

## A Comparative Study on the Attributes of Social Inclusion, and Physical Health of Autistic Children

Bhawna Singh

### ABSTRACT

**Aim:** The study aimed to examine the attributes of physical health and social inclusion of students' opinions toward a peer with autism. **Method:** 42 school students with autism disorder were selected in this research and divided into 3 groups based on their age. Their physical health and social inclusion were assessed using Actical® accelerometer and social inclusion assessment tools, respectively. The responses were recorded and analyzed for any statistical significance. **Result:** A statistically significant disparity was found between the average amount of time spent physically active at moderate to vigorous intensities and the average amount of time spent sitting or lying down. Children diagnosed with ASD later in life are less likely to engage in any kind of physical activity than their younger counterparts. Students who were perceived as shy by their peers were more likely to be rejected socially. High levels of prosocial behavior, as judged by parents, also predicted high levels of social acceptability in comparison to students, but low levels were predictive for students with ASD. **Conclusion:** The current research offers a preliminary foundation for comprehending the processes that may be used to provide a supportive social environment for middle school adolescents with autism disorders and their classmates.

**Keywords:** *Autism spectrum disorder, Children, Developmental issues, Physical health, Social inclusion.*

### INTRODUCTION

With an early beginning and a tendency to cause delays in reaching developmental milestones, autism spectrum disorder (ASD) is one of the most common developmental diseases of infancy and adolescence. The term ASD refers to a wide range of cognitive- and neurobehavioral disorders that are characterized by three groups of symptoms: (1) social interaction problems, (2) verbal and nonverbal communication problems, and (3) stereotyped, repetitive, and constrained patterns of behavior, interests, and activities. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) was updated by the American Psychiatric Association to include the following new diagnostic criteria: Currently, ASD includes autistic disorder, childhood disintegrative disorder, Asperger disorder, and pervasive developmental disorder-not otherwise specified [1,2]. ADHD, anxiety disorders, mood disorders, oppositional defiant, and conduct disorders are among the mental comorbidities that are often present in people with ASD. ASD often has a lifetime negative influence on physical, mental, social, and intellectual development, which in turn impairs the well-being of people with ASD, even with early intensive behavioral therapies that have demonstrated great results. Psychosocial impairments, such as poor social skills (e.g., eye contact), diminished social competence (e.g., peer connections), and restricted social-emotional reciprocity, may affect many facets of daily functioning in children and young people with ASD [3].

Although research exploring the socioemotional consequences of inclusion have had mixed findings,

individuals with ASD are often included in classes. Peer training and other programs have helped children with ASD develop their communication, interpersonal, and play skills, communication, and adaptive behavior among young children with ASD have significantly improved [4]. However, some research has shown negative socioemotional effects, such as poorer confidence levels, a higher level of loneliness, and more frequent drug use compared to peers who are usually developing. Children in mainstream programs with disabilities also reported having fewer intimate relationships, a more unfavorable perception of their bodies, and worse social standing assessments than their counterparts without disabilities [5]. This research based on the attributes of social, and physical health with a focus on autism disorders.

### METHODOLOGY

#### Participants

Forty-two school going students were chosen from a city of northern India. These kids were split up among 3 settings and subsequently they were divided into 3 groups based on their age (8-10 years, 11-14 years, 15-17 years). Before the research session, participants and parents gave their informed permission. The institutional review board of the university's policy was followed in all processes.

#### Physical health assessment

Body weight, height, waist circumference, and BMI of all the participants were recorded. The physical activity was assessed using the Actical® accelerometer

<sup>1</sup> Chirag Special School, Cantonment Board Agra

throughout seven-day during a week. The participants were still in school when the data was gathered. The monitor was attached to the participant's right ankle with an elastic band, and they wore it throughout all awake hours of the day. All activities other than swimming, showering/bathing, and sleeping were recorded. A journal was given to the participants' parents or guardians so they could note any instances in which the monitor was not worn.

**Social involvement assessment**

Two tools were used to identify the social inclusion of autistic children with other classmates

**A sociometric assessment:** This measure was developed to evaluate “how keen children are to make friends with their classmates at school. Children were asked to rate how much they like working with each classmate at school. Children received a list of their classmates' names. There were four response options next to each name: a question mark (to indicate any classmates they don't know well enough to judge how much they like to work with them), a happy face (indicating that they would be happy to work with them), a neutral face (indicating that they don't care whether they work with them or not), and a sad face (indicating that they would prefer not to work with them). By dividing the total number of ratings in categories other than "don't know" by the number of happy faces obtained for each participant, an index of acceptance was produced”. Similar calculations were made using the quantity of disappointed faces received as an indication of rejection.

**“Guess Who: Social Behavior & Bullying Measure”:** Children were invited to name one person in their class who exhibited each of the behaviors listed below as part of an unlimited nomination peer evaluation exercise.

‘Disrupts’ – When in a group, this individual has a tendency of making things messy. They are selfish and insist on having things done their way.

‘Co-operates’ – This individual is a great addition to your organization since they are cooperative and amiable. They participate, share, and pass it over to everyone.

‘Shy’ - With other kids, this individual is bashful; they seem to constantly be working or playing by themselves. Getting to know this individual is challenging.

‘Seeks help’ – This individual is always seeking assistance. Before they have put in a lot of effort, they seek for assistance.

The percentage of classmates who nominated each kid as fitting each of the four descriptions was calculated using these four descriptors.

**STATISTICAL ANALYSIS**

In order to perform the analysis, SPSS 25.0 was used. At first, the participants were split into three groups based on their ages (8-10 years, 11-14 years, and 15-17 years), however since no differences were detected between the 11-14- and 15–17-year-old groups, the data from both were pooled. Between the two groups, an average amount of time (measured in minutes), spent engaging in physical activity was recorded. A threshold of  $p < 0.05$  was chosen as a cutoff to determine significant findings in two-tailed analyses.

**RESULT**

The physical activity reduction criteria and autism diagnosis per parental report qualified 52 individuals for this research. However, 10 children were excluded from analysis due to an incomplete SRS or an SRS score within the normal range. A total of 42 autistic children satisfied the inclusion criteria for this research.

**Demographic characteristics**

Table 1 provides descriptive information about the children included in this cross-sectional study. Preliminary data analysis showed no statistically significant variations in physical activity by IQ, degree of autism, or gender. Because of this, the ensuing study used data from both sexes. We employed analysis of covariance (ANCOVA) with the duration of Actical monitor usage as the co-variate due to the fact that subjects wore the device for varying durations of time. Mean monitor use time varied throughout the day (daily total 17.6 hours; in school total 5.3 hours; after school total 1.9 hours; evening 5.1 hours).

Table 1. Demographic Characteristic		
Characteristics	Group 1	Group 2
Waist circumference	69.30(±13.47)	81.88 (±17.96)
BMI	19.42 (±4.32)	23.52 (±6.03)
weight	40.14(±14.66)	62.36(±21.16)
height	141.7 (±10.90)	158.8 (±9.29)
Gender	M = 14 F = 4	M = 18 F = 6
SRS (Social responsiveness scale)	Mild to moderate = 10 severe = 32	Mild to moderate = 12,
BMI (percentile)	64.81(±29.96)	65.17(±32.9)

**Time spent in physical activity**

Variations in moderate-to-vigorous physical activity were found to be significantly different before ( $p < 0.01$ ), throughout ( $p < 0.05$ ), and after ( $p \leq 0.001$ ) the school day, and in the evening ( $p < 0.05$ ). Using an analysis of covariance, we found that sedentary physical activity differed significantly by time of day: overall ( $p \leq 0.001$ ), at school ( $p \leq 0.001$ ), after school ( $p \leq 0.001$ ), and in the evening ( $p \leq 0.001$ ) (table 2).

**Table 2.** Mean time spent in physical activity

Activity	Group 1	Group 2	P value
Evening moderate to vigorous	40.48±30.64	25.99±33.16	<0.001
In school moderate to vigorous	48.23±21.90	35.10±17.93	<0.01
Total moderate to vigorous	131.57±84.23	90.02 ±97.89	<0.05
After school moderate to vigorous	17.32±8.77	10.28±7.07	<0.001
Evening sedentary	186.51 ±38.41	221.98±50.11	<0.05
After school sedentary	63.47±15.38	75.30 ±12.27	<0.001
In school sedentary	178.98 ±33.39	218.38±44.09	<0.001
Total time sedentary	666.67 ±107.17	789.16 ±113.51	<0.001

**Peer assessments on behavioral measures as a predictor of social inclusion**

Six hierarchical regression analyses were performed to determine whether or not the behaviors assessed by peers had an impact on their acceptance or rejection by their contemporaries. To begin, we used regression analysis to look at how four peer-rated Guess-Who descriptions were related to how well someone was liked by their peers. The data set included the four characteristics mentioned above as well as the group status (ASD = 1 and comparison = 0). Two-way interaction keywords were then included in step two (peer-rated factors x group status). Using social rejection as the criterion variable followed the same procedure.

**Peer-Rating of Behavior**

**Social Acceptance**

There was a substantial major influence of peer-rated behavioral traits in the analysis where “Guess Who scores” were included to predict social acceptability (F =26.32, adjusted R<sup>2</sup> =.74). The concept relies heavily on two factors: cooperation and timidity (Table 3). Cooperation was positively correlated with acceptance, whereas shyness was negatively correlated with acceptance. The following step, including interaction terms, did not improve the model in any way.

**Social Rejection**

Peer-rated behavior substantially predicted social rejection (F=11.49, p<0.001; adjusted R<sup>2</sup> =0.39). Collaboration was the sole important variable contributing to this model, and it showed that a lower degree of cooperation was linked to higher levels of social rejection (Table 3). The peer-rating of shyness interacted with membership in the group to produce a significant impact (F=4.99, p=.03; adjusted R square =.04). We used a strategy for interpreting interactions between categorical and continuous variables to get insight into the nature of the interaction. For the control

group, shyness strongly predicted social rejection, with a .91 standard deviation increase for each unit increase in the shyness rating. There was no statistically significant correlation between ‘shy’ and social rejection in the ASD population.

**Table 3.** Multiple regression analyses predicting social acceptance and social rejection by peer-ratings of behavior (Guess Who)

Social Acceptance				
Predictor	beta	t	df	R <sup>2</sup>
Disrupts	-.10	-1.07	26.32	0.74
Co-operates	.60	7.66		
Shy	-.25	-2.57		
Seeking help	-.01	-0.06		
Group Status	-0.12	-1.40		
Social Rejection				
Disrupts	.18	-1.07	11.49	0.39
Co-operates	-.41	7.66		
Shy	.06	-2.57		
Seeking help	.11	-0.06		
Group Status	.26	-1.35		
Shy x Group Status Interaction	-.55	-0.06	4.99	.04

**DISCUSSION AND CONCLUSION**

The findings of this research suggest that children with autism become less active as they become older. Both reduced levels of moderate-to-vigorous physical activity and elevated levels of sedentary physical activity show this trend. It would indicate that the children with autism in our group are getting the recommended amount of exercise. Decreases in physical activity were more noticeable in children with autism as they got older, and this finding provided light on why these kids don't move as much as their younger counterparts. Furthermore, significant disparities in mild to intense physical activity patterns after school were discovered; these findings, like those of Pan and Frey's (2006) research [8], point to the need of after-school enrichment activities. However, programs that incorporate longer bouts of physical activity are also warranted for further investigation, as small amounts of moderate to vigorous physical activity were obtained during the after-school time frame, with the youngest age group being significantly more active in the immediately following school hours.

The lowest age group, on average, spent 17 minutes engaging in moderate to strenuous physical exercise after school, while the oldest group averaged only 10 minutes. The fact that neither age group spent even a minute each day engaged in intensive physical exercise is cause for alarm. There is evidence that children with autism benefit behaviorally from physical exercise, beyond the health advantages [9, 10]. In particular, intense physical activity seems to have a greater impact on children with autism's stereotypy and self-stimulatory behavior. In order to reap the advantages associated with artificial exercise environments, it is essential to develop programs that encourage more intense bouts of physical activity in a more natural setting.

Consistently beneficial results may be shown with physical exercise therapies for children with autism; nevertheless, the data is limited, making judgments difficult to establish. 18 studies were reported in a recent evaluation of physical activity programs, however only 64 people in total received an intervention [9]. There is a vacuum in the research and an urgent need to address such crucial weaknesses, as shown by the staggering prevalence of obesity among children with autism and the scarcity of descriptive and intervention-based studies on physical activity.

Peer assessments of a person's conduct were used in multiple regression analyses to identify factors that significantly predicted inclusion or exclusion from social groups. Both 'beneficial' and 'costly' activities were hypothesized to predict students' levels of social acceptance and rejection. The opposite pattern of behavior was hypothesized to indicate impending social exclusion.

In predicting social acceptability, the Guess Who peer evaluation measures did not vary across groups. Both groups' social rejection was correlated adversely with cooperation, but only the comparison students' extreme shyness was positively correlated with social rejection. Peer-reported shyness was not significantly associated with social rejection among students with ASD. Students with ASD are more likely to be identified as shy than their typically developing peers or peers with additional special educational needs, according to research conducted by Frederickson et al. (2007) [11]. It is possible that children on the autism spectrum have their generally asocial characteristics labeled as "shy" and that this label, together with the difficulties it creates, leads to special accommodations.

Peer evaluations reveal no substantial correlations with disruptive actions, which is an unexpected finding. Peer-rated disruptiveness on the Guess Who has been linked to socioeconomic position in several prior research [12]. The level of disturbance, as reported by parents, teachers, and peers, is rather low in this data set. This is consistent with findings of high rates of social difficulties, emotional issues, but not behavioral problems, among students with ASD [13]. The suggested practice of putting kids with ASD in peaceful, well-behaved classrooms may explain the comparably low levels of disturbance seen in the mainstream comparator group [14].

There are several inferences that may be made from the current results. The ability to work with others has emerged as a key indicator of whether or not a youngster would be accepted or rejected in their peer group. Social skills training has been extensively supported as an essential way of increasing social acceptability and effective inclusion and is therefore a common

component of intervention programs for kids with ASD. We argue that schools should feel comfortable implementing social skills programs that are not specifically tailored to their students' needs and that, instead, focus on encouraging cooperative conduct. To take advantage of their classmates' apparent readiness to downplay qualities like 'shyness,' however, schools may also strive to supplement such programs by expanding knowledge of ASD among mainstream children.

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