Original Research Article

# Early Intensive Behavioral Intervention: Outcomes for Children with Autism after Three Years in Qatar

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**Abstract:** The number of children with Autism Spectrum Disorders (ASDs) has risen over the past decade. Different responsiveness to intervention programs suggests that improvement with timed treatment approach for all children with autism. The aim of study is to evaluate the effectiveness in practice of early intensive behavioral intervention employed in treatment of patients with ASD. A prospective multicenter cohort study was conducted in mental health centers scattered in Qatar State (July 2012 – July 2016). It included all children with ASD from both gender. Assessment consisted of a standardized interview; Autism Diagnostic Interview – Revised (ADI–R); Autism Diagnostic Observation (ADOS). Reliable change (the extent to which statistical factors can be ruled out as an explanation for apparent change) and clinically significant change (the extent to which change is also clinically meaningful). A 3-year prospective outcome was based on parent, self, and peer report of targeted symptoms confirmed with direct observation at the clinic. The collected data was spread on master sheet, entered computer and managed statistically using SPSS computer program version 21. A 140 cases with ASD were identified during the study period ((80.7%) males, and (19.3%) females). Their mean age was 7.3 years. The mean age of recognition of the symptoms by parents was 3.8 years. Sixty-seven percent demonstrated a reliable change to clinically significant change. Better outcome related to the child age (P=0.000). But not affected by gender (p=0.8). Treatment outcome was best predicted by age at presentation and early intervention.

**Keywords:** Autism Spectrum Disorders (ASD); behavioral treatment; Follow-up; Outcome; Children.

## INTRODUCTION

Autism spectrum disorder (ASD) is a lifelong developmental disability. It is estimated prevalence in different series is converging at around 1% [1-6]. To date, no comprehensive survey has been completed for the prevalence of autism in Qatar. A study is currently underway by Qatar Biomedical Research Institute (QBRI) with cooperation of the Cleveland Clinic and Oregon Science and Health University to find the prevalence of autism in Qatar. The study consists of two groups, individuals with a high probability of autism and individuals with a low probability of autism. The high-probability group was comprised of children aged 5 to 12 years who were enrolled in centers for autism and were evaluated using diagnostic tools such as the ADI™-R and the Autism Diagnostic Observation Schedule™. This phase of the study began in 2007 and will conclude in 2017. The low-probability group are children aged 5 to 12 years in primary school who will be screened using the Social Communication Questionnaire. This phase of the study began in 2014 and will conclude in 2017. If the children screened show signs of autism, they will be further evaluated using diagnostic tools.

In 1999, the first center for autism was established to provide services for students with developmental disabilities and autism. Currently, there are 11 centers for children with autism and other developmental disabilities in Qatar. The ages of students range from birth to 21 years. Services provided include the teaching of independence and social and academic skills. Some of the centers also provide complete support services including occupational therapy, physical therapy, speech and language, counseling, medical, behavior modification, and job training and placement [7].

Autism was first described by Dr. Leo Kanner in 1943 [8]. Diagnostic criteria for autism and related developmental disabilities came out in 1980, and they have been revised several times. At present, diagnostic criteria include deficits in social communication and social interaction and restricted, repetitive patterns of behavior, interests, or activities. Initial signs and symptoms typically are apparent in the early developmental period; however, social deficits and behavioral patterns might not be recognized as

symptoms of ASD until a child is unable to meet social, educational, occupational, or other important life stage demands. Functional limitations vary among persons with ASD and might develop over time [9]. Language delay is invariably present [1]. In addition to those diagnostic criteria, people with ASDs frequently have co-occurring conditions, such as intellectual disability, seizures, psychiatric co-morbidities (e.g., attention deficit/hyperactivity disorder (ADHD), anxiety), gastrointestinal conditions, and sleep disturbance [10]. Typically, autism is manifest by the time a child is three years of age and is life-long [10-12].

Most children with ASD receive at least some treatment in an educational setting, beginning with preschool. For children with ASDs, educational interventions often aim at promoting personal independence and social responsibility. Educational interventions have focused both on traditional areas of academic progression/achievement, as well as on addressing social, cognitive, and behavioral issues in classrooms or through specialized instruction. These interventions include the Treatment and Education of Autistic and Communication related handicapped Children (TEACCH) program, early intervention center- or classroom-based instruction, and computer-based approaches [13, 14]. Specialized support, training, and, in particular, early intervention can help give individuals with autism the tools needed to lead meaningful and productive lives [15].

Medical treatments for symptoms of ASDs comprise a variety of pharmacologic agents including antipsychotics, psycho-stimulants, and serotonin reuptake inhibitors (SRIs) that are generally intended to treat common co-morbidities of ASDs. Modalities such as therapeutic diets, supplements, hormonal supplements, immunoglobulin, hyperbaric oxygen, and chelating agents also have been employed to treat ASDs symptoms [13, 14].

The current study aimed to evaluate the effectiveness in practice of early intensive behavioral intervention employed in treatment of children with ASD in Qatar.

**MATERIALS AND METHOD**
This prospective multicenter cohort study was conducted in mental health centers scattered within the country, State of Qatar. The country's land area is 11,586 $km^2$ with about 2.5 million inhabitants.

All patients diagnosed to have ASD who attended and managed at the study centers during the period from July 1st 2012 to July $31^{st}$ 2016 were enrolled in our study after acceptance of a pre-given informed consent. The study was approved by the local research ethics committee, Qatar. Using predesigned questionnaire, general physical and mental and psychological assessment was performed to participants and then enrolled into an appropriate investigation.

Assessment consisted of a standardized interview; Autism Diagnostic Interview – Revised (ADI–R) [16] with the parent and a standardized observation; Autism Diagnostic Observation (ADOS) [17] with the child. The ADI–R and ADOS were administered by the researcher trained in the use of these instruments.

Reliable change (the extent to which statistical factors can be ruled out as an explanation for apparent change) and clinically significant change (the extent to which change is also clinically meaningful).

A 3-year prospective outcomes were based on parent, self, and peer report of targeted symptoms (e.g., anxiety, externalizing behaviors, social skills, peer relations) confirmed with direct observation at the clinic.

The collected data was spread on master sheet, entered computer and managed statistically using SPSS computer program version 21. Numerical data was expressed as a mean ± SD. The outcome was compared between groups using the Chi-square test. The confidence level was set at 95% CI and p values less than 0.05 were statistically considered significant.

**RESULTS**
A total of 140 cases with ASD were identified during the study period (113 males (80.7%), and 27 females (19.3%)). Their mean age ±SD was 7.3 ± 1.72 years (Range, 1-17 years). The majority 67.1% were from age group 6 to 10 years (Table 1).

Age of recognition of the symptoms by parents was varied with mean at 3.8 ± 1.9 years (Figure 1).

**Table-1: Age groups of Children with ASD**

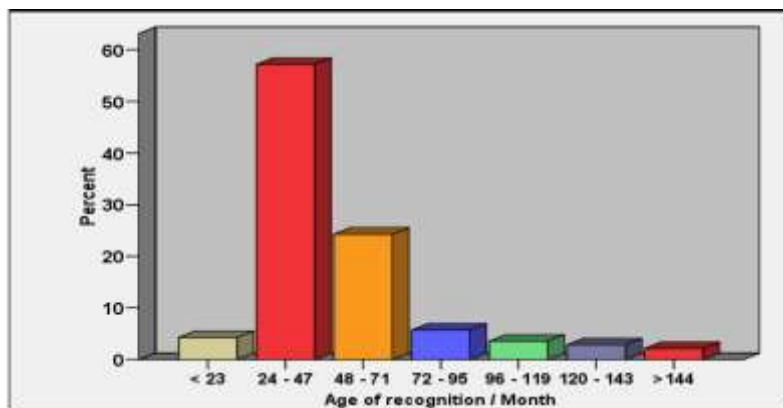| Gender age | No. | Percent |
|---|---|---|
| 1 — 5 | 26 | 18.6 |
| 6 — 10 | 94 | 67.1 |
| 11 — 14 | 15 | 10.7 |
| 15 — 17 | 5 | 3.6 |
| **Total** | **140** | **100.0** |

**Fig-1: Age of recognition of symptoms by their parents**

During follow-up, 67% of cases demonstrated a reliable change to clinically significant change (Table 2). Study found the better outcome in smaller age groups as there is significant statistical difference (P=0.000). Whereas, not affected by gender as the difference was statistically non-significant (p=0.8).

**Table 2: Outcome of management in children with ASD**

| Age group | Outcome | | | | |
|---|---|---|---|---|---|
| | **Clinically significant change** | **Reliable change** | **Poor changes** | **Very poor changes** | **Total** |
| 1 — 5 | 17 (65.4%) | 06 (23.1%) | 02 (7.7%) | 01 (3.8%) | 26 (18.6%) |
| 6 — 10 | 64 (68.1%) | 24 (25.5%) | 05 (5.3%) | 01 (1.1%) | 94 (67.1%) |
| 11 — 14 | 02 (13.3%) | 04 (26.7%) | 05 (33.3%) | 04 (26.7%) | 15 (10.7%) |
| 15 — 17 | — | 01 (20%) | 02 (40%) | 02 (40%) | 5 (3.6%) |
| **Total** | **83** (%) | **35** (%) | **14** (%) | **8** (%) | **140** |

## DISCUSSION

An increasing body of empirical research suggests that early, intensive, structured intervention, based on the principles of applied behavior analysis, is effective in remediating the intellectual, linguistic, and adaptive deficits associated with autism [18].

Follow-up studies published in the past decade have moved toward implementing more rigorous and quantifiable outcome criteria. Using these scoring scales, the study is in agreement with earlier studies [19].

Previous investigators have properly expressed concern regarding the unexplained outcome variability associated with early intervention research and have observed that pretreatment differences in child characteristics may offer some insight [20, 21].

The process of isolating these variables and their relationship to outcomes will enable professionals to match individual children to specific treatment programs. The exigent nature of early intervention requires that practitioners determine a priori which treatment is appropriate to a given child, thus maximizing the benefits for the entire population [21].

At the time of follow-up, we found that, the results were comparable to findings in previous literature, with 67% of cases demonstrating a satisfactory (a reliable change) to good outcome (clinically significant change), whereas, the remainder 33% had a *poor* to *very poor* outcome.

The early intervention research that has generated the greatest amount of interest has been Lovaas's Early Intervention Project [22].

## CONCLUSION

In the present study we demonstrated that the early intensive behavioral treatment program after 2 to 4 years of treatment achieved announced outcomes.

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