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Early Head Start service use by families with court-substantiated maltreatment

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Abstract

Early Head Start (EHS) is an evidence-based intervention program for at-risk children birth through three that seeks to improve child and family well-being. There is little research to date examining the prevalence of child maltreatment among families enrolled in EHS and the extent to which maltreatment is associated with receipt of programs and services available to EHS families. This study sought to (a) identify the prevalence of court substantiated maltreatment in EHS families; and (b) determine the association between substantiated maltreatment and use of EHS program and community-linked services. To answer these questions, archival program and clinical service records and juvenile court records on 743 EHS families were extracted and analyzed. Negative binomial and logistic regression models examined the relationship between court-substantiated maltreatment and use of program and community-linked services. Overall, 14.9% of enrolled families had a court substantiated case of maltreatment. Presence of a maltreatment record was differentially associated with use of program services, including overall number of home visits ($\beta = -0.16$, $p = 0.014$, 95% CI $[-0.28, -0.03]$) and receipt of Child Abuse

Published in *Children and Youth Services Review* 108 (2020) 104602

DOI: 10.1016/j.chilcyouth.2019.104602

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Submitted 26 June 2019; revised 4 November 2019; accepted 5 November 2019; published 22 November 2019.

Prevention Services (OR = 7.21, 95% CI [3.21, 16.21]), Domestic Violence Assistance (OR = 5.88, 95% CI [2.55, 13.53]), and English as a Second Language (OR = 0.26, 95% CI [0.11, 0.63]). Children and families served by EHS experience maltreatment at higher rates than the general population. There is a need to develop strategies to explicitly target families who experience child maltreatment. Implications for serving and engaging high-risk families in EHS are discussed.

Keywords: Child maltreatment, Early Head Start (EHS), Engagement, Service use

1. Introduction

1.1. *Early Head Start*

Early Head Start (EHS) is a federally funded early intervention program for low-income pregnant women and children birth through three, and has been identified as an evidence-based program under the Maternal, Infant, and Early Childhood Home Visitation (MIECHV) research initiative (Avellar & Supplee, 2013; Haskins & Margolis, 2014; Sama-Miller et al., 2017). As outlined in the *Improving Head Start for School Readiness* (2007), EHS provides multidisciplinary, coordinated services to enhance children's "physical, social, emotional, and intellectual development", promote positive parent-child interactions, and help families improve family well-being through self-sufficiency. Service delivery is provided through three program models: center based care, home-based care, and combination options with both center- and home-based care. Research has been conducted on each program option since the initial authorization of EHS in 1996, with results demonstrating effectiveness in improving a wide array of child, parent, and family outcomes, including child social-emotional functioning, enhanced parenting, and family self-sufficiency (see Love, Chazan-Cohen, Raikes, and Brooks-Gunn (2013) for the most recent results of the longitudinal evaluation). EHS Program Performance Standards identify rules and regulations for each specific program model, including curriculum, staff requirements, frequency and length of home visits, and screening tools (Raikes, Brooks-Gunn, & Love, 2013; U.S. Department of Health and Human Services [U.S. DHHS], 2016). This study focuses on the home-based program option.

The Program Performance Standards (U.S. DHHS, 2016) outline specific regulations for provision of program services within the home-based option. Specifically, EHS is required to provide home

visits and group socialization activities; screening and assessments to monitor progress; health, oral health, mental health, and nutrition services; family partnership services; and to establish community partnerships to facilitate access to additional community resources. The Program Performance Standards (U.S. DHHS, 2016) suggest developing collaborative relationships with health care providers, services for children with disabilities, family preservation and child abuse support services, programs to support financial stability (e.g., Temporary Assistance for Needy Families [TANF]), employment training, adult education, housing support, and domestic violence prevention. To most effectively connect families to services, EHS is required to identify family strengths and needs as part of their intake and assessment procedures. The information collected during these procedures provides guidance in connecting families to appropriate program and community resources. Specific strategies or mechanisms with which programs can conduct these assessments and connect families to services are not prescribed; each individual program is permitted to utilize evidence-based strategies of their choosing. Although EHS programs are largely guided by the Head Start Early Learning Outcomes Framework (U.S. DHHS, 2015a), there is currently no prescriptive process across programs to drive selection of evidence-based strategies, particularly for community resources.

1.2. Families enrolled in EHS

Regulations require that EHS programs enroll families that present with the highest level of need based on a community needs assessment (Eligibility, Recruitment, Selection, Enrollment, and Attendance [ERSEA] Standards; U.S. DHHS, 2015b). Eligibility requirements as outlined in §1302.12 of the Program Performance Standards include family income equal to or below the federal poverty line, eligibility for public assistance, homelessness, or foster care placement (U.S. DHHS, 2016). These risk factors, in addition to high prevalence rates of maltreatment observed in the birth to three age range (U.S. DHHS, 2019), reflect that children enrolled in EHS are at increased risk for maltreatment (e.g., Institute of Medicine [IOM] & National Research Council [NRC], 2013; Palusci, 2011; Pelton, 2015; Sedlak, Mettenberg, Basena, Petta, McPherson, Greene, & Li, 2010). This increased risk for maltreatment has been well-established in the extant literature.

There is a small body of research that has broadly evaluated maltreatment occurrence in EHS samples. A recent study examining abuse episodes, as measured by Medicaid claims using ICD-9 child abuse codes, found that children in EHS were 3.15 times as likely to have an abuse episode than comparison children (i.e., a matched sample of families not enrolled in an intervention), with 1.3% of EHS enrolled children reporting an abuse episode in the two years following enrollment (Matone et al., 2018). In the first longitudinal study measuring maltreatment in EHS, Green et al. (2014) evaluated a subset of sites participating in the larger EHS evaluation project, including four homebased sites, one center-based site, and two combined program models. Using administrative data from child welfare agencies over the 13-year study period, the authors found that 15.8% of the sample had a substantiated report of maltreatment, with 18% having at least one child welfare encounter. Approximately 5% of families had their first child welfare encounter when the child was in the birth to three age range.

Five additional studies looking at reductions in maltreatment in the EHS home-based program were identified in the Home Visiting Evidence of Effectiveness review (HomVEE; Sama-Miller et al., 2017). Of these studies, only one demonstrated favorable effects and four demonstrated no effects. Specifically, Roggman and Cook (2010) found one favorable effect on use of physical punishment at 36 months, but no effect on the use of physical punishment at 24 months. The remaining studies (e.g., Chazan-Cohen, Raikes, & Vogel, 2013; Love et al., 2002) assessed spanking, witnessing violence, and emergency room visits for injuries, all finding no effects. Despite the existence of these studies, the HomVEE review identifies maltreatment only as a secondary outcome, and most studies use only proxy measurements of maltreatment. Further, these studies have found mixed effects, with some studies demonstrating reductions in maltreatment following EHS participation and others finding no effects. There is a need for additional examinations of maltreatment occurrence within the EHS home-based option to further expand upon these patterns of findings.

1.3. Engagement and service usage

The current study focuses on the home-based program option, in part because home visitation programs are in a unique position to

identify risk for maltreatment and connect families to appropriate resources and services (Schreier, McCoy, Flood, Wilcox, & Hansen, 2018). Home visitation developed out of a need to provide services to high-risk families that experience complex difficulties that may interfere with participation and engagement (Bilukha et al., 2005; Daro, 2000, 2005; Daro & Cohn-Donnelly, 2002). Engagement in program services remains a particular challenge for high-risk families who tend to participate inconsistently, infrequently, or for brief periods of time (Alonso-Marsden et al., 2013; Ammerman et al., 2006; Daro, 2006; McCurdy et al., 2006). For example, high-risk families may not have regular access to transportation or childcare and may face stressors that interfere with the ability to manage appointments, which can prohibit regular attendance in an intervention program (Avellar & Supplee, 2013; Azzi-Lessing, 2011; McGuigan & Gassner, 2016). Home visitation attempts to reduce these barriers by providing individualized services to families in their own homes, thus eliminating the need for transportation and childcare, and providing the ability to respond to stressors in the environment in which they most frequently occur (Azzi-Lessing, 2011; Korfmacher et al., 2008; Raikes et al., 2006; Shonkoff & Phillips, 2000).

Research to date has demonstrated mixed results with regard to how families involved with the child welfare system, or who experience risk factors for maltreatment (e.g., teen parenthood, parental depression, housing instability), engage in services (Azzi-Lessing, 2013; Duggan et al., 2004; Kemp, Marcenko, Hoagwood, & Vesneski, 2009; Raikes et al., 2006). Some literature has suggested that families involved with child welfare services demonstrate increased engagement, in part because these families are often mandated to service participation (e.g., Kemp et al., 2009; Platt, 2012). Other studies have demonstrated decreased engagement among families experiencing risk factors associated with maltreatment. For instance, Raikes et al. (2006) found shorter home visit duration among teen mothers enrolled in an EHS program. Similarly, Roggman, Cook, Peterson, and Raikes (2008) found that higher levels of housing instability increased likelihood of dropping out of services, but did not find differences in service utilization based on maternal depression or parenting stress. However, Girvin, DePanfilis, and Daining (2007) did find that higher levels of caregiver depression was associated with service completion in a community based program designed to reduce the risk of neglect.

Other risk factors associated with maltreatment, such as caregivers who have experienced psychological aggression, predict service completion in home visiting services, while symptoms related to alcohol/drug use reduced the likelihood of service completion (Damashek, Doughty, Ware, & Silovsky, 2011).

The effectiveness of home visiting programs relies on active parent participation and engagement (Ammerman et al., 2006; Korfmacher et al., 2008; McCurdy et al., 2006; McGuigan & Gassner, 2016). The majority of research to date has focused on initial engagement, retention, attrition, and overall engagement. It is clear that maltreating or high-risk families experience barriers to successful program engagement in these domains. Although a significant component of engagement involves active participation in visits, another facet of engagement includes involvement in programming outside of home visits, including broader health and social services in the community (Wagner, Spiker, Linn, Gerlach-Downie, & Hernandez, 2003). Little is known about whether maltreating or high-risk families engage in these additional program and community-linked services. Typically, research on this facet of engagement measures referral to services and whether a family is connected to the referred service (e.g., Dodge et al., 2014; Goldberg, Winestone, Fauth, Colon, & Mingo, 2018; Silovsky et al., 2011). In one recent study of the broader service coordination context in a non-maltreating sample, Goldberg et al. (2018) found that only 21% of referrals resulted in a family actually receiving services. To our knowledge, there has been no study evaluating specific service receipt among maltreating families within EHS.

The goal of EHS is to enhance child and family functioning through the provision of program and community resources (U.S. DHHS, 2016). Families enrolled in EHS are at increased risk for child maltreatment and experience maltreatment at higher rates than those of the general population (Green et al., 2014; Matone et al., 2018). Although there are significant challenges in serving and engaging high-risk families, particularly those with welfare system involvement, home visitation programs provide an opportunity to improve outcomes for these families (Monteiro, 2016). Within EHS in particular, little is known about service use among child welfare involved families. Given that linkage to community resources is a requirement as outlined in the Program Performance Standards (U.S. DHHS, 2016), more research is needed

to clarify relationships between maltreating or child welfare involved families and service use and participation.

1.4. Current study

Families involved in EHS represent a population at particularly high risk for maltreatment and subsequent negative outcomes. To date, there has been a dearth of research examining occurrence of substantiated maltreatment within EHS, with only one study to our knowledge using child welfare encounters as an outcome (Green et al., 2014). It is critical to increase the understanding of the rates of maltreatment among enrolled families within EHS. Further, there is a clear need to understand the relationship between maltreatment occurrence and service usage among families enrolled in EHS, in order to provide direction for targeted intervention which could potentially increase family engagement and length of participation in EHS. The current cross-sectional study examined the relationship between maltreatment occurrence and receipt of specific program and community-linked services. Specifically, we addressed the following research questions:

- (1) What is the prevalence of court-substantiated child maltreatment among families enrolled in EHS?
- (2) What is the relationship between maltreatment occurrence (IV) and participation in EHS (DV; e.g., home visits, program services)?
- (3) What is the relationship between maltreatment occurrence (IV) and receipt of specific program services (DV; e.g., Substance Abuse Services, Housing Assistance, Domestic Violence Assistance)? What is the likelihood of receipt of specific program services based on presence of court-substantiated maltreatment?

Court-substantiation does not inherently differentiate child outcomes given exposure to at-risk environments (e.g., Hussey et al., 2005; Leiter, Myers, & Zingraff, 1994); as such, this study considered court substantiation to be a conservative estimate of actual incidence of abuse, and a broader reflection of a family's risk for maltreatment.

We expected that families with a maltreatment record would attend fewer home visits and use fewer overall services than families without a maltreatment record. We also expected that families with a maltreatment record would be more likely to receive specific program services (e.g., Child Abuse Prevention Services, Domestic Violence Assistance, Substance Abuse Services, Emergency Crisis Assistance) as compared to those families without a maltreatment record.

2. Method

2.1. Participants

Subjects in the archival database were 743 children enrolled in EHS home-based services in Nebraska between 2008 and 2015. There were no exclusionary criteria for this study. For all analyses, one child was randomly selected as the target child in families with multiple enrolled siblings, leading to a subsample of 522 children. Parents enrolled their children from the prenatal period through their child's third birthday. In the subsample, children were 14 months old on average, 52.3% of children were male, and 50.4% were White. At enrollment, approximately 47% of children were between birth and 11 months of age, 30% were between 12 and 23 months of age, and 24% were between 24 and 36 months of age. Caregivers ranged in age from 12 to 68 ($M = 28.75$, $SD = 6.97$). See **Table 1** for additional child and caregiver demographics for the final sample of 522 children.

2.2. Setting

Data were collected from a grantee agency for an EHS home-based program serving a mid-sized community and outlying rural areas in Nebraska. During the overall study period (2008–2015), the program served approximately 260 families per year with the majority of children (74%) receiving home-based services. Because children are eligible from the prenatal period through age three, many families are enrolled over multiple years.

Table 1 Child and caregiver demographics.

<i>Child</i>		
Age		<i>M</i> = 1.18 (0.90)
Gender	Male	273 (52.3%)
	Female	249 (47.7%)
Race/ethnicity	White	263 (50.4%)
	Hispanic	109 (20.9%)
	Black or African American	84 (16.1%)
	Multiracial/Bi-racial	35 (6.7%)
	Asian	25 (4.8%)
	American Indian/Alaska Native	5 (1.0%)
Primary language	English	300 (57.5%)
	Middle Eastern/South Asian	112 (21.5%)
	Spanish	77 (14.8%)
	East Asian	16 (3.1%)
	African Languages	8 (1.5%)
	European/Slavic Languages	5 (1.0%)
	Other	1 (0.2%)
<i>Caregiver</i>		
Age		<i>M</i> = 28.75 (6.97)
Gender	Male	16 (3.1%)
	Female	506 (96.9)
Race/ethnicity	White	292 (55.9%)
	Hispanic	92 (17.6%)
	Black or African American	86 (16.5%)
	Asian	27 (5.2%)
	Multiracial/Bi-racial	12 (2.3%)
	American Indian/Alaska Native	9 (1.7%)
Primary language	English	304 (58.2%)
	Middle Eastern/South Asian	110 (21.1%)
	Spanish	77 (14.8%)
	East Asian	16 (3.1%)
	African Languages	9 (1.7%)
	European/Slavic Languages	5 (1.0%)
	Other	1 (0.2%)
Highest grade completed	Less than high school degree	186 (35.6%)
	High school diploma/GED	191 (36.6%)
	Some college/Associates degree	103 (19.7%)
	Bachelor's Degree	33 (6.3%)
	Advanced Degree	9 (1.7%)

2.3. Measures

2.3.1. EHS services

Information on participation in EHS program services was extracted from ChildPlus, the online record keeping system used by EHS. During each program year, home visitors recorded family service referral and receipt in ChildPlus. Records for each service included whether the family received each service during a program year (yes/no). Service receipt was a binary variable, reflecting whether each service was received or not received during a program year. Subjects were considered to have received each service if records indicated they had received it at any point throughout the duration of their enrollment. Program and community-based services extracted for this study included: home visits, Emergency Crisis Assistance, Housing Assistance, Adult ESL (English as Second Language classes), Adult Education, Employment Training, Substance Abuse Services, Child Abuse Prevention Services, Domestic Violence Assistance, assistance obtaining Child Support, Parenting Education, Marriage Education, and WIC (Women Infants and Children Program) Services. Of note, the number of home visits was recorded only in narrative form in the records prior to the 2012–2013 program year, which precluded the ability to extract a count of visits without detailed review of individual records. Thus, only the number of home visits for families enrolled after the 2012–2013 program year are included ($n = 286$, 55% of the subsample).

2.3.2. Mental health services

Information related to the provision of mental health services was collected as part of the ongoing partnership between the local grantee agency and consulting mental health providers. Home visitors and contracted mental health consultants recorded service referral and receipt during each program year. Mental health clinical services extracted from ChildPlus were Mental Health Assessment and Joint Home Visit (e.g., a mental health provider attended a home visit with the service provider). Receipt of mental health services were also coded as a binary variable; subjects were considered to have received each service if records indicated they had received it at any point throughout the duration of their enrollment.

2.3.3. *Maltreatment records*

A unique feature of the State of Nebraska is that juvenile court records are available to the public. The Nebraska Justice system provides online access to public information on a majority of the state trial court's case information available through juvenile court records. Accessible records include public information; all non-public information (e.g., Social Security numbers) is redacted from the records before they are entered into the system. The Nebraska Department of Health and Human Services (DHHS) receives reports of possible incidents of child maltreatment and agency workers determine whether risk is sufficient to file a case with the juvenile court system. A case is filed with juvenile court when it is determined that risk for maltreatment exists and that DHHS voluntary services are inadequate for addressing this risk. A filed case is considered a substantiated instance of child maltreatment, as determined by Nebraska DHHS (Voices for Children of Nebraska, 2006). Maltreatment was coded as a binary variable, as present if there was a filed case and absent if there was not a filed case. Records on cases that were reported but not filed/substantiated are not available in the Justice system. The Justice system records were used to assess and track occurrence of maltreatment. Occurrence of maltreatment was measured by the child's parent having ever been referred to juvenile court for charges involving the EHS child or a sibling in the family subsequent to the target child's birth. Maltreatment records were examined for all youth enrolled during the study observation period from 2008 to 2015. Maltreatment could have occurred at any point during the child's life, including prior to enrollment in EHS in 2008, through the end of the outcome observation period, which concluded in February 2016. Thus, maltreatment records could be present prior to enrollment in EHS, during enrollment in EHS, or post-enrollment in EHS. For the purposes of this study, a court-substantiated maltreatment record occurring at any point pre-, during, or post-enrollment is considered to be a proxy for a family's risk for maltreatment during enrollment.

2.4. Procedures

Although the data for this study are archival, families are continuously enrolled in EHS and new measures are collected on an ongoing basis as part of routine program and clinical services. To extract juvenile court records, the Nebraska Justice database was searched for records that match the names of participants included in the archival database. Date of birth was used to verify that records were those of the participants. All components of this study were approved by the University's IRB/Human Subjects Research office.

2.5. Data analyses

Descriptive analyses were conducted to identify frequencies and percentages of service usage by type. Missing data for each service type ranged from 0 to 17% ($M = 11\%$), calculated as number of cases with missing data for each individual service type divided by number of total cases. A missing values analysis using Little (1988) MCAR test was not significant, which indicates that the data were missing completely at random, $X^2(3) = 3.47, p = 0.324$. As such, listwise deletion was employed to account for this missingness. To determine whether maltreatment status related to service utilization for EHS families, two negative binomial regression models were estimated for the two count variables (i.e., number of EHS home visits completed, number of EHS services used). A negative binomial model is appropriate because it allows for overdispersion, which is often present when modeling counts. Relative rates were used to interpret the effect size of β^2 . In this context, the relative rate is the expected rate of increase in services utilized for the maltreated case compared to non-maltreated cases. Next, a series of logistic regression analyses were estimated to examine the relationship between maltreatment status and each service type while controlling for time enrolled in EHS. Because the EHS sample is a low-income sample with a restricted age range, youth age and income were not included as covariates; length of time enrolled was the only covariate used in these analyses. Since multiple tests were performed, the likelihood of committing a Type I error increased. To address this, the significance level was Bonferroni corrected, so the alpha level for each individual test was set at 0.003.

The 95% significance level for odds ratios are reported. SPSS Version 24 was used to perform all analyses.

3. Results

3.1. Occurrence of child maltreatment

The primary outcome variable of court-substantiated maltreatment was measured as presence of a maltreatment record for the target child OR presence of a maltreatment record for another sibling in the family subsequent to the target child's birth. This reflects the notion that substantiated maltreatment within a family affects all members of the family unit, even if the target child was not explicitly listed in the report. Overall, 78 (14.9%) of EHS participant families experienced a court-substantiated instance of maltreatment. A juvenile court record existed for the target child in 60 (11.5%) cases. Of those cases, 18 (30%) of the juvenile court records occurred prior to participation in EHS, 16 (26.7%) occurred during participation in EHS, and 26 (5.0%) occurred after participation in EHS had concluded. An additional 18 children (3.4%) had a record for another juvenile family member subsequent to EHS participation.

Post-hoc analyses were conducted to identify demographic differences between maltreated and non-maltreated cases. Fisher's Exact Test was used to account for cell size < 5 . There were no significant differences with regard to child age, child gender, caregiver gender, and caregiver education. There were significant differences with regard to child's race/ethnicity, $X^2(5) = 12.752$, $p = 0.012$, caregiver's race/ethnicity, $X^2(5) = 13.056$, $p = 0.006$, and caregiver's primary language, $X^2(6) = 32.329$, $p < 0.001$. There were also significant differences with regard to caregiver's age, $t(520) = -2.425$, $p = 0.017$. Caregivers of children with a maltreatment record were older on average, $M_{age} = 31.05$ (9.50) than those without a maltreatment record, $M_{age} = 28.34$ (6.36).

3.2. Service utilization

Number and percentage of participants who received each type of service can be found in **Table 2**. Parenting Education was the most

Table 2 EHS service type usage.

	n (%)
Mental health assessment	106 (20.3%)
Joint home visit	101 (19.3%)
Emergency crisis assistance	275 (52.7%)
Housing assistance	135 (25.9%)
Mental health services	161 (30.8%)
Adult ESL	127 (24.3%)
Adult education	181 (34.7%)
Employment training	70 (13.4%)
Substance abuse services	14 (2.7%)
Child abuse prevention services	30 (5.7%)
Domestic violence assistance	28 (5.4%)
Child support	28 (5.4%)
Parenting education	454 (87.0%)
Marriage education	22 (4.2%)
WIC	412 (78.9%)

commonly received service ($n = 454$), followed by receipt of WIC ($n = 412$), and Emergency Crisis Assistance ($n = 275$). The smallest percentage of participants received Substance Abuse Services ($n = 14$), Marriage Education ($n = 22$), Domestic Violence Assistance ($n = 28$), assistance obtaining Child Support ($n = 28$), and Child Abuse Prevention Services ($n = 30$). Correlations between service types can be found in **Table 3**.

The number of EHS home visits ranged from 1 to 149 ($M = 43.16$, $SD = 33.61$, $Mdn = 30$). This was normally distributed, with skewness of 0.89 ($SE = 0.17$) and kurtosis of 0.04 ($SE = 0.35$). Results of the negative binomial regression indicate that maltreatment status was significantly associated with number of EHS home visits completed, while controlling for time enrolled in the program ($\beta = -0.16$, $p = 0.014$, 95% CI $[-0.28, -0.03]$). The incident rate for families with a maltreatment record is 0.86 as large as families without a maltreatment record, indicating that families with a maltreatment record received fewer home visits than those without a maltreatment record. Holding time enrolled at its grand mean, the predicted number of home visits for maltreated cases is 30.54 ($SE = 1.80$), whereas the predicted number of home visits for non-maltreated cases is 35.71 ($SE = 0.87$). Results

Table 3 Intercorrelations between service type.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Mental Health Assessment	-													
2. Joint Home Visit	0.763**	-												
3. Emergency Crisis Assistance	0.121*	0.052	-											
4. Housing Assistance	0.110*	0.053	0.394**	-										
5. Mental Health Services	0.355**	0.395**	0.196**	0.204**	-									
6. Adult ESL	-0.062	-0.030	0.343**	0.181**	-0.021	-								
7. Adult Education	0.007	-0.059	0.356**	0.388**	0.115*	0.372**	-							
8. Employment Training	0.014	0.002	0.215**	0.205**	-0.018	0.232**	0.296**	-						
9. Substance Abuse Services	0.146**	0.136**	0.074	0.108*	0.203**	-0.081	0.066	0.100*	-					
10. Child Abuse Prevention Services	0.125**	0.130**	0.075	0.082	0.140**	-0.113*	0.037	0.046	0.116*	-				
11. Domestic Violence Assistance	0.188**	0.103*	0.163**	0.095*	0.150**	0.007	0.114*	0.016	0.219**	0.283**	-			
12. Child Support	0.082	0.057	0.163**	0.135**	0.091	-0.096*	0.095*	0.118*	0.166**	0.128**	0.162**	-		
13. Parenting Education	0.024	0.019	0.355**	0.203**	0.241**	0.193**	0.247**	0.115*	0.064	0.095*	0.092	0.063	-	
14. Marriage Education	0.055	0.119*	0.171**	0.180**	0.206**	0.044	0.155**	0.079	0.082	0.121*	0.030	0.074	0.050	-
15. WIC	0.006	0.042	0.290**	0.163**	0.098*	0.220**	0.183**	0.151**	0.024	0.064	0.034	0.034	0.241**	0.086

* $p < 0.05$.** $p < 0.01$.

were not significant ($\beta = 0.02$, $p = 0.744$, 95% CI [-0.11, 0.15]) for maltreated cases compared to non-maltreated cases regarding total number of EHS services used since enrollment.

A series of logistic regressions were estimated for each binary service receipt variable, with time enrolled in the program as a covariate. **Table 4** provides estimated regression coefficients, standard errors, odds ratios, and 95% confidence intervals for odds ratios for the variables in the logistic regression. Due to estimation problems as evidenced by a high Standard Error (SE), receipt of Marriage Education is not included in these results. Presence of maltreatment was significantly associated with receipt of ESL ($OR = 0.26$, $p = 0.003$), Child Abuse Prevention Services ($OR = 7.21$, $p < 0.001$), and Domestic Violence Assistance ($OR = 5.88$, $p < 0.001$). Maltreatment was also significantly associated with receipt of Child Support Assistance ($OR = 2.73$, $p = 0.026$), though this was no longer significant after applying the Bonferroni correction. Interpretation of odds ratios indicates that, as compared to families without a maltreatment record, families with a maltreatment record were 74% less likely to receive ESL, 621% more likely to receive Child Abuse Prevention Services, 488% more likely to receive Domestic Violence Assistance, and 173% more

Table 4 Summary of logistic regression analysis for service receipt.

Predictors	β	SE	OR	95% CI
Mental health assessment	0.18	0.32	1.19	0.63, 2.25
Joint home visit	-0.07	0.33	0.94	0.49, 1.80
Emergency crisis assistance	-0.30	0.27	0.74	0.43, 1.27
Housing assistance	0.03	0.30	1.03	0.57, 1.84
Mental health services	0.21	0.29	1.23	0.69, 2.19
English as a second language	-1.35**	0.45	0.26	0.11, 0.63
Adult education	-0.29	0.30	0.75	0.42, 1.34
Employment training	-0.74	0.49	0.48	0.18, 1.25
Substance abuse services	1.09a	0.63	2.97	0.87, 10.17
Child abuse prevention services	1.98**	0.41	7.21	3.21, 16.21
Domestic violence assistance	1.77**	0.43	5.88	2.55, 13.53
Child support assistance	1.00**	0.45	2.73	1.13, 6.61
Parenting education	0.41	0.44	1.51	0.63, 3.60
Women, infants, and children (WIC)	-0.15	0.30	0.86	0.48, 1.55

* $p < 0.05$, ** $p < 0.01$, $ap < .10$, Bold font = significant after Bonferroni correction.

likely to receive Child Support Assistance. Court-substantiated maltreatment was not significantly associated with receipt of the remaining service types.

4. Discussion

The current study sought to identify rates of court-substantiated maltreatment within an EHS home based program and to determine the relationship between a court-substantiated history of maltreatment and receipt and usage of EHS program and community-linked services. Examinations of juvenile court records for enrolled families indicate that 14.9% experienced court-substantiated maltreatment. Occurrence of maltreatment was measured as presence of a maltreatment record for the target child *OR* presence of a maltreatment record for another sibling in the family subsequent to the target child's birth. Inclusion of siblings' maltreatment in analyses reflects the notion that substantiated maltreatment affects all members of the family unit, even if the enrolled child was not explicitly listed in the report. The observed maltreatment rate of 149 per 1,000 children is consistent with the maltreatment rate documented in the only other

longitudinal study using an EHS sample. Green et al. (2014) examined maltreatment rates over a 13-year period and found that, across program options, 15.8% of the sample had experienced child maltreatment (or 158 per 1,000 children), with 5% having experienced maltreatment in the birth through three range.

While maltreatment rates found in this study are consistent with the only other longitudinal study of maltreatment in EHS, they are higher than those found in longitudinal studies conducted across other settings using random sampling. For example, in a 17-year study of residents in upstate New York with children between the ages of 1 and 10 years, Brown, Cohen, Johnson, and Salzinger (1998) found 46 substantiated cases of maltreatment out of 644 participants when asked retrospectively after age 18 – a rate of 71 per 1,000 children. Similarly, Sidebotham, Heron, and the ALSPAC Study Team (2006) conducted a large-scale cohort study in the United Kingdom and found that 2.1% of children (or 21 per 1,000) were involved in maltreatment investigations prior to age six, with only 0.8% of cases resulting in substantiation. These findings provide further evidence that children enrolled in Early Head Start are at higher risk for maltreatment compared to a general population of children, across both the U.S. and the U.K., likely due to their exposure to factors (e.g., poverty, young age) linked to increased risk for maltreatment (IOM & NRC, 2013; U.S. DHHS, 2016).

Of note, use of CPS reports or cases of court-substantiated maltreatment as primary outcome variables tend to underestimate actual incidence of maltreatment, particularly for infants and very young children (Daro & Harding, 1999; Olds, Eckenrode, & Kitzman, 2005). As such, the majority of studies examining maltreatment outcomes use indicators or proxies such as hospitalization for injury or ingestion; few studies use official records of maltreatment or child welfare services (Hahn, Mercy, Bilukha, & Briss, 2005; Reynolds, Mathieson, & Topitzes, 2009).

Although higher rates of maltreatment observed within EHS may reflect increased risk, it is also possible that these findings are a result of other factors, such as surveillance effects. Research on surveillance bias posits that children and families enrolled in interventions may be more likely to be reported for maltreatment because of their increased contact with service providers and systems (Chaffin & Bard, 2006; Widom, Czaja, & DuMont, 2015). This pattern was found in the Green et al. (2014) study, such that children in EHS had more

substantiated reports of neglect than did children in the control group. The authors suggest that this finding was a result of higher surveillance by program staff rather than a true increase in incidence of neglect. Of note, this finding was only observed for neglect and not for other maltreatment types. The authors posit that this may be due to the difficulty detecting neglectful caregiving practices, particularly within early childhood where the majority of these interactions occur within the home. However, recent research argues that large surveillance bias effects do not exist among child welfare involved families, finding instead initial trivial effects that are temporary and diminish over time (Drake, Jonson-Reid, & Kim, 2017).

Results also examined program and service usage for families with court-substantiated maltreatment, who in this study serve as proxies for families experiencing risk associated with maltreatment. As expected, families with a court substantiated instance of maltreatment received, on average, five fewer home visits than families who did not have a maltreatment record. This is the equivalent of over one month, and 7.5 h of targeted, individualized services. Thus, families with a maltreatment record are receiving a lower dosage of intervention services that could potentially ameliorate risk. Maltreatment occurrence was significantly associated with Child Abuse Prevention Services and Domestic Violence Assistance, consistent with expectations and previous research demonstrating increased risk of maltreatment in families with intimate partner violence (e.g., Ahmadabadi et al., 2018). It is also possible that families may have participated in these services pursuant to court involvement following maltreatment. Before accounting for risk of Type I error, maltreatment was also significantly associated with receipt of assistance obtaining Child Support. Of note, the direction of this service receipt is unknown; home visitors may be referring families to appropriate services or families may have been receiving these services prior to experience of court-substantiated maltreatment.

There were no significant results for total number of EHS program services received or the majority of other community-linked services. This may be because a significant component of EHS involves connecting families to community-based services, and most families receive a variety of available services that may be unrelated to maltreatment (e.g., WIC). Notably, previous research has demonstrated significant program effects with regard to increased positive parenting

and reduced likelihood of maltreatment (Casillas, Fauchier, Derkash, & Garrido, 2016), but our results did not identify a significant relationship between maltreatment occurrence and Parenting Education services. It is possible that this finding is due to variation in how home visitors refer families to specific services within this sample, or could reflect a particular barrier for families in accessing this service in particular. This suggests an opportunity for ongoing training and support to ensure that families are connected with the appropriate services and that families can access all relevant programs. Further, a significant body of research has identified specific factors that increase risk for maltreatment (e.g., Belsky, 1993; IOM & NRC, 2013). Research is needed to consider how presence of risk factors may be tied to utilization of specific EHS program and community services, which may direct EHS to better target service referral at specific risk factors.

Interestingly, families without a maltreatment record were more likely to receive Adult ESL services. While findings related to receipt of Child Abuse Prevention and Domestic Violence Assistance Services are consistent with prior research demonstrating the overlap between family violence and child maltreatment (e.g., Hamby, Finkelhor, Turner, & Ormrod, 2010) and are reflective of risk directly associated with maltreatment, findings related to receipt of Adult ESL were unexpected, as we did not hypothesize any significant relationship between maltreatment status and Adult ESL. Caregivers who receive Adult ESL services are non-native English speakers and may be recent immigrants or have lacked access to Adult ESL services prior to participation in EHS. In the current study, 58.2% of the subsample spoke English as a primary language, reflecting the large number of enrolled families potentially seeking Adult ESL. Our observed rate of 41.8% is higher than rates of dual language learners enrolled in Early Head Start nationally, where estimates suggest that 26% of children come from homes in which a language other than English is spoken (U.S. DHHS, 2013). It is possible that these results reflect the notion that the vulnerabilities associated with both eligibility for EHS and risk for maltreatment (e.g., low-income, homeless, receipt of federal assistance) may be qualitatively different in their level of maltreatment risk for non-native English speakers. Perhaps the vulnerability factors that contribute to eligibility for non-English speaking families are more reflective of recent immigration or family culture of origin rather than broader risk for maltreatment. For example,

low-income status may be more strongly associated with recent immigration rather than reflecting systemic family risk. Further, non-native English-speaking families may also present with additional, culturally-relevant protective factors that reduce risk for maltreatment. Research has previously identified social support and family functioning as protective factors for Latino families (Bailey, Brazil, Conrad-Hiebner, & Counts, 2015), and these factors may have a stronger effect in non-native English-speaking families. Future research is needed to continue to understand this pattern. It is important to note that citizenship is not a requirement for EHS eligibility, so enrolled families reflect a variety of immigration statuses. Similarly, EHS home visitors often reflect the diversity of the populations they serve and can provide services in the family's native language, but community-linked resources may not provide linguistically-consistent services. It is unknown the extent to which culture, language, and availability of translation services may contribute to referral to specific services. Future research should further explore issues related to language, culture, immigration, and maltreatment in the context of EHS service utilization.

4.1. Implications

This study highlights the significant rates of maltreatment occurrence among children and families enrolled in EHS, indicating that this home visitation program serves a particularly high-risk population. These results may provide direction for enhanced service delivery within EHS. Specifically, EHS has an opportunity to more intentionally prevent and address maltreatment and associated risk within its population. These findings provide guidance for better designing and targeting program and community based resources and services to meet family needs.

For instance, families with a maltreatment record received fewer home visits than families without a maltreatment record. It is possible that EHS home visitors may experience discomfort in addressing issues of risk for maltreatment (Schreier et al., 2018). Perhaps home visitor reluctance to visit the higher risk families on their caseloads contributes to difficulty engaging these high risk families. This finding may also potentially reflect the difficulty it itself of engaging families at high risk for or who have experienced maltreatment, and could indicate the need to develop or integrate strategies to better engage

these high-risk families. Existing intervention programs that explicitly target maltreatment outcomes have developed strategies through which to provide variable levels of service based on level of need (e.g., Nurse Family Partnership, Health Families America). In fact, these programs have demonstrated stronger effects and reduced costs by providing more targeted services towards higher needs families (e.g., DuMont, Kirkland, Mitchell-Herzfeld, Ehrhard-Dietzel, & Rodriguez, 2010; Olds, Hill, O'Brien, Racine, & Moritz, 2003). These programs have made efforts to differentially target maltreating families by addressing barriers and incorporating engagement strategies or service delivery mechanisms (Holland, Xia, Kitzman, Dozier, & Olds, 2014; Olds, 2002; America, 2001). Specific engagement strategies from other effective programs include flexible service delivery that allows for greater emphasis on engaging higher-risk families (e.g., Nurse Family Partnership; Olds, 2002), or the assess-train-assess model within SafeCare (Guastaferrro, Lutzker, Graham, Shanley, & Whitaker, 2012). These strategies may be modified for use within EHS, in order to more directly address the engagement barriers these families face.

EHS might also consider how it connects families to program and community-linked resources, perhaps increasing the focus on the process of service coordination and the role of home visitors in ameliorating barriers to successful service referral (Goldberg et al., 2018). Engagement has also been shown to increase when goals are aligned between home visitor and caregiver (Burrell et al., 2018), indicating that connection to community-based services should be specifically linked to a caregiver identified goal. Previous research examining engagement in EHS has also suggested that programs should focus on reducing isolation through increasing social support and improving caregiver self-sufficiency (Hubel, Schreier, Wilcox, Flood, & Hansen, 2017). It is possible that increasing social support and caregiver self-sufficiency could have preventive effects related to maltreatment occurrence. EHS programs should continue to develop opportunities for high-risk families to engage in program services and foster resilience (Easterbrooks, Chaudhuri, Bartlett, & Copeman, 2011). This should also include a continual focus on identifying youth and family strengths, and efforts to connect families to program and community services that enhance and support those strengths. Future research should continue to evaluate service provision and maltreatment prevention within EHS.

4.2. Strengths and limitations

Results from this study contribute to the literature by increasing understanding of maltreatment occurrence and service utilization among families enrolled in EHS. To date, there has been a paucity of research exploring maltreatment rates within EHS and this study adds to this body of literature. Further, there is no existing literature to our knowledge examining community-linked service usage among maltreating families within EHS. Nebraska is also unique in that juvenile court records are available to the public. As a result, this study was able to utilize court-substantiated maltreatment as an outcome variable, which is rare among studies examining child abuse and neglect. However, this restricted definition of maltreatment may have also limited identification of families experiencing maltreatment, as it is a conservative estimate of maltreatment and likely does not reflect actual incidence. This suggests the need to incorporate multiple different forms of measurement to supplement existing indicators, including court records, hospital records, self-report, and observational data, in addition to potential administrative data sharing to include unsubstantiated reports from juvenile court.

Further, families may have moved out of the area at some point during the period of time allowed for the maltreatment outcome measurement, so findings may also have been biased by this attrition. This study is also cross-sectional without a comparison group, which precludes the ability to draw causal interpretations and to evaluate change in service use or maltreatment risk over time. It also represents a sample drawn from one EHS grantee agency in Nebraska, which may limit the generalizability of results. We were also unable to include the number of home visits prior to the 2012 program year, and did not measure intensity of engagement in community-linked services; these should be evaluated in future research. Finally, utilization of court-substantiated maltreatment occurring at any point at or subsequent to enrollment as a predictor for service utilization during enrollment is not temporally consistent. Although we conceptualized families experiencing substantiated maltreatment as having risk for maltreatment prior to court substantiation, future research should consider additional ways to measure risk prior to enrollment in the program. This is a particular challenge for the

population served by EHS, as many children are enrolled prior to or at birth, which may preclude the ability to measure pre-intervention maltreatment.

4.3. Conclusion

Overall, this study contributes to the literature on the occurrence of maltreatment within EHS and how families with maltreatment occurrence and risk engage in EHS program services. Children and families served by EHS experience maltreatment at higher rates than the general population. This study increases our understanding of how families who have experienced or are at risk for maltreatment engage in program services. These findings can provide guidance to EHS for how best to connect families to relevant program and community-based resources. Through provision of these comprehensive, wraparound services, EHS and other home visitation programs have a unique opportunity to reduce risk, prevent maltreatment, and increase healthy family functioning.

Competing Interest – The authors declare that there are no conflicts of interest.

Acknowledgments – The project described was supported by the Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services (#90YR0082). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Office of Planning, Research, and Evaluation, the Administration for Children and Families, or the U.S. Department of Health and Human Services.

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