse or not experiencing abuse. A total number of 134 (73.2%) had a history of abuse.

Mothers' substance use was measured by the Form-90 (Miller, 1996). As a structured interview, the Form-90 uses a timeline follow-back approach to assess daily substance use for the past 90 days. Reliability of this measure is well established, and kappas for different drug classes range from .74 to .95 (Tonigan et al., 1997). In the current study, the frequency of substance use, i.e., the percentage of total days of alcohol, marijuana, cocaine, and opioid use in the prior 90 days assessed at baseline, was used in the current analysis.

Mothers' and children's depressive symptoms were measured by mothers' and children's self-report on the Beck Depression Inventory-II (BDI-II; Beck et al. 1996). The BDI-II is a 21-item scale rated on a 5-point Likert scale. In the current study, the baseline data for mothers was used, whereas the data for their children included the baseline, 3-, 6-, 12- and 18-month follow-up assessments. The Cronbach's alpha was .94 for mothers at baseline, and ranged from .89 to .93 for children across all assessment points.

Covariates used in the analysis included baseline demographic characteristics, such as annual family income, and child's sex and age.

Analytic Strategies

The descriptive analysis was conducted with SPSS (version 24; IBM Corp., 2015). A latent growth curve analysis was applied to test the model with Mplus (version 7.11; Muthén, & Muthén, 1998–2017). Due to participants' missed assessment points, percentage of missing data ranged from 0.5% to 12.1% (Table 1). Using Little's MCAR test (Little, 1988), the data were missing completely at random, $\chi^2(140) = 158.95$, $p = 0.13$. As such, we used full information maximum likelihood (FIML) algorithm for missing data estimation (Enders & Bandalos, 2001). Further, we used the root mean square error of approximation (RMSEA) and the comparative fit index (CFI) as the model fit indexes, with a RMSEA of .05 and

below and CFI of .95 and above indicating good fit and a RMSEA of .05-.08 and CFI of .90-.95 indicating acceptable fit (Hu & Bentler, 1995).

First, a linear latent growth curve model (LGCM) was estimated to model the initial levels and changes in child depressive symptoms over five assessment points. Here, the baseline and follow-up assessments of 3-, 6-, 12-, and 18-months were coded as 0, 1, 2, 4, and 6, respectively, in order to account for the different time intervals between assessments. The LGCM offers enhanced reliability and sensitivity for detecting behavioral change, while taking into consideration both individual and group levels of information (Duncan & Duncan, 2004). Then, the mediation effect was analyzed as suggested by Preacher and colleagues (2007). The bootstrap sampling method was used to estimate the mediation effect, as it provides a more powerful test in detecting indirect effects while not assuming a normally distributed parameter estimate (Shrout & Bolger, 2002). Bias-corrected bootstrap confidence intervals were used as recommended (MacKinnon, Lockwood, & Williams, 2004).

Further, to test the first hypothesis, a multiple-group model was tested to investigate the differences in mediating paths (maternal abuse – maternal depressive symptoms – the slope of child depressive symptoms) between the EBFT and the WHE group. To test this, two models were estimated, with constraints on the mediation pathways being the same or different across groups. The chi-square test was used to compare the model fits of the two nested models. If the unconstrained model yielded a better model fit than the constrained model, the unconstrained model would be retained, as this indicates the parameter estimates of the mediating pathway differed significantly across groups.

Finally, to test the second hypothesis, moderated mediation models were estimated with maternal frequency of substance use moderating the pathway between maternal depressive symptoms and the slope of child depressive symptoms (Figure 1a). Maternal use of alcohol, marijuana, cocaine and opioids were analyzed in four separate models, using the full sample, to test for different effects on child treatment outcomes. The conditional indirect effects were analyzed using the bootstrap sampling method (Preacher & Hayes, 2007; Shrout & Bolger, 2002). High levels of substance use were centered at one standard deviation above the mean of each variable, whereas low levels of substance use were centered as zero (since one standard deviation below the mean was a negative value), respectively.

RESULTS

Descriptive statistics and the bivariate correlations of the study variables are shown in Table 1. Mothers having a history of childhood abuse reported more depressive symptoms ($r = .32$, $p < .001$), and their children reported more depressive symptoms ($r = .16$, $p = .04$) at 6-month follow-up. Maternal baseline depressive symptoms were positively associated with child depressive symptoms at all time points ($r_s = .18 - .30$, $p < .05$). Girls and older children tended to report more depressive symptoms. Maternal baseline marijuana use was positively associated with child depressive symptoms at 12-month and 18-month follow-up ($r = .20$, $p = .01$ and $r = .24$, $p < .01$, respectively).

Latent Growth Curve Model

As recommended by Bollen and Curran (2006), a two-step process was adopted to test the mediation relation. An unconditional LGCM was first estimated to model the initial levels and changes in child depressive symptoms over time. The unconditional model showed a good fit, $\chi^2(9) = 12.03$, $p = .21$; RMSEA = .04 ($CI_{.90} = .00, .10$); CFI = .99; TLI = .99. The mean of the intercept was 7.30 ($se = 0.55$, $t = 13.21$, $p < .001$) and the slope was -0.31 ($se = 0.12$, $t = -2.49$, $p = .01$), indicating a significant reduction in child depressive symptoms overtime. The intercept and the slope was negatively correlated ($b = -2.52$, $se = 1.13$, $t = -2.23$, $p = .03$), indicating that children with higher initial depressive symptoms experienced a faster decline in their symptoms. Moreover, the variances of the intercept and slope were significantly different from zero ($b = 36.92$, $se = 6.02$, $t = 6.13$, $p < .001$ and $b = 1.18$, $se = 0.32$, $t = 3.67$, $p < .001$, respectively), supporting subsequent analysis incorporating predictor variables in the conditional LGCM.

Given that the unconditional model demonstrated adequate model fit and significant variability of the intercept and slope, a conditional LGCM was estimated by adding predictors to explain the variances in the intercept and slope. Maternal history of childhood abuse and depressive symptoms were added to predict the intercept and slope of child depressive symptoms, with maternal childhood abuse also predicting maternal depressive symptoms (Figure 1b). Child sex, age and family income were included as time-invariant covariates. The conditional LGCM model showed a good fit, $\chi^2(27) = 31.73$, $p = .24$; RMSEA = .03 ($CI_{.90} = .00, .07$); CFI = .99; TLI = .98. Maternal childhood abuse was associated with more depressive symptoms in mothers ($b = 10.01$, $se = 2.19$, $t = 4.58$, $p < .001$), while maternal depressive symptoms were related to elevated depressive symptoms in children at baseline ($b = 0.11$, $se = 0.04$, $t = 2.76$, $p < .01$). Older children reported higher baseline depressive symptoms ($b = 0.91$, $se = 0.20$, $t = 4.47$, $p < .001$) and a faster decrease in depressive symptoms ($b = -0.13$, $se = 0.05$, $t = -2.73$, $p < .01$). The indirect effect from maternal history of childhood abuse, maternal depressive symptoms, to changes in child depressive symptoms were not significant in the whole sample (Table 2).

Multiple-Group Analysis

A multiple-group LGCM was estimated to test the difference in the mediation relation (maternal history of abuse - maternal depressive symptoms – the slope of child depressive symptoms) between the EBFT and the WHE group. The mediation paths were first set free in both groups and then were fixed, and the two nested models were compared. The nested model showed a significant increase in model fit ($\chi^2(3) = 8.67$, $p = .03$; model fit $\chi^2(61) = 72.47$, $p = .15$; RMSEA = .05 ($CI_{.90} = .00, .08$); CFI = .97; TLI = .96), indicating that there was a significant difference in the mediation relation between the two groups (Table 2). More specifically, supporting the first hypothesis, maternal childhood abuse was associated with slower decline in child depressive symptoms through elevated maternal depressive symptoms (coefficient = 0.35, $se = 0.16$, $CI_{.95} = 0.12, 0.78$) in the WHE group, whereas this mediation path was not significant in the EBFT group (coefficient = 0.06, $se = 0.13$, $CI_{.95} = -0.15, 0.37$; child depressive symptoms were not associated with maternal history of childhood abuse or maternal depressive symptoms; Table 2).

Moderation and Moderated Mediation

Maternal use of alcohol, marijuana, cocaine and opioids were tested as moderators of the relation between maternal depressive symptoms and the slopes of child depressive symptoms, respectively. As expected, maternal marijuana and cocaine use significantly moderated the path between maternal depressive symptoms and the slopes of child depressive symptoms, whereas maternal alcohol and opioid use did not yield a significant interaction or main effect. Thus, only the two models of marijuana and cocaine use are reported here.

The model of maternal marijuana use moderating the link between maternal depressive symptoms and the slopes of child depressive symptoms yielded a good model fit ($\chi^2(81) = 79.04, p = .54$; RMSEA = .00 (CI_{.90} = .00, .06); CFI = 1.00; TLI = 1.00). The interaction between maternal marijuana use and maternal depressive symptoms was significant in predicting the slope of child depressive symptoms only in the WHE group ($b = -0.05, se = 0.02, t = -2.43, p = .02$). Maternal depressive symptoms were associated with a slower decline in children's depressive symptoms only among children of mothers having low levels of marijuana use in the WHE group ($b = 0.59, se = 0.14, t = 4.10, p < .001$; Figure 2a). Moreover, the conditional indirect effect was significant in that marijuana use moderated the mediation path (maternal history of abuse – depressive symptoms – slope of child depressive symptoms) in the WHE group (coefficient = $-0.05, se = 0.03, CI_{.95} = -0.11, -0.001$). Further analysis indicated that the mediation pathway in the WHE group was significant only among mothers using low levels of marijuana (centered at 0; coefficient = $0.57, se = 0.25, CI_{.95} = 0.13, 1.07$), supporting the second hypothesis that maternal marijuana use attenuates the associations between maternal risk factors and changes in child depressive symptoms.

The model of maternal cocaine use as a moderator also showed good model fit ($\chi^2(81) = 99.33, p = .08$; RMSEA = .05 (CI_{.90} = .00, .08); CFI = .97; TLI = .96). The interaction between maternal cocaine use and maternal depressive symptoms was significant in predicting the slope of child depressive symptoms in both WHE and EBFT groups ($b = 0.20, se = 0.09, t = 2.36, p = .02$ for WHE; $b = 0.09, se = 0.04, t = 2.63, p < .01$ for EBFT). Maternal depressive symptoms were associated with a slower decline in children's depressive symptoms only among children of mothers having high levels of cocaine use (centered at one standard deviation above the mean; $b = 0.89, se = 0.26, t = 3.43, p = .001$ for WHE; $b = 0.23, se = 0.12, t = 1.97, p = .05$ for EBFT; Figure 2b, Figure 2c). The conditional indirect effects were not significant for either of these moderated mediation paths. These findings partially support the second hypothesis that maternal frequent use of cocaine strengthens the relation between maternal depressive symptoms and the change in child depressive symptoms.

DISCUSSION

The current study tested the efficacy of Ecologically-Based Family Therapy (EBFT) in reducing depressive symptoms among children of mothers with a substance use disorder and a history of childhood abuse, mediated through maternal depressive symptoms. Findings showed that baseline levels of maternal marijuana and cocaine use modified the associations

between maternal depressive symptoms and the subsequent change in child depressive symptoms. This finding is consistent with a growing literature showing that different illicit drugs uniquely influence the parent-child relationship (e.g., Slesnick et al., 2014).

Supporting the first hypothesis, maternal history of childhood abuse appeared to be associated with changes in child depressive symptoms through maternal depressive symptoms only in the individual treatment group. Given that maternal depressive symptoms serve as an underlying mechanism in the intergenerational transmission of psychosocial risk (Choi et al., 2017; Fredland et al., 2015), this finding indicates that EBFT reduced the psychosocial risk in treatment outcomes among these children. Specifically, children in the WHE group experienced slower declines in their depressive symptoms if their mothers were abused, compared to their counterparts in the WHE group whose mothers were not abused. On the other hand, children in the EBFT group did not experience a slower decline in depressive symptoms associated with their mothers' abuse history. Family therapy improves maternal functioning and parenting as well as reduces substance use, thereby reducing child depressive symptoms faster than individual treatment (Pelham et al., 1997; Rowe, 2012).

Supporting the second hypothesis, different drugs of abuse moderated the mediation from maternal childhood abuse to change in child depression through maternal depression. In particular, maternal childhood abuse did not slow down the decline in their children's depressive symptoms among mothers using marijuana frequently, in the WHE group. Although marijuana use can be associated with negative maternal psychosocial functioning in general (Belendiuk et al., 2015), frequent maternal marijuana use is possibly a way that mothers self-medicate their depressive symptoms. As depressed mothers tend to be irritable or disengaged with their children (e.g., Lovejoy et al., 2000), the use of marijuana can possibly reduce maternal depressive symptoms intermittently, resulting in less negative parenting. However, instead of using marijuana, there remain more adaptive ways of reducing maternal depression and the impact of maternal depression on their children, such as using psychotropic medication or attending family therapy. Findings of this study are exploratory concerning the effects of marijuana use on mother-child interactions, and future research will need to further investigate this relation.

The current study also found that frequent cocaine use by mothers slowed the reduction in child depressive symptoms in therapy. This effect was observed in both individual and family treatment groups. Whereas rare cocaine use may not have a negative impact on maternal or child depression, frequent cocaine use likely adds to the negative effects of maternal depression since it enhances withdrawal and disengagement in parenting that is typically observed in depressed mothers (Dube et al., 2001; Lovejoy et al., 2000). Thus, family therapists should pay special attention to promoting connectedness and involvement among cocaine using mothers and their children.

Limitations, Conclusion, and Clinical Implications

Limitations of the current study should be considered for interpretation of the findings. First, most mothers in the current study used multiple substances, and it is likely the results can be contaminated by the effect of polydrug use (e.g., Mayes et al., 1997). Future studies should compare treatment effects in children of mothers using a single drug and multiple drugs, or

using multiple drugs with and without the target drug, to better understand the effect of a specific type of drug on mothers and their children. Second, the low versus high substance use was quantified based on the sample characteristics (one standardized deviation below and above the mean), as a standard procedure in testing for moderation (Preacher & Hayes, 2007). A more standardized measure of low and high substance use can be more informative to practitioners as to its influence on mother-child functioning. Additionally, this study focused on the mediating effects of maternal depressive symptoms, but other potential mediators, such as parenting style, should be examined in future studies. Finally, maternal childhood abuse was retrospectively reported by mothers and was assessed by only two questions. Moreover, we only measured lifetime occurrence of childhood abuse, but not how long ago it happened, frequency and severity of the experience, which would provide valuable information in understanding how maternal childhood abuse is associated with future child outcomes. Finally, we did not control for adult traumatic experience, which may be a potential confounding factor in interpreting the results of the current study.

Despite these limitations, the current study has notable strengths. This study utilized a randomized controlled trial design and tested manualized, empirically supported interventions. We also followed participants up to 1.5 years to measure treatment effects. The current study adds to the evidence base supporting the positive effects of family systems therapy on children, showing that by engaging the child of the treatment seeking mother, child depressive symptoms reduced faster as compared to when they were not engaged in treatment. Engaging children of mothers in their treatment provides an opportunity to improve outcomes for the children who otherwise would not receive intervention, as a preventative intervention for this high-risk population of children of substance-using mothers. Moreover, as children's depressive symptoms improve in family therapy, their mothers' substance use behaviors and depressive symptoms also improve (Slesnick & Zhang, 2016), underscoring the reciprocal influence of mother and child behaviors. Finally, findings further showed that the efficacy of family therapy on children's depressive symptoms differed with different types of maternal substance use, suggesting tailoring components of family intervention to special needs of subpopulations of mothers using different types of substances.

Family systems therapy appears to have a stronger and longer lasting effect on family members, promoting treatment effects beyond the identified patient. By reconnecting family members to underlying bonds of love and care, and by guiding them towards considering problems as relational rather than as a result of individual deficiencies, the entire family system will be able to develop healthier ways of interaction. With this change, individual problem behaviors are expected to remit. The greater effect of family therapy on outcomes in family members suggests that family systems therapies should be offered to families who seek services through substance use treatment agencies. Efforts directed towards increasing implementation of family systems therapy in community treatment programs could result in greater benefits for individuals, families and the larger society (Cully et al., 2018).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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(a) The conceptual model.

(b) The conditional latent growth curve model

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. Maternal history of abuse: no = 0 yes = 1.

Figure 1.
The conditional latent growth curve model.

(a) Maternal marijuana use, maternal depression and child depression in the WHE group

(b) Maternal cocaine use, maternal depression and child depression in the WHE group.

(c) Maternal cocaine use, maternal depression and child depression in the EBFT group.

Note. *** $p < .001$, ** $p < .01$, * $p < .05$.

Figure 2.

The moderation between maternal substance use and maternal depressive symptoms in predicting the slope of child depressive symptoms.

Table 1.

Descriptive statistics and correlations between study variables.

	N	Mean	SD	Range	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Treatment group	183	--	--	0-1														
2. M abuse history	183	--	--	0-1	.13													
3. M depression	183	22.65	13.74	0-60	.06	.32***												
4. M alcohol use	183	21.24	29.64	0-100	-.04	-.04	-.05											
5. M marijuana use	183	28.01	38.65	0-100	.03	.08	.02	-.04										
6. M cocaine use	183	9.59	21.95	0-100	.11	.04	.05	.17*	-.06									
7. M opiate use	183	33.08	41.15	0-100	-.02	.14	.24**	-.29***	-.03	-.11								
8. Family income	182	2.48	1.43	1-7	.02	.05	-.07	-.18*	.05	-.17*	.22**							
9. C sex	183	--	--	0-1	.10	.01	.03	-.01	.02	-.08	.04	.07						
10. C age	183	11.54	2.55	8-16	.02	.10	.13	.08	-.17*	.27***	-.26***	-.05	-.10					
11. C depression T0	183	8.11	9.03	0-44	-.08	.05	.18*	-.05	-.10	.01	-.02	-.05	-.12	.33**				
12. C depression T1	164	6.71	7.93	0-37	.06	.13	.25***	-.13	-.04	.09	.03	-.01	-.15	.27***	.45***			
13. C depression T2	165	6.53	9.01	0-52	.05	.16*	.29***	-.13	-.01	.12	.07	-.03	-.19*	.23**	.38***	.55***		
14. C depression T3	161	5.57	6.92	0-36	.06	.12	.30***	-.13	-.04	.19*	.07	.00	-.20*	.19*	.25***	.52***	.48***	
15. C depression T4	159	5.91	8.48	0-42	.03	.03	.30***	-.08	-.03	.24**	.08	-.09	-.25***	.14	.26***	.45***	.37***	.69***

Note.

p<.001**
p<.01*
p<.05.

M = Mother. C = Child. Treatment group: WHE = 0 EBFT = 1. Maternal history of abuse: no = 0 yes = 1. Child sex: female = 0 male = 1. T0: baseline. T1-T4: 3-month, 6-month, 12-month and 18-month follow-up assessments.

Table 2.

Model estimation, mediation and moderation coefficients.

	Whole sample				EBFT group				WHE group			
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI₉₅</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI₉₅</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI₉₅</i>
C depression intercept												
C sex	1.94	1.02	1.89		1.52	1.00	1.53		1.52	1.00	1.53	
C age	0.91	0.20	4.47	***	1.02	0.21	4.78	***	1.02	0.21	4.78	***
Family income	0.18	0.36	0.50		0.55	0.41	1.33		0.55	0.41	1.33	
M history of abuse	0.57	1.22	0.47		0.74	1.12	0.66		0.74	1.12	0.66	
M depression	0.11	0.04	2.76	**	0.16	0.05	3.30	***	0.16	0.05	3.30	***
C depression slope												
Child sex	0.34	0.24	1.43		0.40	0.22	1.79		0.40	0.22	1.79	
Child age	-0.13	0.05	-2.73	**	-0.15	0.04	-3.50	***	-0.15	0.04	-3.50	***
Family income	-0.05	0.08	-0.58		-0.18	0.1	-1.93		-0.18	0.10	-1.93	
M history of abuse	-0.16	0.28	-0.58		-0.18	0.24	-0.74		-0.18	0.24	-0.74	
M depression	0.01	0.01	1.46		0.01	0.01	0.52		0.03	0.01	2.75	**
M depression												
M history of abuse	10.01	2.19	4.58	***	9.53	2.62	3.64	***	10.53	3.30	3.19	***
Family income	-0.81	0.68	-1.20		-0.79	0.69	-1.15		-0.79	0.69	-1.15	
Direct effect	-0.16	0.28	-0.58		-0.61, 0.30	-0.18	0.24	-0.74	-0.62, 0.31	-0.18	0.24	-0.74
Indirect effect	0.13	0.11	1.15		-0.06, 0.40	0.06	0.13	0.50	-0.15, 0.37	0.35	0.16	0.12, 0.78

Note.

p<.001**
p<.01*
p<.05.

M = Mother. C = Child. Direct effect: maternal history of abuse – child depression slope. Indirect effect: maternal history of abuse – maternal depression – child depression slope.