Associations between Early Intervention Home Visits, Family Relationships and Competence for Mothers of Children with Developmental Disabilities

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Abstract

Objectives—To examine the association between intensity of home visits in early intervention (EI), perceived helpfulness of home visits in EI, the family environment, and maternal competence at age 3, controlling for child characteristics, family demographics, and negative life events.

Methods—Data were drawn from the Early Intervention Collaborative Study (EICS), a 24-year longitudinal investigation of approximately 190 families of children with developmental disabilities who participated in EI programs in Massachusetts and New Hampshire. The primary analytic strategy was multivariable regression modeling. Each independent predictor was tested individually and then all together to build the final model. Interactions between independent predictors were also examined.

Results—After controlling for child and family characteristics and negative life events, the intensity of home visits was not significantly associated with maternal competence at age 3. However, the helpfulness of home visits and positive family relationships were associated with higher maternal competence when the child was 3 years old. The hypothesized interaction between positive family relationships and helpfulness of home visits was not significant and thus, not included in the final model.

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Conclusions for Practice—Recommendations for programs and policy include collecting life course data on families, particularly on their family relationships and experiences in EI and home visiting, assessing family relationships at the beginning of EI using a strengths-based perspective, and closely monitoring the quality of services.

Keywords

Part C early intervention; home visits; family relationships; developmental disabilities; mothers; maternal competence

The Individuals with Disabilities Education Act (IDEA) was a milestone in U.S. history protecting the rights of individuals with disabilities, and providing services to promote optimal child development (U.S. Office of Special Education Programs, n.d.). Part C of IDEA mandates early intervention (EI) services are offered to all children with disabilities under the age of three (PL 108-446. Individuals with Disabilities Education Act, Reauthorization, 2004), and currently serves 3% of children in the United States (Early Childhood Technical Assistance Center, 2016a b). Starting in the 1980's with the enactment of P.L. 99-457, efforts were initiated to prioritize children with disabilities and special health care needs, in addition to improving family outcomes and focusing on the family environment. Changes in service provision were motivated by a need, "to enhance the capacity of families to meet the special needs of their infants and toddlers with disabilities" (Department Education, 2004; "PL 108-446. Individuals with Disabilities Education Act, Reauthorization", 2004).

Service provision was therefore challenged to include the family of the target child as often as possible using a family-centered approach to foster a sense of agency, or competence, in both children and families. However, research evaluating which aspects of EI promote maternal competence is lacking, especially given decades of research showing that when parents feel a greater sense of competence in their parenting roles, they are more likely to use parenting practices that promote optimal child development (Conrad et al., 1992; Donovan & Leavitt, 1989; Gondoli & Silverberg, 1997; Sheel & Rieckmann, 1998; Teti & Gelfand, 1991). Data also show that parents are more likely to participate in interventions for their child, attend parent education and conduct additional research when they have strong perceptions of their own competence, consequently leading to better child outcomes and intervention success (Sheel & Rieckmann, 1998; Spoth & Conroy, 1993).

Although service provision for families of children with DD has changed over time, core aspects of EI, in particular home visiting, still remain central and provide one strategy used to facilitate agency and competence. Generally, home visits are thought to offer greater family involvement, more individualized services, and provide opportunities to build rapport and stronger family relationships (Sweet & Appelbaum, 2004). Beyond positive outcomes for children, the broader literature on home visiting suggests positive changes for parents regarding their knowledge, attitudes, and parenting behaviors (Azzi-Lessing, 2011). Unfortunately, data on perceived quality and helpfulness of services from families and providers is lacking, especially regarding associations between home visits within EI and outcomes for parents of children with developmental disabilities (DD). Therefore, the

current study will explore whether EI's efforts, specifically through home visiting, improve maternal competence.

Only a small number of studies have measured associations between aspects of early intervention and outcomes for parents. For example, Warfield et al. (2000) found that the intensity of EI services predicted positive change in the helpfulness of social support from the start of EI to the time of exit, but did not predict change in maternal well-being. There is also evidence that parenting self-efficacy (Dunst et al., 2007) and competence (Washington & Schwartz, 1996) are associated with parent–provider interactions and relationships, such that parents who reported positive relationships with their provider also reported greater parenting competence. Analyses of the National Early Intervention Longitudinal Study (NEILS) found parents were mostly satisfied with early intervention services, and reported feeling competent in their parenting role upon completing the program (Bailey & Powell, 2005). However, more recent empirical research found no association between parent-rated early intervention quality and perceived confidence in the parental role (Bailey, Nelson, Hebbeler, & Spiker, 2007).

In 2007, Turnbull and colleagues provided an extensive look at EI policy gaps in relation to family services and support needs, which addressed many policy and service delivery issues specifically impacting the well-being of parents raising children with disabilities. They highlight research has yet to identify which supports and services are most influential to family well-being (Turnbull et al., 2007). Further research is needed to demonstrate evidence of parental benefit from EI utilizing perceived helpfulness measures.

This study will examine whether critical aspects of EI, including the intensity and perceived helpfulness of home visits, as well as positive family relationships, improve maternal competence. This is particularly important because the family provides a central context for child development, and improved family relationships and enhancing parental capacity are often primary goals of home visits within EI. Findings from this study will be used to make a series of program and policy recommendations.

Objectives

This investigation sought to address gaps in the literature by answering the following research questions: Controlling for child characteristics, family demographics and negative life events,

1. Are greater intensity of home visits in EI associated with lower maternal competence at age 3?

2. Is greater perceived helpfulness of home visits in EI associated with greater maternal competence at age 3?

3. Are positive family relationships associated with greater maternal competence at age 3?

4. Do positive family relationships intensify the relationship between perceived helpfulness of home visits and maternal competence?

Methods

The current study used data from the Early Intervention Collaborative Study (EICS) a 24-year longitudinal investigation of families of children with DD who participated in 29 publicly funded EI programs in Massachusetts and New Hampshire. Approximately 190 families of children with DD were recruited to participate in EICS between 1985–87 when they enrolled in community-based EI programs. The original study gathered data from this sample at the time the child entered EI, one year later, at age 3, and then again at age 5, 10, 15, and 18.

For the present study, the sample was restricted to mothers who completed the sense of competence subscale of the Parenting Stress Index (PSI) (Abidin, 1995) when their child was 3 years old. Mothers were included in the sample if they completed all age 3 measures utilized in the present analyses. The final sample was 118 mothers. Only data from the age 3 time point, which marks the end of eligibility for receiving EI services, was used for these analyses.

Procedure

All procedures performed involving human participants were in accordance with the ethical standards of the institutional research committees and with the 1964 Helsinki declaration and its later amendments. Approval for the study was granted over the years from the institutional review board at Brandeis University. Consent was obtained prior to data collection for all participants. Trained staff, reliable on all data collection procedures and blinded to study hypotheses, conducted home visits with families at each time point. Mothers reported on their child's adaptive behavior and their experiences raising a child with a developmental disability during an in-person interview with one researcher, while another researcher conducted structured assessments with the child. Concurrent to each home visit, mothers independently completed questionnaires and assessments regarding their experience with EI services, the amount and helpfulness of services, and rated their own parenting competence. See Hauser-Cram et al., (2001) for additional details on study procedures and longitudinal data collection.

Measures

All maternal and child variables were measured when the child was three years old.

Maternal competence—Maternal competence, the dependent measure in the present investigation, was assessed using the sense of competence subscale of the Parenting Stress Index (PSI), a 13-item subscale assessing the perceived competence in parenting role management (i.e., managing a child and family, and decision-making skills) (Abidin, 1995). Higher scores on this subscale signify increased stress attributed to perceived parental competence. The scores from this subscale were inverted so that higher values represented greater competence.

Early intervention services—The total number of home visit hours received by each family during the time they were enrolled in EI were recorded and used in this investigation

as a measure of intensity of service receipt. Research coordinators periodically visited individual programs to validate monthly service data for a subsample of participants to ensure data accuracy.

Mothers also rated the helpfulness of each type of EI service they received on a questionnaire developed by EICS. Original variables were recorded on a 5-point likert scale and recoded as a binary variable split at the median. The helpfulness of home visits was the only service rating included in the present investigation.

Family environment—Positive family relationships, a measure of family environment, were assessed using the relationship dimension of the Family Environment Scale (FES) (Moos & Moos, 1981). Mothers independently rated 90 statements about their family as true or mostly true, or mostly false or false. Statements were broken down into 10 subscales. The relationship dimension used in the current analyses was comprised of the cohesion and expressiveness subscale scores.

Family demographics & child disability—Family demographic characteristics, including income, marital status, employment status, and educational attainment were collected through questionnaires filled out by mothers when their child was three. The child's disability was established based on medical records and/or intake information from EI programs and was reconfirmed by study staff when the child was three years old.

Child behavior problems—The Child Behavior Checklist for Ages 2–3 (CBCL/2–3) (Achenbach, 1992) assessed problematic behavior when children were age 3 by having mothers respond to 100 statements about their child's behaviors that were not true, sometimes/somewhat true, or very true/often true. Total scores were used in the current analyses and higher scores indicated more problematic behavior.

Negative life events—Mothers independently completed a subset of the Life Events Scale of the Parenting Stress Index (Abidin, 1995), which included five negative events during the past year: divorce, separation, legal problems, going into debt, and decreased income. The total number of negative life events measured when the child was three years old was used in the current analysis.

Analytic Plan—Sensitivity analyses were conducted and indicated there were similar values among mothers included in the sample from age 3 in comparison to the larger sample. No data were missing from analyses due to inclusion criteria. Descriptive and bivariate analyses were estimated to examine relationships between each independent variable and the outcome, as well as interrelationships between independent predictors. Variables included in the final model were based on relevance and statically significance.

The primary analytic strategy was multivariable regression modeling using STATA SE 13. Based on results of bivariate associations, each independent predictor was tested individually (i.e. included in each model separately) and then all together to build the final model. Interactions between independent predictors were also examined.

Results

Descriptive information on the selected sample when children were age 3 is summarized in Table 1. There were slightly higher percentages of children with motor impairment than those with Down syndrome or developmental delay, somewhat fewer female children in comparison to male children, and 89% of the sample was white. Approximately half of the mothers in the sample were employed, over 80% were married, and they had completed an average of 14 years of education.

The dependent variable, maternal competence, was normally distributed and ranged from 1–31 with a mean of 17.12 (SD = 6.98). There was large variation in the hours of home visits received (mean= 80 home visit hours; SD = 44.28) throughout their entire time in EI. Mothers reported a range of 1.5 to 208 hours of home visits during EI, with the majority falling between 46 and 107 hours (the 25th to 75th percentile). Additionally, 69% of mothers rated their home visits as very helpful and 54% rated their family relationships as positive.

Bivariate analyses showed that there was an association between maternal competence and positive family relationships, such that mothers who had positive family relationships reported greater maternal competence (M = 19.85, SD = 6.18) in comparison to those who had less positive family relationships (M = 13.85, SD = 6.30, t = −5.21, p < .001). There were no other significant associations between maternal competence and independent predictors. There were also no significant associations between any of the independent predictors.

The intensity of home visits received varied by diagnosis, such that families of children with developmental delay received fewer home visits than those with Down syndrome (DS; β = −20.64, S.E. = 10.08, p < .05), but there were no differences between those with a diagnosis of DS and motor impairment. There were also no associations between diagnosis and the helpfulness of home visits or positive family relationships.

Individual regression models testing independent predictors found that *only* positive family relationships significantly predicted maternal competence when entered separately (β = 4.63, S.E. = 1.09, p < .001), after controlling for covariates (See Table 2 for individual regression results and Table 3 for final regression results).

The final regression model revealed that after controlling for child and family characteristics and negative life events, the intensity of home visits was not significantly associated with maternal competence at age 3. However, the helpfulness of home visits (β = 2.94, S.E. = 1.12, p < .01) and positive family relationships (β = 5.11, S.E. = 1.08, p < .001) were associated with higher maternal competence when the child was 3 years old. In addition, more educated mothers (β = 3.35, S.E. = 1.11, p < .01) were more competent at age 3, while mothers of children with greater behavior problems (β = −2.69, S.E. = 1.08, p < .05), and who experienced a greater number of negative life events (β = −.66, S.E. = .20, p < .001) reported lower competence at age 3. Finally, the hypothesized interaction between positive family relationships and helpfulness of home visits was not significant and thus, not included in the final model.

Discussion

The current investigation identified associations between EI home visits, positive family relationships and the maternal competence when the child was 3 years old. The first two research questions addressed relationships between home visiting in EI and competence. The number of hours of home visits received was not associated with competence, but perceived helpfulness of home visits was related to maternal competence when the child was 3 years old. Consistent with current research, it is possible that the quality of interactions during home visits may have been driving the association, in contrast to the amount of services received (Dunst, Hamby, & Brookfield 2007). From a practice perspective, there is a tendency to equate a greater number of visits or services with better outcomes, but it is also possible that more visits are associated with greater challenges, resulting in lower competence due to the added stress of coordinating more service hours. It is also likely that the amount of home visit hours families need varies, which may be related to their perception of home visit helpfulness.

The third research question tested associations between positive family relationships and maternal competence at age 3. Consistent with theories of stress (Perry, 2004), positive family relationships served as a protective factor for mothers. This finding is consistent with previous research reporting associations between family cohesion and maternal well-being using measures of family satisfaction (Lightsey & Sweeney, 2008) and stress (Warfield et al., 1999) during early childhood.

Implications for Service Provision, Data Collection & Future Research

Although perceived helpfulness of home visits in EI was associated with maternal competence, typical state-level service measurement does not include parent-reported ratings of individual services. Instead, measurements typically include the type and amount of service hours per week and month. In alignment with the Patient Centered Outcomes Research Institute's (PCORI) efforts to support effective service provision for children and families, data must be collected on families' experiences in EI and the strategies used to help enhance parental capacity by providers throughout service provision. Data on service provision quality is also lacking; rating aspects of service provision do not explain the mechanisms by which the home visits influenced maternal competence. Data collection on specific strategies used in service provision is necessary. Stronger methods for monitoring data collection and service provision at the local and state levels must be developed. Smaller and more targeted studies can provide insight on measuring families' experiences and quality; however, the remaining issue is how to develop and test measures of family experience and quality and scale them up to investigate these issues in different EI contexts and states.

This study also confirms existing research about the importance of forming strong, positive family relationships during the first few years of life. It is important to note that the impact of positive family relationships were independent of other EI predictors. Having both helpful home visits and positive family relationships did not enhance the relationship with maternal competence. One would postulate that home visits would also address the broader set of social issues families face, such as recognizing additional challenges when working with

families of children with DD. Yet, documentation of families' experiences and relationships are not required in state-level data collection, which is a detriment to families who may not recognize the importance of evaluating their own strengths and needs. By collecting such data, EI would be able to identify mothers who perceive challenges in their family's functioning. In turn, providers would be better equipped to develop appropriate goals and services for the Individualized Family Service Plans focusing on the entire family using a strengths-based partnership approach to providing care focused on fostering resilience and competence.

Future research needs to focus on such relationships and include the voices of families to maximize EI's impact. Researchers and providers may be able to draw from existing models of evidence-based home visiting. For example, the Supporting Evidence-Based Home Visiting to Prevent Child Maltreatment initiative (Boller et al. 2010) presents a set of indicators that may be used by states to monitor their home visiting models and strategies, such as program-level characteristics (e.g., the number of families referred to and enrolled in the program), direct service staff-level characteristics (e.g., employment experience and caseload size), participant-level information (e.g., referral information), and participant program experiences (e.g., the quality of relationships between home visiting staff and participants). Developing a similar set of indicators specifically for EI home visiting appears warranted by the present study, and will help determine program quality and effectiveness for children and parents.

Limitations

All families in the study received EI services, limiting the availability of a comparison group, as it would be unethical to deny services to families eligible for EI. This study was also unable to address variation between EI programs due to the relatively small number of children per program (Hauser-Cram et al., 2001). The generalizability of results is limited due to the geographic region of data collection, family income and education, the sample's ethnic and racial homogeneity, and self-selection bias. Further, the predictor variables represent only a modest portion of the complexity involved in studying human development; There are likely several unexamined factors that contributed to maternal competence. Further, the current study focused on home visits within EI as they are a central component of service provision and offer a family-centered approach, but other components may also contribute to maternal competence.

In addition, results are correlational in nature and do not indicate a causal relationship between variables or their direction. Maternal competence may have influenced how mothers experienced EI services and their levels of participation, consistent with past research findings (Scheel & Rieckmann, 1998). For example, more competence mothers may have been more likely to be more engaged in discussions about service provision and be more involved in home visits than those who felt less competent in their parenting abilities. Finally, the provision of EI services has evolved since the data on families' experiences was collected.

Despite these limitations, this study provided insight into associations between perceived helpfulness of EI home visits, the family environment and mothers' capacity to manage

challenges associated with caring for a child with DD. Findings reinforce the need to focus on factors that influence maternal competence within EI and for families of children with DD.

Conclusion

This study extended research on the importance of home visiting in EI and positive family relationships for parenting a child with a developmental disability. After controlling for child and family characteristics, variance in competence when their child was aging out of EI services was partially explained by mothers' perceived helpfulness of home visits and positive family relationships. Recommendations for programs and policy include collecting additional data on families' experiences in EI, particularly on their family relationships and experiences in EI home visiting, assessing family relationships at the beginning of EI using a strengths-based perspective, and closely monitoring the quality of services. This research is part of a broader movement towards focusing on families and parental competence as central goals of EI that will ultimately enhance child development.

Acknowledgments

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Significance

This provides additional evidence of the importance of EI and positive family relationships during early childhood for families of children with developmental disabilities. Specifically, when home visits were perceived as helpful and mothers reported positive family relationship, they experienced greater maternal competence during early childhood. Findings reinforce the need to focus on family relationships and factors that influence maternal competence as central goals of EI that will ultimately enhance child development. These findings also suggest a need for better data collection on service provision and families' experience in EI, specifically around family relationships and strategies used to enhance parental agency.

Table 1

Description of family characteristics, child characteristics, the outcome variable, and predictor variables (N=118)

Family Characteristics	%	M	SD
Family income			
Less than 10K	11%		
Between 10K and 20K	9%		
Between 20K and 30K	23%		
More than 30K	57%		
Marital status (married)	85%		
Years of education completed		14.12	2.34
Maternal age		31.72	4.77
Older sibling in family	57%		
Negative life events		2.54	2.18
Child Characteristics	%	M	SD
Child's type of disability			
Down syndrome	33%		
Motor impairment	36%		
Developmental delay	31%		
Child's gender (male)	58%		
Child's race			
White	89%		
Black	2%		
Hispanic	4%		
Mixed race/other	5%		
Total child behavior problems		39.50	17.88
Outcome Variable	%	M	SD
Mother competence (Age 3)		17.12	6.89
Predictor Variables	%	M	SD

Family Characteristics	%	M	SD
Positive family relationships (cohesion & expressiveness)			
Less positive family relationships	46%		
Positive family relationships	54%		
Total number of hours home visits over full time in early intervention		79.76	44.27
Mothers' rating of home visits			
Not helpful (Collapsed: not helpful, less helpful, somewhat helpful, helpful)	31%		
Very helpful (Collapsed very helpful)	69%		

Table 2

Summary of separate regression analyses for independent variables predicting maternal competence at age 3 (N=118)

Model 1: Independent Predictor - High Home Visit Intensity		
Variables	**Coefficient**	**S.E.**
Mother education	3.45	1.21 **
Total child behavior problems	−4.28	1.13 ***
High family income	.63	1.41
Negative life events experienced (age 3)	−.68	.26 *
High home visit intensity	−.52	1.13
Intercept	18.83	1.83 ***
R2	.27	

Model 2: Independent Predictor – High Perceptions of Home Visits		
Variables	Coefficient	S.E.
Mother education	3.70	1.20 **
Total child behavior problems	−4.05	1.12 ***
High family income	.78	1.49
Negative life events experienced (age 3)	−.66	.26 *
High perceptions of home visits	1.94	1.20 †
Intercept	16.83	1.91 ***
R2	.28	

Model 3: Independent Predictor – Positive Family Relationships		
Variables	Coefficient	S.E.
Mother education	3.16	1.12 **
Total child behavior problems	−3.06	1.08 **
High family income	1.37	1.40
Negative life events experienced (age 3)	−.52	.25 *
Positive family relationships	4.63	1.09 ***
Intercept	14.65	1.77 ***
R2	.37	

† $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$

Table 3

Final model of multivariable regression analyses for variables predicting maternal competence at age 3 (N=118)

Variables	Coefficient	S.E.
Mother education	3.35	1.11 **
Total child behavior problems	−2.69	1.08 *
High family income	1.57	1.38
Negative life events experienced (age 3)	−.66	.20 ***
High home visit intensity	−.49	1.03
High mothers' rating of home visits	2.94	1.12 **
Positive family relationships	5.11	1.08 ***
Intercept	12.15	2.17 ***
R2	.41	

†
p < .10,

*
p < .05,

**
p < .01,

***
p < .001