A Study of an Online Tool to Support Evidence-Based Practices with Infants and Toddlers

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We investigated Early Head Start home visitors’ use of evidence-based practices and the effectiveness of a web-based system to support these practices. Home visitors learned to use 3 evidence-based practices: (a) frequent assessment of children’s early communication for screening and progress monitoring, (b) 2 home-based language promoting interventions, and (c) data-based decision making in the use of the language promoting intervention strategies. We randomly assigned 1 group of home visitors to use an online data collection system and receive training in data-based intervention decision making and in the evidence-based language interventions. The other home visitors had access to these tools and trainings, but in addition, they had web-based support (Making Online Decisions; MOD) linked to the children’s expressive communication data. We found that the expressive communication of children served by home visitors who used the MOD grew significantly more than children whose home visitors did not have MOD support. Home visitors who used the MOD reported high satisfaction with its use. Future research and implications for early intervention and home visiting practices are discussed.

Keywords: home environment, language/speech, childcare/daycare, family support, systems integration

SUMMARY OF NEED

The goals of most early childhood programs, including Head Start and Early Head Start, are to enhance children’s social and intellectual development and provide opportunities for children to develop the skills they will need to enter school ready to learn. Because children spend the majority of their time with their primary caregivers (e.g., parents or grandparents) during their first few years of life, primary caregivers are key to this preparation. Home visiting is one way in which early intervention providers can build the capacity of parents to support the development of their child.

Similar to K–12 educators, early childhood educators recognize the need for using intervention practices that are informed by research and have demonstrated success in community-based programs. A crucial part of evidence-based practice is the use of data collected about children’s

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performance to document a child’s response to intervention and to identify which children need additional intervention. Using data to inform intervention and decide what to do when a child does not respond to an intervention as expected is an important component of evidence-based practice. Although there is general agreement that data should inform intervention, early childhood educators have reported limited expertise with the use or interpretation of data to inform practice (Hoijnoski, Caskie, Gischlar, Key, & Barry, 2009; Sandall, Schwartz, & LaCroix, 2004). Unfortunately, there are few tools or resources available to support data-based decision making, particularly for intervention services provided to children in homes.

In this article, we describe a system designed to support data-based intervention decision making for infants and toddlers who may be at risk for language delay. We also report the results of a randomized control trial to test the effectiveness of this system for improving communication outcomes of children receiving Early Head Start home visiting services.

**SYSTEM TO SUPPORT DATA-BASED INTERVENTION DECISION MAKING**

Data-based intervention decision making requires (a) frequent and accurate measurement of the outcome of interest (e.g., language, motor development, social-emotional outcomes, etc.); (b) ways to identify children in need of intervention, or interventions that are not having the desired impact; and (c) an evidence-based intervention that targets the outcome and can be individualized to meet children’s specific needs (Barnett, VanDerHeyden, & Witt, 2007; Walker, Carta, Greenwood, & Buzhardt, 2008). The Making Online Decisions (MOD) system described in this article was designed to support early childhood service providers’ data-based decision making. The MOD system is informed by progress-monitoring data collected using the Individual Growth and Development Indicators (IGDIs; Carta, Greenwood, Walker, & Buzhardt, 2010). IGDIs are brief, easily repeatable, and technically sound measurements of child skills that provide a picture of child growth toward an outcome over time (Carta et al., 2010). Although IGDIs that measure children’s skills across developmental areas are available, for the purposes of this article, we describe the Early Communication Indicator (ECI) for infants and toddlers and the associated MOD system for communication intervention decision making.

**The Early Communication Indicator (ECI)**

The ECI is a 6-min, play-based observational assessment of infants’ and toddlers’ expressive communication. The ECI is designed to be administered quarterly for screening and more frequently to monitor a child’s response to intervention. During the assessment, a certified coder codes four key skills: Gestures, Vocalizations, and Single and Multiple Word Utterances (Greenwood, Carta, Walker, Hughes, & Weathers, 2006; Walker & Carta, 2010). The coder tallies the occurrence of these skills on a data sheet and enters them into an online data system, which automatically calculates scores and updates the child’s progress charts (Figure 1). The scores are the rate per minute for each key skill during the 6-min assessment.

**Caregiver-Delivered Evidence-Based Language Intervention Strategies**

The language intervention strategies used in the MOD come from two different manuals: *Strategies for Promoting Communication and Language of Infants and Toddlers* (Walker, Small,
Bigelow, Kirk, & Harjusola-Webb, 2004) and The Language Intervention Toolkit (Crowe, 2002). These strategies are based on the language intervention literature and include milieu teaching (e.g., Hart & Rogers-Warren, 1978; Peterson, Carta, & Greenwood, 2005; Warren & Walker, 2005), prelinguistic milieu teaching (e.g., Warren et al., 2008; Warren, Yoder, Gazdag, Kim, & Jones, 1993), and responsive interaction (e.g., Tannock & Girolametto, 1992; Trent-Stainbrook, Kaiser, & Frey, 2007). The manuals encourage early educators and parents to use the intervention strategies across daily routines (e.g., meals, play, book reading) and to use the examples provided in the manual as suggestions for promoting infant and toddler communication.

Web-Based Tools to Support Data-Based Intervention Decision Making

Early Head Start programs involved in this study were provided password-protected accounts within the online data system where local staff entered their ECI data, generated progress-monitoring graphs for individual children and program-wide reports, and managed home visitors’ user accounts and certification status. Figure 1 shows an example of one type of progress-monitoring graph that can be generated from this online data system.

The MOD system provided home visitors with a structured, individualized approach for evidence-based decision making. MOD-supported decision making began for a child as soon as he or she had an ECI assessment that fell below 1 standard deviation below their age-based benchmark as indicated by the gray area in Figure 1. Through a series of MOD-generated questions within the online data system and responses by the home visitor, details of the five steps were navigated and decisions made to inform subsequent steps (e.g., ECRI-MGD, 1998; Tilly, 2008). These steps were (a) Is there a problem? (b) What is causing the problem? (c) What intervention should be used? (d) Is the intervention being done? and (e) Is the intervention working? After
three ECIs were administered following the start of an intervention, the MOD recommended next steps informed by the child’s progress (Buzhardt et al., 2010).

METHODS TO TEST THE MOD’S EFFECTIVENESS

Within five Early Head Start programs, 48 home visitors were randomly assigned to either use the MOD (MOD group) or not (NonMOD group). There were 26 home visitors and 63 children in the MOD group and 22 home visitors and 61 children in the NonMOD group. The NonMOD home visitors administered, scored, and entered ECI assessments into the online data system as usual. The NonMOD group could review children’s progress charts (Figure 1 and graphs of individual key skill elements), make decisions regarding interventions, and access the language intervention manuals described earlier. In addition to the tools and procedures available to the NonMOD group, MOD home visitors had access to the MOD resources to support their data-based intervention decision making. MOD home visitors attended a workshop conducted by the researchers in which the purpose of the MOD was described, there was a demonstration of its use, and case examples of MOD activities were reviewed. At the conclusion of the study, the MOD group also completed a survey of their satisfaction with the MOD.

RESULTS

In this study, we documented that home visitors in both the MOD and NonMOD groups increased their frequency of ECI assessments and also increased the number of interventions they reported using for children who fell below benchmark on the ECI. To determine if there were differences between the groups in terms of child communication outcomes, we compared the ECI performance of children served by NonMOD home visitors with those served by MOD home visitors. Results showed that children with MOD home visitors had greater communication growth as measured by the ECI than children with NonMOD home visitors. Figure 2 shows that children in both groups had comparable communication skills at the start of the study. However, when children fell below benchmark for their age on the ECI, the average monthly increase in communication of the children in the MOD group was 1.72 per minute compared with 1.05 per minute for the children in the NonMOD group. Children with MOD home visitors made greater gains on the ECI even after accounting for age at eligibility or Individualized Family Service Plan status. These differences were statistically significant. Survey ratings reflected that the Early Head Start home visitors were highly satisfied with the MOD both in terms of usability and usefulness.

THE IMPORTANCE FOR DATA-BASED DECISION MAKING FOR EARLY CHILDHOOD SERVICES

Implementing evidence-based practice that includes monitoring the progress of infants and toddlers and using data to inform intervention decision making requires sufficient resources and administrative support. Early childhood interventionists, especially those who deliver home-based services, have struggled to fully integrate data-based decision-making practices into their
work with young children (Hojnoski et al., 2009; Roehrig, Dugger, Moats, Glover, & Mincey, 2008; Sandall et al., 2004). The MOD is a system for home visitors and other interventionists that facilitates the use of evidence-based practice and data-based decision making. The evidence-based practices supported by the MOD include universal screening, progress monitoring, and the inclusion of language-promoting interventions, all of which are linked to the online IGDI website (www.igdi.ku.edu).

The MOD overcomes a number of the barriers to implementing data-based decision making in early childhood practice, such as managing and interpreting data, translating data findings into intervention recommendations, and individualizing and using evidence-based interventions. It represents an alternative to simply providing professional development on how to use these practices by providing structure and support for conducting evidence-based intervention decision making. We believe the MOD represents a major step forward in providing home visitors and other early interventionists with access to tools that support evidence-based intervention decision making for infants and toddlers.

REFERENCES


FIGURE 2  ECI total communication growth for children served by MOD home visitors compared with those served by NonMOD home visitors.


