Evidence for the Effectiveness of Different Service Delivery Models in Early Intervention Services

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Consideration of the evidence for all aspects of service delivery is a growing relevant concern of occupational therapists, including those providing early intervention to children and families. We conducted a review of the literature to uncover what evidence existed for determining the effectiveness of different service delivery models and methods used to improve occupational performance for children and families who receive early intervention services. Through a comprehensive search, we reviewed and synthesized studies, finding common themes of family-centered and routine-based approaches, service setting, and the inclusion of parent participation and training. Families consistently reported positive perceptions of family-centered and routine-based approaches. Parent participation and training resulted in positive outcomes. No specific setting or method of service delivery was identified as clearly most effective, with most studies reporting combined approaches and environments for interventions.

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Trends in health care, and in occupational therapy specifically, include the need to examine all aspects of evidence-based practice (Arbesman & Lieberman, 2011). Efforts to establish pathways or guidelines for clinical practice include examining not only intervention effectiveness but also factors such as safety, feasibility, cost-effectiveness, and patient satisfaction. One of the components of the provision of intervention that can be considered in reviewing the evidence is the way in which services are offered. Examination and comparison of service delivery can consider elements such as setting, provider, format, dosage, and so forth. In early intervention, as in all aspects of practice, these types of service delivery methods and options are an important concern in evaluating the available evidence to guide practice.

Background

In 1986, the Education for All Handicapped Children Amendments (Pub. L. 99–457) expanded programs for children from birth to age 5 who needed special services and education. Before this time, both public and private agencies provided a variety of services for young children, with laws and service provision varying a great deal from state to state (Gallagher, Harbin, Eckland, & Clifford, 1994). This law was later titled Part C of the Individuals With Disabilities Education Act of 1990 [IDEA]; Pub. L. 101–476]). By 2009, 348,604 children in the United States had received or were currently receiving early intervention services under Part C of IDEA (Early Childhood Technical Assistance Center, 2011).

The Individuals With Disabilities Education Improvement Act of 2004 (Pub L. 108–446) mandates that Part C services involve caregivers and other service providers in natural settings to the greatest extent possible. The term *natural environment* began to appear in the literature in 1989 with the first

IDEA regulations and became more commonly used with the Part C amendments in 1991 (Individuals With Disabilities Education Act Amendments of 1991; Pub. L. 102–119). Many authors have further examined the key ingredients and intent of the term *natural environment* and have identified lack of clarity and uniformity in the application of this concept. Dunst, Trivette, Humphries, Raab, and Roper (2001) emphasized the importance of "natural learning opportunities" and proposed that the setting, type of activity, and practitioners involved all contribute to the spirit of the natural environment intentions. They stated that "learning opportunities provided in everyday settings are natural learning environments when the learning itself is contextualized, functional and socially adaptive" (p. 52). They further stated that defining a natural environment by a setting or provider alone is limiting. Jung (2003) further warned of the limitations of defining a natural environment by setting alone and stated that "services that are provided in a natural setting can still be delivered in an unnatural manner" (p. 22).

The 2004 reauthorization of IDEA shifted the focus from compliance with policies and procedures to a greater emphasis on performance and outcomes of programs (Bradley et al., 2011). The movement toward increased accountability requires evidence to support decisions regarding interventions, including service delivery factors. Acknowledging the multiple aspects of early intervention services to consider when defining natural environments and best practices, we examined the research evidence supporting specific models of service delivery in early intervention (e.g., location or setting, type of activity, provider, or method such as coaching or consultation).

Purpose

When recommending services, not only do occupational therapists recommend frequency and duration, but they may also be called on to recommend the environment in which those services will take place. As primary service providers in the early intervention system, occupational therapists provide direct services to infants and young children as well as training and education to caregivers and other service providers. Although many options for the delivery of service are available, the question of best practice in service delivery models has not been fully addressed. Therefore, the following question guided our review of the early intervention research literature: What is the evidence for the effectiveness of different service delivery models and methods used in occupational therapy services for young children and their families?

Method

The articles included in this review were the result of database searches on articles published from 1995 through December 2010. In addition, we reviewed bibliographies of selected articles for potentially relevant articles. As noted in Arbesman, Lieberman, and Berlanstein (2013), selected articles were recommended by experts in the field. Search terms for the review were *activities-based; child development; coaching; consultation; deficit model; developmentally appropriate practices; direct service; distributed learning; early childhood; early childhood education; early intervention; family-centered; home visiting; home visits; inclusion; infant, newborn; infant, premature; infants; interdisciplinary; monitoring; natural environments; natural learning environment; parent-centered; parent family adaptation; preschool children; routines based; service coordination; service delivery; toddlers; transdisciplinary; transdisciplinary teaming;* and *young children.*

Articles selected for review included studies in which the focus was on infants and young children from birth to age 5. In addition, the interventions studied were within the scope of practice of occupational therapy. Detailed information about the methodology and a complete list of search terms for the entire project dedicated to early intervention and early childhood services can be found in the article "Method for the Systematic Reviews on Occupational Therapy and Early Intervention and Early Childhood Services" in this issue (Arbesman et al., 2013).

Summary of Key Findings

In this review, 42 research articles were identified and considered, with 18 studies selected for inclusion. Of the 18 articles selected, 8 were Level I, 4 were Level II, 3 were Level III, and 3 were Level IV studies. In addition, an attempt was made to develop a typology for themes or types of service delivery. The reviewers considered the exclusion and inclusion criteria and also identified key elements of the article for the evidence table. In the end, the following three main themes, and associated subthemes, were chosen to help classify the aspects of service delivery considered in the selected article: (1) family centeredness, including family-centered practice and routine-based interventions; (2) service setting, including community, natural environments, and home-based interventions; and (3) type of parent participation, including parent training and parent–child relationship interventions (see Supplemental Table 1, available online at http://ajot.aotapress.net; navigate to this article, and click on "Supplemental Materials").

Family-Centered and Routine-Based Interventions

Given the emphasis on family-centered care in early intervention in the practice literature (Shelton, Jepson, & Johnson, 1987), relatively few studies were found for this theme. Five articles relating to family-centered or routine-based intervention were identified (1 Level I, 1 Level II, and 3 Level III). Types of studies reviewed included meta-analysis, nonrandomized controlled trial, and multiple-baseline design.

These studies found that parents' perceptions of efficacy and satisfaction increased when interventions are embedded in family routines and settings. For example, Bruder (2003) conducted a series of case studies and small-sample controlled group interventions and reported a number of areas in which parents reported positive effects from having early intervention activities embedded in family routines and from parent participation in intervention activities. McCart, Wolf, Sweeney, and Chai (2009) and Romer and Umbreit (1998) also reported high levels of parent satisfaction when families participated in programs that used family-centered or routine-based interventions. Although Bruder reported that parents were more satisfied when intervention activities were embedded in routines, infants' developmental gains were higher in the control group (a traditional early intervention program without the increased emphasis on parent training). Therefore, the effect of parent training in contrast to therapist-directed intervention on child and parent outcomes needs further study. Moes and Frea (2002), however, reported that family involvement did not jeopardize behavioral intervention attempts at reducing challenging behaviors for young children with autism. Studies by Dunst, Trivette, and Hamby (2007) and McCart et al. (2009) revealed moderate evidence that use of a family-centered approach leads to a higher sense of parental efficacy.

Community, Natural Setting, and Home-Based Interventions

For the theme of community, natural setting, and home-based interventions, 6 articles (3 Level I articles and 3 Level II articles) presented discussion or examination of the setting in which intervention is delivered. Types of studies included randomized controlled trials; cross-sectional descriptive, retrospective analysis; and a nonrandomized cohort study. Among these studies, several provided evidence that combined approaches across environments (i.e., home and center based) were effective. These studies did not specifically compare differences in outcomes in varying environments (Bruder, 1997; Chazan-Cohen et al., 2007; Love et al., 2005).

For example, although Bruder (1997) presented a large body of evidence to show that the majority of early intervention programs surveyed provided services in both home- and community-based settings, she did not examine variation in outcomes between settings. In contrast, Love et al. (2005) compared outcomes in mixed home- and center-based programs and found that children had better gains in the combined programs than in those that included only one or the other setting. Bierman, Nix, Greenberg, Blair, and Domitrovich (2008) examined early intervention services using a combined home- and center-based approach and demonstrated positive outcomes for executive functions in young children when socioeconomic factors were controlled.

Chazan-Cohen et al. (2007) focused on the timing of intervention, demonstrating that a combined home- and center-based approach was more effective in producing the intended outcomes (decreased maternal depression) for children who had services initiated at age 2 than for those who had services initiated at age 3. However, in another study by Luiselli, O'Malley-Cannon, Ellis, and Sisson (2000), the age at which intervention services began did not affect outcomes, but in that case duration of home-based treatment predicted the participants' developmental outcomes. These studies suggest that more research is needed that is focused specifically on dosage, timing, and duration of interventions so that evidence-based decisions can be made regarding these questions.

Parent Training and Parent–Child Relationship Interventions

Seven articles examined parent training or parent–child relationship interventions (4 at Level I, 1 at Level II, and 2 at Level IV), including randomized controlled trials, systematic reviews, and descriptive studies with analysis of results. The Level I and Level III articles within this theme suggested that parenting programs can promote both child outcomes and family relationships (Barlow, Coren, & Stewart-Brown, 2003; Chang, Park, & Kim, 2009). The addition of parenting classes to early intervention services resulted in decreased stress and improved relationships for parents (Barlow et al., 2003) and improved cognitive scores in children (Chang et al., 2009).

Two Level IV descriptive studies, with analysis of outcomes, reported further evidence to support the impact of parenting programs on a variety of outcomes for both children and family relationships (Hume, Bellini, & Pratt, 2005; Whitaker, 2002). For example, Hume et al. (2005) reported that parent training was important in the parents' perception of their children's gains; the parents highly valued training that facilitated their skills in

improving communication, play, and behavior outcomes. In this study, parents also reported improved quality of life in relation to receiving regular progress reports from the therapeutic intervention programs. In another study, increased group outcomes were shown in parent training programs facilitated by a therapist versus those without the active attendance of a trained therapist (Barlow et al., 2003; Montgomery, Bjornstad, & Dennis, 2006). In addition, Lakes et al. (2009) presented evidence suggesting that offering child care, flexible scheduling, community locations, and meals improves family attendance at trainings when this aspect of early intervention is provided.

Discussion

Few research studies have specifically addressed service delivery in early intervention systems. Because of the relatively few studies available, we considered studies that described the service delivery component in detail, including where and how the service delivery took place. Early childhood intervention can be provided by a variety of skilled professionals, including occupational therapists and trained caregivers. Family-centered and routine-based intervention was a central theme for many of the studies, and the evidence suggests that embedding intervention within a family's natural routines can lead to positive outcomes, specifically positive parent reports of satisfaction and efficacy.

Given occupational therapists' commitment to individualized, family-centered care and focus on occupation-based interventions, these findings resonate with the core tenets of the *Occupational Therapy Practice Framework: Domain and Process* (2nd ed.; American Occupational Therapy Association, 2008). Most occupational therapists naturally provide training to parents and caregivers, especially for young children in early intervention. The studies demonstrated that parenting programs can have a positive impact on a variety of outcomes for the family, the child, and familial relationships (Barlow et al., 2003; Hume et al., 2005; Whitaker, 2002). For example, when parents attended a parenting group, their children improved on cognitive test scores, and the parents reported lower levels of stress. Parent training programs with a therapist who facilitated and provided feedback have been shown to increase positive outcomes in children's behavior, in comparison with group training without the active attendance of a trained therapist (Barlow et al., 2003; Montgomery et al., 2006). Parents highly value training that facilitates their skills for improving their child's communication, play, and behavior (Hume et al., 2005). However, the vital inclusion of parents and family members in intervention does not diminish the important role of a skilled expert in planning and implementing intervention and may require reframing and review of the optimal ways in which programs are provided (Jung, 2003). Clearly, more work is needed to better understand the most effective ways to blend the provision of specialized therapeutic techniques within family-centered and routine-based settings (Dunst et al., 2001).

When focusing on the environmental context of intervention, an important theme surrounding community-based, home-based, and natural setting interventions emerged. The literature suggests that a combination of treatment approaches across multiple environments is most effective (Bruder, 1997; Chazan-Cohen et al., 2007; Love et al., 2005). In one instance, the duration of home-based intervention was shown to be a predictor of child improvement (Luiselli et al., 2000). Currently, the evidence to support the provision of service in one environment over another is insufficient, and most studies included interventions across more than one environment. Further research regarding the environments in which intervention takes place is needed. Finally, the gaps in the current literature reveal that more work is needed to better understand the effect of dosage, timing, and duration of early intervention services.

Limitations

The small number of studies at Levels I and II, small sample sizes, and reliance on self-reports are among the most significant limitations of the studies in this systematic review. Most of the research lacked standardized and established measures with strong reliability and validity. Many studies did not include randomization or relied on self-selection of participants. Finally, a significant limitation was the limited number of research studies that have examined service delivery as an independent variable.

Implications for Occupational Therapy Practice

Although the number of studies specifically aimed at service delivery methods in early intervention is small, findings that serve to guide occupational therapy practice emerged. The studies suggest the following considerations for practice:

- Because a family-centered approach was generally well received and resulted in favorable outcomes, the continued use of this approach in occupational therapy interventions is supported.

- Because no clear results demonstrated better outcomes in specific settings (e.g., home vs. clinic vs. community), occupational therapists will best serve their young patients and families by offering individually tailored interventions that provide the optimal combination for each situation, rather than a subscribed plan.
- Because positive outcomes varied widely across service delivery methods (e.g., decreased maternal depression, enhanced developmental levels, future academic performance), occupational therapists will want to consider a range of postintervention assessments to determine the effectiveness of their programs.
- Therapist feedback was shown to increase outcomes of groups; thus, occupational therapists may wish to review and increase their efforts to provide feedback to participants.
- The fact that parents were shown to highly value training that facilitates their skills in improving communication, play, and behavior outcomes reveals a natural fit for occupational therapy intervention and may assist in guiding therapists to frame components of their programs around these important considerations.

Conclusion

With scant published research on service delivery models, more studies are needed to determine the key ingredients of family-centered and routine-based intervention, settings for programs, and the role of parent participation and relationship-based approaches. In addition to guiding practice, further clarification of these questions will help to guide advocacy efforts for funding and legislation that will be in the best interest of all children and families who need and benefit from all aspects of early intervention, including occupational therapy. ▲

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