Al-Mahdi Research Journal (MRJ)
Vol 5 Issue 5 (July-Sep 2024)
HJRS HEC Journal Recognition System Category Y
ISSN (Online): 2789-4150
ISSN (Print): 2789-4142

Relationship between Cognitive skills and Social Skills among Children with Autism Spectrum Disorder

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Abstract

Autism is a neurodevelopmental disorder affecting the child's brain, which involves impairment in social interaction, communication, and engagement in repetitive, peculiar mannerisms. These behavioral abnormalities are observed soon after birth and are fully expressed in the first year of the child's life. ASD is a condition whereby children have learning and development problems particularly, with the skills that involve intellect and social competence children with ASD face a lot of challenges. The analysis demonstrated that in the ASD group, cognition correlates with internalizing issues. In contrast, socialization correlates with both internalizing and externalizing difficulties—furthermore, the present research targeted to analyze the correlation between Cognition and Social skills in children with ASD. As for the instrument, the Slosson test and Vineland Adaptive Behavior Scales (VABS) were employed; the data were collected from 100 ASD children and their parents with the assistance of teachers from different public and private institutions in Lahore. The data collected in this study were analyzed using SPSS software. The data showed that there are no gender differences in cognitive and social development. The Pearson Product correlation results proved that there exists a strong positive correlation between the two variables which are the cognitive and social skills among children with ASD. The outcomes of the ANOVA indicate no significant difference in the cognitive and social skills of three different socioeconomic statuses. Therefore, one can assert that the level of general cognitive abilities is positively related to the development of social competencies in children with ASD. The results showed that intervention regarding cognitive development may well impact the child's social development. Future research should explore longitudinal effects and intervention efficacy.

Keywords: Autism Spectrum Disorder, cognitive skills, social skills IQ: intelligence quotient, Slosson test VABS: Vineland Adaptive Behavior Scale, SPSS: Statistical Package for Social Sciences.

Introduction

Autism Spectrum Disorder is a neurodevelopmental disorder with malfunctions in communication, social interaction, and repetitive behaviors which are stereotypes in nature. These signs appear within two to three years of a child's life. (Alamer, K. S. 2020).

DSM-IV-TR argued three domain criteria for autistic disorder which include social interaction impairments, repeated and stereotyped behaviors, and lack of effective communication with others (American Psychiatric Association. 2013). Among all three symptoms, social interactions are considered the most significant as compared to the other two domains. Moreover, the prevalence of at least six symptoms is compulsory to declare children to have autistic problems, and the symptoms appear before 36 months of age of children (Lord, C., et al. 2020).

The general term; autism spectrum disorder (ASD) is related to the disorders of the brain. These disorders are found in different intensities falling both in verbal and non-verbal domains causing communication and social interaction of affected children. All the previous disorders that were found in different sub-heads such as autistic disorder, disorder related to disintegration and pervasive developmental disorder-not otherwise specified (PDD-NOS) and Asperger Syndrome (DSM-V, 2013) have been merged under the broad spectrum of ASD in the research literature.

Cognitive skills are related to the brain that are required to perform tasks of every nature at a wide spectrum; very simple to complicated. The skills are more concerned with mechanisms of learning, memory, and problem-solving in contrast to the actual knowledge. The skills involve motor skills, language, social skills, etc. Autistic children bear deficits in basic cognitive skills (Cotugno, A. J. 2009). It was argued that autism emerged from the inability to effectively manage and trigger the stimuli in a meaningful way (Boucher, J., &Scarth, L. 2018). The research literature shows that autistic children lack basic cognitive skills that involve language, sequencing, coding functions, etc (Tager-Flusberg, H. 2014).

Social skills refer to the set of behaviors resulting in effective social interaction in a positive way that involves both verbal and non-verbal interpersonal communication effectively and responds through gestures such as smiling, questions and answers, making eye contact, and responding to communication through body language during interaction in a social setting (Beidel, Turner, & Morris, 2005). Social skills have been observed to play a pivotal role in the child's development, and their deficits are found to adversely affect communication (Carter, Davis, Klin, &Volkmar, 2005). The research literature showed that these deficits lead to poor eyeball-to-eye ball contact, inability to express through facial expressions, gestures, and other non-verbal communication thus leading to poor social interaction in their environment and increasing the difficulty level in establishing and adjusting the environment, especially under minor deviations. (DSM-V, 2013)

Statement of the study:

Autistic children have basic cognitive deficits such as poor memory, low attention, and less problem-solving (Ozonoff, S., Dawson, G., McPartland, J., Day, A. E., &Beytien, A. 2010). Social skills are one of the major deficits among children bearing ASD all over the world (DSM-V, 2013). Children feel difficulty in initiating and maintaining relationships with others (Krasny, Williams, Provencal, &Ozonoff, 2003). Many researches have been conducted on autism spectrum disorder but there are very few researches done to pursue cognitive skills and social skills in children possessing ASD in developing countries. Pakistan is a developing country; it urges the researcher to know the level of social skills and cognitive skills in ASD children. The researcher has decided to "find the relationship between cognitive skills and social skills among children with autism spectrum disorder".

Objectives of the study

This study was conducted to accomplish the following objectives:

1. Study current levels of cognitive skills among children with Autism spectrum disorder.
2. Study the current levels of social skills among children with Autism spectrum disorder.
3. Find the relationship between cognitive and social skills among children with Autism spectrum disorder.
4. Find the difference between cognitive and social skills among children with ASD based on gender and socioeconomic status

1.6 Questions of the study

1. What are the current levels of cognitive skills among children with Autism Spectrum Disorder?
2. What are the current levels of social skills among children with autism spectrum disorder?

3. What type of relationship exists between cognitive and social skills among children with Autism Spectrum Disorder?

4. What is the difference between cognitive and social skills among children with ASD on the basis of gender and socioeconomic status?

Significance of the study:

The following are the significance of the study.

1. The study helps to recognize the relationship between cognitive skills and social skills among children with ASD leading towards the development of new strategies and guidelines for teachers as well as parents.
2. This study benefits the teachers, resource persons, psychologists, caretakers, and speech therapists.
3. To apply better therapeutic techniques for the enhancement of cognitive skills among children with ASD.
4. This study gives directions for future research

Limitations of the study:

The study comprised the following limitations:

1. Due to the nature of disability, the random sampling technique was not used. Therefore, the results of the study may be generalized carefully.

Delimitations of the study:

The following were the delimitations of the present study:

1. The study was conducted in Lahore only due to a shortage of resources.
2. The study comprised on a Sample of 100 respondents due to shortage of time.

Literature Review:

Developmental disabilities:

Developmental disabilities are considered vital and are attributed to a disturbance in skill sets such as social, cognitive, and language which significantly impact the growth of a child (McGregor, K. K., Ohlmann, N., Eden, N., Arbisi-Kelm, T., & Young, A. 2023). There are features common in children having developmental disabilities, however, these disabilities are heterogeneous and are presented through various combination sets of symptoms. These combinations define the association between the skills about gross and fine motor. Moreover, their cognitive and social skills are different from each other. Specific learning disorder (SLD), language impairment (SLI), intellectual disabilities (ID), and autism spectrum disorder (ASD) are some of the disabilities included and are described below (Kim, H., Carlson, A. G., Curby, T. W., &Winsler, A. (2016).

Autism spectrum disorder:

Autism spectrum disorder (ASD) falls in a group of neurodevelopmental disorders that are lifelong and have different shades based on severity levels and deficiencies in social interaction and communication in different contexts. Children with ASD possess stereotyped behaviors in repetition and confined interests (American Psychiatric Association, 2013). This is a devastating developmental disorder and is found in at least one in a thousand children and adults. This is a biological-based disorder with having strong genetic component, however, behavioral criteria are still considered as a diagnostic approach.

Autistic people have low IQ levels and their learning curve is low further they possess stereotyped repeated behaviors and interests and they respond to sensory stimuli in an unusual way (American Psychiatric Association, 2013).

Diagnostic criteria according to DSM-5:

The appearances of at least six developmental and behavioral characteristics are required as diagnostic criteria before the age of three. Moreover, there is no other evidence is found that such similar conditions are present. People with ASD must fulfill the following two domains; social communication and interaction, and repetition in particular behaviors (APA, 2013).

Prevalence of ASD:

The genetic component of autism is being conceived at large by the research community as it affects nearly 1 case in every 166 cases in the United States (Lewthwaite, P. 2010). Statistically speaking, out of every 800 babies, 1 baby is born with Down syndrome (Centers for Disease Control and Prevention 2006). The overall gender observed ratio (male to female) has been observed which ranges from 6:1 to 1.8:1 (Rutherford, M., McKenzie, K., Johnson, T., Catchpole, C., O'Hare, A., McClure, I., & Murray, A. 2016). The literature shows male dominance in ASD studies (Kim, Leventhal, Formonne&Laska, 2011).

Characteristics of ASD:

Autism leaves its effects on individuals in the way they perceive and find difficulty in communication and interaction in social setup. The main challenges in Autism spectrum disorder (ASD) are social-interaction difficulties, communication, and the extent to which repetitive behaviors are engaged. However, there is diversity in symptoms across all the core areas. On the high-functioning end of this spectrum, they may result in less intense challenges in some cases, and for others, they may be taken as severe with repetitive behaviors, language issues, and interaction in daily life. Thus, every case is unique in autism (Kim, Leventhal, Foremonne&Laska, 2011).

Impairment in social interaction:

In normal routine, the children develop social habits with their growth and respond to voices, give gestures, and smile by the age of 2 -3 months. The children with autism symptoms feel difficulty in responding to others during interaction and with the growing age they feel difficulty in communication. At the age of 8 to 10 months, they are unable to respond to their names and lack interest in social circles and their response level is very low (Jones, W., Carr, K., &Klin, A. 2008).

Further, growing age leads autistic children to difficulty in playing games and responding to and imitating others. They prefer to be alone instead. They fail to understand the emotions of joy and displeasure of their parents (Denham, S. A. 2007).

Generally, they adopt monotonous gestures and pattern themselves in a confined environment with inappropriate habits such as crying and being hyper which leads them to lose control of themselves and they develop aggressive behavior. The loss of control due to immature behavior further leads to frustration which may result in self-harming behaviors such as head collisions, hair pulling and self – biting, etc. However, autistic children can be trained and taught to identify facial expressions and interact in a social environment. Further, some strategies can be used to reduce frustration levels (Chen, C. H., Lee, I. J., & Lin, L. Y. 2016).

2.5.2 Impairment in communication:

The autistic children face problems in interacting and speaking with people and they have very low responses and learning gestures. These are children who later develop autism and may experience babble in speech before losing communication. The cases of delayed response and speaking and children speak at much later stages, J. M. (2018).

Nonverbal communication such as pictures, signs, electronic word processors, or even speech-generating devices are understood by autistic children and adults. While speaking some may have face difficulty in combining the words to make sentences. They do not face difficulty in speaking a single word or phrase (Chen, C. H., Lee, I. J., & Lin, L. Y. 2016).

2.5.3 Repetitive behaviors:

Repetitive behaviors, and confined and restricted range of activities are included in the core symptoms of autism. Repetitive behaviors such as rocking, jumping and twirling, setting and resetting of objects, and imitating sounds or phrases are common in autistic children. At times repetitive behavior is self-generated such as waving off in the air and front of eyes (Prizant, B. M., & Fields-Meyer, T. 2022).

The restricted range of activities may be that children focus on the toys while playing. While playing with toys, they line up the toys in a sequence and reorder again and again instead of playing with them. Some autistic children play with household items and preoccupy their minds with fixing them in order. They may become disturbed if the order is disturbed by someone and they require consistency at an extreme level in their routine (Chen, C. H., Lee, I. J., & Lin, L. Y. 2016).

Cognition:

Cognition is the sequential process of activities related to different processes such as knowing different aspects of things, logical reasoning, judgment, and perception. Knowledge is the reiteration of production and process and so cognition is not merely a process but a mental process leading to the accomplishment of specific objectives (Neisser, U. 2014).

Cognitive development:

Cognitive development is related to the changes in the mental activities of children over the period during their growth (Schalock, R. L., Verdugo, M. A., & Gomez, L. E. 2011).

Theories of cognitive development:

Two prominent authors have theorized the field of cognitive development: Piaget's theory (Piaget, 1952) and (Vygotsky 1962).

Piaget's theory of cognitive development:

According to Jean Piaget's theory of cognitive development, intelligence is a coupling between person and environment to ensure the balance between them that is achieved by the actions of a developing person. This is achieved through the actions of the developing person in the world. During any stage of development the surrounding environment is assimilated in the set of existing and such settings are transformed objectively actions if they are appropriate (Amann-Gainotti & Ducret, 1992).

Piaget coined four periods related to reversible thought process structures which are explained below. It changes with the change of levels and becomes more abstract and more structured It changes qualitatively, attaining increasingly broader, more abstract, and structures with more equilibrium are generated to access various levels of the organization (Piaget, 1952).

State 1: Sensorimotor period:

The Sensorimotor initiates the cognitive development as a first step among all the four stages. In this stage, the children develop familiarization in his or her surrounding environment through coordination of sensory experiences with physical, and motor actions. During this process, the infants obtain knowledge about the world in their surroundings and perform physical activities in this learning process. The end of this phase leads to the objective performance and understanding of the objects even when they are not able to see, hear, or physically interact with the objects (Chapman, 1988).

Stage 2: Preoperational period:

In the second stage, the child learns new patterns and images of physical things and can draw words pictures, and drawings. This stage leads the child to build the conceptual base through reasons and beliefs but still at this stage the child is unable to perform physical activities as conceived and performed by him mentally and thus faces difficulty in gauging the input of others in this learning process (Chapman, 1988).

The symbolic function sub-stage: starts at the age of two to four and the child can conceive and draw objects that do not exist physically.

The intuitive thought sub starts: between the ages of 4 and 7 and at this stage, the children are familiar with the surrounding environment and inquire about different aspects of their learning through primitive reasoning.

Stage 3: Concrete operational stage:

This stage is considered the most important and solid operational stage as per the theory of Piaget in cognitive development and it starts at the ages of 7 and 11. This stage uses logical reasoning to gather information and to learn it. (Commons, Goodheart, Pekker, Dawson, Draney & Adams, 2008)

Stage 4: Formal operational stage

The formal operational stage in cognitive development as per the Piaget'stheory is the fourth and final of the periods. It starts at 11 years of age is considered the solid operational stage and goes until adulthood. This stage leads the persons to think beyond their experience and develop abstract thinking in their normal routines with logical reasoning and conclude about the phenomenon based on the collected information (Commons, Goodheart, Pekker, Dawson, Draney & Adams, 2008).

Vygotsky theory of cognitive development:

As per this theory, consciousness and cognition are the outcomes and are preceded by social interaction.

Zone of proximal development:

Zone of Proximal Development or ZPD pertains to the child's learning and the concept was initiated by Vygotsky (1962). The children falling in the zone of proximal development can perform tasks almost independently if they perform specific tasks and with little assistance, they can complete the task successfully. On one extreme of this zone, the child can analyze and solve the problems without any help, and on the other extreme; the child may hold additional responsibility with the support of a skilled instructor (Wink & Putney, 2002). As per Vygotsky's Zone of Proximal Development concept, social influences play an important role in the development of the child.

Scaffolding:

Vygotsky gave two main concepts; Scaffolding and Zone of proximal development. In this conceptual domain, the child is given temporary support by the guide such as a parent or teacher till the time he or she obtains the skill set to perform the task independently. The quality of the performance of the child depends on the quantity and quality of the guide and sessions provided to the child. On the other hand, the children facing difficulty in performing tasks need more guidance from the instructor. On learning the complete task and when the child starts working independently, the support is removed.

Vygotsky's theory of cognitive development aimed to highlight the social environment in both cognitive and psychosocial development. This contribution has shifted the focus of research studies from individuals to the interactional levels such as parent-child, teacher-student, and other relationships (Wink & Putney 2002).

Cognitive skills:

Cognitive skills focus on knowledge acquisition and include logical reasoning, intuition, and perception about the environment and are considered the mental skills that are important to acquire the literacy skill set (Siow, L. C. 2015) As the learning curve of the child grows, these skills keep on enhancing and the findings of the children become more concrete and purposeful. Siow, L. C. (2015) argues that through cognition the information is processed, the knowledge is applied and new knowledge is generated.

Cognitive development in ASD:

There is a wide continuum of cognitive levels in ASD with different severity levels. The levels include severe intellectual disability (ID) to an intellectual functioning above average. Generally, children with ASD come up with ID (IQ below 70), however, children with IQ above 70 have also been identified with ASD (Rice, K., Moriuchi, J. M., Jones, W., &Klin, A. 2012) which further highlights that about 40 to 75% of children with ASD diagnosis also have ID. There is strong evidence that children have abnormal profiles of verbal and performance abilities and are measured by IQ tests (Carr, 2006). The literature shows that children with ASD give better performance in visuals as compared to the verbal tests.

It is argued that individuals with autism spectrum disorder (ASD) have specific profiles with specific levels of cognitive strengths and weaknesses and find difficulties in appreciating the feelings and thoughts of others. They are unable to perceive the surrounding environment. There are different studies that have tapped the cognitive profile of children with ASD and require longitudinal studies for more understanding of this profile in children with ASD.

On the whole, Pellicano (2005) observed in his three-year study that children with ASD had the same profile of behavior at the beginning and end of the study. More closely, it was observed that individual performance of the children varied in context to cognitive strength and weaknesses and each child was a unique case in the cognitive skills. For instance, one child had a problem in understanding the problem and the other was facing difficulty in the execution of the activities.

Social skills:

Social skills are referred to as behaviors that lead to interaction in social life (Gresham, F. M., Elliott, S. N., Cook, C. R., Vance, M. J., &Kettler, R. 2010), and these behaviors may be verbal or nonverbal for effective communication of people with one another. All kinds of body language, verbal and nonverbal contact such as smiling, eye contact, discussion and arguments, and other social exchange processes are considered social

skills (Campbell, C., Hansen, D. J., &Nangle, D. W. 2010). Effective social skills in children during their development have been observed to play a positive contribution in developing good relationships and performing better in their routine work such as academics and mental health (Beauchamp, M. H., & Anderson, V. 2010).

Social development theories:

Different theories about social development accompany different aspects of socialization. Bandura's (1986) theory is the most prominent social development theory.

Bandura's theory of social development:

In the early 1960s, during the development of theories of social development, Albert Bandura and his team observed many missing links in the literature related to these developments and based on their observations they evaluated different aspects of learning and theorized their work. Social development theory posits that the socialization of humans is carried out in a social environment. People acquire knowledge about rules, beliefs, and other skills by observing other people. They also learn the usefulness and compatibility of behaviors with the environment as per different models and observe their surrounding environment. Social cognitive development theory refers to the process of mind that might not be reflected with prompt changes in behavior (Bandura, 1986). Generally, social cognitive modeling is based on demonstrations followed by a description of the model's ideas and actions referring to; learning as an internal process and is goal-oriented.

Social skills deficits in ASD:

Individuals with ASD are not the best fit while interacting with people in social environments and face problems in the interaction sessions in different contexts. The youth who are reported with ASD mostly show more willingness to interact with their peers in social environments and also show poor social support and feel isolated as compared to their other peers (Bauminger&Kasari, 2000). In general, children with ASD in the classrooms while interacting with their classmates do not get attention fully and more often they are rejected and they are left alone without any social interaction (Chamberlain, 2001). Due to weakness in social skills lead to low standards in academics and they are unable to develop optimum social interaction which reduces their efficiency overall (Teng, K. Y. 2016). This may develop certain health issues such as mood and anxiety problems (White, S. W., &Schry, A. R. 2011).

There is a wide range of impairments found in individuals with ASD related to the different functions of behaviors of humans in social environments including language, speech, and interpersonal skills. These impairments distort social interaction with people and behave in a distorted way they have the habit of taking sudden turns and changing the direction of discussion and they raise and lower the voice tone abruptly and distort the communication with abnormal behaviors. They were unable to express their viewpoint with clarity and they felt difficulty interpreting indirect communication such as the use of metaphors and proverbs (OluwaseunEhineni, T. 2016). The behavior of children with ASD may be improved through analysis of applied behavior principles and intervention at appropriate levels and in an organized and systematic way. The problematic behavior related to aggression may be improved through effective communication and therapy based on applied behavior training (Hanley, G. P., Iwata, B. A., &McCord, B. E. 2003), but social deficits may not be improved significantly (Bailey, D. B., Hatton, D. D., Skinner, M., &Mesibov, G. 2001). Therefore, the treatment of all the social deficits in children with ASD has become a challenge (Weiss & Harris, 2001).

Vineland Adaptive Behavior Scales are used to study the adaptive skills in children with ASD "early childhood psychosis, including autism" and in which co-occurring ID had a comparison with children with ID only. The group with autism was observed with significantly poorer social functioning than the comparison group (Davis, N. O., Carter, A. S., &Volkmar, F. R. 2014).

Another study conducted by Loveland and Kelley (1988) showed no significant difference in the adaptive skills of children with two types of impairments; autism and those with Down's syndrome. It was further revealed that a group of children with autism had a delayed response in the acquisition of learning the behaviors of communication and social domains of VABS such as interpersonal relationships. Another study was conducted on preschool children and the results revealed that they had significantly lower scores on socialization by the children with autism as compared to the scores of children with Down's syndrome which is mentioned in the study of Perry, A., Flanagan, H. E., Dunn Geier, J., & Freeman, N. L. (2009).There is a lot of evidence concerning the difficulties of children with ASD in cognition and social spheres, but still, there

are questions about the connections between these two spheres. Moreover, previous literature has examined the components of cognitive and social development separately without investigating the interrelation between the mentioned domains in children diagnosed with ASD, while taking into consideration the SES and gender. Moreover, the specificity of the impact of the set of executive functions and the role of other adaptive skills such as socialization in weakening the internalizing and externalizing issues requires future research. Research has also been done using other formal assessment measures such as the Slosson test and the Vineland Adaptive Behaviour Scales (VABS) in different contexts of education. This paper aims at filling these gaps by providing a detailed examination of the combination of social and cognitive needs to relationships among children with ASD taking into account different demographic variables.

Methodology and procedure:

The purpose of this study was to investigate the relationship between cognitive skills and social skills among children with ASD. This study is descriptive in nature and investigates the relationship between cognitive skills and social skills among children with ASD.

Population:

The population of the study consisted of children with ASD and their parents.

Sample:

The authors purposively recruited 100 children diagnosed with ASD and their parents. The sample consisted of students from different public and private schools in Lahore. After getting permission from the school, researchers collected the data from ASD children with the help of teachers and from their parents. The type of research used for this study is descriptive quantitative research to know the correlation between the cognitive and social skills among the children diagnosed with ASD. The quantitative method enabled the researchers to make quantifiable measurements that can be analyzed statistically to compare the relationship of these skills in the population. The inclusion criteria for the study were clinically diagnosed ASD, participants aged from 6 to 18 years, parental permission to enroll participants in the study, and the willingness of teachers to collect data. The involvement of both parents and teachers ensures a comprehensive assessment of the children's cognitive and social skills across different environments.

Sr.	Name of Institutions	Children	Parents
1	Autism Institute of Pakistan	20	20
2	Global Institute for Autism	10	10
3	Rising Sun	20	20
4	Compass	10	10
5	Amin Maktab	10	10
6	Children's Hospital Special Education Department	10	10
7	Oasis	10	10
8	Turning Point	10	10

Instrument of study:

Research instruments were the Slosson test and the Vineland Adaptive Behavior Scale. The researchers via university bought test of Vineland Adaptive Behavior Scale and the Slosson Test. Vineland's adaptive behavior scale was developed by Sara, Sparrow, David, Balla, and Domenic, Cicchetti in 1985 and the Slosson test was developed by Richard in 1963. The Vineland Adaptive Behavior scale was administered to the parents and Slosson was administered to students with the help of teachers. Vineland Adaptive Behavior Scale measured four domains (communication, daily living skills, socialization, and motor skill domain) but the researcher used only the socialization domain for this study. The socialization domain consists of 66 items of which there are 28 items measure interpersonal relations, 20 items measure play and leisure activities, and 18 copying skills. Slosson measures cognitive skills from 0- 27 years.

Data collection:

In this study data collection procedure was enhanced through several steps to cover all the necessary information. First, the researchers asked the parents and teachers of the children if they could allow their children to be given these tests. The Slosson Intelligence Test (SIT) was used for the children with ASD and teachers were helpful to facilitate the test to the child since many of the children with ASD have difficulties in the process of completing the test. For the Vineland Adaptive Behavior Scales (VABS), both the children and parents gave the information regarding the assessed child. Parents filled out the VABS to indicate their child's adaptive behavior in socialization. Wherever the parents had challenges filling out the questionnaire, the teachers were allowed to complement the information that was to be filled.

Data Analysis:

According to the study, analysis of data involved the application of descriptive statistics where demographic information of the sample were described and scores obtained from SIT and VABS. Cognitive and social skills have Pearson correlation applied on them, to establish the strength and the direction of the relationship between them. Independent sample t-test was used to know the difference based on gender. ANOVA was applied to the similarities and differences in the socioeconomic status of the students. To analyze the data, as the study calls for various statistical tests, SPSS software was used throughout the study. Once data was collected, the researchers scored the tests to obtain the IQ scores based on the SIT test and the social skills based on the VABS test. The researcher, who has been a qualified psychologist in a government special education center, has already used these tests multiple times. This expertise emphasizes the dependability and credibility of the data collection and analysis procedures.

Results:

Table 1:

Descriptive analysis of participants

Variables	*M*	*SD*
Age of participants	9.27	3.593
Father age	41.88	6.523
Father income	209180	300220.672
Mother age	37.5	5.945
Mother income	14150	36390.52
Family monthly income	2.73	0.489
Intelligence Quotient	42.81	10.172
The sum of social skill	49.55	10.060

The average age of the participant's mother is 37.5 ± 5.945 years, the average income of the participant's mother is 14150 ±36390.52, the participant's average intelligence Quotient is 42.81 ± 10.172 and the average social skills score is 49.55 ± 10.509. Table 4.12 shows that the average age of participants is 9.27±3.593 years. The average age of the participant's father is 41.88±5.523 years, and the average income of the participant's father is 209180 ± 30022.672

Table 2:

Correlation was run to see is there any significant relationship between the Intelligence and Social Skills of Students with ASD.

Table 2 shows that there is a strong correlation between the intelligence and social skills of students with

			IQ	Social Skills
Spearman's rho	Intelligence Quotient	Correlation Coefficient	1.000	.811**
		Sig. (2-tailed)		.000
		N	100	100
	Social Skills	Correlation Coefficient	.811**	1.000
		Sig. (2-tailed)	.000	
		N	100	100

ASD. The calculated correlation is (*r = .811**, sig = .000*).

Table 3

An Independent sample t-test was run to see if there was any significant difference between the genders of students with ASD based on Intelligence.

Total Variable	*Gender of the Participants*	*N*	*M*	*S.D*	*t*	*Df*	*P*
Total Score	Male	82	42.46	10.73	0.725	98	0.47
	Female	18	44.39	7.122			

Table 3 shows that females are not significantly different from males in Intelligence quotient (p = .460). Inspection of the two groups' means indicates that the average IQ of females is 44.39 which is not significantly higher than the male IQ which is 42.46. The difference in IQ between males and females is 1.93 which is not significant.

Table 4

An Independent Sample t-test was run to see if there was any significant difference between the genders of students with ASD based on social skills.

Total Variable	*Gender of the Participants*	*N*	*M*	*S.D*	*t*	*Df*	*P*
Total Score	Male	82	42.46	10.73	0.725	98	0.47
	Female	18	44.39	7.122			

Table 4 shows that females are not significantly different from males based on SS (p = .334). Inspection of the two groups' means indicates that the average SS of females is 51.28 which is not significantly higher than the male SS score which is 48.62. The difference in SS between males and females is 2.66 which is not significant.

Table 5

ANOVA test to know the significance among the three levels of socioeconomic status of students on IQ and SS

		SS	*df*	*MS*	*F*	*p*
Intelligence Quotient	Between Groups	281.468	2	140.734	1.37	0.259
	Within Groups	9961.922	97	102.7		
	Total	10243.39	99			
Social skills	Between Groups	374.775	2	187.388	1.722	0.184
	Within Groups	10558.225	97	108.848		
	Total	10933	99			

Table 5 shows that a statistically insignificant difference was found among the three levels of Socioeconomic status of students on IQ, F (2, 97) = 1.370, p = .259, and on SS F(2,97) = 1.722, p = .184. Hence it can be concluded that all three socioeconomic statuses are not significantly different on the base of IQ and SS.

Discussions:

A few researches have been done on cognitive skills and social skills among children with ASD. In Pakistan, research is equal to none on this topic. The autism area is much neglected and still present age. Although many researchers have been revealed in developed countries to evaluate autism in a multidimensional way. The cognitive area of autism is not discussed finely. So our main area is to check the link between cognitive skills and social skills. Children with high socio-economic status have a high prevalence rate of ASD. Our findings also support that research as the ANOVA table showed that the prevalence of Autism is high in the upper class (Adak, B., &Halder, S. 2017). Cognition as well as social development, is a complex, multidimensional exemplified idea that develops as the child interacts with his or her surroundings. Healthy cognitive development has a positive impact on social development, so it means there is a strong linkage between cognitive skills and social skills (Hellendoorn, A., Wijnroks, L., Van Daalen, E., Dietz, C., Buitelaar, J. K., &Leseman, P. 2015). The prevalence of ASD is greater in males as compared to females. There is male-female ratio is 3:1 (Kim, Leventhal, Formonne&Laska, 2011). There is a strong tendency for uneven intellectual/developmental profiles regarding verbal and performance abilities measured by IQ tests (Carr, A., & O'Reilly, G. 2016). Our study also shows the same as they do not follow the same pattern as described by Jean Piaget's sensorimotor stage. Most of the ASD have low IQ(Ratcliff, M. J. 2023). Children with ASD have problems in social interaction both verbal and nonverbal and they need training and intervention in this area (Yavuz, H. M., Selçuk, B., &Korkmaz, B. 2019). Bandura stated that children learn social skills by imitating and interacting with society but children with ASD have no interaction with peers, poor eye contact, and not observing others. Due to these reasons, they have poor social skills (Bandura, 1986). The ASD children with better cognitive levels perform better on empathy and conservation (Nakajima, S. 2019). The neuro-anatomical studies showed that there is a strong linkage between motor, cognitive, and social development (Davis, A. S., Pass, L. A., Finch, W. H., Dean, R. S., &Woodcock, R. W. 2009).

Conclusion:

This paper investigated the composite of children with ASD regarding their cognitive and social skills by using SIT and VABS. These comprised 100 students selected from different public and private schools The results showed a positive relationship that existed between cognition and social skills. The gender of the child did not mediate the relationships observed in this study, thus emphasizing that these findings apply to both boys and girls with ASD. Also, the effect of socioeconomic status on the level of cognitive and social skills was not significant, suggesting that these skills are rather cultivated without being greatly affected by the level of SES in this age group. This research emerged from parent and teacher involvement in the collection of data which gave a broad perspective of the children's functional levels across settings, thereby adding to the credibility and dependability of the results. The application of the SPSS software for carrying out the statistical analysis

of the data provided the study with increased credibility and a generator of the results. The findings underlined the need to include both, cognitive and social aspects within the children with ASD treatment plans. The integration between these skills is well-established and thus, enhancing one sphere, such as cognitive skills, can lead to the enhancement of social development as well. This piece of knowledge is vital when it comes to designing strategies that can improve the well-being as well as the development of kids with ASD. Therefore, it was concluded that children with ASD in the school exhibited a strong positive correlation between the Cognition and Social domain. The independent sample t-test revealed no significant: differences between genders in students' cognitive and social competence. According to the ANOVA test used in the study, there was no perceived distinction in the cognitive and social competencies about the tier of social class. It was aimed that the children who have high cognitive ability regarding autistic children are, have more imitating power than those children having low cognitive abilities (Saban-Bezalel, R. , Zachor, D. A. , & Ben-Itzchak, E. 2022) and cognitive knowledge contributes to the socialization of adolescence (Vovchenko, O. A., Lytvynova, N. A., Tsekhmister, Y. V., Hoshovska, D. T., &Vichalkovska, N. K. 2022)

Recommendations/Implications:

- Develop teacher training to adequately educate children with ASD. Teachers should thus be in a position to be able to give and apply tests in the areas of cognitive and social skills as well as have procedures for the development of these skills within the classroom.
- They are integrating the diverse intervention programs that focus on both the cognitive and the social aspects to address. It is therefore expected that assets that serve to build up cognitive capacities will also uplift social skills, and in the same vein strengths that enrich social skills will also build up cognitive capacities.
- Ensure parents are engaged in the developmental process of the child through their child's development plan. Building up the capacity of parents through training and support can enable the parent to foster the necessary skills required in the development of the child's cognitive and social skills at home.
- Future researchers may use a larger sample size in the study of the given subject area.
- It is important to conduct prospective investigations to observe the long-term impact of the interventions aimed at teaching cognitive and social abilities. Learning about the stages and the relations between these skills may help to gain a better understanding and improve the approaches to intervention.

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