Published in final edited form as:

Child Maltreat. 2018 August ; 23(3): 281–293. doi:10.1177/1077559517751671.

A Randomized Trial of Home Visitation for CPS-Involved Families: The Moderating Impact of Maternal Depression and CPS History

Melissa Jonson-Reid¹, Brett Drake¹, John N. Constantino², Mini Tandon², Laura Pons², Patricia Kohl¹, Scott Roesch³, Ellie Wideman¹, Allison Dunnigan¹, and Wendy Auslander¹

¹Brown School of Social Work, Washington University, St. Louis, MO, USA

²Division of Child & Adolescent Psychiatry, Washington University School of Medicine, St. Louis, MO, USA

³Department of Psychology, San Diego State University, San Diego, CA, USA

Abstract

Home visitation (HV) interventions may hold promise to improve parenting and prevent child maltreatment recidivism in families reported to child protective services (CPS) with young children, but this has rarely been studied. Findings are presented from an 18-month randomized controlled trial in which intact families ($N = 122$) with at least one CPS report were provided with a facilitated connection to a paraprofessional evidence-based HV program or usual care services from child protection. Results are reported for changes in maternal stress, depression, and social support outcomes and repeat reports to CPS. No significant changes were found in maternal outcomes by group. Among nondepressed mothers or families without multiple CPS reports prior to study enrollment, HV was associated with a significantly lower likelihood of CPS report recidivism. These results indicate potential for HV to prevent maltreatment recidivism but suggest that higher intensity intervention is warranted for mothers exhibiting significant depressive symptoms or families with extensive CPS histories.

Keywords

early childhood home visitation; child protection; recurrent maltreatment; maternal depression

Young children, especially those 0–2 years of age, experience the highest rate of reported child maltreatment (DeVooght, McCoy-Roth, & Freundlich, 2011; U.S. Department of Health and Human Services [U.S. DHHS, 2017]). Young children already known to child protective services (CPS) are prone to recidivism and are a high priority for intervention due to this risk and a plethora of heightened physical and developmental vulnerabilities (Putnam-

Reprints and permission: sagepub.com/journalsPermissions.nav

Corresponding Author: Melissa Jonson-Reid, Brown School of Social Work, Washington University, St. Louis, MO 63130, USA. jonsonrd@wustl.edu.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Hornstein & Needell, 2011; Shonkoff et al., 2012). Without intervention, long-term negative impacts of maltreatment have been found across behavioral, cognitive, health, and mental health domains (Currie & Widom, 2010; Jonson-Reid, Drake, & Kohl, 2009; MacMillan et al., 2009; Shonkoff et al., 2012). Recurring maltreatment is associated with even worse outcomes across these domains with some effects persisting into adulthood (English et al., 2005; Jaffee & Maikovich-Fong, 2011; Jonson-Reid, Kohl, & Drake, 2012; Lanier, Jonson-Reid, Stahlschmidt, Drake, & Constantino, 2009).

Home visitation (HV) programs are a promising approach to improve a broad range of child and family health outcomes (Chen & Chan, 2016; Howard & Brooks-Gunn, 2009; Stagner & Lansing, 2009). Many HV models name child maltreatment prevention as a goal, but success in this area has been mixed (Duggan et al., 2007; LeCroy & Whitaker, 2005; Reynolds, Mathieson, & Topitzes, 2009; Zielinski, Eckenrode, & Olds, 2009). Little is known about how families involved with CPS fare in such programs and studies indicate that CPS-involved families with young children are rarely connected to services (Casanueva, Cross, & Ringeisen, 2008; Jonson-Reid, Drake, Kim, Porterfield, & Han, 2004; Wiggins, Fenichel, & Mann, 2007).

Background

Because of physical vulnerabilities and sensitive periods in brain development, adversity in the early years of life, particularly maltreatment, is of great concern (Shonkoff et al., 2012; Teicher, Samson, Anderson, & Oyashi, 2016). Research on families involved with child welfare (CW) has found elevated rates of child mental health and related developmental problems (Barth et al., 2008; Jonson-Reid et al., 2004; Leslie et al., 2005). Among children known to CW, those with repeated official reports have worse outcomes across behavioral, cognitive, health, and mental health domains (e.g., Jonson-Reid et al., 2012; Lanier et al., 2009).

Unfortunately, repeated referrals to CPS are common with a 3-year rereport rate of 22–45% (Connell, Bergeron, Katz, Saunders, & Tebes, 2007; Fluke, Shusterman, Hollinshead, & Yuan, 2008; Jonson-Reid, Drake, Chung, & Way, 2003). CPS-involved families also show low rates of participation in early childhood support services (JFK Partners, 2003; Silver et al., 1999; Administration for Children and Families, 2004). This is concerning given research that suggests that early intervention can buffer the effect of preexisting risk factors or reduce impairment associated with existing disability (Hubmann et al., 2016; Johnson, 2016). Improving our ability to serve families with young children who are known to CPS to prevent ongoing maltreatment and improve developmental outcomes is key.

Intervention to prevent repeated maltreatment and support child development

There are several well-known, evidence-supported HV models across the country (e.g., Early Head Start [EHS], Berlin et al., 2011; Healthy Families America [HFA], DuMont et al., 2008; Nurse Family Partnership [NFP], Olds et al., 2008, 2010; and Parents as Teachers [PAT], Wagner, Iida, & Spiker, 2001; Zigler, Pfannenstiel, & Sietz, 2008). Such HV models have gained significant recent attention from policy makers including increased funding (Medicare Access and CHIP Reauthorization Act, 2015). None of the models designed for

primary prevention in early childhood (e.g., HFA, NFP, or PAT), however, have been tested with a CPS population.

There has been some controversy about the degree of effectiveness of more commonly available home visiting programs in reducing child maltreatment. While early work showed great promise (Olds et al., 1997) more recent meta-analyses of home visiting programs in general (Sweet & Appelbaum, 2004) found statistically significant but practically marginal (Cohen's $d < .2$) effects, with no significant reduction of child abuse (see also Howard & Brooks-Gunn, 2009). For example, prior work assessing the effectiveness of PAT has primarily measured impacts on self-reported parenting knowledge, attitudes, and behaviors, often reporting null or small effects (Wagner & Clayton, 1999; Wagner, Spiker, & Linn, 2002), though with stronger effects may exist for at-risk children (Pfannenstiel, Lambston, Yarnell, Research and Training Associates Inc., & United States of America 1991). It has been more difficult to demonstrate reduction of maltreatment than to demonstrate gains in developmental outcomes and effects are often found to be stronger among disadvantaged populations (Avellar & Supplee, 2013).

Theory

HV may offset risk of poor outcomes for young children who have been reported to CPS by preventing maltreatment and/or improving parenting skills and access to supportive resources. The Double ABCX model of family stress and adaptation (McCubbin & Patterson, 1983) describes the role of accumulating stress in the development of maltreating behaviors and posits that buffering factors like social supports may counter the risk. Risk factors for initial and recurring maltreatment are similar including poverty (Drake & Jonson-Reid, 2014), mental health disorders like maternal depression (Ammerman, Putnam, Chard, Stevens, & Van Ginkel, 2011; Casanueva, Cross, Ringeisen, & Christ, 2011; Howard & Brooks-Gunn, 2009; Kohl, Jonson-Reid, & Drake, 2011; Leschied, Chiodo, Whitehead, & Hurley, 2005), stress (Ammerman et al., 2011; DePanfilis & Zuravin, 2002), poor social support, poor parenting skills, and limited child development knowledge (Berlin, Appleyard, & Dodge, 2011; DePanfilis & Zuravin, 2002; Dorsey, Mustillo, Farmer, & Elbogen, 2008; MacMillan et al., 2009). Some argue that chronically maltreating families have greater numbers of risk factors and this explains at some of the impact of chronicity on developmental outcomes (Jaffee & Maikovich-Fong, 2011).

Many HV programs address elements of the aforementioned risk factors. For example, all early childhood HV programs provide social support and offer training in parenting skills and child development (Chen & Chan, 2016). Referral to outside resources is a common element of HV programs, which may lead to other risk factors being addressed through these connections. In a randomized trial of PAT, program sites enhanced with internal specialized case management had better outcomes (Wagner & Clayton, 1999).

Notably, maternal depression has received significant attention as both common within and a potential moderator of HV effects (Ammerman, Putnam, Bosse, Teeters, & Van Ginkel, 2010; Duggan, Berlin, Cassidy, Burrell, & Tandon, 2009). While HV models typically do not have specific content related to maternal depression, some research reported benefits of HFA and EHS programs for depressed mothers (Ammerman et al., 2011). Another study

found that maternal depression symptoms improved with parenting training alone (DeGarmo, Patterson, & Fogatch, 2004). A review of EHS (a program that can be center based or home visiting or both) found that attachment, not depression, moderated parenting outcomes—although baseline depression and attachment were associated (Berlin, Whiteside-Mansell et al., 2011). Given that many of the widespread primary prevention HV models have not been tested with a child protection sample, it is unclear if depression may abate due to parenting training or become a barrier to expected outcomes. A recent meta-analysis suggested greater gains for higher risk families, with no significant variation by according to paraprofessional versus nurse or mental health professional delivery (Nievar, Van Egeren & Pollard, 2010). Of course, the programs reviewed were not targeted at families involved in child protection and the reviews did not measure maltreating behaviors as an outcome.

Although there are specialized HV programs that were designed with child protection samples in mind such as Safe-Care (Chaffin, Hecht, Bard, Silovsky, & Beasley, 2012) or Attachment and Biobehavioral Catch-up for children in foster care (Dozier, Peloso, Levine, & Laurenceau, 2008), these are generally not widely available in most communities. Initial implementation of such models requires sufficient resources for training and supervision (e.g., Guastafarro, Lutzker, Graham, Shanley, & Whitaker, 2012). Arguably, investment in the most effective programs for each given population is ideal, but in the context of often limited resources targeted rather than universal delivery is often the best possible alternative. Given the lack of data on the degree to which families reported to child protection engage in commonly available Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) -funded HV, it is unclear if there may be a benefit to such participation—particularly among families with young children reported for a first time. If a portion of families involved in child protection can be successful once properly connected to existing services, this may help with triage of families in need of more intensive services.

Eligibility and access

Why are more families known to CPS not engaged in HV? While some studies indicate that child protection may be one of the first systems to contact vulnerable families with young children (Jonson-Reid et al., 2004; Thompson, English, & White, 2016), CPS staff may be unaware of the regionally available types of early childhood services (JFK Partners, 2003; Silver et al., 1999; Stahlschmidt et al., 2017). As families often report needing help navigating services and referrals (Kemp, Marcenko, Hoagwood, & Vesneski, 2009), lack of knowledge among CPS staff about varying program eligibility standards and enrollment processes may pose a significant barrier to access. For example, NFP is restricted to first-time mothers engaged in prenatal care (e.g., Olds et al., 2010), while three widespread paraprofessional models accept high risk families and are not restricted to first-time mothers: EHS, HFA, and PAT. A referral to the former program is unlikely to be appropriate for most CPS-involved families.

Of course, enrollment does not guarantee participation. Attrition is a common issue in HV research (Daro, McCurdy, Falconnier, & Stojanovic, 2003; Wagner et al., 2001) and research on parenting intervention with CW families (Chaffin, 2007). While intuitively greater

stressors might inhibit ongoing participation, it is not clear this is true. For example, some studies suggest maternal depression can be a barrier to participation in HV services (Duggan et al., 2009; Robinson & Emde, 2004) while another study found program completion to be higher among depressed mothers (Girvin, DePanfilis, & Daining, 2007). No studies could be located describing current levels of participation in community-based HV programs among CPS-involved families.

The Early Childhood Connections (ECC) Study

ECC was designed to determine whether or not CPS-involved families could be engaged in and benefit from a readily available community-based early childhood HV program (PAT). The EHS, HFA, or PAT model would have fit the criteria for eligibility of CW-involved families. HFA was not available in the study region, EHS had limited availability and was sometimes operated as center based, thus leaving PAT as the only readily available purely home visiting model. ECC was a structured process whereby CPS workers working with intact families with young children were trained to provide a facilitated referral to PAT. To test feasibility and effectiveness, the study employed a randomized design with CPS workers assigned to either the ECC referral condition or usual care. Caregiver outcomes related to maltreatment risk (stress, depression, and social support) and rereports of maltreatment were compared between families that received the facilitated referral (the equivalent of a “warm handoff” to a PAT parent educator) and families receiving the usual care CPS response. The present analyses address the following questions:

- 1** Do caregivers in the facilitated referral group experience changes in depression, stress, or social support compared to controls?
- 2A** Do families in the facilitated referral group have a reduced rate of recurrent reports to CPS compared to usual care controls?
- 2B** Does the presence of maternal depression or prior multiple reports of maltreatment moderate the impact of HV participation on recurrent reports?

The primary goal of the present study was to examine the potential of participation in HV in reducing recurrent maltreatment. Literature suggests that families with multiple prior reports (e.g., Jaffee & Maikovich-Fong, 2011) and/or caregivers with maternal depression (e.g., Duggan et al., 2009; Robinson & Emde, 2004) may be more at risk for poor outcomes. Therefore, Question 2B includes baseline measures of these variables as potential moderators of recurrent maltreatment.

Method

The ECC project (NIMH, 1R34MH083871) was developed through a university-field partnership that included faculty across two schools, state and local child protection agencies, PAT, and other regional early childhood education providers. Following development of ECC, a project advisory board was created that included representatives of the leadership of other HV programs in the region, regional agencies addressing issues of health and mental healthcare, lead abatement, child day care, and state agencies responsible for CW, education, and mental health. ECC was designed to enable CW to make a facilitated

referral to PAT and to support PAT staff in serving this population. This randomized pilot study of ECC employed a two group (ECC vs. usual care) design, following participants for 18 months and examining change at the caregiver level as well as recurrent maltreatment and child development. The present analysis focuses on the impact on caregiver risks and behaviors. Human subjects approval was obtained from the Washington University institutional review board (IRB) as well as the Missouri state CW human subjects review committee.

Randomization of CW Workers

The study involved a two-stage recruitment and consent process. Because CPS cannot delay intervention following a report of abuse or neglect, randomization occurred at the level of child protection workers. Workers were assigned to a group trained to refer eligible families on their caseload to ECC PAT or workers were assigned to a usual care condition. "Usual care" workers only knew about the option to refer to a study of child development. The benefit to families in usual care was that they would receive a free in-home child development screening along with any needed referral if the child screened in a concerning range. In this study, CPS workers included both investigation/assessment workers who respond to an initial telephone hotline report and workers providing in-home case management services, known as family-centered services (FCS), for families who remained intact and offered voluntary FCS (no court involvement) after the initial investigation. Because the state moved to a privatized system for in-home and foster care services just as the project was implemented, FCS workers from both private and public agencies were included in the ECC and control conditions. No changes were made to how agencies assigned families to workers which was based solely on worker availability for in-home and hotline services as new cases arose.

The university IRB required that CPS workers were separately consented through direct contact rather than in meetings or through supervisors, so that the agency administration was blind to whether workers opted in or out of the study. Agency lists of hotline and in-home services workers were used to randomly assign the workers to treatment or control prior to contact so that their role could be fully explained via phone. E-mails and phone calls inviting participation were sent/made directly to the workers following randomization. Workers replying with interest were assented by phone. This process resulted in a relatively balanced number of treatment and control workers recruited with relatively balanced assent rates from each group (see Figure 1). Participating workers included 45 consenting ECC public CPS workers (40% were hotline workers) and 49 consenting Usual Care (UC) public CPS workers (45% were hotline workers). There were 10 private agency ECC treatment staff and 7 UC private agency staff. The vast majority (between 80% and 86%) were female across public and private agencies and ECC or UC groups. The public CPS staff had a higher non-White proportion (over 63%). The private agency FCS staff were more likely to be White (over 67%).

Written consent of workers was obtained at study trainings. ECC treatment workers received trainings on child development, HV programming and referral, and the goals of the study. Usual care workers received a brief training on child development providing a rationale for

the need to understand more about child development in CPS-involved families with young children but were not given additional training on HV services or told the complete intent of the study until recruitment ended. ECC did not alter the way in which CPS interacted with families over time. Family contact with hotline and FCS workers ranged from a single assessment visit (hotline only cases) to case management check-ins every 3 weeks—the average number of visits reported across families in the study was 8.6.

Family Assignment

Families with at least one child between the ages of 2 months and 2.5 years of age who were not court mandated to participate in CPS could participate in ECC. The lower boundary was set because of the lower limits of the Ages and Stages Questionnaire child development screener used by PAT. As families were reported to CPS, they were assigned to either an ECC treatment group worker or a usual care worker based on regular agency practice. Supervisors and those taking hotline calls were not aware of which workers were in the treatment or usual care conditions. CPS workers were asked not to refer families whose eligible children had known, significant delays at birth (e.g., Down syndrome) because of the difficulty in assessing child development changes over time and the likelihood they would already be engaged in early childhood services. Eligible families assigned to an ECC treatment group CPS worker could be offered the facilitated referral to in-home PAT services. Families assigned to usual care CPS workers could be offered a chance to participate in a study of child development. Agency human subjects policy limited our ability to contact families until after a worker talked to them about the study.

Regional PAT Operation

ECC was implemented in a medium-sized urban Midwest region where PAT is offered through school districts. The delivery method for PAT varies, as not all states operate PAT within the public school system platform (PAT National Center, 2017a; Wagner et al., 2001). PAT, like HFA, is a paraprofessional HV program with a child development and parenting curriculum and a service period up to 3 years if a child is enrolled at birth. Curriculum elements are provided at the discretion of the home visitor rather to allow flexibility (see Essential Requirements, PAT, 2017b). PAT is included in the MIECHV listing of evidence-based HV programs, but prior studies did not include child maltreatment as a research outcome. Instead PAT benefits were found on certain measures of child development, parenting knowledge, and related stressors (Wagner & Clayton, 1999; Wagner et al., 2001, 2002; Zigler et al., 2008). One early study suggested a stronger effect for at-risk children (Pfannenstiel et al., 1991).

PAT services were impacted by the recession just as the study began. In the study, state- and district-level PAT programs are paid by state reimbursement for home visits and screenings. When districts were forced to cut back on their staff, it was no longer feasible to purchase time from full-time PAT staff to hold open space for new cases. Therefore, ECC PAT was provided by three PAT part-time parent educators (all female; two Black and one Caucasian) contracted by the research team outside their regular district hours. All ECC parent educators had completed formal PAT training, had the same access to district supervision, were certified by the PAT National Center, and delivered the manualized PAT HV

curriculum to subjects in the treatment group. As mandated reporters, all PAT staff receive a minimal training on child maltreatment through their school districts. Additionally, ECC PAT staff received a study training on risk and protective factors associated with maltreatment and how the CW system operates. In addition to the supervision available through their school district positions, ECC home visitors received additional supervision from the master's-level program coordinator throughout the study. The coordinator also provided the home visitors with customized referral resource packets specific to where participating families lived to enhance the effectiveness of referrals to additional services and resources.

Sample

The study required a two-stage recruitment process to address the real-world constraints of how CPS are offered and the concerns of the university IRB. Stage 1 recruitment was discussed in detail above, and summary information was illustrated in Figure 1.

Stage 2 was recruitment of families with at least one biological child between the ages of 2 months and 2.5 years without indication of significant delay at birth (e.g., Down syndrome or medical concern that typically results in extensive service involvement already) on a rolling basis as they were reported to CPS and assigned to a treatment or control CPS worker (see Figure 1, Stage 2). A total of 93 families were referred from the treatment condition and 77 from the control condition. Three families were excluded from the treatment condition because they were already participating in HV services.

The research team contacted any usual care families that provided verbal assent and conducted in-home information sessions to obtain written consent and conduct baseline interview. Because of university human subjects concerns that treatment families might feel coerced into participating in the study to receive PAT, families who assented to PAT were invited to participate in the study by the PAT parent educator as an additional option. If a family assented to the study, the research team contacted them and completed in-person written informed consent and baseline interviews. The consent forms included an additional consent to individual-level cross-referencing of their identifying information with official records of maltreatment reports and CW services at the end of the study.

Despite efforts to reach out to families as quickly as possible, some families were lost between verbal assent and in-person baseline interviews due to inaccurate information or the family moving. Ninety-three percent of treatment families who agreed to meet for consent completed written consent compared to 94% of control families (refer to Figure 1, Stage 2).

As shown in the final section of Figure 1, a total of 65 treatment caregivers and 57 control caregivers completed the baseline interview. If a family had more than one child in the correct age range, data were also included on the other children. Baseline data were completed for 159 children from the 122 families. Eighty percent of the treatment group and 77% of the control group were retained through the 9-month interview, but only about 53% of the sample was retained at the 18-month interview. This retention rate is similar to HV studies generally (Daro et al., 2003) and past published studies of PAT (Wagner et al., 2002).

Sample generalizability—The state CW agency would not allow release of individual data about families that workers chose not to refer to the study. The IRB requirement that supervisors not know which caseworkers were participating also made it impossible to request an anonymous listing of cases from workers who never referred a family. Clearly, there were more eligible families that came to CPS attention than were referred to ECC. Only 25% of the consented hotline workers referred cases and 45% of the FCS workers referred cases.

While the study state does report data to the National Child Abuse and Neglect Data System, as per the privacy policy noted above no information on caregivers or maltreatment type is reported for unsubstantiated or newborn crisis referrals. The best possible comparison of the ECC sample characteristics to the typical CPS population in the region was a description of families with CPS contact from the same region from an administrative study (hereafter “older study”) done some years prior (see Jonson-Reid, Drake et al., 2009).

Overall, the ECC sample was similar to the older study of all families with children under age 11 reported to CPS about 6 years earlier. The older study sample was limited to those with similar age children to ECC at baseline for comparison. Maternal age at child’s birth (older study 24.5 compared to ECC 26 years) and lack of a High School diploma (older study 42% vs. ECC 40%) were similar across studies. The ECC study had a higher rate of ethnic/racial designation of “Other” (older study 1.3 compared to ECC 12%) and lower rate of “White” families (older study 29% compared to ECC 19%). In the years since the older study, there has been an increase in families of other ethnicities (particularly Latinx), which likely explains this difference. CPS hotline reasons could not be compared as the older study excluded newborn crisis referrals.

Data Collection and Management

Baseline data were obtained via in-home interviews with the mothers, which took less than 1 hr on average, and were conducted by trained MSW students who had completed at least 1 year of graduate study. Subsequent interviews were conducted at 9 and 18 months. Treatment families also received two interim service utilization check-in calls at 3 and 12 months (not reported in the present article). All participating families consented to individual-level cross-referencing of their identifying information with the official maltreatment report and CW records; however, the agency and university IRB process required this be delayed until after the 18-month follow-up was concluded. These data included records of CPS contacts prior to entry into the study as well as during the follow-up period. Participation in PAT was logged by the parent educator according to participant ID and provided to the research team on a monthly basis. Linked records from PAT and CPS were merged with interview information and deidentified for analyses. Data were transferred to SAS for cleaning.

Measures

Measures included in the present analysis include child and family demographics, parent outcome measures, and official child maltreatment reports.

Parent outcome measures—The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) was used to measure maternal depression, which has been associated with maltreatment (Leschied et al., 2005) as well as poor HV outcomes (Duggan et al., 2009). Parent outcomes also included subscales of the Parenting Stress Index (Abidin, 1990) related to child temperament (mood and demandingness) and parenting (efficacy and attachment) and self-reported life stressors (stress index). In the present article, we report data from Family Support Scale (Dunst, Trivette & Hamby, 1984; $\alpha = .79$) adding one question about PAT as a service. Constructs captured by these measures have been found to be related to child and parenting outcomes among vulnerable populations (Bishop & Leadbetter, 1999; E. J. Silver, Heneghan, Bauman, & Stein, 2006).

Child maltreatment—Prior studies assessing the impact of HV on child maltreatment have used very different measures including child behavior (e.g., Caldera et al., 2007), parental self-report of parenting behaviors (e.g., Bugental & Happaney, 2004; DuMont et al., 2008), or officially reported maltreatment (e.g., Duggan et al., 2007). Available scales measuring maltreatment risk are not designed for parents of infants and studies of chronic maltreatment using official reports have yielded similar findings to those measuring maltreatment by self or parent report. This study uses official rereports, whether substantiated or not, to CPS as the maltreatment measure. Prior research suggests there is little difference between substantiated and unsubstantiated cases (Hussey et al., 2005; Kohl, Jonson-Reid, & Drake, 2009). Further, the present study was conducted in a differential response state meaning that most cases are diverted to an assessment track resulting in a very small proportion of substantiated cases. For Question 2, the outcome was any rereport. Family level versus child-specific reports were used as the focus of HV is on changing parental behavior and because some forms of maltreatment (e.g., child neglect) typically impact all the children in a home.

Analyses

Analyses were conducted in both SAS Version 9.4 and MPlus Version 7.3. Bivariate analyses were conducted to assess group randomization and the need for multilevel modeling. Only marital status, specifically divorced versus other was significantly different between families in the treatment (14.1% reported current status as divorced) and control (3.6% reported current status as divorced) groups. This was tested as a control variable in analyses of outcomes between treatment and control groups, but the variable was not significant nor did its inclusion improve the model fit so the variable was dropped from final models.

Intraclass correlations (ICC) were tested for possible clustering by neighborhood (ZIP code) and CW worker and were extremely low. Because there was little variability in the level of poverty in the sample, the lack of effect of ZIP code was expected. The low ICC by CW worker was also unsurprising because families receiving only hotline or voluntary in-home services typically have very brief and scant contact with a particular worker contacts ranged from a single assessment visit to periodic check-ins over 1–4 months. Because only the treatment group was assigned to home visitors, clustering by PAT worker cannot be included. As only one caregiver responded, there was no clustering by family for Question 1.

With regard to Question 1, simulation studies have provided guidance on the best analytic techniques for specific missing data mechanisms (Enders, 2010; Schafer & Graham, 2002) and these are included in guidelines for handling missing data in clinical trials (National Research Council, 2010). In the current study, we used the full-information maximum likelihood approach to missing data, as implemented in the multilevel modeling procedure of MPlus. This approach has been shown to be valid when data are assumed to be missing at random (MAR; e.g., Hallgren & Witkiewitz, 2013). Schafer and Graham (2002) state:

When missingness is beyond the researcher's control, its distribution is unknown and MAR is only an assumption. In general, there is no way to test whether MAR holds in a data set, except by obtaining follow-up data from nonrespondents or by imposing an unverifiable model (p. 152).

We supplemented the analytic approach based on the MAR assumption with sensitivity analyses. While there was higher attrition related to race/ethnicity (White worse) and baseline social support (lower social support worse), there was not, importantly, differential dropout between the two conditions. Supplemental tests included both race/ethnicity and baseline support as covariates and then as auxiliary variables, respectively. No substantive changes were found supporting the utility of the MAR assumption. Further, lack of differential dropout between conditions makes a treatment effect bias (or absence thereof) unlikely (Bell, Kenward, Fairclough, & Horton, 2013).

To analyze Question 2, CPS rereports were categorized as a dichotomous outcome (yes/no within 18 months) with no Time $\times$ Group interaction. Because of the family-level reports for Question 2, clustering by family was controlled for that question. CPS reports were drawn from statewide administrative records so attrition in interviews did not impact sample size ($n = 159$ children in 122 families). Analyses were conducted in SAS using Proc Surveyfreq which allows for clustered data (more than one child per family) as well as testing of nested tables (interaction effects). The Rao–Scott χ^2 was used to assess significance. Analyses included (1) CPS rereport by treatment compared to controls, (2) moderation of the association between CPS rereport by group by prior CPS history at baseline, and (3) moderation of the association between CPS rereport by group by baseline maternal depression (clinical range on screener). Although the study was initially designed to test PAT as an intervention with families having a first contact with CPS, when the linked data arrived it became clear that many families had prior CPS histories—sometimes years prior. This led to testing a possible moderating effect of prior CPS contact (question 2B). As poor maternal mental health has been noted as a risk factor for both recurrent maltreatment and less positive HV outcomes, analyses tested the potential moderating effect of clinical range depression symptoms at baseline (question 2B).

Results

All primary caregivers in the present study were female. Sixty-nine percent were Black, 19% White, and the remainder (12%) were mixed race or other groups. About 20% were currently married or cohabitating. The average age was 26 years. Forty percent had not finished high school. Prior to the study, 24.2% of families were initially reported solely for general or medical neglect, 13.3% were reported solely for physical abuse, nearly 20% were

newborn referrals (presence of drugs in the system at birth), 10% were referred for emotional abuse, and 22.5% were referred for multiple forms of abuse and neglect. Nearly, 57% of mothers had baseline CES-D scores in the clinical range (16 or above). The intent of ECC was to serve families at first contact with CPS, but later linked administrative data revealed that many of the families had prior reports or CW service episodes (66% of families) prior to study participation. Among the treatment group families, the average length of stay with a home visitor was 13.8 months (range 0–18) with 24% of families ending PAT before 9 months. There was an average of 61.8% of appointments with home visitors kept.

Research Question 1: There were no statistically significant differences in change over time in maternal depression, self-reported stressors, parenting stress subscales (competency, attachment, child demandingness, or child mood), or helpfulness of social supports (family and friends, community groups, and formal services) between the control and treatment groups. The mean scores (standard deviation in parentheses) across the three time points are summarized in Table 1 as well as the *F*-test statistics and *p* values for regression models of intervention by time.

Research Question 2A: There was no statistically significant between-group difference in the proportion of children ($N = 159$) with rereports to CPS during the 18-month follow-up window (41.9% ECC vs. 54.8% controls). Many ECC families had maltreatment reports and/or prior CPS service episodes prior to the report that led to the referral to the study. As it was possible that prior history could impact the outcome, an interaction term was examined between study group and those with prior CPS history ($n = 107$ children) and those without ($n = 52$ children). Among children whose families had no prior CPS history, there was a treatment effect. The treatment group had fewer rereports (11.5%) compared to the control group (50%; Rao–Scott $\chi^2 = 6.22$, $p = .012$). Among children whose families had prior CW contact, there was no difference in rereport rates.

Research Question 2B: There was also a significant moderating effect between maternal depression at baseline and study group status and likelihood of a later rereport. Among mothers who scored in the clinically depressed range at baseline, there was no difference in later report by ECC treatment group. Among those who did not score in the clinically depressed range, however, the families in the ECC group had a significantly lower rate of reports than that of the controls (25.7% Tx vs. 67.6% controls, Rao–Scott $\chi^2 = 10.96$, $p = .0009$; $RR = 0.43$).

There was a slightly higher proportion of mothers with indicators of clinical depression at baseline among those with a prior CPS history (58.9% vs. 51.9%), but this difference was not significant. The sample size precluded tests of a three-way interaction between study group, baseline prior CPS history, and maternal depression.

Discussion

It is important to note that the majority of families with CPS contact were willing to engage in PAT. Engagement of families involved with CPS is frequently noted as challenging (Kemp et al., 2009); however, engagement in nonstigmatizing and preexisting services like HV may

be less so. Low participation may be more strongly related to lack of CPS worker training in early childhood development and/or available services (JFK Partners, 2003; Wiggins et al., 2007). While CPS-involved families may have needs that go well beyond the capacity of HV to address that should not preclude routine referral to such services as a part of a service plan. Our findings suggest that HV services may hold promise for preventing recidivism for certain portions of this population.

Unlike some prior HV studies, our study did not find statistically significant reductions in caregiver-level risk factors thought to be associated with child maltreatment by treatment group status (e.g., Green et al., 2014). In some ways, this is counterintuitive given the promising findings regarding maltreatment recurrence for certain subgroups in our study. On the other hand, to our knowledge, this study is the only study of early childhood HV with a sample comprised entirely of families with at least one preexisting referral to CPS. Prior work suggests limited ability to predict maltreatment recurrence associated with risk measures used in CPS (Van der Put, Assink, & Stams, 2016). Relatively, few studies of recurrent reporting exist in comparison to the broader literature on maltreatment risk and there is significant variation in predictors measured and sample characteristics (e.g., Connell et al., 2007; Dorsey et al., 2008; English, Marshall, & Orme, 1999). Even fewer studies have attempted to model changes in status over time as compared to how baseline characteristics impact rereport (e.g., Jonson-Reid, Emery, Drake, & Stahlschmidt, 2010). Studies of chronically reported families indicate that the accumulation of risk, including external stressors and material needs, as compared to particular individual factors may be more important in understanding whether there will be a continued maltreatment trajectory (Millett et al., 2016; Siegel & Loman, 2006). It may be that the measure of repeated referrals prior to study enrollment is a “proxy” for unmeasured sources of accumulated risk.

Maternal depression is often listed as a risk factor for maltreatment because they are associated, but the exact nature of that relationship is not fully understood (Hildyard & Wolfe, 2007). Depression is not always a significant predictor of maltreating behavior among high risk or CPS-involved families when other factors are controlled (Bugental & Happaney, 2004; Conron, Beardslee, Koenen, Buka, & Gortmaker, 2009; Taylor, Guterman, Lee, & Rathouz, 2009). In our study, baseline maternal depression did appear to moderate the impact of the intervention with buffering effects of HV noted only among those mothers not depressed at baseline. This is consistent with research indicating that maternal mental health factors are moderators of child outcomes in HV studies (Duggan et al., 2009; Robinson & Emde, 2004).

Limitations and Implications

The present study was small and limited to one region. It is, however, the first known study of the use of usual care early childhood HV with intact CW-involved families. It is worth pointing out the degree to which this article illustrates the difficulty in conducting community-based research projects that benefit from consistency in policy and agency functioning. This stability may often not be present and can result in a series of unanticipated methodological issues and compromises being unavoidable. The present study was not able to control for all possible factors known to increase risk of recurrent

maltreatment such as domestic violence (e.g., Taylor et al., 2009). The relatively small sample (largely due to attrition) precluded greater exploration of covariates and complex interrelationships, although the mean scores for maternal outcome measures over time were not suggestive of power issues in detecting change. Due to IRB limitations at the agency and university levels, it was not possible to compare characteristics of families that were not referred to the study by CPS workers. It may also be that unmeasured variation impacted the association between HV and parent and maltreatment outcomes in this study. Clearly, more studies are needed of how CPS-involved families fare in community-based HV programs.

Another limitation is the high level of attrition by the study end. Although attrition is a common issue in HV research (Daro et al., 2003; M. Wagner et al., 2001), it is not possible to say with certainty that the families that left were not different in a substantive way from those that remained. It is possible that variations in families participating was associated with the null intervention findings with respect to maternal outcomes. On the other hand, there was a lack of differential attrition by treatment group status. Further there was a rather high retention rate at 9 months, and there was no indication of significant changes from baseline at that time.

Despite limitations regarding attrition and generalizability, our null overall findings are consistent with a number of prior studies (Bilukha et al., 2005) as is our finding regarding the moderating impact of maternal depression (Duggan et al., 2009; Robinson & Emde, 2004).

While we suggest that one way in which HV may impact outcomes is through referral to outside resources, it is not clear how often effective referrals are made in community-based HV (Duggan et al., 2007). If ongoing maltreatment risk and other poor parenting outcomes are associated with multiple unmet needs outside the mission of HV, it is important that studies of HV track both the type and follow through on referrals made to address those needs. For example, there is evidence that material needs and economic stressors impact the likelihood of depression (Newland, Crnic, Cox, & Mills-Koonce, 2013) and are well-known contributors to the risk of maltreatment and CPS system involvement (Drake & Jonson-Reid, 2014; Pelton, 2015). While there was little variation in neighborhood poverty in our sample, we did not have measure of ability to meet material needs. More research is needed to explore how risk and protective factors may differ for initial development of maltreating behaviors as compared to ongoing maltreatment and whether this varies according to services received.

Our findings indicate that CPS-involved families are willing to engage in existing community-based HV services. For families having a first contact with child protection who may present with fewer risks (e.g., not highly depressed), there may be benefit in reducing risk of recurrence. Given the limited resources available, understanding which CPS-involved families benefit from already available community resources is important. More work needs to be done to understand how CPS-involved families fare in such programs alone and in comparison to targeted evidence-based approaches (e.g., Chaffin et al., 2012; Cicchetti, Rogosch, & Toth, 2006) according to baseline risk level. Given the great concern regarding

the impact of maltreatment on young children and the current emphasis on early childhood programming in policy, this seems an opportune time for such work.

The relationship of and appropriate approach to intervening in maternal depression to reduce risk of maltreatment requires further study. Our study and others (Duggan et al., 2009) suggest that depression moderates the impact of HV. Because our study was not limited to families with newborns, it is not clear if results would have varied according to the onset of depression (e.g., antenatal compared to postnatal onset). Relatively, few studies of recurrent reporting exist in comparison to the broader literature on maltreatment risk. Many researchers have called for improved screening of maternal depression (Ammerman et al., 2011) and this may be a useful triage tool for CPS. It may be feasible to add a brief screener like the CES-D to CPS investigations and assessments to increase the likelihood of referral to treatment when depression is present.

A more proactive option would be to attend to maternal depression and other risks directly in prevention programs prior to the onset of maltreating behaviors. There are a variety of evidence-based approaches to depression that vary in intensity and duration as well as level of training for delivery that could be tested for more preventive effects. For example, psychosocial and problem-solving approaches are widely used to address maternal depression in Europe and can be used in nonspecialty care settings (e.g., Dennis, 2005). Economic intervention is being explored as a means of intervention for depression (e.g., Casey et al., 2004) as well as prevention of maltreatment (Slack, Holl, McDaniel, Yoo, & Bolger, 2004). A combination of attention to external stressors and individual risk factors like depression has, to our knowledge, yet to be tested. Studies are needed that examine the potential reduction in CPS contacts when mothers receive appropriate intervention at or prior to a child's birth to address the risk factors present.

Acknowledgments

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This project was funded through a grant from the National Institute of Mental Health (1R34MH083871). Points of view expressed in this article do not necessarily reflect those of the funding agency.

References

- Abidin, R. Parenting stress index3. Odessa, FL: Psychological Assessment Resources; 1990
- Ammerman RT, Putnam FW, Bosse NR, Teeters AR, Van Ginkel JB. Maternal depression in home visitation: A systematic review. *Aggression and Violent Behavior*. 2010; 15:191–200. [PubMed: 20401324]
- Ammerman R, Putnam F, Chard K, Stevens J, Van Ginkel J. PTSD in depressed mothers in HV. *Psychology Trauma: Theory, Research, Practice, & Policy*. 2011; Advance online publication. doi: 10.1037/a0023062
- Avellar S, Supplee L. Effectiveness of home visiting in improving child health and reducing child maltreatment. *Pediatrics*. 2013; 132:90–99.
- Barth, RP., Scarborough, A., Lloyd, E., Losby, J., Casanueva, C., Mann, T. Developmental status and early intervention service needs of maltreated children. *Institute for Social and Economic Development*; 2008Apr. Retrieved from <http://aspe.hhs.gov/hsp/08/devneeds/report.pdf>

- Bell M, Kenward M, Fairclough D, Horton N. Differential dropout and bias in randomised controlled trials: When it matters and when it may not. *British Medical Journal*. 2013; 346:e8668.doi: 10.1136/bmj.e8668 [PubMed: 23338004]
- Berlin L, Appleyard K, Dodge K. Intergenerational continuity in child maltreatment: Mediating mechanisms and implications for prevention. *Child Development*. 2011; 82:162–176. [PubMed: 21291435]
- Berlin LJ, Whiteside-Mansell L, Roggman LA, Green BL, Robinson J, Spieker S. Testing maternal depression and attachment style as moderators of Early Head Start's effects on parenting. *Attachment & Human Development*. 2011; 13:49–67. [PubMed: 21240694]
- Bilukha O, Hahn R, Crosby A, Fullilove M, Liberman A, Moscicki E. ... Task Force on Community Preventive Services. The effectiveness of early childhood HV in preventing violence. A systematic review. *American Journal of Preventive Medicine*. 2005; 28:11–39. [PubMed: 15698746]
- Bishop S, Leadbeater B. Maternal social support patterns and child maltreatment: Comparison of maltreating and non-maltreating mothers. *American Journal of Orthopsychiatry*. 1999; 69:172–181. [PubMed: 10234383]
- Bugental DB, Happaney K. Predicting infant maltreatment in low-income families: The interactive effects of maternal attributions and child status at birth. *Developmental Psychology*. 2004; 40:234. [PubMed: 14979763]
- Caldera D, Burrell L, Rodriguez K, Crowne SS, Rohde C, Duggan A. Impact of a statewide HV program on parenting and on child health and development. *Child Abuse & Neglect*. 2007; 31:829–852. [PubMed: 17822765]
- Casanueva C, Cross T, Ringeisen H. Developmental needs and individualized family service plans among infants and toddlers in the child welfare system. *Child Maltreatment*. 2008; 13:245–258. [PubMed: 18495948]
- Casanueva C, Cross T, Ringeisen H, Christ S. Prevalence, trajectories, and risk factors for depression among caregivers of young children involved in child maltreatment investigations. *Journal of Emotional and Behavioral Disorders*. 2011; 19:98–116.
- Casey P, Goolsby S, Berkowitz C, Frank D, Cook J, Cutts D, ... Meyers A. Maternal depression, changing public assistance, food security, and child health status. *Pediatrics*. 2004; 113:298–304. [PubMed: 14754941]
- Chaffin, M. A motivational intervention can improve parenting program retention among deep-end child welfare cases, but it depends on the type of parenting program. Paper presented to the APA 115th Annual Convention; San Francisco, CA. 2007 Aug.
- Chaffin M, Hecht D, Bard D, Silovsky JF, Beasley WH. A statewide trial of the SafeCare home-based services model with parents in child protective services. *Pediatrics*. 2012; 129:509–515. [PubMed: 22351883]
- Chen M, Chan KL. Effects of parenting programs on child maltreatment prevention a meta-analysis. *Trauma, Violence, & Abuse*. 2016; 17:88–104.
- Cicchetti D, Rogosch FA, Toth SL. Fostering secure attachment in infants in maltreating families through preventive interventions. *Development and Psychopathology*. 2006; 18:623–649. [PubMed: 17152394]
- Connell CM, Bergeron N, Katz KH, Saunders L, Tebes JK. Re-referral to child protective services: The influence of child, family, and case characteristics on risk status. *Child Abuse & Neglect*. 2007; 31:573–588. [PubMed: 17537504]
- Conron KJ, Beardslee W, Koenen KC, Buka SL, Gort-maker SL. A longitudinal study of maternal depression and child maltreatment in a national sample of families investigated by child protective services. *Archives of Pediatrics & Adolescent Medicine*. 2009; 163:922–930. [PubMed: 19805711]
- Currie J, Widom C. Long-term consequences of child abuse and neglect on adult economic well-being. *Child Maltreatment*. 2010; 15:111–120. [PubMed: 20425881]
- Daro D, McCurdy K, Falconnier L, Stojanovic D. Sustaining new parents in HV services: Key participant and program factors. *Child Abuse and Neglect*. 2003; 27:1101–1125. [PubMed: 14602094]

- DeGarmo D, Patterson G, Fogatch M. How do outcomes in a specified parent training intervention maintain or wane over time? *Prevention Science*. 2004; 5:72–89.
- Dennis CL. Psychosocial and psychological interventions for prevention of postnatal depression: Systematic review. *British Medical Journal*. 2005; 331:15–22. [PubMed: 15994688]
- DePanfilis D, Zuravin SJ. The effect of services on the recurrence of child maltreatment. *Child Abuse & Neglect*. 2002; 26:187–205. [PubMed: 11933989]
- DeVooght K, McCoy-Roth M, Freundlich M. Young and vulnerable: Children five and under experience high maltreatment states. *Early Childhood Highlights*. 2011; 2:1–20.
- Dorsey S, Mustillo SA, Farmer EZ, Elbogen E. Caseworker assessments of risk for recurrent maltreatment: Association with case-specific risk factors and rereports. *Child Abuse & Neglect*. 2008; 32:377–391. [PubMed: 18377987]
- Dozier M, Peloso E, Lewis E, Laurenceau JP, Levine S. Effects of an attachment-based intervention on the cortisol production of infants and toddlers in foster care. *Development and Psychopathology*. 2008; 20:845–859. [PubMed: 18606034]
- Drake, B., Jonson-Reid, M. Poverty and child maltreatment. In: Korbin, J., Krugman, H., editors *Handbook of child maltreatment* Dordrecht, the Netherlands: Springer; 2014:131–148
- Duggan A, Berlin L, Cassidy J, Burrell L, Tandon D. Examining maternal depression and attachment insecurity as moderators of the impacts of HV for at-risk mothers and infants. *Journal of Consulting and Clinical Psychology*. 2009; 77:788–799. [PubMed: 19634970]
- Duggan A, Caldera D, Rodriguez K, Burrell L, Rohde C, Crowne SS. Impact of a statewide HV program to prevent child abuse. *Child Abuse & Neglect*. 2007; 31:801–827. [PubMed: 17822764]
- DuMont K, Mitchell-Herzfeld S, Greene R, Lee E, Lowenfels A, Rodriguez M, ... Dorabawila V. Healthy Families New York (HFNY) randomized trial: Effects on early child abuse and neglect. *Child Abuse & Neglect*. 2008; 32:295–315. [PubMed: 18377991]
- Dunst, C., Trivette, C., Hamby, D. Measuring social support in families with young children with disabilities. In: Dunst, C., Trivette, C., Deals, A., editors *Supporting and strengthening families. Volume 1: Methods, strategies and practices* Cambridge, MA: Brookline Books; 1984:152–160
- Enders, C. *Applied missing data analysis* New York, NY: Guilford Press; 2010
- English DJ, Marshall DB, Orme M. Characteristics of repeated referrals to child protective services in Washington State. *Child Maltreatment*. 1999; 4:297–307.
- English DJ, Upadhyaya MP, Litrownik AJ, Marshall JM, Runyan DK, Graham JC, ... Dubowitz H. Maltreatment's wake: The relationship of maltreatment dimensions to child outcomes. *Child Abuse & Neglect*. 2005; 29:597–619. [PubMed: 15970327]
- Fluke JD, Shusterman GR, Hollinshead DM, Yuan YY. Longitudinal analysis of repeated child abuse reporting and victimization: Multistate analysis of associated factors. *Child Maltreatment*. 2008; 13:76–88. [PubMed: 18174350]
- Girvin H, DePanfilis D, Daining C. Predicting program completion among families enrolled in a child neglect preventive intervention. *Research on Social Work Practice*. 2007; 17:674–685.
- Green BL, Ayoub C, Bartlett JD, Von Ende A, Furrer C, Chazan-Cohen R, ... Klevens J. The effect of Early Head Start on child welfare system involvement: A first look at longitudinal child maltreatment outcomes. *Children and Youth Services Review*. 2014; 42:127–135. [PubMed: 26744550]
- Guastaferro KM, Lutzker JR, Graham ML, Shanley JR, Whitaker DJ. SafeCare®: Historical perspective and dynamic development of an evidence-based scaled-up model for the prevention of child maltreatment. *Psychosocial Intervention*. 2012; 21:171–180.
- Hallgren K, Witkiewitz K. Missing data in alcohol clinical trials: A comparison of methods. *Alcoholism: Clinical and Experimental Research*. 2013; 37:2152–2160.
- Hildyard K, Wolfe D. Cognitive processes associated with child neglect. *Child Abuse & Neglect*. 2007; 31:895–907. [PubMed: 17804068]
- Howard KS, Brooks-Gunn J. The role of home-visiting programs in preventing child abuse and neglect. *The Future of Children*. 2009; 19:119–146. [PubMed: 19719025]
- Hubmann P, Gardini E, Neuhauser A, Burkhardt SC, Schaub S, Lanfranchi A, ... Ehlert U. Early intervention moderating the effect of maternal sensitivity on FKBP5 methylation in children living in psychosocially disadvantaged families. *Psychoneuroendocrinology*. 2016; 71:60.

- Hussey JM, Marshall JM, English DJ, Knight ED, Lau AS, Dubowitz H, ... Kotch JB. Defining maltreatment according to substantiation: Distinction without a difference? *Child Abuse & Neglect*. 2005; 29:479–492. [PubMed: 15970321]
- Jaffee SR, Maikovich-Fong AK. Effects of chronic maltreatment and maltreatment timing on children's behavior and cognitive abilities. *Journal of Child Psychology and Psychiatry*. 2011; 52:184–194. [PubMed: 20735512]
- JFK Partners Interagency collaboration guidebook: A strategic planning tool for child welfare & part C agencies Denver: University Center of Excellence for Developmental Disabilities, Department of Pediatrics & Psychiatry, University of Colorado at Denver and Health Sciences Center; 2003 p.
- Johnson B. Early intervention in children with developmental disabilities. *BMH Medical Journal*. 2016; 3:1–4.
- Jonson-Reid M, Drake B, Chung S, Way I. Cross-type recidivism among child maltreatment victims and perpetrators. *Child Abuse & Neglect*. 2003; 27:899–917. [PubMed: 12951139]
- Jonson-Reid M, Drake B, Kim J, Porterfield S, Han L. A prospective analysis of the relationship between reported child maltreatment and special education eligibility among poor children. *Child Maltreatment*. 2004; 9:382–408. [PubMed: 15538037]
- Jonson-Reid M, Drake B, Kohl P. Is the overrepresentation of the poor in child welfare caseloads due to bias or need? *Children and Youth Services Review*. 2009; 31:422–427. [PubMed: 25598566]
- Jonson-Reid M, Emery C, Drake B, Stahlschmidt M. Understanding chronically re-reported cases: Implications for services and research. *Child Maltreatment*. 2010; 15:271–281. [PubMed: 20941889]
- Jonson-Reid M, Kohl PL, Drake B. Child and adult outcomes of chronic child maltreatment. *Pediatrics*. 2012; 129:839–845. [PubMed: 22529281]
- Kemp SP, Marcenko MO, Hoagwood K, Vesneski W. Engaging parents in child welfare services: Bridging family needs and child welfare mandates. *Child Welfare*. 2009; 88:101–126. [PubMed: 19653455]
- Kohl PL, Jonson-Reid M, Drake B. Time to leave substantiation behind findings from a national probability study. *Child Maltreatment*. 2009; 14:17–26. [PubMed: 18971346]
- Kohl P, Jonson-Reid M, Drake B. The role of parental mental illness in the safety and stability of maltreated children. *Child Abuse and Neglect*. 2011; 35:309–318. [PubMed: 21620157]
- Lanier P, Jonson-Reid M, Stahlschmidt M, Drake B, Constantino J. Child maltreatment and pediatric health outcomes: A longitudinal study of low-income children. *Journal of Pediatric Psychology*. 2009; 35:511–522. [PubMed: 19797405]
- LeCroy C, Whitaker K. Improving the quality of HV: An exploratory study of difficult situations. *Child Abuse and Neglect*. 2005; 29:1003–1013. [PubMed: 16159664]
- Leschied A, Chiodo D, Whitehead P, Hurley D. The relationship between maternal depression and child outcomes in a child welfare sample: Implications for treatment and policy. *Child and Family Social Work*. 2005; 10:281–291.
- Leslie LK, Gordon JN, Meneken LE, Premji K, Michelmores K, Ganger W. The physical, developmental, and mental health needs of young children in child welfare by initial placement type. *Journal of Developmental and Behavioral Pediatrics*. 2005; 26:177–185. [PubMed: 15956866]
- MacMillan H, Wathen C, Barlow J, Fergusson D, Leventhal J, Taussig H. Interventions to prevent child maltreatment and associated impairment. *Lancet*. 2009; 373:250–266. [PubMed: 19056113]
- McCubbin, H., Patterson, J. The family stress process: The Double ABCX model of adjustment and adaptation. In: McCubbin, H., Sussman, M., Patterson, J., editors *Social stress and the family: Advances and developments in family stress theory and research* New York, NY: Haworth Press; 1983:37–37
- Medicare Access and CHIP Reauthorization Act, 42 U.S.C. §§ 1305 (2015).
- Millett LS, Ben-David V, Jonson-Reid M, Echele G, Moussette P, Atkins V. Understanding change among multi-problem families: Learnings from a formative program assessment. *Evaluation and Program Planning*. 2016; 58:176–183. [PubMed: 27419622]
- National Research Council The prevention and treatment of missing data in clinical trials Washington, DC: National Academies Press; 2010

- Newland RP, Crnic KA, Cox MJ, Mills-Koonce WR. The family model stress and maternal psychological symptoms: Mediated pathways from economic hardship to parenting. *Journal of Family Psychology*. 2013; 27:96. [PubMed: 23421837]
- Nievar MA, Van Egeren LA, Pollard S. A meta-analysis of home visiting programs: Moderators of improvements in maternal behavior. *Infant Mental Health Journal*. 2010; 31:499–520. [PubMed: 28543835]
- Olds DL, Eckenrode J, Henderson CR, Kitzman H, Powers J, Cole R, ... Luckey D. Long-term effects of home visitation on maternal life course and child abuse and neglect: Fifteen-year follow-up of a randomized trial. *Journal of the American Medical Association*. 1997; 278:637–643. [PubMed: 9272895]
- Olds DL, Kitzman HJ, Cole RE, Hanks CA, Arcoleo KJ, Anson EA, ... Stevenson AJ. Enduring effects of prenatal and infancy HV by nurses on maternal life course and government spending: Follow-up of a randomized trial among children at age 12 years. *Archives of Pediatrics & Adolescent Medicine*. 2010; 164:419–424. [PubMed: 20439792]
- Parents as Teachers. Evidence-based model2017aRetrieved from <http://parentsasteachers.org/evidence-based-model/>
- Parents as Teachers. Essential requirements2017bRetrieved from <http://parentsasteachers.org/essential-requirements>
- Pfannenstiel, J., Lambson, T., Yarnell, V. Research and Training Associates Inc., & United States of AmericaSecond wave study of the Parents as Teachers program: Executive summarySt. Louis, MO: Parents as Teachers National Center; 1991
- Pelton LH. The continuing role of material factors in child maltreatment and placement. *Child Abuse & Neglect*. 2015; 41:30–39. [PubMed: 25169149]
- Putnam-Hornstein E, Needell B. Predictors of child protective service contact between birth and age five: An examination of California's 2002 birth cohort. *Children and Youth Services Review*. 2011; 33:1337–1344.
- Radloff LS. The CES-D scale a self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 1:385–401.
- Reynolds A, Mathieson L, Topitzes J. Do early childhood interventions prevent child maltreatment? A review 2010 of research. *Child Maltreatment*. 2009; 14:182–206. [PubMed: 19240245]
- Robinson J, Emde R. Mental health moderators of Early Head Start on parenting and child development: Maternal depression and relationship attitudes. *Parenting: Science and Practice*. 2004; 4:73–97.
- Schafer J, Graham J. Missing data: Our view of the state of the art. *Psychological Methods*. 2002; 7:147–177. [PubMed: 12090408]
- Shonkoff JP, Garner AS, Siegel BS, Dobbins MI, Earls MF, McGuinn L, ... Wood DL. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*. 2012; 129:e232–e246. [PubMed: 22201156]
- Siegel, GL., Loman, LA. Extended follow-up study of Minnesota's family assessment responseSt Louis, MO: Institute of Applied Research; 2006
- Silver EJ, Heneghan AM, Bauman LJ, Stein RE. The relationship of depressive symptoms to parenting competence and social support in inner-city mothers of young children. *Maternal and Child Health Journal*. 2006; 10:105–112. [PubMed: 16382333]
- Silver J, DiLorenzo P, Zukoski M, Ross P, Amster B, Schlegel D. Starting young: Improving the health and developmental outcomes of infants and toddlers in the child welfare system. *Child Welfare*. 1999; 78:149–163.
- Slack KS, Holl JL, McDaniel M, Yoo J, Bolger K. Understanding the risks of child neglect: An exploration of poverty and parenting characteristics. *Child Maltreatment*. 2004; 9:395–408. [PubMed: 15538038]
- Stagner MW, Lansing J. Progress toward a prevention perspective. *The Future of Children*. 2009; 19:19–38. [PubMed: 19719021]
- Stahlschmidt M, Jonson-Reid M, Pons L, Constantino J, Kohl P, Drake B, ... Auslander W. Implementation of a real-world intervention for families with young children involved with child

- welfare: Lessons learned. *Evaluation and Program Planning*. 2017; 66:133–140. NIHMSID 917550. [PubMed: 29091788]
- Sweet MA, Appelbaum MI. Is home visiting an effective strategy? A meta-analytic review of home visiting programs for families with young children. *Child development*. 2004; 75(5):1435–1456. [PubMed: 15369524]
- Taylor C, Guterman N, Lee S, Rathouz P. Intimate partner violence, maternal stress, nativity, and risk for maternal maltreatment of young children. *American Journal of Public Health*. 2009; 99:175–183. [PubMed: 19008518]
- Teicher MH, Samson JA, Anderson CM, Ohashi K. The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Reviews Neuroscience*. 2016; 17:652–666. [PubMed: 27640984]
- Thompson R, English DJ, White CR. Maltreatment history as persistent risk: An extension of Li and Godinet (2014). *Children and Youth Services Review*. 2016; 64:117–121.
- U.S. DHHS, Children's Bureau Child maltreatment 2015 Washington, DC: Author. U.S. Department of Health and Human Services (US DHHS); 2017
- Administration for Children and Families, Children's Bureau. Final report: Missouri Child and Family Services Review Executive Summary 2004 Retrieved May 2005 from <http://www.acf.hhs.gov/programs/cb/cwrp/executive/mo.html>
- Van der Put CE, Assink M, Stams GJJ. The effectiveness of risk assessment methods: Commentary on "Deciding on child maltreatment: A literature review on methods that improve decision-making. *Child Abuse & Neglect*. 2016; 59:128–129. [PubMed: 27377793]
- Wagner M, Clayton SL. The parents as teachers program: Results from two demonstrations. *The Future of Children*. 1999; 9:91–115. [PubMed: 10414012]
- Wagner, M., Iida, E., Spiker, D. The multi-site evaluation of the parents as teachers HV program: Three-year findings from one community 2001 Retrieved from www.sri.com/policy/cehs/early/pat.html
- Wagner M, Spiker D, Linn M. The effectiveness of the parents as teachers program with low-income parents and children. *Topics in Early Childhood Special Education*. 2002; 22:67–81.
- Wiggins, C., Fenichel, E., Mann, T. Literature review: Developmental problems of maltreated children and early intervention options for maltreated children Chapel Hill: University of North Carolina, School of Social Work University of North Carolina, Frank Porter Graham Child Development Institute, ZERO TO THREE; 2007
- Zielinski D, Eckenrode J, Olds D. Nurse HV and the prevention of child maltreatment: Impact on the timing of official reports. *Development and Psychopathology*. 2009; 21:441–453. [PubMed: 19338692]
- Zigler E, Pfannenstiel J, Sietz V. The parents as teachers program and school success: A replication and extension. *Journal of Primary Prevention*. 2008; 29:103–120. [PubMed: 18404381]

Stage 1 Worker Recruitment and Randomization	N=213 workers randomized from public and private agency lists to treatment or control	
	ECC Child Protection Workers 111 ^a	Control Child Protection Workers Staff 102 ^b
	Consented and trained for study n=57	Consented and trained for study n=65
Stage 2 Family Recruitment and Consent	N=93 families referred 90 eligible ^c	N=77 families referred – all eligible
	n=73 agreed to meet for consent 17 unable to contact	n=68 agreed to meet for consent 9 unable to contact
	n=68 Consented 5 refused	n=64 Consented 3 refused
Caregiver Interview Participation	n=65 caregivers completed baseline ^d N=86 children ^e	n=57 caregivers completed baseline ^d N=73 children ^e
	9 month Interview n=52 caregivers	9 month interview n=42 caregivers
	18 month interview n=34 caregivers	18 month interview n=29

^a 12 served populations not eligible for study and were excluded, 21 could not be reached, 6 quit or retired from positions prior to consent, 5 refused and 9 consented but never attended the trainings and were withdrawn

^b 5 served populations not eligible for study and were excluded, 15 could not be reached, 5 quit or retired positions prior to consent, 5 refused and 7 consented but did not show for trainings and were withdrawn

^c 3 families were already receiving early childhood intervention and were not eligible

^d 3 families moved prior to completing verbal consent and could not be located

^e 7 families moved prior to completing the verbal consent and could not be located

^f Child maltreatment report outcomes are based on matches between baseline and administrative data unless a family withdraws after consent (which did not occur). So the n size for this outcome is not subject to attrition. Only caregiver data and child development measures (not included in present article) were collected through interviews and thus subject to loss due to participants moving and being unable to contact them.

Figure 1.
Early childhood connections: enrollment, allocation to intervention, and follow-up.

Table 1Maternal Risk and Supports by Treatment Groups: Means (*SDs*) and *F* Test for Time by Group Regression.

Variable Names	Treatment				Controls				Time × Group Interaction <i>F</i> Test	<i>p</i> Value
	Baseline	9 Months	18 Months		Baseline	9 Months	18 Months			
	<i>N</i> = 64	<i>n</i> = 52	<i>n</i> = 34		<i>N</i> = 56	<i>n</i> = 42	<i>n</i> = 29			
Depress (mean)	17.1 (9.4)	12.9 (10.0)	13.4 (10.3)		19.5 (11.4)	15.3 (9.7)	14.4 (9.9)		2.67	.465
Stressors	5.2 (2.8)	4.2 (2.6)	4.5 (2.8)		6.1 (2.9)	5.3 (2.7)	5.4 (2.8)		1.12	.290
Competency	32.6 (6.0)	28.9 (6.0)	27.9 (6.4)		32.1 (6.3)	29.8 (7.1)	31.0 (6.2)		2.41	.120
Attachment	14.1 (3.6)	14.1 (3.7)	13.4 (3.9)		14.7 (4.0)	13.9 (3.7)	14.3 (3.1)		0.13	.716
Child demanding	20.9 (5.5)	20.6 (5.0)	21.4 (6.8)		20.9 (6.1)	21.5 (6.4)	21.6 (4.7)		0.34	.558
Child mood	11.6 (3.1)	11.6 (3.2)	12.3 (4.6)		11.6 (3.3)	11.4 (4.0)	11.8 (3.7)		0.14	.704
Social support rating (0 = <i>not helpful</i> to 5 = <i>extremely helpful</i>) average for type										
Community groups	3.0 (1.2)	3.1 (1.2)	3.2 (1.4)		2.7 (1.3)	2.9 (1.4)	2.8 (1.3)		0.21	.644
Family friend	3.1 (1.0)	3.1 (1.0)	3.2 (0.9)		3.1 (1.0)	3.3 (1.0)	3.1 (0.8)		0.03	.868
Formal services	3.5 (0.9)	3.6 (0.9)	3.6 (0.8)		3.4 (0.9)	3.3 (1.1)	3.4 (0.9)		0.80	.371