Life Span and Disability XXII, 1 (2019), 29-53

Social development of children with mild and moderate Intellectual Disabilities at special schools in India

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Abstract

Background: The effects of a social skills training on the social development of children with mild and moderate Intellectual Disabilities (ID) at an Indian state (Jammu) J&K was studied.
Procedure:, Seventy children with mild and moderate ID fulfilling inclusion and exclusion criteria were divided into control and experimental groups, thus forming four non-equivalent groups. A non-randomized, pre-test/post-test control group design was applied. Vineland Social Maturity Scale was administered as a pre-test. Intervention in social skills training included eight social skills, each skill being taught for three weeks in 60-minute daily sessions. After twenty-four weeks, all the skills were practiced for additional eight weeks (total 32 weeks). Post-tests were administered to all groups by researchers at the completion of the intervention.
Results: ANCOVA analysis indicated that adjusted $F_{(1, 31)} = 238.012$, $P = .000$ *in children with mild Intellectual Disabilities, and* $F_{(1, 33)} = 44.014$, $P = .000$ *in children with moderate Intellectual*

Received: May 31, 2018; *Revised:* March 31, 2019; *Accepted*: April 15, 2019
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The authors report no conflicts of interest.

Disabilities were significant at .01 level. The effect size of the social skills training intervention turned out to be large in children with mild Intellectual Disabilities, and moderate in children with moderate Intellectual Disabilities. Therefore, we assumed that social skills training adopting different teaching strategies from Applied Behavior Analysis is a practical, feasible and effective intervention tool for improving social development among children with mild and moderate Intellectual Disabilities in special school settings.

Keywords: Intellectual Disabilities; Social development; Applied Behavior Analysis; Intervention; Social skills.

1. Introduction

Social skills strictly relate to successful social interactions and healthy social relationships (Garrote, Dessemontet, & Opitz 2017). These skills help building satisfying relationships and receiving positive feedbacks (Geldard & Geldard, 2008). The basic priority for the inclusion of children with Intellectual Disabilities (ID) in community schools is the provision of educational interventions that are focused on the enhancement of social skills (Maria & Nikolaos, 2017). Impairment in social functioning is often associated to Intellectual Disabilities as well as to the diagnosis of mental retardation (American Psychiatric Association, 2000; American Association on Mental Retardation, 2002). Individuals with ID show impaired social skills (Smith & Matson, 2010), which often present with delays in effective communication and social interactions, with impairments being detected across communication partners (Alwell & Cobb, 2009; Carter, Sisco, Chung, & Stanton-Chapman, 2010). Lack of social skills limit opportunities for meaningful social interaction, acceptance by peers, and classroom performance (Siperstein, Parker, Norins Bardon, & Widaman, 2007). Deficits in social skills have been associated to more severe ID and problems in verbal and nonverbal communication (Dagnan, 2007). Individuals with ID often have difficulties in making and sustaining friendships, and their friendship is often characterized by less warmth and closeness and less positive reciprocity, as compared to the friendships of normally developing peers (Tipton, Christensen, & Blacher, 2013). This inability has been attributed to poor social skills development (Tipton *et al.*, 2013). There is a significant relationship between the measures of social maturity scale and the IQs of those children (Kumar, Singh, & Akhtar, 2009). Therefore, research literature has always put an accent on the relevance of social skills deficits, which are defined as the inability to learn various social skills or the inability to use previously acquired social skills in appropriate situations and settings which are common among individuals with Intellectual Disabilities (McCoy & Hermansen, 2007). Given the importance of social skills for young individuals with Intellectual Disabilities to succeed in their adulthood (Steiner, Silverman, Karnik, Huemer, Plattner, Clark *et al.*, 2011), interventions were focused on participation and ability to cope in the community, with positive outcomes in improving their social skills (Kam, Greenberg, & Kusché, 2004; Murray & Doren, 2013; Kim, Blair, & Lim, 2014). Social skills training, including social skills instructions and peer support, demonstrated to have a significant

effect on young people with Intellectual Disabilities (Kam *et al.*, 2004; Domitrovich, Cortes, & Greenberg, 2007; Murray & Doren, 2013; Kim *et al.*, 2014), since this kind of training has the potential to increase the probability of successful interaction, independence, and social competence of pupils with Intellectual Disabilities within school settings (Kam *et al.*, 2004).

Children learn social skills to perform effectively in school settings (Steedly, Schwartz, Levin, & Luke, 2008), therefore, different innovative ideas for teaching social skills have been developed and included in learning curricula to support learning (Kim *et al.*, 2014).

Different teaching strategies and social skills have been used by researchers to teach social skills to children with ID. Effective strategies that can modify the social behavior of students with Intellectual Disabilities are increased cooperation skills (working in groups, and doing homework in groups) and the use of models (modeling) (Christakis, 2011). Role-playing, video modeling, and photo-based directions are some of the methods being adopted in social skills training for children with ID (Kam *et al.*, 2004; Hammond & Whatley, 2010). Ar, Kiliç and Yarpuzlu (2008) assessed the success and efficacy of the training practices for the acquisition of basic personal hygiene skills and proper behaviors for hand washing and body care, using forward chaining, backwards chaining and complete skill training methods in a group of thirty participants with Intellectual Disabilities receiving care and special education at a drop-in daycare/special education service. Mechling (2008) focused on teaching personal safety skills to persons with Intellectual Disabilities and identified six areas of instructions: pedestrian/street crossing safety; home accident prevention; application of first aid (including identification and reporting of illnesses); response to lures or advancements of strangers; fire safety; and emergency use of telephones.

Although a higher proportion of persons with ID live in low and middle-income countries (Mckenzie, McConkey, & Adnams, 2013), there is little evidence-based intervention research in the field of ID that focus on improvements in these settings. There are studies from different developed and developing countries supporting the social skills training for children with Intellectual Disabilities. Bates (2006) studied the effectiveness of interpersonal skills training on the communication skill acquisition of sixteen children with moderate and mild ID, through instructions in the introduction and small talk, providing play materials and interacting with children during play. Tekinarslan and Sucuoglu (2007) found that cognitive-

process approach based on social skills program was effective on learning and generalizing three social skills (apologizing, coping with teasing and avoiding inappropriate touching) of nine students with Intellectual Disabilities. Alavi, Savoji and Amin (2013) assessed the effects of social skills training on the aggression of children with Intellectual Disabilities: the experimental group received social skills training for two hours, and then performances were compared in the pre-test and post-test sessions. Pasha and Gorjian (2010) examined the effects of social skills training on social development by administering Vineland's social development scale to seventy persons with Intellectual Disabilities in a pre-test/post-test design. Olcay Gul (2016) investigated the effects of an intervention using computer-presented video modeling and social stories with three persons (males) with Intellectual Disabilities (aged 20 to 25 yrs) in teaching social skills. Author reported that all participants acquired the targeted social skills with a 100% accuracy and that these skills turned out to be preserved over time, and generalized in other situations and social interactions. Al-Qahtani and Al-Juda (2018) studied the effects of mobile application for the development of social skills, such as communication skills and behavioral skills for students with Intellectual Disabilities in a quasi-experimental design in a pre-test post-test control group design and reported that communication skills and behavioral skills improved and had statistically significant value in post-test and follow-up. Yakubova and Taber-Doughty (2013) recruited three students with autism for a series of social skills through the use of video modeling and verbal prompting, one student at each intervention session, for an overall period of three weeks. Pasha and Gorjian (2010) indicated that there were significant differences between experimental and control groups in social development and total scores relating to behavioral disorders and concluded that adaptable behaviors in children with educable Intellectual Disabilities could increase social development and decrease behavioral disorders. Alavi and colleagues (2013) also indicated a positive effects of social skills training on decreasing aggression of children with Intellectual Disabilities. Salomon (2000) reported a positive effect of social skills training to develop social relations in a four-year-old child with ID. Daly and Kinsella (2014) focused on the design, implementation and evaluation of a Social Skills Training (SST) program for adults with ID through a model of counseling frequently used by school psychologists and concluded that counseling represents an effective model of service-delivery when applied to a service for Intellectual Disability. Salomon (2000) also reported that one of the most effective treatment methods for these children was

playing games and training social skills. O'Handley and colleagues (2016) evaluated the effects of the Superheroes Social Skills program; they found that all children demonstrated substantial improvements in skill accuracy in both settings, with teacher ratings of social functioning (O'Handley, Ford, Radley, Helbig, & Wimberly, 2016). Adeniyi and Omigbodun (2016) concluded that the social skills of pupils with ID improved significantly during the 8-week training with Explore social skills curriculum; the social skills levels of participants were assessed by Matson evaluation of social skills for individuals with severe retardation (MESSIER) at baseline and immediately after the intervention. Karra (2013) studied achievements in social skills by children with ID using survey method on a sample of 150 children (aged 5 to 10 yrs) through the six domains (Attachment, Interaction, Initiation, Cooperation, Self-management and Social Play) of the Social Skill Rating Scale (SSRS).

In recent years, particular emphasis has been put on the need to help these individuals to acquire certain social skills in order to prepare them for social life. There are about one thousand special schools for children with Intellectual Disabilities in India, most of which are managed by non-governmental organizations. Social Skills are important for teaching functional academics, community living and vocational skills to children with Intellectual Disabilities (Karra, 2013). Special schools in India provide training in basic skills, such as dressing, washing, etc. to help children improve self-esteem, extra-curricular activities and develop occupational skills. These children are unable to perform various functions such as communicating and socializing with others, and, in many instances, even looking after themselves. The educational programs focus on functional academics, daily living skills, and vocational training, although little emphasis is put on social development. Therefore, this research study aims to analyze the effects of social skills training intervention on the social development of children with mild and moderate Intellectual Disabilities, using teaching strategies adopted from Applied Behavior Analysis. The hypothesis tested in the present research were:

1. There are no significant differences in the social development adjusted mean scores either in the experimental or the control groups of children with mild Intellectual Disabilities, having the Pre-social development as the covariate;
2. There are no significant differences in the social development adjusted mean scores either in the experimental or the control groups of

children with moderate Intellectual Disabilities, having the Pre-social development as the covariate;
3. There are no significant differences in the effect size of the social skills training intervention in children with mild and moderate Intellectual Disabilities;
4. There are no differences in the socio-economic status of children with mild and moderate Intellectual Disabilities selected for intervention in social skills training.

2. Material and methods

2.1. Research Design

Pre-test post-test control group, quasi-experimental design was used in this research. Participants were divided into experimental and control groups. Participants were not randomly matched within groups, due to the little sample sizes. Indeed, more troubling children, when out of their daily-living context, might have biased the effectiveness of the intervention. So, the sampling procedures were rather strict, and the sample being investigated was therefore small, as compared to that in probability sampling. Children with mild and moderate Intellectual Disabilities fulfilling the selection criteria were divided into experimental and control groups, thus forming four non-equivalent groups. After the formation of the groups, a random procedure was used to include children either in experimental or controlled conditions.

2.2. Ethical considerations

Ethical approval was obtained from the Department of Education, University of Jammu. The permission from the head of the institutions was granted to conduct research. Parents were assured that the identities and personal information of their children would remain confidential during the reporting of the study. The study procedure was explained in detail through information sheets to the legal guardians who then signed the consent forms.

2.3. Criteria for sample recruitment and participants (sample characteristics) for the intervention in social skills training

Seguin Form Board Intelligence test was administered individually to all the children attending five special schools in Jammu District, Jammu & Kashmir State of India, to determine their Intelligence Quotient (IQ). The procedure adopted was in compliance with the directions and guidelines of Seguin Form Board Test manual. On the basis of their IQ scores, children with Intellectual Disabilities were categorized into mild, moderate and severe Intellectual Disability groups, based on the International Classification of Diseases-10 criteria (World Health Organization, 1992). The first group included 70 children with mild and moderate ID (34 with mild ID and 36 with moderate ID; Tab. 1). Children from Asha Tiger School for Mentally Retarded and Sahara Special School for Mentally Challenged Children were assigned to experimental groups and given intervention in social skills training, whereas the children in Jeevan Dhara – St. John's Health Centre, Rotary Inner wheel – and Sahyog India were assigned to the control groups. At baseline, only 70 children, out of 75, completed the intervention, as 3 children were unable to continue the research period due to health problems and 2 left the school. Children selected met both inclusion and exclusion criteria.

- Inclusion criteria
  1. Children of both genders, aged 6-17 years.
  2. Children with mild and moderate Intellectual Disabilities as established by an IQ test.
  3. Children who could follow instructions and perform social skills training program safely.
  4. Children attending special schools five days a week, 5 hours a day.

- Exclusion criteria
  1. Children with cerebral palsy and multiple disabilities.
  2. Children with severe and profound Intellectual Disabilities (due to their inability to follow intervention procedures).
  3. Children who were on antidepressant or sedative medication.
  4. Children who had severe behavior disorders or destructive behavior judged by teachers or caregivers as being at risk.

Table 1 - *Sample distribution – Children with mild and moderate Intellectual Disabilities recruited for intervention in social skills training*

ID Level	Group	Male	Female	Total
Mild	Control	13 (10*,3***)	07 (7*)	20
Mild	Experimental	6 (6*)	08 (7*, 1*)	14
Moderate	Control	9 (6*,3***)	06 (5*, 1**)	15
Moderate	Experimental	14 (11*,1**, 2***)	07 (5*, 2***)	21
Total		42	28	70

Note: * Children with ID only; ** Autism; *** Down Syndrome

Table 2 - *Age, IQ, and socioeconomic status scores of children recruited for intervention in social skills training*

ID Level	Group		*N*	*M*	*SD*
Mild	Control	Age (yrs)	20	13.66	3.14
		IQ	20	58.85	4.82
		Socioeconomic status	20	60.10	4.91
	Experimental	Age (yrs)	14	12.13	2.99
		IQ	14	57.40	3.42
		Socioeconomic status	14	64.50	7.21
Moderate	Control	Age (yrs)	15	12.61	2.92
		IQ	15	42.57	3.22
		Socioeconomic status	15	53.20	16.76
	Experimental	Age (yrs)	21	11.47	2.22
		IQ	21	41.16	3.21
		Socioeconomic status	21	64.23	10.21

Table 3 - *Socioeconomic status of children with mild and moderate Intellectual Disabilities recruited for intervention in social skills training*

Socioeconomic status	Children with mild ID		Children with moderate ID		Total
	Control	Experimental	Control	Experimental	
High	–	–	–	–	–
Above average	–	–	–	4.7%	1.4%
Average	30.0%	71.4%	33.3%	61.9%	48.6%
Below average	70.0%	28.6%	46.7%	28.6%	44.3%
Poor	–	–	20.0%	4.8%	5.7%

In the control group, 11.4% of the sample represented the urban area, whereas 88.6% represented the rural area. In the experimental group, 100% of the sample represented the urban area. So, a total of 55.7% of the sample came from urban areas, whereas 44.3% came from rural areas.

2.4. Development of an Intervention Sheet for social skills training

Parents, teachers, and caregivers were asked to suggest their ideas for the social skills training of children with Intellectual Disabilities during their group interactions. An Intervention Sheet was drafted after studying available literature related to social skills and teaching strategies adopted by special schools at national and international level. Among Indian publications reviewed, there were Social Skills (Narayan & Kutty, 2001), Behavioral Assessment Scale For Indian Children-Mental Retardation (Domestic-Social) (Peshawaria & Venkatesan, 1992), Vineland Social Maturity Scale (Bharathraj, 1992).

After integrating suggestions from parents, caregivers and teachers, different social skills identified were categorized into eight domains such as: Interactional skill, Introducing skill, Friendship making skill, Phoning the relatives, Cleanliness skill, Health safety and security, Aggression control and Cooperative playing skill.

The pre-final version of the Sheet was discussed once again in a group session with caregivers, teachers and the heads of the special schools. The session was moderated by the researcher. Teachers were provided with a copy of the Sheet and were asked to implement the interventions at their respective special schools. The intervention Sheet was administered to children with mild and moderate ID divided into 8-student groups for two weeks, each session lasting for about one hour. Based on teachers' experience in administering the Intervention Sheets, further suggestions were integrated in the final version.

The final version of Intervention Sheet was finalized after getting feedbacks from teachers, heads of special schools, psychologists, special educators in the field of Intellectual Disability and parents of children with ID. Teachers' approval that selected children could follow the instructions and their intent to implement the social skills training was also sought.

The program included individualized and group activities, which were adopted sequentially, carefully supervised and implemented as planned. Indoor and outdoor activities were performed under the supervision of two trained teachers of special schools, who had had been trained in social skills

teaching by the researchers. The training was implemented by adopting a slow-pace, progressive method, involving each of the children.

2.5. Teaching strategies adopted from Applied Behavior Analysis

In this research study, the experimental group received the social skills training, that included teaching strategies from Applied Behavior Analysis in a sequential manner, that is verbal instruction, modeling, role-playing, prompting (clueing, physical prompt, verbal prompts), rewards (Primary rewards, Social Rewards, Material Rewards, Activity Rewards, Privileges) and feedback. The activity selected was modeled by the instructor, and then each child was motivated to role-play, which was helpful to provide opportunities for practice and feedback. Each child was provided with the opportunity to rehearse the situations two-to-three times. Prompting helped children with Intellectual Disabilities to learn specific target behaviors. Frequent feedbacks and encouragement helped the children to proceed from one step to the next. After the acquisition of each behavior, child was rewarded, so that the behavior might occur again. Appropriate feedback was constantly provided to children by the instructor during the training of the skill, which was typically positive in nature; the instructor also praised children's efforts and rewarded desired behavior. The instructors never criticized the children who failed to understand a particular skill; instead, they correctly modeled the desired skill again and practiced it with the children.

2.6. Time schedule

Intervention in social skills training included eight social skills, each skill being taught for three weeks, 60 minutes a day. After twenty-four weeks, all the skills were practiced for additional eight weeks (total 32 weeks) as the repetition of the skill improved retention of the desired skills. Social skills were taught under the supervision of two trained teachers who were trained for the different social skills, teaching strategies, time schedule, etc. by the researchers. To ensure replication of the intervention program, researchers used the TIDieR checklist and guide (Hoffmann, Glasziou, Boutron, Milne, Perera, Moher *et al.*, 2014).

2.7. Social skills

1. *Interactional skills:* Children were given the chance to observe situations where they can see others interacting with each other. The skills were demonstrated through role-playing. The interactional skills included smiles in response to others and waving goodbye, greeting others, using magic words (thank you, sorry, please and excuse me), and returning borrowed materials.
2. *Introducing skill*: Children were verbally instructed how to introduce them to a food store/ party. Through role-playing, the skill was demonstrated.
3. *Friendship-making skill:* This skill included making small talks with the other members of the group. Children were verbally instructed how to start conversation with the others in a group and then, through modeling, the friendship making skill was demonstrated.
4. *Phoning the relatives:* Children were verbally instructed how to start talking to their parents, brother or sister, on the phone and expressing how they feel at school, what they have done over the last week and how they are doing in life.
5. *Cleanliness skill:* Cleanliness (self-care) and good hygiene are positive social skills that help improve self-esteem. Children with Intellectual Disabilities may need extra support and personal care to follow hygiene rules and routines, because they struggle to socially learn how and when to fix a hygiene issue. The development of personal hygiene skills is important for individuals with intellectual and developmental disabilities, in order to promote health and ensure opportunities for increased socialization, participation in a range of environments, and access vocational opportunities (Mattson, Roth, & Sevlever, 2016). Teachers demonstrated cleanliness skills through modeling and role-playing. Cleanliness skills, as taught, were: washing hands, eating food calmly, not to talk while eating, teeth brushing after eating, putting on clean clothes and folding clothes, combing hair daily, collecting wastes and throwing in the dustbin and sweeping floor after using the bathroom.
6. *Health safety and security skill:* It is important for persons with Intellectual Disabilities to learn to recognize, prevent, and react to potential emergencies and unsafe situations (Mechling, 2008). Children were taught about the need for health safety and security skills through teaching strategies adopted from ABA. Skills taught

were: how to avoid playing with the matchstick, avoid playing on the top of walls and hills, and avoid throwing stones/things to others.

7. *Aggression control skill:* The consequences of aggression were demonstrated through role-playing. The social skills taught included: refraining from aggressive behavior towards peers and self, allowing others to comfort him/her if upset or agitated, self-regulating when tense /upset or high energy, dealing with being left out of a group, accepting not being first at a game or activity, accepting losing at a game without becoming upset/angry, saying "no" in acceptable way to things he/she does not want to do, using appropriate voice tone and volume during talks.
8. *Cooperative playing:* Children were motivated to play in the group rather than alone and motivated to do every activity in a team, not individually. The skills included sharing toys and talking about the activity with peers, even though the play agenda of the other children is different, physically and verbally responding to interactions from peers (accepting toys from peer, answering questions), knowing appropriate ways of joining in an activity with peers, inviting others to play, turn-taking during play activities, obeying game rules, requesting toys, food, and materials from peers, and playing cooperatively with peers during play.

2.8. Intervention fidelity

Compliance to the intervention design greatly contributed to the pursuit of the study aims (Nigg, Allegrante, & Ory, 2002) and validated researchers' conclusions about the association between the intervention and the study outcomes (Calsyn, 2000). Teachers/Instructors strictly implemented planned intervention programs at special schools and, at the same time, were flexible enough to meet individual needs. The intervention in social skills training was thoroughly supervised and implemented as previously planned in the Sheet. This latter was integrated with a checklist, which ensured timely completion of all the activities. All the activities performed were recorded in the logbook by teachers/supervisors on a daily basis. Researchers visited the special schools regularly to monitor the intervention and sought regular feedback to further standardize the intervention. There was no modification in the intervention program during the period of study. All the school teachers complied to a single training protocol to ensure standardized delivery of training.

2.9. Instruments

In this study, the following assessment instruments were used:

1. Seguin Form Board Test (Goel & Bhargava, 1990), to assess IQ through visual discrimination, matching, speed, accuracy, eye-hand coordination and visual-motor skills. Revalidated norms for SFB test for Indian children were used (Venkatesan, 1998). It was also used as a quick measure of general intelligence in children with Intellectual Disabilities and adults. To re-standardize the scale, test-retest was done by the researcher after 20-day time interval to check the reliability of the scale r (25) = .80, $p < .01$.
2. Socio-economic status scale (Minakshi, 2004), to assess the social and economic status of children in the community under four areas: Finance, Property, Education and Social status. It is a 3-to-10 point scale, depending upon the component of the variable under assessment. It was standardized on a sample of 1127 rural/urban children. For re-standardization of the scale, test-retest was done by the researcher to check reliability, which was r (35) = .81, $p < .01$ with 30-day time interval.
3. Indian adaptation of Malin's Vineland Social Maturity Scale (Bharathraj, 1992) for the assessment of social competence and social development. The scale was administered in a semi-structured informal setting, with the teacher/caregiver being alone with the child. This scale was re-standardized by the researcher, and sample test-retest reliability coefficient was calculated (N = 50), at the beginning and then again after a mean duration of 4 months, r (48) = .734, $p <$ .01 indicated good test-retest reliability.

2.10. Procedure

Data on the Socioeconomic status were collected from parents/guardians of recruited children during the parent-teacher meeting before the experimental treatment. As a pre-test, the Vineland Social Maturity Scale was administered to both groups. Intervention Sheet for social skills training, as developed by researchers, was introduced sequentially to the experimental group in the two selected special schools of Jammu (J&K), India. The teaching strategies from Applied Behavior Analysis, details of social skills activities (aims and procedures to be followed) and time schedule were explained in the Intervention Sheet for social skills training.

Children from the control group were not engaged in any additional social interaction or in social skills training. Post-test (Vineland Social Maturity Scale) was administered to both the control and experimental groups, after completion of the intervention program (32 weeks), to find out the effects of social skills training on social development of children with mild and moderate Intellectual Disabilities. Every child was tested individually by the researcher during the pre-test and post-test.

2.11. Statistical Analysis

Descriptive and inferential statistics were used to analyze and describe the data pertaining to the Vineland Social Maturity Rating Scale in children with mild and moderate Intellectual Disabilities. Data were analyzed using ANCOVA, as it adjusts the post-test means due to non-randomization, and the pre-test scores were used as covariates.

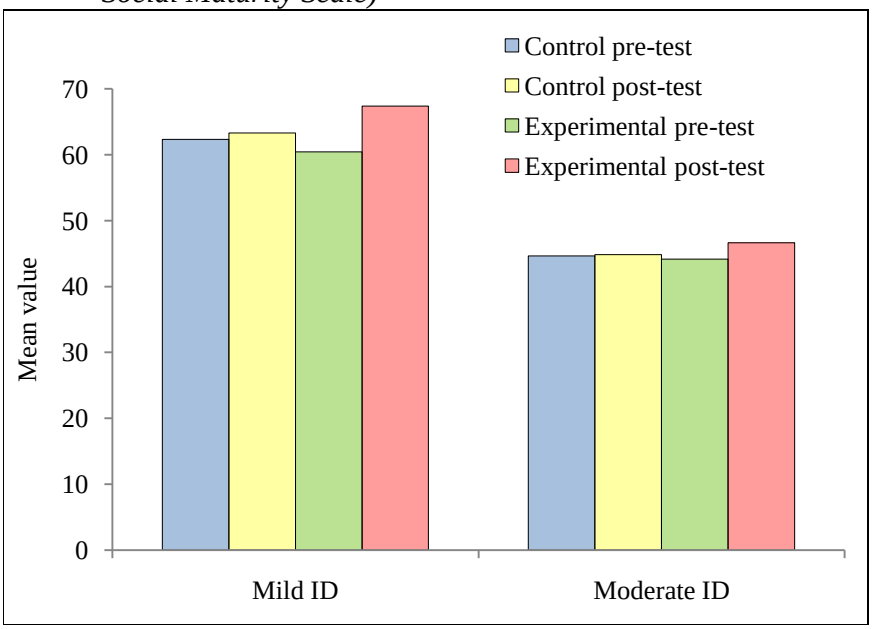
3. Results

Raw scores obtained at the Vineland Social Maturity Scale were converted to social age score following the table values provided. The social age was then converted to Social Quotient. The Social Quotient scores were taken as social development scores. The mean and standard deviation of the pre-test and post-test scores from the experimental and control groups of children with mild and moderate Intellectual Disabilities are shown in Table 4 and represented in a chart (Fig. 1).

Table 4 - *Comparison between pre-test and post-test Social Quotient scores from experimental and control groups of children with mild and moderate Intellectual Disabilities (measured by Vineland Social Maturity Scale)*

ID Level	Control				Experimental			
	Pre-test		Post-test		Pre-test		Post-test	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Mild	62.307	5.735	63.275	5.933	60.408	4.399	67.334	5.788
Moderate	44.604	4.323	44.812	4.430	44.131	4.998	46.598	6.058

Figure 1 - *Comparison between pre-test and post-test Social Quotient scores from the experimental and control groups of children with mild and moderate Intellectual Disabilities (measured by Vineland Social Maturity Scale)*



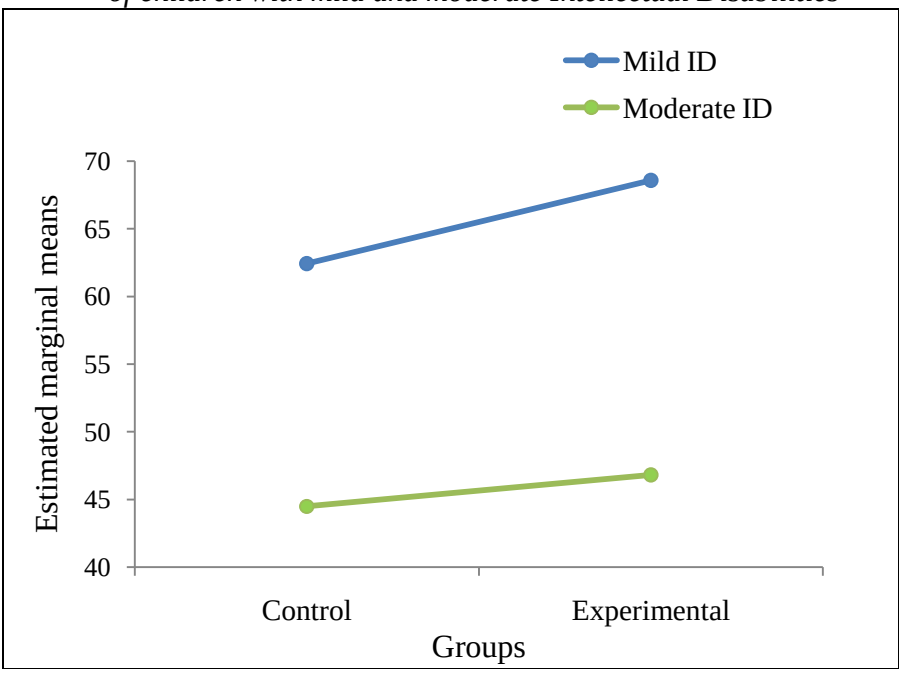
Results in Table 4 and Figure 1 indicate that the pre-test Social Quotient (mean) scores of children with mild ID were higher than those of children with moderate ID in both experimental and control groups, thus indicating that children with mild ID had better social skills than children with moderate ID. In the experimental group, children with mild ID also scored higher than children with moderate ID in post-test (mean).

Table 5 - *Summary of social development ANCOVA - Pre-social development was used as a covariate (Vineland Social Maturity Scale)*

ID Level		Sum of Squares	*df*	Mean Square	*F*	Sig.	Effect Size
Mild	Contrast	301.563	1	301.563	238.012*	.000	.885
	Error	39.277	31	1.267			
Moderate	Contrast	46.802	1	46.802	44.014*	.000	.579
	Error	35.090	33	1.063			

* Significant at .01 level

Figure 2 - *Graphical representation of estimated marginal post-test means of children with mild and moderate Intellectual Disabilities*



4. Discussion

Results of Analysis of Covariance (ANCOVA) of children with mild Intellectual Disabilities in Table 5 indicate that adjusted $F_{(1, 31)}$ = 238.012, P = .000 were significant at .01 level, with df = 1/31. Therefore, adjusted mean scores of social development in the experimental and control groups differed significantly when considering Pre-social development as a covariate. Thus, the first hypothesis "There are no significant differences in the social development adjusted mean scores either in the experimental or the control groups of children with mild Intellectual Disabilities, having the Pre-social development as the covariate" was rejected. Further, the adjusted mean score of social development in the experimental group was 68.566, which is significantly higher than that of the control group, whose adjusted mean score of social development was 62.413 (Fig. 2). Based on estimated marginal means, the mean difference between experimental and control groups of children with mild ID is 6.513 and std. error .399, which is significant at the .01 level.

Results in Table 5 for children with moderate ID indicate that adjusted $F_{(1, 33)}$ = 44.014, P = .000 was significant at .01 level, with df = 1/33. This

means that adjusted mean scores of social development in the experimental and control groups differed significantly when considering Pre-social development proficiency as a covariate. Thus, the second hypothesis, "There are no significant differences in the social development adjusted mean scores either in the experimental or the control groups of children with moderate Intellectual Disabilities, having the Pre-social development as the covariate" is rejected. Moreover, the adjusted mean score of social development of the experimental group was 46.816, which is significantly higher than that of the control group, whose adjusted mean score of social development was 44.501 (Fig. 2). Based on estimated marginal means, the mean difference between experimental and control groups of children with moderate Intellectual Disabilities is 2.316 and std. error .349, which is significant at the .01 level. Results reflected a significant effect of the intervention in social skills training on the social development of children with mild and moderate Intellectual Disabilities, when both experimental and control groups were matched for pre-social development scores.

Since a significant difference was found in the adjusted mean scores of social development of both control and experimental groups, the effect size was also calculated. The effect size of an intervention in social skills training for children with mild Intellectual Disabilities was .885, which indicated a large effect size of the intervention, whereas the effect size of the intervention in children with moderate Intellectual Disabilities was .579, thus indicating a medium effect of the intervention. Children with mild ID had a higher effect size than children with moderate ID. Thus, the third hypothesis, "There are no significant differences in the effect size of the social skills training intervention in children with mild and moderate Intellectual Disabilities" was also null and rejected.

Results reported in Table 3 indicated that the sample recruited for the intervention in social skills training represented children coming from different socioeconomic status (below average, average and poor socioeconomic status). Thus, the fourth hypothesis, "There are no differences in the socio-economic status of children with mild and moderate Intellectual Disabilities selected for intervention in social skills training" was rejected either. The characteristics of the experimentally accessible population and the target population (other Indian states and developing countries) are similar with respect to certain significant and relevant characteristics, such as intelligence, associated problems due to Intellectual Disability, socio-economic status, geographic (rural and urban area) conditions, cultural and political environments. Therefore, the Intervention

Sheet developed in the present research as well as research results could be replicated in other States of India having similar socio-economic, cultural, geographical and political conditions, and likewise, the results could be generalized in other developing countries. Researchers gave due consideration to the experimental design for generalizing the study's findings. Due to low intelligence levels, there were very little chances of having the *Hawthorne effect*, and fewer chances that pre-testing may increase or decrease the responsiveness of children with Intellectual Disabilities in the experimental groups to the post-test responses. There was no 'interaction effect' due to each single intervention at a time.

It was concluded that social skills training adopting different teaching strategies from Applied Behavior Analysis is a practical, feasible and effective intervention tool for improving social development in children with mild and moderate Intellectual Disabilities attending special school settings.

4.1. Implications of the study

Social skills training Intervention Sheet, as developed by researchers, is an interesting and safe intervention program which requires only a trained teacher who is able to systematically implement it. It adds playful and recreational activities in daily routines and can improve social skills of these children. It can also be tested with children and adults with behavior disorders or destructive behaviors. It can also be used as a treatment for anxiety and depression among children and adults with mild ID. This social skills training program can be introduced as part of the daily curriculum at Indian special schools, because, in addition to improving social skills, it contributes with more recreational, fun and exciting activities in daily routines. For the development and integration of social skills curricula into routine, teaching programs for pupils with intellectual and developmental disabilities should be mandatory (Adeniyi & Omigbodun, 2016). This training program helps engage children in more useful activities during the day and reduces their non-work activities. Therefore, to successfully promote the participation of these children in social skills activities, it's necessary to train teachers/caregivers on different social skills, so that they could systematically implement the social skills training program as mentioned in the Sheet. Teachers and parents should focus on social skills as a part of the school curriculum for the overall development of children with mental retardation (Karra, 2013).

4.2. Limitations of the study and suggestions for further research

The intervention in social skills training was confined to special schools in Jammu city only and within school hours. It was difficult to control some factors during testing and intervention, such as lack of interest to participate in the training program. Future research should focus on following-up children after post-test sessions. This might be useful to find out retention of the skills as taught. Interventions used in the present study can be replicated on a larger sample from other Indian States. Interventions on social skills training could also be tested in children with severe Intellectual Disabilities, whenever possible. More innovative interventions in different areas could be developed and tested in children with Intellectual Disabilities, such as yoga, dance therapy, hydrotherapy, play activities, Vedic Chanting, and art/craft activities.

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