Module 5 paper

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**Recommendations for early intervention physical therapy: a review of literature to determine if family-centered natural environment therapy is more effective than traditional clinic based therapy to help a child in the early intervention program (ages 0-3) reach their motor development milestones.**

**Introduction**

The Infants and Toddlers with Disabilities Program (Part C) of the Individuals with Disabilities Education Act was created in 1986 to enhance the development of children with disabilities, minimize potential developmental delay, and reduce educational costs by decreasing the need for special education services as children with disabilities reach school age.1 These types of early intervention programs provide a range of educational and therapeutic services to families and their children with developmental delays.2 Early intervention programs target infants and toddlers from birth to three years of age and include services such as physical therapy, speech therapy, occupational therapy, assistive technology, and service coordination.1,2 The age of onset for intervention services is dependent on the type of disability, but generally begins as soon as the developmental delay or risk for delay is recognized.2

Research has shown that children’s earliest experiences play a key role in brain development, and that neural circuits are most flexible during the first three years of life.1 Persistent stressors such as poverty, abuse, neglect, and maternal depression can damage the child’s developing brain leading to lifelong problems with mental and physical health.1 It has been stated that the brain is strengthened by positive early experiences, safe/supportive environments, and appropriate nutrition.1 Early intervention services have the ability to change a child’s developmental trajectory, and improve the lives of the child, their family, and their community.1 Research has found that early intervention services have a positive impact on several developmental aspects, including health, language, communication, cognitive development, social/emotional development, and motor development.1 These programs also benefit the community as a whole by reducing the economic burden through a decreased need for special education as the child ages.1 Overall, early intervention has been shown to improve scores on developmental outcome measures, strengthen parent-child interactions, and provide a supportive environment for the family.2 Long-term follow up studies have also shown enhanced school achievement, better parenting skills, greater independence, lower criminal activity, and higher earnings in individuals who received early intervention services.2

Currently federal law under the Individuals with Disabilities Education Act Part C mandates that family-centered care be the service delivery model used in early intervention programs.3 Family-centered care has been defined as a philosophy of care in which the pivotal role of the family is recognized and respected in the lives of children with special needs, and in which parents and professionals are seen as equals in a partnership committed to the optimal development of the child.3 More recently it has been suggested that providing therapy within natural environments reinforces family-centered care.4 Natural environments are defined as environments that are encountered within the child’s everyday life, and settings that are normal for the child’s age peers who have no disabilities.4 More importantly recent studies have pointed out that natural environments not only define where early intervention takes place, but also influences the interactions that take place between the healthcare provider and primary caregiver.4 Although family-centered therapy within the natural environment is the current standard for early intervention there is very little research directly comparing its benefits to center based child-focused physical therapy treatment.

The purpose of this literature review is to outline the literature regarding early intervention to determine if family-centered natural environment therapy is more effective than traditional clinic based therapy to help a child reach their motor development milestones. The results of this review will help physical therapists to choose appropriate treatment settings and approaches that will deliver the best developmental results for their patients.

**Summary of Evidence**

A review of literature comparing natural environment family-centered physical therapy to traditional clinic-based physical therapy for the 0-3 age range results in no studies that specifically focus on these topics. There are several available resources that focus on family-centered early intervention and natural environments, which can be applied to this PICO question. The following section will outline these studies.

**Evidence**

There was sufficient evidence supporting family-centered therapy, and more specifically a large number of studies focused on the effects of parental coaching through physical therapy treatment. Chiarello et. al. conducted a randomized controlled trial to test the effects of a home-based physical therapy program focused on improving mother-child interactions.5 The sample consisted of 38 mothers and their children (ages 6 to 34 months) who received five physical therapy treatments within their natural home environments.5 The experimental intervention program was designed to guide parents in understanding and responding to their child’s behaviors, interests, and needs.5 Results showed that mothers within the experimental group had an increase in appropriate holding of their children, whereas mothers in the control group demonstrated a decrease.5 The mothers in the experimental group also became more directive, thus having greater influence over their children’s behavior.5 In another randomized controlled trial done by Cornill et. al. a comparison was made between 21 infants in a family-centered physical therapy program to 25 infants in a traditional physical therapy program.6 All participants received physical therapy services from 3-6 months of age at a frequency of two times a week.6 No developmental differences on the AIMS or MDI scores were noticed between the two groups, but the amount of time spent on parental coaching was shown to have a positive correlation with functional ability gains.6 These two randomized controlled trials have the limitations of small sample size, but show the impact that a physical therapist can make in the home environment through parental coaching. Working in natural environments can enable therapists to expand their hands-on time with each child and move alongside the parent as a coach rather than a lead player.4

In a review of literature done by Mahoney et. al. it is suggested that early intervention practitioners renew their focus on the involvement of parental education within their treatment plans.7 The review points out that the typical goals of parent education should include teaching parents strategies to assist children in attaining developmental skills, helping parents learn to manage their child’s behavior, and enhancing their skills in engaging their children in play.7 It also suggests that parents be viewed as more equal and active partners to their child’s treatment, and that learned behavior for the child is more likely to generalize and be maintained if the behaviors are taught within the child’s home environment with their natural caregiver present.7 These thoughts on parental involvement are supported in a meta-analysis done by Shonkoff and Hauser-Cram which revealed that structured physical therapy programs that planned extensive parent involvement showed significantly greater effects than those with no parental involvement.8 Within the natural home environment the study recommended that parental involvement occur through assisting with planning, developing, and implementing activities during therapy sessions and on a daily basis when the therapist is not present.8 Furthermore, this study found that the most influential physical therapy programs were those in which the intervention was targeted at the parent and infant working together.8 These two articles relate to the concept of treatment within the natural environment, which includes the concept that generalization of skills (in both parent and child) are more likely to occur when there is no delineation between the intervention setting and the natural environment.4,7 As a physical therapist who can only be with the child once or twice a week, the parent can serve as one of your greatest tools by carrying out therapeutic activities on a daily basis that were taught through parent coaching. In a cross sectional study done by O’Neil et. al investigating parent perceptions of therapists’ behaviors, findings suggested that therapists who treated parents as equal partners and primary decision makers in their child’s care were perceived to be more helpful to the child’s progress by the parents.3

Parental coaching and family centered therapy within the natural home environment is further supported by a series of case studies done by Schultz-Krohn.9 This article presents three different early intervention case studies where treatment is based on family goals, parental coaching, and involving the whole family (including siblings) in treatment sessions.9 The author suggests that professionals who provide early intervention services within natural environments must recognize the importance of the interactional relationship within the family in order to provide successful treatment.9 He identifies the family as the constant in each child’s life, and therefore, views the family as the primary agent for change.9 During natural environment therapy involvement of family members, including siblings, is recommended during therapy sessions to improve the family’s interaction with the child.4

In a cross sectional study of 63 children in their parents done by Dunst et. al to assess the characteristics and consequences of natural learning environment interventions, findings suggest that the presence of more favorable development enhancing activity setting characteristics is associated with significantly more learning opportunities and parent/child play opportunities.10 The study demonstrated that the different activities that make up the fabric of everyday life are important natural learning environments for promoting child development and function.10 This study also suggested that for developmental consequences to be realized the activity must capture the child’s interest and take place on a regular basis over an extended period of time10, which would best be accomplished through parental involvement. The study concluded that these findings supported the theory that children’s interests, engagement, exploration, and mastery would be the best predictor of variations in the outcomes of everyday natural learning opportunities.10 In a more recent cross sectional study by Dunst et al done on 801 parents of children within the early intervention program, results demonstrated a positive relationship between natural activity settings and parent/child well-being.11 The study indicated that natural learning environment practices have desirable benefits for both children and parents.11 These two studies correspond with the concept behind therapy in natural environments occurring where the parent and child choose to be, and engaging in activities which they find interesting enough to incorporate into their everyday lives.4

**Limitations**

These studies offer a number of important implications for early intervention physical therapy practice, however, these studies do have their limitations and the results may not generalize to the entire infant and toddler population. The sample sizes of all the studies, except for the last cross sectional study by Dunst et al 11are too small to be representative of the entire early intervention population. Some studies, such as the Schultz-Krohn case study9 have as few as 3 participants. The study designs were also weak, consisting of only two randomized controlled trials with 38 and 46 subjects.5,6 Other resources consisted of weak research designs one case study9, one meta-analysis8, one literature review7, and three cross sectional studies4,10,11. Also, not all of the studies define the specific diagnoses of the children involved, but instead just state that they had general developmental delay.

**Conclusions**

These studies provide a good starting point for comparing family centered natural environment therapy to child-centered clinic based therapy, but more research is needed in this area to make the results more representative of the early intervention population. To date there are no studies specifically comparing developmental results of infants and toddlers treated with the family centered natural environment approach to those treated with a child-based clinic approach. In the future it would be beneficial to conduct a large randomized controlled trial on this topic so that results could be applied towards current early intervention therapy practices. The evidence reviewed provides strong support for the family-centered approach to therapy, especially for the inclusion of parent coaching into therapy sessions. Some studies also supported the use of everyday learning activities occurring in natural environments to encourage the child to participate in therapeutic play. The common theme of these studies centered on teaching the parents to incorporate therapeutic play into everyday activities within their home and other natural environments to help the child reach their developmental goals.

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