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Examining Services for Young Children with Autism Spectrum Disorder: Parent Satisfaction and Predictors of Service Utilization

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Abstract

Autism spectrum disorder (ASD) is the fastest growing group of neurodevelopmental disorders in childhood. Earlier detection means an increased need for early intervention and other educational services. This study examined what services a sample of young children with ASD received, what variables predicted service utilization, and how satisfied parents were with the services. Sixty children (2–7 years) and their families from the Northwestern United States participated in the study. Results suggest that, on average, children received 13 hours of educational and therapeutic services per week, with younger children receiving fewer services than older children. Child age, atypical behavior, and family income predicted number of service hours received. Children's adaptive behavior and autism symptoms did not predict service hours. Although services received were, by most standards, minimal and far below best practice recommendations, parents reported high satisfaction, especially for their toddlers and preschool-aged children. Implications and future directions are described.

Keywords

autism; early intervention; service utilization; best practices

Autism spectrum disorder (ASD) is characterized by persistent and pervasive impairments in social-communication and interactions, as well as restricted and repetitive patterns of behavior, activities, or interests (American Psychiatric Association, 2013; National Research Council [NRC], 2001). ASD remains the fastest growing neurodevelopmental disability among children in the United States (US; Boyle et al., 2011). Consistent with global prevalence rates of between 1 and 2% (Elsabbagh et al., 2012; Hahler & Elsabbagh, 2015), an estimated 1 in 68 children in the United States have an ASD diagnosis (Centers for Disease Control and Prevention [CDC], 2014).

Early intensive interventions are recommended for children with ASD (NRC, 2001). Early intensive interventions have been associated with placement in less restrictive educational settings (e.g., Lovaas, 1987), as well as gains in a number of areas including IQ, adaptive functioning, and language (Warren, McPheeters, Sathe, Foss-Feig, Glasser, & Veenstra-

VanderWeele, 2011). The timing and intensity of intervention may potentiate effects, such that more positive outcomes occur for younger children receiving intensive interventions (e.g., Fenske, Zalenski, Krantz, & McClannahan, 1985; Harris & Handleman, 2000). Early intervention services are federally mandated in the United States (U.S.) for all children with disabilities under the Individuals with Disabilities Education Act. Through this mandate, publicly provided services are available for all individuals with disabilities starting from birth until the age of 21. Variations in the nature of early intervention services and state developed treatment guidelines for individuals with ASD demonstrate a persistent lack of agreement regarding what constitutes early intervention (Stahmer & Mandell, 2007). Efforts to address this disunity include recommendations for effective early intervention for this population, comprehensive treatment guidelines, and evaluations of the extant literature (e.g., NRC, 2001; National Autism Center [NAC], 2009, 2015; Odom, Boyd, Hall, & Hume, 2010a; Odom, Collett-Klingenberg, Rogers, & Hatton, 2010b; Rogers & Vismara, 2008). Guidelines have addressed issues such as the timing, intensity, foci of interventions, and types of interventions used for individuals with ASD. Nevertheless studies indicate that current early intervention practices deviate from these recommendations, albeit to varying degrees.

According to current practice guidelines, services should be provided as soon as ASD is suspected, even before a formal diagnosis (NRC, 2001). However, delays occur in accessing services. Over a quarter of the U.S. early intervention programs surveyed by Downs and Downs (2011) reported wait times of 6 months and 6% of programs reported wait times of a year or greater. Thus, even young children identified with ASD may have to wait to access intervention. Once services are accessed, the intensity of services tends to be below recommendations (Downs & Downs, 2010; Wise, Little, Holliman, Wise, & Wang, 2010). Specifically, the NRC (2001) recommends intensive interventions across 5 days per week, for a minimum of 25 hours per week, with high staff to student ratios. Most programs do not provide 25 hours of intervention per week. Only 12% of early intervention programs surveyed by Downs and Downs (2010) indicated that they provided near the recommended 25 hours of per week (i.e., 23 to 26 hours). Similarly, Wise et al. (2010) found that almost half of early intervention programs surveyed across the United States provided fewer than 5 hours per week to young children with ASD.

Although there are recommendations for the areas in which interventions for young children with ASD should focus, no one intervention has been endorsed by professional organizations over another (NRC, 2001). In fact, a number of interventions may be needed to target skills in the areas of communication, social, cognitive, sensory and motor development, and adaptive skills, while reducing problem behaviors. Given the heterogeneous nature of this population in terms of needs, multiple interventions may be appropriate for affecting positive outcomes. Interventions delivered by early intervention service providers have varying levels of empirical support. Both practices and comprehensive treatment models (CTMs) have been investigated in the literature. Many of the recommendations provided by the NRC (2001) were based on characteristics identified in CTMs. CTMs are typically manualized or *branded* programs (Rogers & Vismara, 2008; e.g., Lovaas Model, Denver Model, May Institute) that include a set of practices targeting the core features of autism (Odom et al., 2010a). Commonly reported outcomes for CTMs

include gains in IQ, expressive and receptive language, adaptive skills, as well as reductions in autism symptomatology (See reviews Odom et al., 2010a, Rogers & Vismara, 2008).

Individual practices have been widely evaluated (see review by Odom, Collet-Klingenberg, Rogers, & Hatton, 2010b; NAC, 2009, 2015). One of the most comprehensive evaluations to date was completed by the NAC (2005, 2015) and involved a review of published literature through 2012. Interventions utilized for individuals with ASD were rated as – established, emerging, or unestablished. Established interventions (e.g., discrete trial instruction [DTI], pivotal response training [PRT], and picture/visual schedules) have sufficient evidence indicating that they lead to positive outcomes, while interventions rated as *emerging* (e.g., functional communication training, Picture Exchange Communication System, and exercise) demonstrate promising outcomes but require further examination. The *unestablished* distinction is provided when there is insufficient evidence to indicate whether the intervention is effective, ineffective, or even harmful. Examples of *unestablished* intervention include animal-assisted therapy, DIR/Floortime, gluten-free casein-free diet, facilitated communication, and sensory integration package.

Interventions based on applied behavior analysis (ABA) tend to have the strongest empirical support for individuals with ASD (Odom et al., 2010a; Odom et al., 2010b; Rogers & Vismara, 2009). However, early intervention programs tend to use a combination of interventions with and without empirical support, choosing an eclectic approach and selecting different strategies depending on the focus of intervention (Downs & Downs, 2010; Stahmer et al., 2005). The majority (72%) of early intervention programs surveyed by Downs and Downs (2010) used ABA to address problem behavior, while 54% of early intervention programs endorsed developmental-individual differences-relationship-based (DIR)/Floortime as a utilized curriculum. Stahmer, Collings, and Palinkas (2005) found that 73% of children with ASD from birth to five years received ABA, 64% percent received discrete trial instruction and 32% percent received pivotal response treatment. In contrast, 77% of children with ASD from birth to five years received occupational therapy with sensory integration, 68% received DIR/Floortime, and 23% received music therapy.

Young children with ASD utilize a range of services and investigations examining the extent to which child and family characteristics predict service utilization is an emerging area of research. Given current recommendations and U.S. legal requirements relating to early intervention, we would expect factors indicating child need to drive service utilization rather than demographic, economic, or geographic variables. However, a number of studies have found that age, gender, race, income, parent education, and income impact service utilization while indicators of child need did not. For example, Siller, Reyes, Hotez, Hutsman & Sigman (2014) found that child age and gender predicted service utilization, while autism severity and severity of global developmental delay did not. Siller et al. (2014) found that older children and males received more service hour per week. Further, income and parent education have been associated with greater service utilization (Irvin, McBee, Boyd, Hume, & Odom, 2012; Siller et al., 2014). Higher SES families may be more likely to select certain service types (i.e., ABA) over others and utilize private services – although this finding has varied in the literature (Irvin et al., 2012; Thomas, Ellis, McLaurin, Daniels, & Morrissey, 2007). Race has been associated with the amount and type of service accessed (Irvin et al.,

2012; Thomas, et al., 2007). For example, Irvin and colleagues (2012) found that White children received more occupational therapy and speech and language therapy compared to Hispanic children. Location – including the state of residence and area type may also predict service utilization (Stahmer & Mandell, 2007; Thomas, et al., 2007). Thomas et al., (2007) found that individuals in metropolitan areas had greater access to services.

Purpose of the Study

There is a persistent discrepancy between recommended treatment guidelines for young children with ASD and the actual services utilized. There are variations in service utilization and investigation regarding the variables that may contribute to differences in service utilization is an emerging area of research. Further, the extent to which parents are satisfied with these services is unclear. The majority of available research regarding this area largely includes older children and is not specific to experiences relating to early intervention services. Thus, the present study sought to add to the current body of literature regarding service utilization for young children with autism in the United States using data from an ongoing study investigating experiences of young children with ASD and their families in the Northwestern United States. Three research questions were addressed in this study: (1) What services are young children with ASD receiving? (2) What variables predict service utilization? (3) How satisfied are parents with the services their children receive?

Method

This study was part of a larger study investigating child, family, and community variables associated with early identification and treatment of ASD in the Northwestern United States. Child and family demographic data, family experiences surrounding accessing medical information and care, service and treatment utilization information, and child autism symptoms, adaptive behavior, and behavior problems were collected via in-home assessments and interviews with primary caregivers. This study was approved by the authors' Institutional Review Board (IRB protocol #08212011.072) and participating caregivers provided their written informed consent.

To be eligible for the study, the child (a) was 7 years old or younger, (b) had a prior diagnosis of ASD, and (c) lived with his or her primary caregiver for 1+ years. Recruitment of children and families occurred via early intervention agencies, early childhood education programs, and developmental evaluation clinics. Interested caregivers responded to invitation letters and contacted the research office. Participants were screened by telephone for eligibility.

Participants

Sixty families with a young child with ASD participated in the study. Table 1 displays child and family demographics. On average, children were 4 years old ($M = 53.78$ months; $SD = 14.55$). The majority of children (83.3%) were boys. Seventy percent of the sample identified as White/Caucasian, consistent with the demographics of the region from which the data were collected. The child's biological mother served as primary caregiver in 83.3% of families, with the majority of other primary caregivers being another female caregiver

(adoptive mother, $n = 9$, 15%; other female relative, $n = 1$, 1.7%), heretofore referred to as “mothers”. Mothers were an average age of 35.2 years and the majority (90%) was married or living with a partner. The majority of mothers (60%) had a high school diploma/GED equivalent or less. More than half of mothers (56.7%) did not work, with the remaining working either full-time or part-time. The majority of children (81.7%) had at least one sibling living in the home. The average household size was about 4 people ($M = 4.28$), and 78.3% of families qualified for some form of government aid or support. Families had a median income of \$30,000 ($M = 38,418$; $SD = 22,704$) and 28.3% of families fell below the U.S. Department of Human and Health Services poverty guideline.

Measures

Demographics and service history—A family demographics and service history questionnaire was created for this study and completed as an interview with the primary caregiver. A range of child and family demographic questions were included as well as the child’s current educational and therapeutic services. Parents reported how many hours per week children received services through educational placements, related services, and other therapies. Examples and descriptions of each service were provided to parents during the interview. Parents used a 5-point Likert-type scale to report on satisfaction with the child’s current services (1 = very dissatisfied; 3 = neutral; 5 = very satisfied).

Adaptive behavior—Research assistants administered the Survey Interview Form of the Vineland Adaptive Behavior Scales 2nd edition (Vineland-II; Sparrow, Cicchetti, & Balla, 2005) with the primary caregiver to assess the child’s adaptive functioning in the areas of communication, daily living skills, socialization, and motor skills. These domains are combined to yield an overall Adaptive Behavior Composite standard score, with a mean of 100 and standard deviation of 15.

Autism symptomatology—Research assistants administered the Childhood Autism Rating Scale – 2nd edition (CARS 2; Schopler, Van Bourgondien, Wellman, & Love, 2010) to rate children’s autism symptoms in 15 areas. Ratings on the CARS-2 are made on a 7-point scale reflecting numerical values of 1 to 4 (higher scores indicate greater impairment). Scores reflect the degree to which the child’s behavior deviates from that of a typically developing child of the same age. Scores on the 15 items are summed to form an overall score ranging from 15 to 60. Internal consistency reliability for the CARS-2 in the present sample was $\alpha = .87$.

Atypical behavior—Research assistants administered the Temperament and Atypical Behavior Scale (TABS; Bagnato, Neisworth, Salvia, & Hunt, 1999) to assess atypical behaviors considered to be developmentally inappropriate and challenging. The TABS is a 55-item checklist comprising four subtests: (a) Detached (20 items; $\alpha = .79$; example items include “acts like others are not there” and “tunes out or loses interest in what is going on”), (b) Hypersensitive/Active (17 items; $\alpha = .82$; example items include “mostly on the go or in high gear” and “almost always refuses to do what is told”), (c) Underreactive (11 items; $\alpha = .49$; example items include “shows no surprise to new events” and “doesn’t care when others are hurt”), and (d) Dysregulated (7 items; $\alpha = .64$; example items include “often cries

too long” and “doesn’t have a regular sleep schedule”). For each item, the caregiver is asked to indicate if the behavior is present or absent (rated as “yes” or “no”). In each subtest, items are summed to provide a raw domain score, which is then converted to a T-score ($M = 50$, $SD = 10$). Raw domain scores are summed to form the Temperament and Regulatory Index (TRI) or total raw score, which is converted to a standard score ($M = 100$; $SD = 15$). Higher raw scores and lower standard scores (or T-scores) are indicative of more atypical behavior. Internal consistency reliability in the present sample for the TABS TRI was $\alpha = .87$.

Data Analysis

Descriptive statistics were conducted to understand the demographic characteristics of the sample. Univariate analyses (Chi-square, independent samples t tests) were used to assess differences in service by child educational level. Bivariate correlations and linear regressions were used to examine relations among child and family characteristics, child service utilization, and parent satisfaction with current services.

Results

Services Received

Table 2 displays the educational and therapeutic services that children with ASD received. All but two children (96.7%) received special education and the majority (81.7%) received related services. For example, 60% of the sample received speech therapy and approximately 40% received occupational therapy (OT) and sensory integration. Far fewer children received physical therapy (PT; 8.3%), behavioral programming/ABA (21.7%) or DIR/ Floortime interventions (3.3%). Although 60% of the sample received speech therapy, there was some variability in the number of sessions received. On average, children received 1.10 ($SD = 0.64$) 30-min session of speech therapy per week. Of the 26 children receiving OT, the average number of 30-min sessions per week was 0.89 ($SD = 0.65$). Of the 5 children receiving PT, the average number of 30-min sessions per week was 1.22 ($SD = 1.58$). Thirteen children received ABA, with the average number of ABA hours per week being 8.61 ($SD = 2.36$).

On average, children in this sample received 13.17 total hours of educational and therapeutic services per week; however, this varied greatly depending on child grade level. Children in early intervention (birth to 3 years) received the fewest number of hours ($M = 3.16$) and children in 1st grade received the greatest number of hours ($M = 23.10$) of services ($F = 19.03$, $p < .001$). Beyond educational services, approximately one-quarter (26.7%) of the sample was reported to receive a special diet (e.g., gluten-free, casein-free) and nearly all (91.7%) children were reported to take vitamins or medications (see Table 2).

Predicting Total Service Hours

We investigated the extent to which child functioning and family demographic variables predicted total service hours provided per week to children with ASD. Table 3 displays results for the linear regression predicting total service hours per week. Children’s age, adaptive behavior functioning, atypical behavior, autism symptom severity, maternal education, and family income were entered in the regression. The model explained 49% of

the variance of total service hours per week, with child age, atypical behavior, and family income explaining unique variance. Older children, more atypical behavior, and higher family income were predictive of receipt of more total service hours per week.

Satisfaction with Services

Despite receiving few service hours, parents generally reported high satisfaction with their child's current services. For example, 80% of parents of children in early intervention, 72% of parents of children in early childhood special education/preschool, and 58% of parents of children in kindergarten reported being satisfied or very satisfied with the services that their child was currently receiving. On the other hand, 0% of parents of children in 1st grade reported being either satisfied or very satisfied with their child's services. In fact, parent satisfaction with services was negatively associated with both child age ($r = -.30, p = .02$) and total service hours received per week ($r = -.26, p = .04$). Parents were more satisfied with services when their child was younger. Younger children in this sample received fewer hours of service. Satisfaction was not related to other sociodemographic variables such as maternal education or family income.

Discussion

In our sample, children were identified with ASD early and the majority of children received special education and related services. Yet, the overall number of service hours per week received by the majority of children in the sample, were far below the number recommended for this population and was the lowest for our birth to 3 subsample. This is contrary to current practice recommendations and a strong body of literature indicating the importance of intervening early for this population. The types of services received include those with and without empirical support for this population. Atypical behaviors predicted the number of service hours received per week, although adaptive behavior and autism symptomatology did not. It is unclear what other factors were associated with service decisions for these children with ASD.

Almost all children in the present sample received special education and related services. However, consistent with other studies (e.g., Stahmer & Mandel, 2007), services included a mixture of those with and without empirical support. For instance, applied behavior analysis interventions were utilized by less than a quarter of the sample despite the fact that these interventions have the strongest empirical support for children with ASD (NAC 2009, 2015; NRC, 2001). Related services, including speech therapy, occupational therapy, physical therapy, and adaptive physical education, may support skill acquisition across a number of domains including social, communication, and motor skills. Unfortunately, evaluations regarding the effectiveness of these therapies is challenging because individuals providing these therapies may utilize approaches both with and without empirical support.

Approximately 40% of children received sensory integration therapy, 7% received play therapy, and 3% received DIR/Floortime. Sensory integration and DIR/Floortime are considered *unestablished* by the NAC (2015), while play therapy is not empirically supported for this population (NAC, 2015). The term *play therapy* in the colloquial sense may refer to many practices and information regarding the specific practices used was not

collected as part of the present study. Thus, the extent to which “play therapy,” as endorsed by parents in this sample, reflects a traditional play therapy approach is unclear. Roughly 18% of children received services from a one-to-one aide. Even though this suggests efforts to increase the intensity of services by reducing the staff-to-student ratios, the actual methods and quality of the supports provided to children in the sample is unclear.

Finally, just over a quarter of children received special diets (e.g., gluten-free, casein-free) and almost all children consume vitamins or medication. Presently, no diets or vitamins are approved to treat ASD, and the gluten-free/casein-free diets are considered *unestablished* by the NAC (2015). However, supplements like melatonin may be used to treat sleep disturbances that are commonly associated with ASD (Rossignol & Frye, 2014). Risperidone and aripiprazole are the only medications approved by the U.S. Federal Drug Administration for treating ASD. These medication address irritability but do not address the core symptoms of ASD (Blankenship, Erickson, Stigler, Posey, & McDougle, 2010).

Across age groups most children in our sample received fewer than the 25 hours per week recommended by the NRC (2001). Only seven children (11.67%) received 25 or more hours per week of services. Older children tended to receive more service hours per week on average. As children become school-aged, the location of their services starts to change and move away from more natural settings (i.e., home and community settings) toward more traditional school-based settings. A change in location of services combined with a longer school day associated with more traditional school-based settings, may explain this finding. Specifically, a longer school day in a school-based setting may provide greater access to services through increases in available instructional time with access to on-site service providers.

Although most children in our sample were identified early and were likely to receive early intervention services, children in the birth to 3 subsample received the fewest weekly service hours overall. There may be a number of considerations in accessing services that are unique to this age range. For example, services delivered in Part C (birth to 3) program may use a parent education model whereby the interventionists provide informational support to the parent who is then expected to provide direct intervention with the child across daily routines. Thus, there may be fewer hours of services provided by professionals in birth to 3 programs. In contrast, providers for school-aged children may be more likely to provide services in small group settings in the school context, thus increasing the number of hours of services provided by professionals. Given current practice standards, we would expect newly diagnosed children in the birth to 3 age group to receive intensive early intervention services for a minimum of 25 hours per week. However, in the present study, this subsample received an average of approximately 3 hours of services per week provided by professionals. To put this in perspective, this is about 12% of the 25 hours per week recommended by the NRC (2001).

In the present study, service utilization was not associated with adaptive behavior or autism symptomatology. Specifically, same-aged children with ASD were likely to receive the same number of service hours regardless of level of adaptive functioning and autism symptoms. However, children with more atypical behaviors, as measured by the Temperament and

Atypical Behavior Scales (TABS), received more service hours per week. Atypical behaviors that are developmentally inappropriate and challenging (e.g., throws or breaks things on purpose, bites/hits/kicks, difficult sleep patterns) may be more salient to caregivers and/or interventionists; thus, contributing to greater service utilization irrespective of adaptive functioning or autism symptomatology. Family income significantly predicted the number of service hours received per week, with higher income families reporting more service hours per week for their children. Under the provisions of U.S. special education law, children with disabilities are eligible for special education and related services at no cost. Thus, family income should not further contribute to inequities associated with poverty of other types of social disadvantage.

Despite receiving more service hours per week than younger children, parents of older children reported less satisfaction with services than parents of younger children. Moreover, parent satisfaction decreases as the number of service hours increased. Eighty-percent of parents of children receiving early intervention services in the birth to 3 subsample reported satisfaction ratings of either satisfied or very satisfied – even though they received 3 hours of services per week on average. This association between child age and parent satisfaction, despite increases in service hours associated with child age, is consistent with other studies (e.g., Spann, Kohler, & Soenksen, 2003). Parent satisfaction may relate to experiences unique to children's age, such as the nature and location of service delivery or changes in perceptions of their child over time. Provision of service in the home for young children may provide increased opportunities to engage with service providers, serving as an additional source of parental social support, and provide more opportunities for parents to directly participate in interventions. Further, increases in services as children age may be a source of parental stress, as parents may need to coordinate with a greater number of service providers. Bitterman, Daley, Misra, Carlson, and Markowitz (2008) suggest that parents may be satisfied with the program but report dissatisfaction with other aspects of service, such as access to typically developing peers. Taken as whole, global ratings of services may not be adequate to fully understand the nuances of parent satisfaction.

Limitations and Future Directions

There are several limitations that should be considered when interpreting findings from the present study. Respondents were sampled through only one geographic region and the sample size was relatively small, especially when examining differences between the age groupings. Further, consistent with the region sampled, the majority of respondents were White. Although findings from this study are generally consistent with other published studies, it is important to note that these results may not generalize to non-majority populations outside of the region sampled. Finally, findings of this study suggest a gap between research and practice; however, it was beyond the scope of this study to identify the mechanisms that contribute gap. It is unclear why these gaps persist; however, it's likely that multiple factors play a role, such as limited funding and resources to support more comprehensive intervention programs.

Limitations notwithstanding, the present study adds to the present body of literature regarding service utilization and young children with ASD, and suggests a need for future

research. Partnering with early intervention service providers, educators, and policy makers may be a prudent next step in gaining additional information in order to identify potential next steps to reduce these barriers. Some have suggested that policy makers should consider autism specific treatment models as a way to alter the landscape of services for this population (Stahmer & Mandell, 2007; Shattuck & Grosse, 2007). The heterogeneous nature of this population may prove challenging in effectively implementing this plan. We suggest that the individual child need should drive services. Models that are too prescribed may lead to one-size fits all treatment, rather a model of intervention driven by individual child need. Thus, a policy and practice recommendation may be to increase capacity of the service delivery system by increasing the number of well-trained intervention professionals and funding to support family access.

Despite not receiving the recommended intensity of services, parents of young children reported high levels of satisfaction. Certain features of the services not measured in the present study may contribute to parent satisfaction in ways that intensity does not, such as location of services (i.e., home versus school), frequency of interactions between parents and service providers, or the relationship quality between parents and service providers. Further, some parents may be more knowledgeable and experienced with support services, which may influence their satisfaction. Future research should more specifically examine aspects of interventions that directly contribute to this finding, and whether these aspects relate to child and family outcomes.

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References

- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed.. American Psychiatric Publishing; Arlington, VA: 2013.
- Bagnato, SJ., Neisworth, JT., Salvia, J., Hunt, F. Temperament and Atypical Behavior Scale: Early Childhood Indicators of Developmental Dysfunction. Paul H. Brookes Publishing; Baltimore, MD: 1999.
- Bitterman A, Daley TC, Misra S, Carlson E, Markowitz J. A national sample of preschoolers with autism spectrum disorders: Special education services and parent satisfaction. *Journal of Autism and Developmental Disorders*. 2008; 38:1509–1517. doi:10.1007/s10803-007-0531-9. [PubMed: 18228122]
- Blankenship K, Erickson CA, Stigler KA, Posey DJ, McDougle CJ. Aripiprazole for irritability associated with autistic disorder in children and adolescents aged 6-17 years. *Pediatric Health*. 2010; 4(4):375–387. doi:10.2217/phe.10.45. [PubMed: 21359119]
- Boyle CA, Boulet S, Schieve LA, Cohen RA, Blumberg SJ, Yeargin-Allsopp M, Kogan MD. Trends in the prevalence of developmental disabilities in US children, 1997-2008. *Pediatrics*. 2011; 127:1034–1042. doi: 10.1542/peds.2010-2989. [PubMed: 21606152]
- Centers for Disease Control and Prevention. Prevalence of autism spectrum disorder among children aged 8 years – Autism and developmental disabilities monitoring network, 11 sites, United States, 2010. *Morbidity and Mortality Weekly Report, Surveillance Summaries*. 2014; 63(SS02):1–21.
- Downs RC, Downs A. Practices in early intervention for children with autism comparison with the national research council recommended practices. *Education and Training in Autism and Developmental Disabilities*. 2010; 45(1):150–159.

- Elsabbagh M, Divan G, Koh YJ, Kim YS, Kauchali S, Marcín C, Fombonne E. Global prevalence of autism and other pervasive developmental disorders. *Autism Research*. 2012; 5:160–179. doi: 10.1002/aur.239. [PubMed: 22495912]
- Fenske EC, Zalenski S, Krantz PJ, McClannahan LE. Age at intervention and treatment outcome for autistic children in a comprehensive treatment program. *Analysis and Intervention in Developmental Disabilities*. 1985; 5:49–58. doi:10.1016/S0270-4684(85)80005-7.
- Hahler E, Elsabbagh M. Autism: A global perspective. *Current Developmental Disorders Report*. 2015; 2(1):58–64. doi: 10.1007/s40474-014-0033-3.
- Harris SL, Handleman JS. Age and I.Q. at intake as predictors of placement for young children with autism: A 4-to 6-year follow up. *Journal of Autism and Developmental Disorders*. 2000; 30(2): 137–142. doi: 0162-3257/00/0400-0137. [PubMed: 10832778]
- Irvin DW, McBee M, Boyd BA, Hume K, Odom SL. Child and family factors associated with the use of services for preschoolers with autism spectrum disorder. *Research in Autism Spectrum Disorders*. 2012; 6(1):565–572. doi:10.1016/j.rasd.2011.07.018.
- Lovaas OI. Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology*. 1987; 55(1):3–9. doi: 10.1037/0022-006X.55.1.3. [PubMed: 3571656]
- National Autism Center. National standards project, phase 1. Author; Randolph, MA: 2009.
- National Autism Center. Findings and conclusions: National standards project, phase 2. Author; Randolph, MA: 2015.
- National Research Council. Committee on Educational Interventions for Children with Autism. In: Lord, C., McGee, JP., editors. *Educating children with autism*. National Academy Press; Washington, DC: 2001. Division of Behavioral and Social Sciences and Education
- Odom SL, Boyd BA, Hall LJ, Hume K. Evaluation of comprehensive treatment models for individuals with autism spectrum disorders. *Journal of Autism and Developmental Disorders*. 2010a; 40:425–436. doi: 10.1007/s10803-009-0825-1. [PubMed: 19633939]
- Odom SL, Collett-Klingenberg L, Rogers SJ, Hatton DD. Evidence-based practices in interventions for children with autism spectrum disorders. *Preventing School Failure*. 2010b; 54(4):275–282. doi: 10.1080/10459881003785506.
- Peters-Scheffer N, Didden R, Korzilius H, Sturmey P. A meta-analytic study on the effectiveness of comprehensive ABA-based early intervention programs for children with autism spectrum disorders. *Research in Autism Spectrum Disorders*. 2010; 5(1):60–69. doi:10.1016/j.rasd.2010.03.011.
- Rogers SJ, Vismara LA. Evidence-Based comprehensive treatments for early autism. *Journal of Clinical and Adolescent Psychology*. 2008; 37(1):8–38. doi:10.1080/15374410701817808.
- Rossignol DA, Frye RE. Melatonin in autism spectrum disorders. *Current Clinical Pharmacology*. 2014; 9(4):326–334. [PubMed: 24050742]
- Schopler, E., Van Bourgondien, ME., Wellman, GJ., Love, SR. *Childhood Autism Rating Scale*, 2nd ed. (CARS-2). Western Psychological Services; Los Angeles, CA: 2010. doi: 10.1080/15374410701817808
- Shattuck PT, Grosse SD. Issues related to the diagnosis and treatment of autism spectrum disorder. *Mental Retardation and Developmental Disabilities Research Reviews*. 2007; 13:129–135. doi: 10.1002/mrdd.20143. [PubMed: 17563895]
- Siller M, Reyes N, Hotez E, Hutman T, Sigman M. Longitudinal change in the use of services in autism spectrum disorder: Understanding the role of child characteristics, family demographics, and parent cognitions. *The International Journal of Research and Practice*. 2014; 18(4):433–436. doi:10.1177/1362361313476766.
- Spann SJ, Kohler FW, Soenksen D. Examining parents' involvement in and perceptions of special education services: An interview with families in a parent support group. *Focus on Autism and Other Developmental Disabilities*. 2003; 18(4):228–237. doi:10.1177/10883576030180040401.
- Sparrow, SS., Cicchetti, DV., Balla, DA. *Vineland Adaptive Behavior Scales*. 2nd ed.. American Guidance Service; Circle Pines, MN: 2005.

- Stahmer AC, Collings NM, Palinkas LA. Early intervention practices for children with autism: Descriptions from community providers. *Focus on Autism and Other Developmental Disabilities*. 2005; 20(2):66–79. doi: 10.1177/10883576050200020301. [PubMed: 16467905]
- Stahmer AC, Mandell DS. State infant/toddler program policies for eligibility and services provision for young children with autism. *Administration and Policy in Mental Health Services Research*. 2007; 34(1):29–37. doi:10.1007/s10488-006-0060-4.
- Thomas KC, Ellis AR, McLaurin C, Daniels J, Morrissey JP. Access to care for autism-related services. *Journal of Autism and Developmental Disorders*. 2007; 37(10):1902–1912. doi: 10.1007/s10803-006-0323-7. [PubMed: 17372817]
- Warren Z, McPheeters ML, Sathe N, Foss-Feig JH, Glasser A, Veenstra-VanderWeele J. A systematic review of early intensive intervention for autism spectrum disorders. *Pediatrics*. 2011; 127(5): 1303–1311. doi: 10.1542/peds.2011-0426.
- Wise MD, Little A, Holliman J, Wise PH, Wang JC. Can state early intervention programs meet the increased demands of children suspected of having autism spectrum disorders? *Journal of Developmental and Behavioral Pediatrics*. 2010; 31(6):469–476. doi: 10.1097/DBP.0b013e3181e56db2. [PubMed: 20585267]

Table 1
Child and Family Demographics (N = 60)

Demographic	<i>n</i>	%
Child age in months – <i>M (SD)</i>	53.78 (14.55)	
Sex (Male)	50	83.3
Race		
White/Caucasian	42	70.0
Hispanic/Latino	3	5.0
Multiple	15	25.0
Grade		
Early Intervention (0 – 3 years)	10	16.7
Preschool	32	53.3
Kindergarten	12	20
1 st grade	6	10
Vineland-II standard score– <i>M (SD)</i>	71.88 (10.70)	
CARS-2 Total Score – <i>M (SD)</i>	39.12 (6.51)	
TABS Temperament & Regulatory Index – <i>M (SD)</i>	52.73 (5.87)	
Mother's age in years – <i>M (SD)</i>	35.23 (7.95)	
Father's age in years (<i>N</i> = 59) – <i>M (SD)</i>	37.63 (7.98)	
Mother's employment – <i>n (%)</i> employed	26	43.4
Father's employment – <i>n (%)</i> employed	51	86.4
Mother's marital status		
Married or living with partner	54	90.0
Household income/year in USD – <i>M (SD)</i>	\$38,418 (22,703)	
Child/family qualify for government aid	47	78.3

Note. CARS-2 = Childhood Autism Rating Scale – 2nd Edition. TABS = Temperament and Atypical Behavior Scale.

Table 2
Educational and Therapeutic Services Received (*N* = 60)

Service	<i>M</i> (<i>SD</i>)	<i>n</i> (%)
Total service hours/week	13.17 (7.60)	
Early Intervention (<i>n</i> = 10)	3.16 (1.56)	
Preschool (<i>n</i> = 32)	13.21 (4.74)	
Kindergarten (<i>n</i> = 12)	16.42 (5.19)	
1 st grade (<i>n</i> = 6)	23.10 (11.61)	
Receive special education		58 (96.7)
Receive related services		49 (81.7)
Speech therapy		36 (60)
Occupational therapy		26 (43.3)
Sensory integration		24 (40)
Physical therapy		5 (8.3)
Behavioral program/applied behavior analysis		13 (21.7)
DIR/Floortime		2 (3.3)
1:1 classroom aide		11 (18.3)
Adaptive physical education		1 (1.7)
Play therapy		4 (6.7)
Other		11 (18.3)
Receive special diet (e.g., gluten/casein free)		16 (26.7)
Receive vitamins or medications		55 (91.7)

Table 3
Linear Regression Results for Child and Family Characteristics Predicting Total Service Hours/Week ($N = 60$)

Predictors of total service hours/week received	B	Std Error	β
Child variables			
Age	0.36	0.06	0.69***
Vineland-2 ABC	0.09	0.09	0.13
TABS TRI raw score	0.25	0.12	0.30*
CARS-2 Total Score	-0.14	0.19	-.12
Family characteristics			
Maternal Education	0.16	0.40	.04
Family Income	0.90	0.39	0.26*

Note. CARS-2 = Childhood Autism Rating Scale – 2nd Edition. TABS = Temperament and Atypical Behavior Scale. Vineland-2 ABC = Vineland Adaptive Behavior Composite standard score.

* $p < .05$.

*** $p = .001$, $R^2 = .49$, $F = 8.49$, $p < .001$