



# Outcome Study of Intensive Day Treatment for Children with Pervasive Developmental Disorders

Nazanin Alavi<sup>1\*</sup>, Nasreen Roberts<sup>2</sup>, and Elizabeth DeGrace<sup>2</sup>

<sup>1</sup>Department of Psychiatry, Queen's University, Kingston, Ontario, Canada

<sup>2</sup>Department of Child and Adolescent Psychiatry, Queen's University, Kingston, Ontario, Canada

\*Corresponding author: Nazanin Alavi, Department of Psychiatry, Queen's University, Kingston, Ontario, Canada, Tel: 6135332000; E-mail: [nazanin.alavi@queensu.ca](mailto:nazanin.alavi@queensu.ca)

Rec date: October 13, 2014; Acc date: Nov 17, 2014; Pub date: Nov 24, 2014

Copyright: © 2014 Alavi N, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Abstract

**Objectives:** a) To study the characteristics of children referred to day treatment for Pervasive Developmental Disorders (PDD). b) To study association between outcome and the variables understudy.

**Method:** This was a retrospective chart review of all children and adolescents with PDD, who attended a hospital based Day treatment program. Demographic data and variables such as type of community classroom they came from, Length of Stay (LOS), full scale IQ scores, DSM-IV Diagnosis and type of placement at discharge were extracted. Descriptive statistic was used for categorical data and multinomial logistic regression was used for association between outcome and variables understudy.

**Results:** There was an association between gender and outcome, females had better outcome than males. 2/3 of the patients with and without comorbidities had a significant reduction in behavioral symptoms allowing successful reintegration into community schools.

**Conclusions:** A proportion of children with Autistic Spectrum Disorder (ASD) present with severe emotional and behavioral dysregulation which are unmanageable. These children have multiple comorbidities and require more intensive longitudinal assessment by a skilled multidisciplinary team and specific evidence-based interventions to enable them to return to community school. Intensive Day treatment in a therapeutic classroom by skilled multidisciplinary staff reduces the impairing behaviors and allows families and schools to better manage these children.

**Keywords:** Pervasive developmental disorder; Day treatment; Child and adolescent

## Introduction

Autism was declared one of the five priorities in the Kirby report on Mental Health, Mental illness and Addiction services in Canada in 2006 [1]. The DSM-IV TR Classifies Autism, Asperger's Syndrome, Pervasive Developmental Disorders Not Otherwise Specified (PDD NOS) under the PDD [2]. The prevalence of these disorders is estimated at 60/10000 live births or 6% in children 3-17 years of age. Approximately 1 in 165 children have ASD[3]. The effects of ASD vary for each individual on the spectrum, for example in those who are "high functioning", social differences may be more disabling than any actual symptoms or problems caused by ASD. In others there may be severely disabling behavioral and communication problems. Intervention, treatments and services are fundamentally necessary for the majority of people with ASD, to help them reach their full potential. The right to reach one's full potential and to receive a meaningful education is often dependent upon the availability and accessibility of scientifically validated treatment. Access to individualized education coupled with effective treatment can greatly improve a person's quality of life, including their ability to learn communication and care for themselves.

Various interventions, alone or in combinations, are being investigated to examine the efficacy, reliability and validity of these interventions. Behaviorally-based programs have the largest body of published research and it has been shown that they are effective in helping children and adults, by teaching new skills in a step-by-step approach, enabling the individual to have more success at home, at school, at work, and out in the community [4,5]. However research has also demonstrated that, not all that we think works, affects outcome [6]. One such intervention is group based social skills development [7]. Social reciprocity deficits are a core feature of the autism spectrum disorders and group based social skills training programs abound. A review of all published studies of group based social skills interventions between 1985 and 2006, identified 14 studies which met the requirements developed by National Institute of Mental Health (NIMH) work group to study their effectiveness. This study revealed incomplete empirical support for this modality [8].

There is very little extant literature on the outcome of intensive day treatment for this population [9,10]. To address this gap to a small measure we undertook our study in hospital based classroom model, Day treatment program. The classroom had 8 places and referrals were primarily from schools through our outpatient clinics. The schools made referrals after having tried all other interventions, including in some cases their own autism class placement, which had failed to address the behavioral issues. The treatment team consisted of an Occupational Therapist (OT), psychologist, behavioral therapist and

Social Worker, all trained in assessing and treating this population, a full time teacher from the school board and a part time child and adolescent psychiatrist. The treatment team conducted a comprehensive assessment, reviewed diagnosis and medication and then developed individualized behavioral program, parent training and interventions such as focused adaptive technology and Applied Behavior Analysis (ABA) to facilitate change and gradual transition back to community schools. The average Length of Stay (LOS) ranged between 6 weeks to 4 months.

Day program was consisted of highly structured teaching, based on applied behavior analysis and positive behavioral support for managing behavioral problems. This program provided intervention and direct instruction, using ABA principles and procedures, in order to increase their cognitive and social abilities in the home, school and community. A psychologist, OT and behavioral therapist spent several hours with children every day to help the patients reach their potential in a positive, learning environment by using a team- based approach, individualized program planning and recreational activities.

## Method

This was a retrospective chart review of all children and adolescents who attended a hospital based Day treatment program from September 2000 to June 2010 and met criteria for DSM-IV-TR for ASD, Asperger's Syndrome or PDD NOS.

Demographic data included age, gender, caretaker, referral source. Data was extracted for other variables; type of class referred from and sent to at discharge, LOS, full scale IQ scores, DSM-IV diagnosis and outcome. Due to the small sample we divided the IQ into two groups, of average or above and below average. Outcome was rated as a) Good: return to full-time community school regular class with some support b) Fair: manageable in special class at community school and c) Poor: non return or not manageable in the classroom they were assigned to or had behavioral deterioration leading to either re-entry to Day treatment or inpatient ward. Descriptive statistic was used for categorical data and multinomial logistic regression was used for association between outcome and variables understudy.

## Results

There were 120 patients at the Day treatment program, from 2000 to 2010. Of these, 63 patients met the criteria for one of the PDD diagnoses.

**Age:** The average age of both girls and boys was 11 years; range was 7 to 15 year. 2 girls and 6 boys had more than 1 admission (12.6% readmission) in different academic years with different outcomes and are counted as separate admissions n=71.

**Gender:** There were 7 females and 56 males (Figure 1).

**Grade level at the time of admission to the program:** The largest referral rate was for grades 6 to 8 followed by grades 2 to 5 and the least for grade 9 to 10 (Figure 2).

**Living arrangement:** It is remarkable that none of the children were under the custody of Children's Aid or in foster homes and that 65 % of children lived with both biological parents and remainder with other family members.

**Intelligence:** Those who had come without intellectual assessments were tested using the Wechsler Intelligence Scale for Children-IV (WISC-IV). One's from the community who came with WISC-III,

were accepted as such. Forty eight had average or above average and 15 had IQ at below average.

**Outcome at discharge:** More than 2/3 of the children had a fair to good outcome, returning to full time school in various class settings. Only 19% had a poor outcome with unremitting problems and inability to return to full time community school attendance in any setting (Figure 3).

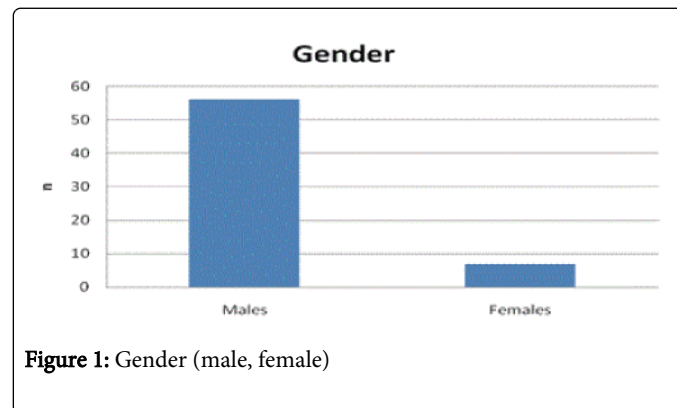


Figure 1: Gender (male, female)

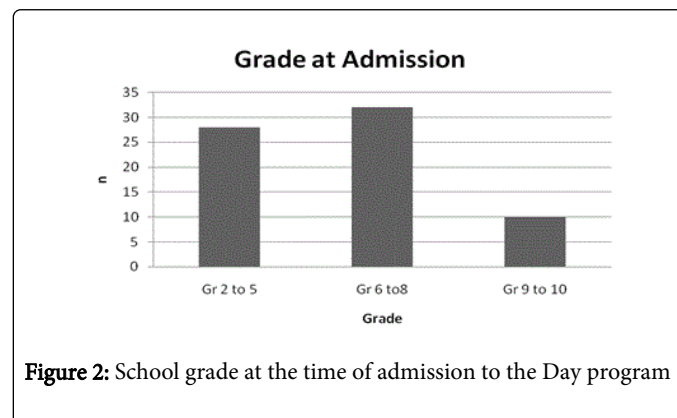


Figure 2: School grade at the time of admission to the Day program

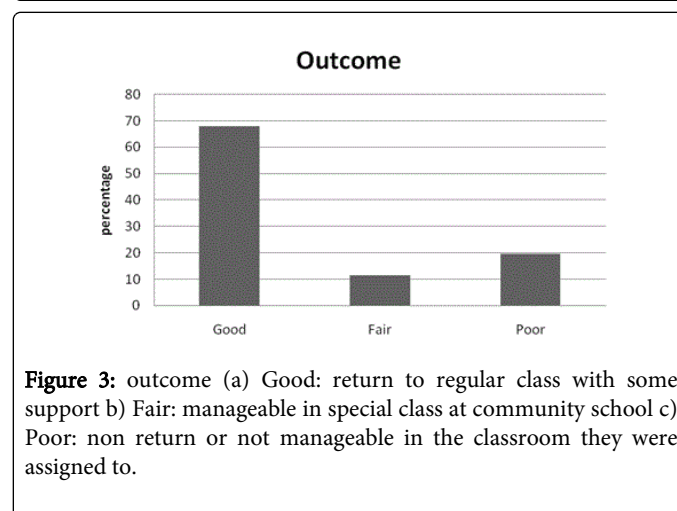


Figure 3: outcome (a) Good: return to regular class with some support b) Fair: manageable in special class at community school c) Poor: non return or not manageable in the classroom they were assigned to.

**Relationship between outcome and other variables:** An association was found between gender and outcome. A Multinomial logistic regression showed that females had a significantly better outcome compared to males ( $p=0.025$ ). However there was no association between outcome and age, caretaker, grade level, type of class, LOS

and IQ. (For age: p=0.6 For caretaker: p=0.16, For grade: p=0.74, For class: p=0.17, For LOS: p=0.21, For IQ: p=0.71) (Table 1).

Fair vs. Poor	B (SE)	Lower	Odds Ratio	Upper
Intercept	-22.05(4.06)			
Age	.42(.71)	0.39	1.53	6.06
Grade	-.41(.69)	0.17	0.66	2.57
LOS	-.21(.16)	0.59	0.81	1.11
Gender	18.45(.00)	1.03	1.03	1.03
Caretaker	1.09(.77)	0.65	2.98	13.59
Class	1.33(.79)	0.81	3.81	18.02
IQ	.66(.87)	0.35	1.93	10.75
Good vs. Poor				
Intercept	-18.99(5.01)			
Age	-.63(.98)	0.08	0.53	3.65
Grade	.39(1.004)	0.21	1.48	10.58
LOS	.182(.197)	0.81	1.2	1.76
Gender	20.92(.00)	1.21	1.21	1.21
Caretaker	-1.07(1.17)	0.03	0.34	3.42
Class	.95(.92)	0.43	2.6	15.73
IQ	-.26(1.24)	0.07	0.77	8.83

**Table 1:** relationship between outcome and age, grade, LOS, gender, caretaker, class and IQ

## Discussion

Pervasive developmental disorders bring children to the psychiatric services most frequently due to the social behavioral problems that cause significant impairment in interpersonal functioning and pose problems for the management in the school setting; these problems may result in exclusion from school and other social situations. Thus both early recognition and effective sustained interventions to ameliorate symptoms and behaviors, such as pharmacotherapy, special education, speech/communication therapy, and behaviour modification is necessary [11-13].

This retrospective study provides support for the recommendations made by Volkmar et al. [11] that, provision of sustained special educational setting, pharmacotherapy, intensive behavior intervention and social communication skills have a significant positive outcome for these children and adolescents. It is also apparent from the distribution of grade level at entry into the day program that schools and families try hard to address these problems prior to approaching psychiatric intervention. Further, that school based autism classroom may not be able to manage some of these children without additional education from specialized psychiatric multidisciplinary teams. We speculate that if we intervened earlier, at grade 2 to 5, we would reduce the numbers presenting at grade 6-8, as it is apparent that after that sharp rise in grade 6 to 8, very few children presented in grade 9-10 for the first time.

Our study didn't show any association between either caretaker or IQ with outcome, which suggests that the outcome was more related to being involved in structured teaching and a relationship-based approach to learning. Therapists carried out the intervention toward individualized goals for each child, and worked collaboratively to improve how the children were responding socially and communicating.

About 80% of the children had a fair to good outcome, returning to full time school in various class settings which suggests that children improve in functioning with intensive intervention, although there was no association between outcome and length of treatment.

## Limitation

This is a retrospective chart review of a small sample size, based on records which were for clinical purposes rather than systematic data for research. Thus discrepancies such as using different versions of the WISC and using Autism Diagnostic Observation Schedule (ADOS) [14], Behavior Rating Inventory of Executive Function (BRIEF) [15] and SWANN [16] only for later admissions, occurred in our study.

In addition our study showed that females had a significantly better outcome compared to males, however this conclusion may be biased due to the unequal gender distribution in our sample.

## Conclusion

There is a significant impact on the daily functioning of a child who presents with moderate to severe behavioral problems. Addressing these problems early, would reduce the amount of time lost and the burden of suffering for the child and the family. As it is evident from this small study, a large proportion of moderate to severe impairment can become manageable both at home and in school. Our future research will look at the results from our dedicated PDD classroom in a community school which has replaced our hospital based classroom.

## References

1. Kirby MJL (2006) "Out of the Shadows at Last- Transforming Mental health, Mental illness and Addiction services in Canada" chapter 6: 137-156.
2. American Psychiatric Association (2000) Diagnostic Statistical Manual of Mental Disorders -IV TR.
3. Fombonne E, Zakarian R, Bennett A, Meng L, McLean-Heywood D (2006) Pervasive developmental disorders in Montreal, Quebec, Canada: prevalence and links with immunizations. *Pediatrics* 118: 139-150.
4. Magiati I, Charman T, Howlin P (2007) A two-year prospective follow-up study of community-based early intensive behavioral intervention and specialist nursery provision for children with autism spectrum disorders. *the Journal of Child Psychology and Psychiatry*. 48: 803-812
5. Cohen H, Amerine-Dickens M, Smith T (2006) Early intensive behavioral treatment: Replication of the UCLA model in a community setting. *Journal of Developmental and Behavioral Pediatrics*. 27: 145-155.
6. Francis K (2005) Autism interventions: a critical update. *Dev Med Child Neurol* 47: 493-499.
7. Rao PA, Beidel DC, Murray MJ (2008) Social skills interventions for children with Asperger's syndrome or high-functioning autism: a review and recommendations. *J Autism Dev Disord* 38: 353-361.
8. Williams White S, Keonig K, Scahill L (2007) Social skills development in children with autism spectrum disorders: a review of the intervention research. *J Autism Dev Disord* 37: 1858-1868.

9. Sverd J, Dubey DR, Schweitzer R, Ninan R (2003) Pervasive developmental disorders among children and adolescents attending psychiatric day treatment. *Psychiatr Serv* 54: 1519-1525.
10. Bryson SE, Rogers SJ, Fombonne E (2003) Autism spectrum disorders: early detection, intervention, education, and psychopharmacological management. *Can J Psychiatry* 48: 506-516.
11. Volkmar F, Cook EH Jr, Pomeroy J, Realmuto G, Tanguay P (1999) Practice parameters for the assessment and treatment of children, adolescents, and adults with autism and other pervasive developmental disorders. *American Academy of Child and Adolescent Psychiatry Working Group on Quality Issues. Journal of American Academy of Child and Adolescent Psychiatry* 38: 32-54.
12. Baghdadli A, Picot MC, Michelon C, Bodet J, Pernon E, et al. (2007) What happens to children with PDD when they grow up? Prospective follow-up of 219 children from preschool age to mid-childhood. *Acta Psychiatr Scand* 115: 403-412.
13. Burd L, Kerbeshian J, Westerland A, Labine J, Barth A, et al. (2002) Prospective long-term follow-up of patients with pervasive developmental disorders. *J Child Neurol* 17: 681-688.
14. Lord C, Risi S, Lambrecht L, Cook EH, Jr., Leventhal BL, et al. (2000) The Autism Diagnostic Observation Schedule–Generic: A Standard Measure of Social and Communication Deficits Associated with the Spectrum of Autism. *Journal of Autism and Developmental Disorders* 30.
15. Gioia GA, Isquith PK, Guy SC, Kenworthy L (2000) Behavior rating inventory of executive function. *Child Neuropsychol* 6: 235-238.
16. Swanson JM, Schuck SP, Miranda M, Carlson C, Hartman C, et al. (2012) Categorical and dimensional definitions and evaluations of symptoms of ADHD: history of the SNAP and SWAN Rating Scales. *The International Journal of Educational and Psychological Assessment* 10.