



## Developmental Interventions for Young Children with Autism Spectrum Disorders\*

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**ABSTRACT.** The purpose of this study was to investigate the outcomes of developmental interventions for young children with autism spectrum disorders. Six criteria were used to select the studies included in this review. In the end 14 studies met the criteria and were included in the review. The table in Reichow and Volkmar (2010) study was used to analyze the studies. Five studies were based on developmental interventions (DI) and nine studies were based on developmental and behavioral interventions (DBI). Eleven out of 14 studies, interventions were provided via parents. This shows a growing emphasis on parent involvement in education of young children with autism. Considering that an early intervention study should address family-centered practice, natural involvement and active learning, there is a need for more studies searching for the ways of how to involve parents in intervention process. In three studies, outcome measures were increase in IQ level and the number of functional words. However, this can be questioned about how these measures were meaningful for young children with autism spectrum disorders.

**Keywords:** Young children with autism spectrum disorders, developmental interventions, early intervention

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### INTRODUCTION

In the last two decades, the prevalence rate of autism spectrum disorders (ASDs) has increased (Boyd, Odom, Humpreys, & Sam, 2010; Wetherby & Woods, 2008) to 1 in 110 births. The improvements in the field of autism such as increased awareness, broadening the definition of ASDs and expansion of valid screening and diagnostic tools have contributed to increase in prevalence (Colombi, Kim, Schreier & Lord, 2012; Lord & Bishop, 2010). These changes helped identification of children with autism as early as 18 months and as more infants and toddlers are being identified with ASDs, the question of best intervention methods for young children with ASDs is raised.

Parents and policy makers are creating pressure on early interventions and service systems to produce effective interventions. Behaviorally based interventions were declared as the most effective treatment option for children with autism by National Research Council (2001); however, this might be due to relying on the studies including children older than three years and due to the fact that there were more behaviorally based intervention studies to review. Intervention criteria suggested for young children with ASDs may not be appropriate for the age and developmental level of these children because developmental needs of young children and older children can be different. While toddlers spent their time mostly with parents (or primary caregiver), older children are becoming more social and less dependent to their parents (Kelly & Lamb, 2000; Ralph & Goldman, 2007). As a result of such critics towards behaviorally based interventions, for toddlers and infants, many researchers and practitioners are also advocating intervention approaches drawn from the developmental and social pragmatic literatures (Boyd et al., 2010; Ingersoll, 2010).

Schertz, Baker, Hurwitz and Benner (2011) also raised concerns about implementing intervention methods with toddlers that have been studied only on older children with ASDs. This is a contradiction with the principles of early intervention (EI) and recommended practices for toddlers with ASDs. It was suggested that intervention for young children on the spectrum should differ from the ones for older children. There must be criteria that are also supported by Part C policy (Individuals with Disabilities Education Improvement Act [IDEIA], 2004), and practice recommendations of the Division for Early Childhood of the Council for Exceptional Children (DEC) and the National Association for Educating

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Young Children (NAEYC). Accordingly, an early intervention study should address family-centered practice, natural environment, active learning, and functional and systematic practices which consider developmental readiness and unique variations in learning (Schertz et al., 2011).

Besides EI principles, early intervention studies should address evidence based practice (EBP). The National Research Council (NRC) founded the Committee for Evaluating Educational Interventions for Children with Autism (Lord, Bristol-Power, Cafiero, Filipek, Gallagher, & Harris, 2001). This committee reviewed interventions for young children with autism and no single intervention approach was revealed as EBP. This was due to a lack of an operational method for evaluating evidence. In addition, evaluation of the treatment of single subject research was problematic within these committee's reviews because specific quality indicators for single case experimental designs were not identified (Reichow, Volkmar, & Cicchetti, 2008).

In the past, there was a lack of consensus on how to evaluate studies about young children with ASDs because of definitional inconsistencies on evidence based practice (EBP). Reichow and his colleagues (2008) developed an evaluation method for interventions for young children with ASDs. This method includes three instruments (1) rubrics for the evaluation of research rigor; (2) guidelines for the evaluation of research report strength; and (3) criteria for determining if an intervention has the evidence needed to be considered as an EBP (Reichow et al., 2008).

In Reichow and his colleagues study (2008), the strength of the research report was decided using the second instrument of the evaluative method. Accordingly, strong, adequate, and weak levels of research strength were reported. If the primary and secondary quality indicators were met in majority, this research reports were indicated as a strong rating. If the research was showing strong evidence in many areas but not all, this was considered as an adequate rating. Finally, having many missing elements in a research report resulted in a weak rating. In that case, studies with a weak rating are not included for deciding whether the intervention used in the study is an EBP or not.

The review conducted by Schertz and her colleagues (2011), while it assessed the studies to what extent their methods reflected the recommended practices of early interventions for toddlers with autism, this paper, on the other hand, interested in outcomes of the developmental interventions conducted among young children with autism spectrum disorders. The studies including developmental and behavioral strategies together were also included; however, the purpose is not to show the superiority of one method over another.

## **METHOD**

Six criteria were used to select the studies included in this review. First the participants involved in the studies must have been diagnosed with ASD. Second, the age of the 50% of the participants should be less than three and the rest should not more than five. Third, the study must have been published in a peer-reviewed journal between 1990 and 2010. Fourth, interventions should be either developmental or combination of developmental and behavioral. Interventions including only behavioral interventions were not included in the review. Fifth, evaluation of the interventions must have been conducted using one of the following research designs: (a) true experimental designs (i.e., randomized clinical trial); (b) quasi-experimental multiple group comparison, or (c) single subject experimental designs (e.g., multiple baseline, alternating treatments, withdrawal). Therefore qualitative case studies were not included in this review. Sixth, study reports had to receive acceptable or strong methodological rigor ratings on the rubric outlined in the Evaluative Method for Determining Evidence-Based Practices in Autism (Reichow et al., 2008). Studies were extracted using the three steps literature search done in the following order: (a) electronic database searches (Google Scholar, ERIC (EBSCO), psycINFO) using the search terms 'autism spectrum disorders, developmental interventions, young children with autism', (b) review of references from review articles, (c) hand search of relevant journals. In the end 14 studies (5 were developmental

interventions and 9 were both developmental and behavioral interventions) met the criteria and were included in the review.

The evaluation of outcomes is not simply comparing the results of interventions. Rather it is to checking all the characteristics of the intervention. The method, participants (age, gender, diagnosis, education level, skills), interventionist, rigor of the method, design of the study and procedural fidelity all affect outcomes. Therefore, if a conclusion is needed to be made about outcomes of an intervention, all these dimensions should also be stated. Some of the elements of the table in Reichow and Volkmar's (2010) study were used in this analysis. The second instrument which was elaborated above in Reichow and his colleagues (2008) study on Evaluative Method for Determining Evidence-Based Practices in Autism was also used in this review in order to check the rigor of a particular method.

## RESULTS

In this review, the results were reviewed under two main categories: developmental interventions (DI) and developmental and behavioral interventions (DBI). Summary of the studies were included in the Table 1. (*see Table 1*) The table was composed of four main parts; (a) methodological characteristics, (b) participants characteristics, (c) intervention characteristics and (d) results.

First of all, methodological characteristics were coded as rigor, design, generalization/ maintenance, and fidelity. Overall experimental rigor rating was determined using the second instrument of Reichow and his colleagues (2008) Evaluative Method for Determining Evidence based Practices in Autism. Second, study design was categorized (i.e., randomized control trial, quasi-experimental multiple group comparison, or single subject research design). Third, generalization and/or maintenance was indicated as present or not present. Fourth, treatment adherence, treatment differentiation, and therapist performance were used for procedural fidelity. In this alignment, as Reichow and Volkmar (2010, p.3) defined:

*“Treatment Adherence (TA) is the consistent delivery of the treatment as planned across and within participants of a sample. Treatment differentiation (TD) is the evidence provided whether the groups of a comparative study received different levels of the treatment package. Therapist Performance (TC) is the evidence of therapist training and/or evaluation of therapist performance.”*

Participant characteristics were coded as total number, age range, gender and cognitive level functioning of the participants (Reichow & Volkmar, 2010). The total number of participants represents the total number of individuals receiving intervention. Instead of listing all the participants' ages within a specific study, the age ranges were provided as declared in the studies. The number of males and females in the studies were indicated. Three categories were formed for cognitive functioning of the participants as lower functioning (limited or no verbal language skills and had an  $IQ < 55$ ), medium functioning (rudimentary verbal communication skills with  $55 < IQ < 85$ ) and higher functioning (typically well-developed verbal communication skills with an  $IQ \geq 85$ ). In other randomized clinical trial and quasi experimental comparison group design, average IQ levels of the groups were indicated.

Intervention characteristics were coded as delivery agent, density and setting (Reichow & Volkmar, 2010). Delivery agent provides information about by whom intervention sessions were carried. The amount direct services delivered during the intervention were coded as intervention density. There were three categories for settings. When the intervention services were provided in participants' typical home, home settings were coded. If it was in any place or classroom within a school, classroom setting was coded. If the intervention provided in a professional office or hospital setting, this was coded as clinical setting. Finally, study results were defined as the outcomes measures for each study.

**Table 1.** Developmental interventions for young children with autism spectrum disorders

Reference	Methodological Characteristics				Participants Characteristics				Intervention Characteristics			Study Results
	Rigor	Design	G/M	Fidelity	n	M, F	Age	IQ Level	Delivery Agent	Density	Setting	Outcome Measures
<i>Behavioral &amp; Developmental</i> Aldred, Green, & Adam, (2004)	Adequate	Randomized treatment trial design	M	TA, TD	14	13,1	2-5	Lower and Medium	Experimenter and Parents	Parents 30minutes daily for 6 months	Clinic and Home	Shared attention
Drew et al., 2002	Adequate	Randomized clinical trial	G/M	TA, TD	24	19, 5	2-3	Lower and Medium	Parents	3.5 -7h/ week parent-delivered intervention	Home	Joint attention Language
Gulsrud, Jahromi, & Kasari, 2010	Strong	Randomized wait list control design	M	TA	34	26, 8	2-3	Lower and Medium	Parents	3 sessions/ week	Laboratory	Joint attention, engagement and Emotion regulation
Ingersoll, Schreibman, & Stahmer (2001)	Strong	Multi-group comparisons	M	TA,TC	6	2, 4	2-3.5	Lower and Medium	Teacher	Half days	Classroom (inclusive)	Peer social avoidance behavior and language
Kasari, Freeman, & Paparella, (2006)	Strong	Random Clinical Trial	G	TA, TD, TC	58	46, 12	3-4	Medium and High	Experimenter and Parents	30 minutes daily for 5-6 weeks	Classroom	Joint attention Play skills Mother child interaction
Kasari, Gulsrud, Wong, Kwon, & Locke (2010)	Strong	Randomized wait list control design	M	TA	38	29, 9	2-3	Lower and Medium	Parents	3 sessions/ week 30-min each	Laboratory	Joint attention behaviors and play diversity
Rogers, Hayden, Hepburn, Charlifue-Smith, Hall, & Hayes, (2006)	Strong	Single subject	G/M	TA	10	10, 0	1.5- 5	Lower and Medium	Clinician and Parents	12 1-h weekly sessions of therapy and 1-h home intervention therapy	Clinic and Home	Language (the number of functional words)
Rogers & Dilalla (1991)	Adequate	Randomized clinical trial	M	TA, TC	49	36, 13	4-5	Lower and medium	Experimenter	4.5 h per day 43 weeks per year	Classroom	Cognitive and language functioning
Yoder & Stone, (2006)	Strong	Randomized group comparison design	M	TA ,TC	35	31, 4	1.9- 7.8	Medium and High	Clinician and parent	20 minutes sessions/ 3 times a week Times for parents were not provided	Clinic	Joint attention Turn taking

**Table 1. (continued)**

Reference	Methodological Characteristics				Participants Characteristics				Intervention Characteristics			Study Results
	Rigor	Design	G/M	Fidelity	n	M, F	Age	IQ Level	Delivery Agent	Density	Setting	Outcome Measures
Developmental Interventions												
Mahoney & Perales (2003a)	Adequate	Randomized group design	G/M	TA, TC	26	16, 8	3-5	Lower and Medium	Parent	5-10 minutes videotapes/ per 2 weeks for a year	Center or Home	Social-emotional functioning
Mahoney & Perales (2005b)	Adequate	Group comparison design (pre-test & post-test)	G/M	TA, TC	50	33, 17	1-5	Lower and Medium	Parent	1 hour with parent for one year	Center or Home	Communication Socio-emotional functioning
Ingersoll, Dvortcsak, Whalen, & Sikora (2005)	Adequate	Single subject	G/M	TA, TC	3	3, 0	2-3	Lower	Therapist	50 minutes 2× week 10 weeks total	Clinic	Social communicative behavior
Schertz & Odom (2007)	Adequate	Single subject	G/M	TA, TC	3	3, 0	< 3	Lower	Parent	1 hr/week with parent 5hr/ week Planned parent child interaction in routines	Home	Joint attention
Wetherby & Woods, (2006)	Adequate	Quasi-experimental design (one group, pre-test post-test)	G/M	TA, TC	35	29, 6	2-3	Lower and Medium	Parent	2 home visits/ week Intensity of the parent implemented play sessions were not included	Home	Communication Joint attention Imitation

### ***Developmental Interventions***

Five studies (Ingersoll, Dvortcsak, Whalen, & Sikora, 2005; Mahoney & Perales, 2003a, 2005b; Schertz & Odom, 2007; Wetherby & Woods, 2006) were based on developmental interventions for young children with autism. All reached an adequate level of methodological rigor and all met procedural fidelity by indicating treatment adherence (TA) and therapist competence (TC). Two of them (Ingersoll, Dvortcsak, Whalen, & Sikora, 2005; Schertz & Odom, 2007) used single case experimental design; one (Wetherby & Woods, 2006) was a quasi-experimental one-group comparison design, one was (Mahoney & Perales, 2003a) a randomized group comparison design and finally the other one (Mahoney & Perales, 2005b) was a group comparison design (pre-test and post-test). All included generalization and maintenance phases.

In single subject studies, all participants were between two and three years of age and all were male. Randomized clinical trial and quasi-experimental control group designs included more participants (e.g. 26, 50, and 35) with ASD than did the single subject studies. Girls with autism were included in these studies (8, 17, and 6) however the ratio of boys was still high with respect to girls. Overall, in all studies cognitive functioning of the children with autism were in either lower or medium range.

In four out of five studies, interventions were provided by parents; only one intervention was provided by a therapist. In other words, a majority highlighted parent-mediated interventions. Accordingly, intervention settings were homes of the children most of the time but there were sessions carried out in centers and clinics as well. Group design studies used home and clinic settings, single subjects design studies used either home or clinic. Overall density of the interventions was not more than three sessions per week ranging from 10 to 60 minutes for each session up to one year.

Outcomes measures were concentrated on the joint attention, imitation and social emotional regulations. Two of the studies (Schertz & Odom, 2007; Wetherby & Woods, 2006) concentrated on joint attention skills. Two other studies (Mahoney & Perales, 2003a, 2005b) focused on social-emotional regulation. Cognitive level functioning or verbal speech production were not included within the scope of these developmentally based interventions. Rather focus was on the skills that are precursor to later language and social development such as joint attention and imitation.

Overall, developmental interventions, with an adequate level of methodological rigor, highlighted parent involvement in education of young children with autism. Although one intervention was carried out in a clinic setting by a therapist, home environment was the dominant setting among the other interventions which were provided via parents. No intervention included a session longer than 60 minutes in a day and all interventions indicated generalization and maintenance. Finally, outcomes measures for all the interventions included social emotional regulations and skills that are precursor to later language development such as joint attention, imitation.

### ***Developmental and Behavioral Interventions***

There were nine studies (Aldred, Green, & Adam, 2004; Drew et al., 2002; Gulsrud, Jahromi, & Kasari, 2010; Ingersoll, Schreibman, & Stahmer, 2001; Kasari, Freeman, & Paparella, 2006; Kasari, Gulsrud, Wong, Kwon, & Locke, 2010; Rogers & Dilalla, 1991; Rogers, Hayden, Hepburn, Charlifue-Smith, Hall, & Hayes, 2006; Yoder & Stone, 2006) based on developmental and behavioral interventions for young children with autism. Six (Gulsrud, Jahromi, & Kasari, 2010; Ingersoll, Schreibman, & Stahmer, 2001; Kasari, Freeman, & Paparella, 2006; Kasari, Gulsrud, Wong, Kwon, & Locke, 2010; Rogers et al., 2006; Yoder & Stone, 2006) of nine studies reached a strong level of methodological rigor rating and the remaining three studies (Aldred, Green, & Adam, 2004; Drew et al., 2002; Rogers & Dilalla, 1991) reached an adequate level.

Treatment adherence (TA) was indicated in all of these studies. Four studies described the therapist competence (TC) during the intervention and three studies clearly stated the treatment differentiation (TD) between control and treatment group. Seven of them were using randomized clinical trial design; one (Rogers et al., 2006) was single subject experimental design, and one was (Ingersoll, Schreibman, & Stahmer, 2001) multi-group comparison design. Eight studies included maintenance over time and three studies included generalization across settings.

The number of the participants was not less than six (Ingersoll, Schreibman, & Stahmer, 2001) or more than 58 (Kasari, Freeman, & Paparella, 2006) in any of the study. The ratio of boys was high with respect to girls. Overall, although two studies (Kasari, Freeman, & Paparella, 2006; Yoder & Stone, 2006) included children with high cognitive functioning level, in all studies cognitive functioning of the children with autism were in either lower or medium range.

Interventions were provided either by parents or teachers, experimenter, and clinicians. Parent mediated sessions emphasized on the daily routines of the child with ASD. Therefore intervention settings varied: homes of the children as well as centers, clinics, laboratory and classrooms within a school. Overall density of the interventions was ranging from 30 minutes to four and a half hours per day for six to twelve months.

Outcomes measures fell into two broad groupings; six of nine studies focused on joint attention, turn taking, play diversity, and social- emotional regulation. The remaining three studies emphasized quantifiable changes in cognitive functioning (IQ level) and language (the number of functional words). To illustrate, while one study (Rogers et al., 2006) used naturalistic behavioral principles to increase IQ level and the number of the words produced by the young children with autism, another study (Gulsrud, Jahromi, & Kasari, 2010) targeted joint engagement on emotion co-regulation outcomes.

To sum up, developmental and behavioral interventions, with an adequate or strong level of methodological rigor, emphasized parent involvement in education of young children with autism. Daily routines and natural settings such as home and classroom environment were important while providing the interventions between reasonable time limits (30 minutes to four and a half hours in a day). In addition, majority of the studies concentrated on joint attention, turn taking, play diversity, and social-emotional regulation instead of quantifiable changes in IQ level and the use of words.

## **DISCUSSION**

In this review, outcomes of developmental interventions for young children with autism spectrum disorders were analyzed and it was found that parents were the dominant delivery agent of the intervention among these studies. Among the studies, inclusion of parents within an intervention was mostly used to teach imitation and/or joint attention behaviors to young children with autism (e.g., Gulsrud, Jahromi, & Kasari, 2010). The inclusion of the naturalistic elements such as including parents is consistent with recommended practices for early childhood education (Reichow & Volkmar, 2010).

Parent and family involvement is considered to be a crucial element of the interventions for young children with autism (Lord et al., 2001). Among the studies included in this review, in eleven out of 14 studies, parents were included in interventions for their young children with ASDs. This shows a growing emphasis on parent involvement in education of young children with ASDs. Considering that an early intervention study should address family-centered practice, natural involvement and active learning (Boyd et al., 2010; Schertz et al., 2011), there is a need for more studies searching for the effective ways of how to involve parents in intervention process.

Social skills such as joint attention, imitation, turn taking, and play diversity were the outcome measures in most of the studies. This may give a clue about the change in the direction from concentrating on academic skills to social-communication skills for young children on the spectrum. Because weaknesses in social communication skills is among the core characteristics of autism (Whalen, Schreibman, & Ingersoll, 2006) and these can be observable beginning in early infancy. Joint attention, to illustrate, is the earliest social impairment in the children with autism and found to be a precursor to later language development (MacDuff, Ledo, McClannahan, & Krantz, 2007; Thurm, Bishop, & Shumway, 2011). Therefore, focusing on such a prerequisite social-skill in an early intervention may naturally help to develop later social skills for a young child on the spectrum. Besides, only in three studies, outcome measures were increase in IQ level and the number functional words. However, this can be questioned about how these measures were meaningful for young children with autism spectrum disorders (Kasari, 2010; Schertz et al., 2011).

There is a growing body of evidence that developmental interventions can be effective in education of young children with ASDs (Ingersoll, Dvortcsak, Whalen, & Sikora, 2005; Mahoney & Perales, 2003a, 2005b; Schertz & Odom, 2007; Wetherby & Woods, 2006). For example, joint attention treatments, which include developmental elements, were stated as among the effective treatments for children on the spectrum within the report of National Standard Project (2009). Still, in the same report, it was indicated that the treatments comes from behavioral literature (e.g., applied behavior analysis (ABA), behavioral psychology and positive behavior support) are dominating in the field. Therefore, there is a need for more studies in the line of developmental perspective for particularly young children with ASDs.

In most of the studies (ten out of 14), interventions were provided in natural environments such as classroom and home settings (Kasari, Freeman, & Paparella, 2006; Schertz & Odom, 2007; Wetherby & Woods, 2006). Even if an intervention was carried in a center or a clinic, home settings were included in some part of the intervention procedure (Mahoney & Perales, 2003a, 2005b; Rogers, Hayden, Hepburn, Charlifue-Smith, Hall, & Hayes, 2006). In addition, incorporation of the activities in daily routines within these natural settings (Mahoney & Perales, 2003a; Schertz & Odom, 2007) indicates a change in the interventions for young children on the spectrum: *less dependency on professionals and more natural settings/ delivery agents*. Because traditional behavioral techniques were required a high level of effort on teachers and parents, implementation in classroom and home settings was problematic (Strain, McGee, & Kohler, 2001). In that sense these studies showed that young children with autism spectrum disorders can also learn important skills (e.g., joint attention, play skills and turn taking) in less structured environments with familiar adults as part of their daily life.

In this review, all of the developmental interventions reached an adequate level of methodological rigor rating according to the instrument developed by Reichow and his colleagues' (2008) study on Evaluative Method for Determining Evidence-Based Practices in Autism. Therefore, the reasons of not reaching a strong level of research strength can be investigated. This may help to empower the methods of future studies based on developmental interventions.

One limitation in this review is that articles in languages other than English were not included in this review. Still, the results and conclusions of this review should be made with caution because there is an issue of publication bias because of the narrow inclusion criteria. Therefore the readers should be alert to selection bias within this review.



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## Otizm Spektrum Bozukluğu Olan Küçük Çocuklarda Gelişimsel Müdahale Yöntemleri

**ÖZ.** Bu çalışmada, otizm spektrum bozukluğu olan küçük çocuklar için kullanılmış gelişimsel müdahale yöntemlerini içeren çalışmaların sonuçları incelenmiştir. İncelenecek çalışmaların seçiminde bazı ölçütler kullanılmıştır ve toplamda 14 makale seçilmiştir. 14 makalenin sonuçlarının çözümlenmesinde, Reichow ve Volkmar'ın (2010) çalışmasındaki çizelgeden yararlanılmıştır. Bulgular; gelişimsel müdahale yöntemlerini (GMY) içeren çalışmalar ve gelişimsel ve davranışsal müdahale yöntemlerini (G-DMY) birlikte içeren çalışmalar olmak üzere iki başlık altında incelenmiştir. Ulaşılan çalışmaların 5'i GMY'yi, 9'u ise G-DMY'yi içermektedir. İncelenen 14 araştırmanın 11'inde, müdahale aileler aracılığıyla sağlanmıştır. Bu durum, otizmlili küçük çocukların eğitiminde aile katılımının önemini ortaya koymaktadır. Küçük çocuklar için erken müdahale yöntemlerinin; aile, doğal ortam ve etkin öğrenme merkezli olması gerektiği düşünüldüğünde, ailelerin sürece nasıl dahil edileceği ile ilgili araştırmalara da ağırlık verilmesi gerekmektedir. İncelenen bazı çalışmalarda (n=3) ise nihai ölçüt, IQ seviyesindeki ve işlevsel kelime sayısındaki artışla ilişkilendirilmiştir. Ancak bu ölçütlerin otizmlili küçük çocuklar için ne derece anlamlı olduğu sorgulanmalıdır.

**Anahtar Sözcükler:** Otizmlili küçük çocuklar, gelişimsel müdahale yöntemleri, erken müdahale

### ÖZET

**Amaç ve Önem:** Otizm spektrum bozukluğunun görülme sıklığı 110 doğumda 1'e kadar yükselmiştir (Boyd, Odom, Humpreys ve Sam, 2010; Wetherby ve Woods, 2008). Otizmlili küçük çocukların sayısındaki artış, bu çocuklar için en uygun müdahale yönteminin ne olduğu sorusunu birlikte getirmiştir. Yaş ve gelişim dönemleri farklılıkları sebebiyle (Kelly ve Lamb, 2000; Ralph ve Goldman, 2007), pek çok araştırmacı ve uygulamacı 0-3 yaş grubundaki çocuklar için doğal gelişimlerine uygun yöntemler kullanılması gerektiğini savunmaktadır. Gelişimsel müdahale yöntemleri de bunlardan birisidir. Bu çalışmada, otizm spektrum bozukluğu olan küçük çocuklar için kullanılmış gelişimsel müdahale yöntemlerini içeren çalışmaların sonuçları incelenmiştir.

**Yöntem:** 1990'lı yıllardan sonra ilgili alanyazında yaygınlaşan (Wetherby, 2008, syf. 178) gelişimsel müdahale yöntemlerinin yer aldığı çalışmalar, araştırmacının çalışma evrenini oluşturmuştur. İncelenecek çalışmaların seçiminde bazı ölçütler kullanılmıştır. İncelenecek çalışmaların, temele alınan ölçütler ışığında seçimi için öncelikle elektronik veri tabanları (Google Scholar, ERIC, EBSCO, psycINFO) taranmış, sonra ulaşılan makalelerin kaynakçaları incelenmiştir. Ayrıca ilgili dergilerin (Journal of Autism and Developmental Disorders, Topics in Early Childhood Special Education) içerisinde de tarama yapılarak toplamda 14 makale seçilmiştir. 14 makalenin sonuçlarının çözümlenmesinde, Reichow ve Volkmar'ın (2010) çalışmasındaki çizelgeden yararlanılmıştır.

**Bulgular:** Gelişimsel müdahale yöntemlerini (GMY) içeren çalışmalar ve gelişimsel ve davranışsal müdahale yöntemlerini (G-DMY) birlikte içeren çalışmalar olmak üzere iki başlık altında incelenmiştir. Ulaşılan beş GMY'yi içeren çalışmaların tümü (tek denek deseni=2, yarı-deneysel çoklu grup karşılaştırması deseni=2, gerçek deneysel deseni=1) yöntemsel sağlamlık ve süreç geçerliliği açısından yeterli düzeyde bulgulanmıştır. Bu çalışmaların dördünde müdahale, aile aracılığıyla birinde ise terapistle sağlanmıştır. Çalışmaların ikisi ortak dikkat becerilerini, ikisi sosyal-duygusal düzenleme becerilerini, biri de sosyal-iletişim davranışlarını nihai ölçüt (Outcome Measure) olarak almıştır. Ulaşılan dokuz G-DMY'yi içeren çalışmaların ise (gerçek deneysel deseni=8, tek denek deseni=1) yöntemsel sağlamlık açısından altısı güçlü üçü ise yeterli seviyede bulgulanmıştır. G-DMY'yi içeren çalışmalardaki müdahaleler, terapistler ya da araştırmacılar tarafından ailelere ya da öğretmenlere verilen eğitimlerle sağlanmıştır. Çalışmaların çoğunda; ortak dikkat, sıra bekleme, sosyal-duygusal düzenleme becerileri ve oyun çeşitliliği nihai ölçüt kabul edilmiştir. Sadece üç çalışmada, IQ seviyesindeki ve işlevsel kelime sayısındaki artış, nihai ölçüt olarak kabul edilmiştir.

**Tartışma, Sonuç ve Öneriler:** Bu çalışmada, incelenen 14 araştırmanın 13'ünde, müdahalenin aileler aracılığıyla sağlandığı ortaya çıkmıştır. Bu durum, otizmlili küçük çocukların eğitiminde aile katılımının önemini ortaya koymaktadır. Küçük çocuklar için erken müdahale yöntemlerinin; aile, doğal ortam ve etkin öğrenme merkezli olması gerektiği (Boyd ve diğerleri, 2010; Schertz ve diğerleri, 2011)

düřünüldüğünde, ailelerin sürece nasıl dahil edileceđi ile ilgili arařtırmalara da ađırlık verilmesi gerekmektedir. İncelenen bazı çalıřmalarda (n=3) ise nihai ölçüt, IQ seviyesindeki ve işlevsel kelime sayısındaki artışla ilişkilendirilmiştir. Ancak bu ölçütlerin otizmlı küçük çocuklar için ne derece anlamlı olduđu sorgulanmalıdır (Kasari, 2010; Schertz ve diđerleri, 2011). Çalıřmaların çoğunda (14 arařtırmanın 10'u) müdahale ev ve okul gibi dođal ortamlarda sađlanmıştır (Kasari, Freeman ve Paparella, 2006; Schertz ve Odom, 2007; Wetherby ve Woods, 2006). Ayrıca dođal ortamlarda uygulanan etkinlikler günlük rutinlerin içine katılmıştır. Bu durum otizmlı küçük çocuklar için uygulanan gelişimsel müdahale yöntemlerinde, *daha az uzmana gereksinim* ve *daha çok dođal ortam/uygulayıcı* yönündeki deđişimi göstermektedir.