

Assessing Social Skills of Children Diagnosed with Autism Spectrum Disorders in India: A Pilot Study

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ABSTRACT

Introduction: The prevalence of Autism is increasing now-a-days in India so there is an evident need to develop early intervention programs targeting social-communication and behavioural skills of children with Autism Spectrum Disorders (ASD) that are applicable in the Indian setting. However, a lack of adequate measurement of social skills, hampers the evaluation of effectiveness of such programs.

Aim: To evaluate the correlation between Social Skills Rating Scale (SSRS) and Indian Scale for Assessment of Autism (ISAA) and to find out the validity of SSRS in Indian children.

Materials and Methods: The present study was an observational study. Fifty children diagnosed with ASD between 3-6 years

as per the DSM-V criteria were recruited from March 2016 to February 2017. Social Skills were assessed on SSRS and severity of autism was assessed on ISAA. Pearson correlation coefficient were calculated between seven subdomains of SSRS and total score of ISAA to evaluate the validity of SSRS.

Results: A significant negative correlation was found between Social Skills and total score of ISAA ($r=-0.61$, $p<0.01$) and positive correlation between problem behaviours and ISAA total score ($r=0.60$, $p<0.01$).

Conclusion: The study concluded that SSRS may be used to assess the social skills of children with ASD in Indian setting.

Keywords: Early intervention, Indian setting, Indian scale for assessment of autism, Problem behaviours

INTRODUCTION

In recent years, diagnosis of ASD has become a routine in any child development centre or children hospital. A current year study has estimated presence of approximately 1.7-2.0 million children with ASD in India [1]. However, another Indian study estimated over 10 million persons with autism [2]. ASD is characterised by severe and pervasive impairments in social-communication skills along with repetitive and stereotyped behaviours. As awareness has increased for this developmental disorder, the children with autism are getting easily screened out even before the age of 18 to 24 months [3,4]. Furthermore, these children demonstrate social skills deficits and behavioural symptoms that single them out from their typically developing counterparts in their initial preschool days.

The children with ASD may either be too lost in themselves or may become highly energetic and socially intrusive. Mainstream teachers generally do not have necessary skills to manage these problems and there is also a general lack of resource persons and special education teachers specifically trained in the field of autism [2]. The professionals specialised in other fields tend to overlook ASD specific needs and work on them as any other disability. The children with ASD in particular, have social skills deficits, which of course, cannot be intervened without the help of effective social skills training programme. Hence, there is an urgent need to develop training programmes for these children that can be easily implemented by rehabilitation professionals. Published literature suggests for early intervention of social-communication skills of the children with ASD [5-9]. It has been observed that the early interventions not only increase socio-adaptive behaviours but also improve long-term neuro-developmental circuits by normalising brain activity [6]. Quartz SR et al., suggested that a period of synaptic density occurs around age of 3 years in which new neural circuits are constructed and pruning of unused circuits is held. However, this developmental step is believed to be highly dependent on the environmental inputs [10].

Since the core deficit in children with ASD is socialisation, one of the emerging targets is to identify social skills deficits in children with ASD [11]. Most of the Indian intervention studies relied on observation of child's behaviours in natural settings to assess the effectiveness of the therapy [12,13]. However, naturalistic behavioural observations have been considered as one of the primary methods to assess social skills of children [14-16]. Behavioural observation methods can be costly and time-consuming for Indian settings. Moreover, these methods are also prone to errors and biases [15,17]. Previous studies have observed promising empirical evidences of using behaviour rating scales to assess social skills of children [15,18]. Behaviour rating scales are generally filled by the parents or teachers who on the daily basis, observe the child across multiple settings and people. The scales apparently require less time in administration and amount of time goes in learning of scale administration is also comparatively less [19]. Previous studies have reported improvement in behaviours other than target social behaviours as part of social skills training [20-23]. Some of the rating scales also assess other important behaviours/skills, which individuals may learn directly or indirectly during the intervention.

It is suggested that use of standardised and socially valid rating scales would help in evaluating efficacy of the intervention programmes [24,25]. There are many assessment tools available for assessment of social skills like- Autism Social Skills Profile [26], Assessment of social and communication skills for children with autism [27], social responsiveness scale-2 [28], profile for social difficulty [29], behaviour assessment system for children, second edition [30]. However, we do not have any such social skills rating scale specific to Indian population.

Therefore, the present study attempted to assess social skills of children with autism with the help of SSRS [31]. Convergent validity was also calculated between ISAA and autism-specific domains of SSRS.

MATERIALS AND METHODS

The present study was an observational study in which social skills of children with ASD were assessed. The duration of the study was one year from March 2016 to February 2017 and it was a part of doctoral thesis entitled, "Effectiveness of video modeling on social skills of children diagnosed with Autism Spectrum Disorders". The Board of Research Studies, University of Delhi, India, approved the above-mentioned doctoral topic in year 2014. The present study followed ethical considerations. Parents were given complete information about the research and informed consent was also obtained from them.

Participants

Fifty children diagnosed with ASD on the basis of DSM-5 criteria [32] were included in the present study. The inclusion criteria of selecting participants were children in the age range between 3-6 years diagnosed with ASD. Mild to moderate level of autism severity and Developmental Quotient (DQ) ranging between moderate to below average level were also considered as inclusion criteria of the study. The exclusion criterion was children diagnosed with any other comorbidity such as Cerebral Palsy, seizure disorder, auditory or visual deficits. The participants were recruited from three special schools located in National Capital Territory of India. A competent rehabilitation team consisting of a clinical psychologist, occupational therapist, speech therapist, and special educator confirmed the diagnosis of ASD.

Tools Used

Developmental Screening Test (DST) [33] was used to assess developmental functioning. It is a well-established Indian tool to measure child development from birth to age 15. It gives an overall score, i.e., DQ.

Autism severity was assessed on ISAA [34]. ISAA is an Indian standardised tool developed for the purpose of assessment and certification of individuals with autism by Indian Government. It has 40 items assessing six domains: social relationship and reciprocity, emotional responsiveness, speech-language and communication, behaviour patterns, sensory aspects and cognitive component. It has three forms, i.e., parent, teacher, and self-forms. The items are scored on likert scale and severity of autism is categorised as mild (70-108), moderate (109-153), and severe level (more than 153). Criterion test validity of ISAA with Childhood Autism Rating Scale-2 (CARS-2) was 48.03. Test-retest reliability of ISAA was $r=0.83$, $p<0.001$. Sensitivity and specificity of test to differentiate ASD from controls were 96.3% and 100%, respectively. SSRS [31] is an international tool to assess social skills and problem behaviours for 3-18 years. It covers 7 domains of social skills (Communication, Cooperation, Responsibility, Engagement, Self Control, Assertion, and Empathy) and four domains of problem behaviors (Externalising, Bullying, Internalising, and Hyperactivity/Inattention). The scale also gives an ASD specific score, i.e., Autism Spectrum Raw score that includes Social Skills Autism Spectrum and Problem Behaviours Autism Spectrum. The scale has sound psychometric properties, excellent internal consistency with coefficient $\alpha=0.874$, and cross cultural validity of 69.9 [35]. The current study used only parent form. Interviews of parents (both the parents/single parent) and observation of children were used to score the tools. The assessment of each child took approximately two hours. Only raw scores of the scales (ISAA and SSRS) were used for the study.

STATISTICAL ANALYSIS

IBM SPSS Statistics (version 25.0) was used for statistical analysis. Pearson correlations were calculated between the domains of ISAA and domains of SSRS.

RESULTS

The age range of participants was between 39 months to 76 months. The mean age of the participants was 59.4 months. Total number of females was 15 and males were 35 in number. The range of DQ was from 50 to 79, i.e., mild to borderline level of developmental functioning were included. The mean DQ was 61.56. Mean severity of autistic symptom was 84.26 on ISAA. Severity of autism was considered from mild to moderate level [Table/Fig-1].

	Mean	SD	Range
Age (months)	59.46	11.38	39-76
DQ	61.56	10.43	50-79
ISAA total	84.26	12.08	61-119
Social skills	34.54	16.59	11-85
Problem behaviours	21.76	7.00	10-44

[Table/Fig-1]: Characteristics of participants including observed sample mean, standard deviation, and range of the variables.

Social skills and problem behaviours were assessed on Social skills rating scale (SSRS); DQ: Developmental quotient as measured on Developmental schedule test (DST)

Correlation between ISAA and SSRS

The total score of ISAA was significantly negatively correlated ($r=-0.61$, $p<0.01$) with social skills of SSRS and positively correlated ($r=0.60$, $p<0.01$) with problem behaviours as assessed on SSRS. Further, six domains of ISAA were also found to be significantly correlated with social skills and problem behaviours as evaluated on SSRS [Table/Fig-2].

	Social skills scale [†]	Problem behaviours	ASD-Total	SS autism spectrum	PB autism spectrum
Social skills		-0.55**	-0.77**	-0.85**	-0.52**
ISAA-Total	-0.61**	0.60**	0.72**	0.61**	0.69**
SR	-0.56**	0.48**	0.65**	0.61**	0.54**
ER	-0.41**	0.49**	0.59**	0.45**	0.60**
Speech-Lang	-0.54**	0.40**	0.57**	0.57**	0.47**
Behav pattern	-0.43**	0.44**	0.58**	0.43**	0.60**
Sensory aspects	-0.36**	0.23	0.46**	0.33*	0.50**
Cognition	-0.24	0.41**	0.40**	0.28*	0.43**

[Table/Fig-2]: Correlation between domains of ISAA and SSRS.

ISAA Total: Indian scale for assessment of autism-total score; SR: Social relationship and reciprocity; ER: Emotional responsiveness; Speech Lang: Speech, language and communication; Behav Pattern: Behavioural patterns; [†]Social Skills: Social skills as measured on social skills improvement system (SSIS); Problem Behaviours: Problem behaviours as measured on SSIS; ASD Total: Autism spectrum total score; SS Autism Spectrum: Social skills autism spectrum; PB Autism Spectrum: Problem behaviour autism spectrum; *significant at 0.05 level (2-tailed); **significant at 0.01 level (2-tailed)

ISAA total autism score also obtained significant correlations (range, $r=-0.35$ to -0.56) with seven domains of social skills scale of SSRS. A sub-domain of ISAA, i.e., Sensory Aspects was significantly correlated only with three subdomains of social skills (Communication, Assertion, Empathy) and Cognition subdomain of ISAA was correlated with only two subdomains of social skills (Assertion and Responsibility). The cognitive component of ISAA assesses attention and concentration, delayed response, unusual memory, and savant skills. The social skill of self-control obtained significant correlation with only two subdomains of ISAA (Social Relationship and Reciprocity and Speech, Language and Communication). The self-control skill has seven items on SSRS. Most of self-control items were related to the reaction of individuals in situations like getting hit/teased/criticised by others. The study assumed that self-control would have significant correlation with emotional responsiveness of ISAA, which also evaluates reactions to the situations. But a very low correlation was found between the two. Otherwise, self-control shared significant correlation ($r=-0.35$, $p<0.05$) with total autism score on ISAA [Table/Fig-3].

	Comm	Coop	Asser	Respons	Emp	Engage	Self ctr
ISAA-Total	-0.56**	-0.56**	-0.54**	-0.47**	-0.40**	-0.53**	-0.35*
SR	-0.55**	-0.55**	-0.44**	-0.39**	-.038**	-0.56**	-0.31*
ER	-0.40**	-0.40**	-0.33*	-0.30*	-0.32*	-0.37**	-0.17
Speech	-0.51**	-0.51**	-0.46**	-0.37**	-0.33*	-0.46**	-0.40**
Behaviour	-0.34*	-0.34*	-0.37**	-0.30*	-0.37**	-0.40**	-0.26
Sensory	-0.37**	-0.37**	-0.49**	-0.23	-0.32*	-0.21	-0.21
Cognition	-0.20	-0.20	-0.31*	-0.38**	-0.04	-0.22	-0.14

[Table/Fig-3]: Correlation between domains of ISAA and subdomains of Social Skills scale, SSRS.

ISAA Total: Indian Scale for assessment of autism-total score; SR: Social relationship and reciprocity; ER: Emotional responsiveness; Speech Lang: Speech, language and communication; Behav Patr: Behavioural patterns; Sensory: Sensory aspects; Social skills subscales of SSIS (Comm: Communication; Coop- Cooperation; Asser: Assertion; Respons: Responsibility; Emp: Empathy; Engage: Engagement; Self Ctr: Self control); *significant at 0.05 level (2-tailed); **significant at 0.01 level (2-tailed)

Correlation between ISAA and Autism Specific Scores of SSRS

Total autism score of ISAA was also positively correlated with autism specific social skills and autism specific problem behaviours of SSRS ($r=0.61$, $p<0.01$; $r=0.69$, $p<0.01$), respectively. The high correlation values ($r=0.28$ to 0.72) also established convergent validity of ISAA and its subdomains with autism specific social skills scale and problem behaviours scale of SSRS [Table/Fig-2].

DISCUSSION

The present study suggested that social skills training programmes may use SSRS to identify social skills deficits and tailor their programmes according to the specific needs of children in Indian settings. SSRS provides an overview of the social skills and behavioural problems present or absent in the children at minimal expenses, in less time, and also provide practical utility. The ratings would be less biased because the primary consumers of these programmes, i.e., parents and teachers mark the responses on the scale.

SSRS has been used extensively in pharmacological and behavioral treatment studies of typically developing children with behavioural problems [36-38]. Some of the intervention studies on ASD have also shown changes in social skills scores of SSRS [39,40]. Few studies did not find SSRS sensitive to find differences between pre- and post-intervention scores [41].

We also measured convergent validity between domains of ISAA and ASD specific domains of SSRS. Similarly, a study [42] found that CARS was negatively correlated ($r=-.45$, $p<0.01$) with Socialisation scale of Scales of Independent Behaviour-Revised (SIB-R) [43] and also had negative correlation ($r=-0.58$, $p<0.01$) with socialisation skills of Vineland Adaptive Behavior Scales- Classroom Edition (VABS) [44]. Previous literature also demonstrated correlations between problem behaviour and autistic symptoms [45,46]. Atypicality subscale of Behavioural Assessment System For Children Second Edition, BASC-2 was significantly correlated with the externalising scale of Autism Spectrum Disorder-Problem Behavior for Children (ASD-PBC), $r_s=0.48$, $p<0.01$ [46]. The atypicality subscale was also significantly correlated with the internalising scale of ASD-PBC, $r_s=0.51$, $p<0.01$ [46]. Chen KL et al., [45] found small correlation (ranging from $r=0.32$ ~ 0.49 , $p<0.005$) between Social Responsiveness scale-2, SRSTM- 2. [28] and Childhood Autism Rating Scale (CARS) in children with autism. The study concluded that both the tools measure different behaviours and collect data from different sources. Social skills scale of BASC-2 had obtained negative correlation (-0.81) with autism spectrum scale of SSRS [46].

ISAA was primarily developed to identify and assess severity of autism in Indian population. However, it had low agreement with CARS, i.e., Kappa coefficient 0.14, minimal acceptable value ≥ 0.4 [47]. This tool was found useful in routine clinical setting [48]. It is an ISAA a freely available tool and requires minimal training.

Moreover, it is an indigenous scale that is available in multiple regional languages of India. It also has satisfactory psychometric properties. Mukherjee SB et al., found construct validity of ISAA acceptable ($r=0.8$ - 0.89) only in two domains of ISAA, i.e., Social and Emotional domains; and sub-optimal validity (≤ 0.5) was found in the other four domains of ISAA [47]. However, the present study obtained significant correlations between domains of ISAA and autism specific scale of SSRS [Table/Fig-2]. We could not administer CARS, otherwise, we might have compared the results of SSRS with respect to these two tools (CARS and ISAA).

According to Freeth M et al., ASD should be characterised by impairment in socialisation and communication across cultures [49]. However, the observed manifestations of these deficits, i.e., behaviours may vary in nature or intensity across cultures. Gosh and colleagues elaborated that genetic influences, cultural and environmental differences also effect pattern of socio-communication deficits [50]. There is a lack of knowledge on behavioural manifestations of ASD among Indian children diagnosed with Autism [50]. During the administration of SSRS, we asked the parents to give examples pertaining to social skills given in the SSRS. This was done to understand how do Indian parents perceive various social skills. For example, an item on SSRS was based on the understanding of other's feelings. The parents' responses on the items were child would fetch water for mother; ask others about their feelings like sadness; request mother to sit near fan when she feels hot after cooking in the kitchen, etc., On the item eliciting child's reaction when teased by others, parents told that children often complaint to parents or teachers, or children would tell the others not to do it. This was done to understand whether parents were able to relate with the social skills items of SSRS.

LIMITATION

The current study was an observational study that was conducted to assess the feasibility of using SSRS in the Indian setting. We could not establish the validity of SSRS on Indian population due to small sample size. However, the significant correlations between subdomains of SSRS and ISAA suggested utility of the tool in the absence of any standardised Indian tool for social skills assessment. Moreover, SSRS is not a freely available tool. The authors required it for their future research purpose. It was observed viable to first assess the tool on a small sample size before using it on a larger sample size. Validity of the SSRS on Indian population may be established in future. The study also suggests urgent need of an Indian scale to social skills of children with ASD.

CONCLUSION

A lack of adequate measurement of social skills for Indian children diagnosed with ASD led to the conceptualization of the present study. It may be concluded that SSRS can be used to assess social skills and problem behaviours of children with ASD in Indian setting.

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