

**“Evaluation and Designing of TLM (Teaching Learning Material)
for children with autism”**

THESIS SUBMITTED

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IN

HOME SCIENCE

(HUMAN DEVELOPMENT AND FAMILY STUDIES)

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2018

CANDIDATE DECLARATION

I, hereby declare that this doctoral work entitled “**Evaluation and Designing of TLM (Teaching Learning Material) for children with autism**” submitted by me under the supervision of Dr. Shalini Agarwal, Assistant Professor, Department of Human Development And Family Studies, School for Home Sciences, Babasaheb Bhimrao Ambedkar University, Lucknow, it is an outcome of my noble and original research work. I also declare that this thesis or any part of this thesis has not been previously submitted for any other degree to this or any other university and also undertaken that the thesis is essentially free from all kinds of plagiarism.

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CERTIFICATE

This is to certify that the thesis titled “**Evaluation and Designing of TLM (Teaching Learning Material) for children with autism**” submitted by **Ms. Bavita** is an original research work and has not been previously submitted in part or full for the award of any other degree or diploma to this or any other university.

The thesis submitted to Babasaheb Bhimrao Ambedkar University, Lucknow satisfies all the requirements as stipulated in the *Doctor of Philosophy (Ph.D) regulations- 1999 as amended in 2008/2010/2013* and it is fit for submission and evaluation for the award of the degree of Doctor of Philosophy of the University.

Date:

Supervisor

Head of the Department

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No individual is complete in himself. He need to develop many things by learning, with the encouragement and assistance from his parents, teachers, colleagues etc in all stage of life.

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ABSTRACT

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Autism Spectrum Disorders (ASD) are a group of complex neurological developmental disabilities with core features that include social, communication challenges and restricted, repetitive and stereotyped patterns of behavior. ASD can often be reliably detected by the age of 3 years and in some cases as early as 18 months. ASD is a descriptive umbrella term that encompasses five different diagnostic categories: Autistic disorder, Asperger's disorder, Pervasive developmental disorder- not otherwise specified (PDD-NOS), Rett's disorder, Childhood Disintegrative disorder.

Children with Autism disorder can appear to have little or no interest in making friends or establishing relationships with others and appear more interested in objects than people.

Asperger's Disorder is characterized by highly impaired social skills, children with Asperger's develop typical communication skills in the first few years of life and do not understand social rules and might lack empathy for others. Childhood Disintegrative Disorder (CDD) is a condition that occurs in 3 to 4 year olds and is characterised by deterioration in cognitive, language and social functioning following a period of at least two years of normal development. The child with Childhood Disintegrative Disorder loses previously acquired skills such as language, social skills, bowel or bladder control, play and motor skills.

Rett's disorder appears only in females and is characterised by deteriorating cognitive and physical development usually occurring between 6 to 12 months of age. Some of their characteristic behaviors include: loss of speech, repetitive hand-wringing, body rocking, and social withdrawal. Those individuals suffering from this disorder may be severely to profoundly mentally retarded. A child with PDD-NOS (Pervasive developmental disorder –

not otherwise) specified has severe impairment in verbal or non-verbal communication skills or displays unusual behaviors, interests, and activities.

People with autism may also experience over or under sensitivity to sound touch, taste, smell, light or colours. Asperger syndrome is a form of autism. People with Asperger syndrome are often of average to above average intelligence. They have fewer problems with speech but may still have difficulties with understanding and processing of language.

According to National Institute of Neurological Disorders and Stroke Fact Sheet 2008 estimated that three to six children out of every 1,000 given births a year will have autism. With this number, male children are four times more likely to have autism than females. Hence the present research was undertaken with the following objectives:

- To identify children with Autism in Lucknow city.
- To explore Teaching Learning Material used by various institutes having children with Autism.
- To design low cost Teaching Learning Material for children with Autism.
- To check the acceptance of developed low cost Teaching Learning Material by children and teacher.
- To study the impact of developed low cost Teaching Learning Material on children with Autism.
- Interview schedule along with checklist, observation sheet and standardized scale "Indian Scale for Assessment of Autism" was used to collect general and specific information, available TLM in NGO's, acceptability of developed TLM and to assess category of autism among children. Total 100 children enrolled in from different NGOs who are working for special children were selected for the study. The collected data was analysed with the help of different kind of statistical tools like mean, one way ANOVA, Chi-square test and paired t test for the purpose of drawing inference from the collected data more than half of the respondents were between the age group of 5-8 years of the respondents were between the age group of 9-12 years. More than 90.0 % of respondents were boys while other 10% respondents were girls. More than 55.0 % of the respondents had mild autism, 43.0 % of the respondents had moderate autism and very few 2.0 % had severe autism. Mean scores of different parameter ranged from 27.36 - 11.31, where, social relationship and reciprocity category had highest score (27.36) while cognitive category had lowest score (11.31). The mean scores on different parameter showed that respondents of age group 9-12 years scored more than respondents of age group 5-8 years in all categories except emotional responsiveness, where 5-8 years respondents scored more. Regarding availability of TLM, it was concluded that most of the TLM mentioned in observation sheet were available in all the NGO's. Regarding category of autism pre and post intervention evaluation, 55.0 percent of the respondents had mild autism before intervention, while

after intervention 60.0percent of the respondent came in category of mild autism whereas (45.0percent) respondents had moderate autism before intervention and after post intervention there were 40.0percent respondents.Regarding category of autism, pre and post intervention evaluation across age (37.5%) of respondents of age 5-8 year and (17.5%)respondents of age 9-12 year had mild autism before intervention and after intervention (40.0%) respondents of age 5-8 year and (20.0%) respondents of age 9-12 year had mild autism, While (27.5%) respondents of age 5-8 year and (17.5%) of respondents of age 9-12 year had moderate autism before intervention, after intervention (25.0%) respondent of age 5-8 year and (15.0%) respondents of age 9-12 year belonged to moderate category of autism. Regarding acceptability of low cost TLM by teachers and children, it was concluded that almost all the low cost TLM were accepted by both teachers and children. Regarding category of autism 26.3% of the respondents had mild autism while 23.8 percent respondents had moderate autism post intervention in case group. Regarding category of autism across gender, more than half (45.0%) of the boys and (7.5.0%) of girls had mild autism While (42.5%) of boys and (5.0%) of girls had moderate autism post intervention in case group. Regarding category of autism across different age group, 32.5 percent respondents belonging to age of 5-8 years and 20.0% respondents belonging to age group of 9-12 years had mild autism while 20.0% respondents of age group 5-8 year and 27.5% respondents of age group 9-12 year had moderate autism post intervention in case group. No significant difference was found in the percentage of respondents belonging to different gender in the category of Autism.

No significant difference was found in the percentage at respondent belonging to different age groups in terms of category of Autism. Significant difference was seen in term of level of autism across gender. Significant difference was seen in term of level of autism across different age group. No significant differences were observed in different domains across gender. No significant differences were observed in different domains across different age groups. Highly significant differences were observed in category of autism in case group post intervention. Highly significant differences were seen in different domain post intervention after using the low cost TLM.

Thus, it was concluded that the use of low cost teaching learning material was liked by both children with Autism and Teachers and its use effective in terms of improvement in different level of autism and different domains.

Date:

Km. Bavita

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ABBREVIATIONS

ADHD	Attention-deficit/hyperactivity disorder
ASD	Autism spectrum disorders
TLM	Teaching Learning Material
CDD	Childhood Disintegrative Disorder
PDD-NOS	Pervasive developmental disorder not-otherwise specified
DSM	Diagnostic Statistical Manual
RS	Rett's Syndrome
NIH	The National Institute of Health
ADOS	Autism Diagnostic Observation Schedule
ADIR	Autism Diagnostic Interview-Revised
CASD	Checklist for Autism Spectrum Disorders
M-CHAT	Modified Checklist for Autism in Toddlers
CHAT	Checklist for Autism in Toddlers

CSBS	Communication and Symbolic Behaviour Scales
ATEC	Autism Treatment Evaluation Checklist
ASQ:SE	Ages and Stages Questionnaire: Social-Emotional
SRS	Social Responsive Scale
CARS	Childhood Autism Rating Scale
SCQ	Social Communication Questionnaire



CHAPTER-1 INTRDUCATION



CHAPTER- 1

INTRODUCTION

“Autism is really more of a difference to be worked with rather than a monolithic enemy that needs to be slain or destroyed”

Stephen Shore

Children- the mirror of a nation, are future and the most precious resources. The quality of tomorrow’s world and perhaps even its survival will be determined by the wellbeing, safety and the physical, intellectual development of today’s children. To predict the future of a nation, it has been remarked that one need not consult the stars; it can more easily and plainly be read on the faces of its children (Pathil, 2006).

NEUROLOGICAL DISORDERS

Neuro-developmental disorders are disabilities associated primarily with the functioning of the brain. Neuro-developmental disorders in children include attention-deficit/hyperactivity disorder (ADHD), autism, learning disabilities, intellectual disability (also known as mental retardation), conduct disorders, cerebral palsy, and impairments in vision and hearing. Children with neuro-developmental disorders can experience difficulties with language and speech, motor skills, behavior, memory, learning, or other neurological functions (**America’s Children and the Environment, 2015**).

A child’s brain and nervous system are vulnerable to adverse impacts from pollutants because they go through a long developmental process beginning shortly after conception and continuing through adolescence. This complex developmental process requires the precise coordination of cell growth and movement, and may be disrupted by even short-term exposures to environmental contaminants if they occur at critical stages of development. This disruption can lead to neuro-developmental deficits that may have an effect on the child’s achievements and behaviour even when they do not result in a diagnosable disorder

Disability is itself a form of social oppression; it is the restriction imposed on top of our impairments by the way our society is organised (**Sheldon, 2004**).

World Health Organization data suggests that neurological and psychiatric disorders are an important and growing cause of morbidity. The magnitude and burden of mental, neurological, and behavioral disorders is huge, affecting more than 450 million people globally. According to the Global Burden of Disease Report, 33 percent of years lived with disability and 13 percent of disability-adjusted life years (DALYs) are due to neurological and psychiatric disorders, which account for four out of the six leading causes of years lived with disability (Mathers *et al.* 2003).

Famous people with mental illness

Many eminent people were faced neurological problem during their childhood. If these children are not identified and remedied, we will be guilty of losing eminent people. Many time, because of the punishment given by teachers and parents such children use their skills in negative way, becoming criminals and antisocial elements.

Some of the eminent persons with neurological problems are as:-

Abraham Lincoln: 16th President of U.S. suffered from severe and debilitating and on occasion suicidal depressions, as recorded by Carl Sandburg in his comprehensive six-volume biographical analysis of his life.

Brooke Shields: Talked about her disabling Post-Partum Depression in her newly published book "Down Came the Rain: My Journey through Postpartum Depression." Shields reported she first had difficulty bonding with her baby and later thought of hurting it and even killing herself. She was able to gain a significant improvement in her mood through medication and the help of a skilled nurse-helper who recognized her problem and encouraged her to get help.

Dr. Kay Redfield Jamison: Professor of psychiatry at Johns Hopkins University, Baltimore, MD, author of many books on mental illness. Dr. Jamison has bipolar illness herself and has attempted suicide.

Drew Carey: Drew Carey's dealt with some serious problems in his day. His 1997 autobiography revealed that he was once molested and that he later suffered bouts of

depression and even attempted suicide (twice) by swallowing copious amounts of sleeping pills.

Eugene O'Neill: Famous playwright, author of "Long Day's Journey into Night," and "Ah, Wilderness!" came from a deeply troubled family background, suffering from clinical depression in the greater portion of his life. His most famous plays were written between 1935 and 1943 despite persistent mental illness. He is the only American playwright to have won the Nobel Prize for literature.

Herschel Walker: Herschel Walker revealed that he suffered from dissociative identity disorder, or what used to be called multiple personality disorder. As a result of the warring personalities, Walker says he doesn't remember the moment or even the season that he won the Heisman Trophy.

Howard Hughes: Howard Hughes was known for being a pioneer in business, aviation, and filmmaking but now he's sadly remembered as a recluse driven to crippling depths by obsessive-compulsive disorder. Yet even his fixation on Russell's physique was a sign of his mind's inability to let things alone. He spent most of the end of his life hiding from public view and addicted to various medications

Isaac Newton: Most famous mathematician of the 17th Century was responsible for many scientific discoveries we take for granted today such as the "corrected" Gregorian calendar date. Newton's greatest mathematical discovery was the gravitational relationship between the earth and the moon, and of centrifugal force. Newton was well educated, had access to the best knowledge of his day and was wealthy in later life. He suffered from several "nervous breakdowns" in his life

Vivien Leigh: Actress made famous by her leading role in "Gone With the Wind" and her creative genius for stage and screen, suffered from serious bouts of manic depression, tuberculosis, and poor health her entire life. Vivien was once able to make a full recovery after shock treatments, only to succumb some years later. A nervous breakdown associated with a miscarriage proved to be the unravelling of her marriage with actor Lawrence Olivier. She was finally diagnosed with cyclical manic-depression with hallucinations and had to be confined to a nursing home only to recover and return to the screen for her last movie.

Shawn Colvin: Winner of two Grammys in music, talked about her struggle with depression. Colvin has suffered from major depressive disorder for more than 20 years.

Michael Phelps: Michael Phelps is just another guy who's had to deal with a problem that's confronted many other people: attention-deficit hyperactivity disorder, or ADHD. After an inability to concentrate led to the diagnosis when Phelps was in middle school, he worked with his parents and teachers to impose a better structure on his life and learning habits.

Lionel Aldridge: A football player for the Green Bay Packers during the 1960's, developed paranoid schizophrenia and was homeless for 2 1/2 years. (**Personality Disorders 2012**)

There are many neurodevelopment disorders. Some of them are entitled as:-

- Intellectual Disabilities
- Communication Disorders
- Autism Spectrum Disorder
- Attention-Deficit/Hyperactivity Disorder
- Specific Learning Disorder
- Motor Disorders
- Schizophrenia Spectrum and Other Psychotic Disorders
- Catatonia
- Bipolar and Related Disorders
- Depressive Disorders
- Anxiety Disorders
- Obsessive-Compulsive and Related Disorders
- Trauma- and Stressor-Related Disorders
- Dissociative Disorders
- Somatic Symptom and Related Disorders
- Feeding and Eating Disorders
- Sleep-Wake Disorders

- Elimination Disorders
- Breathing-Related Sleep Disorders
- Parasomnias
- Sexual Dysfunctions
- Gender Dysphoria
- Disruptive, Impulse-Control, and Conduct Disorders
- Substance-Related and Addictive Disorders

Autism

Autism was first identified in 1943 by Leo Kanner, an American psychologist. Kanner noticed distinctive, common characteristics within a subgroup of children in whom other mental disorders had been diagnosed originally. Kanner recognized the inability of this subgroup to relate in the ordinary way to other people and situations, and he described this behaviour as “extreme autistic aloneness” (**Kanner, 1943**).

The term Autism is derived from the Greek word *Autos* means SELF. Autism is a complex neurobehavioral disorder characterized by impairment in reciprocal social interaction, impairment in communication, and the presence of repetitive and stereotypic patterns of behaviors, interests and activities. The logo of Autism is puzzle, because puzzle indicates the mystery and complexity of Autism. Each puzzle piece indicates the child with Autism waiting to complete the picture and give it a meaning.

Autism is a term used to describe a group of developmental brain disorders. Autism is a lifelong developmental disability that affects how a person communicates with, and relates to, other people. People with autism may also experience over- or under-sensitivity to sounds, touch, tastes, smells, light or colours.

It is a spectrum condition, which means that, while all people with autism share certain difficulties, their condition will affect them in different ways. Some people with autism are able to live relatively independent lives but others may have accompanying learning disabilities and need a lifetime of specialist support.

Autism spectrum disorders (ASD) are complex neurodevelopment disorders that include deficits in social interaction, communication, and the presence of repetitive and restricted behaviors. The symptoms are generally present before the age of 3 years and may be accompanied by impairment in cognitive functioning, learning, attention, and sensory processing (**Coplan, 2010**).

Autism Spectrum Disorder (ASD), sometimes referred to as “autism”, is “a chronic disorder whose symptoms include failure to develop normal social relations with other people, impaired development of communicative ability, lack of imaginative ability, and repetitive, stereotyped movements” (**Carlson, 2007**).

Individuals with autism disorder have markedly different social and emotional actions and reactions than non-autistic individuals. For example, many autistic children do not seem to care whether or not they get attention from their parents. ASD also has an effect on IQ. While 30% of individuals with autism have an average or gifted IQ, 70% are considered mentally retarded (**Sarason and Sarason, 2002**).

Category of Autism

It is a neuro-developmental disorder categorized in the Diagnostic and Statistical Manual of Mental Disorders 4th edition, Text Revision (DSM-IV-TR) as a Pervasive Developmental Disorder (PDD). This category of disorders includes:

- Autistic disorder,
- Asperger’s Disorder,
- Pervasive Developmental Disorder-not otherwise specified (PDD-NOS)
- Rett’s syndrome,
- Childhood Disintegrative Disorder (DSMIV- TR).

Autistic disorder-

This disorder is often referred to as the hallmark of autism .Individuals with autistic disorder usually have significant language delays, social and communication challenges, and unusual behavior and interests. Many children with Autistic disorder can appear to have little or no

interest in making friends or establishing relationships with others and appear more interested in objects than people (**American Psychiatric Association, 2000**).

Asperger's disorder-

Asperger's disorder is characterized by highly impaired social skills, difficulty relating to others, a lack of imaginative play, and a preoccupation with a highly specific topic. (**Vanbergeijk and Shtayermman, 2005**). Asperger syndrome is a form of autism. People with Asperger syndrome are often of average or above average intelligence. They have fewer problems with speech but may still have difficulties with understanding and processing language” (**The National Autistic Society, 2012**).

Pervasive developmental disorder not-otherwise specified (PDD- NOS)-

A child with PDD-NOS has severe impairment in either verbal or non-verbal communication skills or displays unusual behaviors, interests, and activities; they do not meet criteria for a specific pervasive developmental disorder. For example, this would include a child who does not meet criteria for autistic disorder because of late age of onset or a typical symptom (**American Psychiatric Association, 2000**).

Retts Syndrome (RS)

Andreas Rett (1966) first described this progressive genetic neurodevelopment disorder which is one of the most common causes of mental retardation in females. RS is characterized by apparently normal development for the first 6–18 months of life, followed by a period of regression in language and motor skills. Characteristics of this disorder includes loss of purposeful hand use replaced with repetitive stereotyped hand movements, social withdrawal, communication dysfunction, loss of acquired speech and cognitive impairment (**Matijevic et al., 2009**). Other features of this disorder includes panic-like attacks, respiratory dysfunctions (episodic apnoea and/or hyperpnoea), impairment of sleeping patterns, progressive kyphosis or scoliosis, decreased somatic growth (**Williamson and Christodoulou, 2006**).

Childhood Disintegrative Disorder (CDD)

Childhood disintegrative disorder is characterised by deterioration in cognitive, language and social functioning following a period of at least two years of normal development. The child with Childhood Disintegrative Disorder loses previously acquired skills such as language, social skills, bowel or bladder control, play and motor skills.

Characteristics of Children with Autism Spectrum Disorders

Children with ASD's will therefore require direct teaching of social signals and conventions, such as responding to their name as an attention-alerting signal, turn-taking skills, the timing and dynamics of social interactions, the concept of sharing, the capacity to classify and respond to pertinent information, and the modulating of levels of arousal (**Jordan, 2005**).

1. Social characteristics

Social skills deficits are common to all individuals with an ASD. These skills are pervasive, and typically manifest at a very young age. The DSM-IV-TR (**APA, 2000**) lists the impairments in social interaction as:

- 1) Deficits in nonverbal behaviors (e.g., eye-to-eye gaze, recognition of facial expressions, use of gestures to regulate social interaction).
- 2) Failure to develop peer relationships appropriate to the child's developmental level.
- 3) Lack of spontaneous seeking to share enjoyment and interests (e.g., failure to show, bring, or point out objects of interest).
- 4) Lack of social or emotional reciprocity (e.g., unable to respond to emotions or social interactions from others).

2. Communication characteristics

Children with ASD are almost universally delayed in their acquisition of spoken language (**Tager et.al. , 2005**).

Greater number of children in the group with ASD produced no vocalizations. Moreover, the vocalizations of children with ASD were less likely than those of children in the other groups

to be paired with nonverbal communication, such as shifts in gaze, gestures, or changes in facial expression, as has frequently been reported (**Wetherby et al., 2007**).

Children with ASD's need to be directly taught the purpose of communication and the variety of ways in which we communicate, such as gestures, eye signalling, facial expression, and body posture (Jordan, 2005).

Several studies have described the communicative characteristics of children in the second and third year of life who are identified with ASD. They include:

- * Abnormal gaze patterns.
- * Limited social referencing and sharing of affect.
- * Low frequency of joint attention, showing, or commenting.
- * Inconsistent response to name.
- * Low frequency of nonverbal communication.
- * Failure to respond to or use conventional gestures.
- * Limited pretend play.
- * Limited motor or vocal imitation.
- * Limited interest in people and interactive games.
- * Delayed onset and development of spoken language.
- * Unusual vocalizations

(Chawarska and Volkmar (2005))

Most striking, are recent analysis associating grammatical deficits to the disorder. Amongst others, are problems with morphological marking of finite verbs, such as the omission of the past tense morpheme *-ed* or *-s* marking the third person of the singular (**Tager and Flusberg, 2004**).

3. Language characteristics

TERM	DEFINITION	EXAMPLE
Echolalia	Children repeat what has been said to them either immediately or after some period of time.	Parent: "Do you want a drink?" Child with ASD: "Do you want a drink?" Child with ASD repeats question instead of providing an answer.
Contact gestures	Children use other people as a tool to get what they need or want. The gesture is not symbolic.	Child with ASD grabs adult's hand without making eye contact and drags to the television to get the adult to change the channel.
Pronoun reversals	Children use first (I, me) and second pronouns (you, he, she) incorrectly.	Child with ASD: "You want to go to the park." TD child: "I want to go to the park."
Neologisms	Children assign meaning to a word or phrase that is not the socially accepted meaning.	Child with ASD is given popcorn during a movie about a dog named Rebel. The next time the child wants popcorn, he/she asks for "Rebel." The word Rebel is a neologism for popcorn.

(Helfin and Alaimo, 2007)

Table 1.1 Language Characteristics of Autism Spectrum Disorder (ASD)

4. Behaviour characteristic

Children with ASDs exhibit rigid thought and behaviour patterns, which may lead to obsession behaviour, repetitive interests, and ritualistic play. Fundamental behaviour of joint attention include eye contact, gaze shifting between a social partner and an object, and pointing gestures. As a child continues to develop, these behaviors are mastered and advanced through the combination of these behaviors with language.

Eye contact, the earliest and most prominent form of joint attention, makes an appearance in the very beginning of an infant's life. Within 5 days after birth, infants show a significant preference for images of faces with direct eye gaze over faces with an averted gaze (**Farroni, et.al. 2002**).

Speech, Language and Communication deficits in children with Severe ASD

Communication development is experienced by all children with ASD. The deficits included lack of interest to communicate with others, lack of intentionality in communication, and lack of abilities to initiate, maintain and end a reciprocal interaction. These deficits in communication hinder the children's abilities to progress in speech and language development since this developmental process needs to be grounded within the context of communication (**Tomasello, 2008**).

The majority of children with ASD experience delay in speech and language development, with as many as a quarter of them do not develop verbal language at all. (**Sigman and Govern, 2005**).

Children with severe ASD might have severe language processing deficits that hinder their abilities to process sound- and vocabulary related information (**Rapin and Dunn, 2003**).

Language processing deficits are believed to block their access to word meanings and to build a word repertoire mentally. As a result, many of them are unable to recognize spoken words and to understand the associated meanings. On the other hand, some children with severe ASD might also have problems in manipulating and imitating fine motor actions, including the movements of lips and tongue (**Ming, et.al. 2007**).

Joint attention is one of the prerequisites for the development of language, which is typically delayed in children with autism (**Carpenter, et.al. 2002**). Joint attention is one of the earliest difficulties detected in autism (**Charman, 2003**).

In the preverbal phase, children with autism develop a typical way of communication. Usually these are not gestures, vocalizations or gazing, but rather self-abuse, aggression, screaming and crying (**Bara, et.al. 2001**). It has been demonstrated that autism affects the processing of information regarding the human face(**Trepagnier et al., 2002**).

People with this disorder had difficulties recognizing faces, although they recognized objects correctly (even slightly better than the control group). By monitoring gaze direction, it was shown that they focused their gaze on the face for a much shorter time. Problems in communicating with the child are probably one of the most important causes of the high level of anxiety in mothers. In the research conducted by **Sekuowicz (2000)**, a high level of anxiety was found in half of 34 mothers of autistic children. It was significantly more than in the other tested groups like mothers of children with cerebral palsy and mothers of children with mental retardation. The relatively higher level of anxiety in mothers of children with autism was also demonstrated in comparison with mothers of children with Down syndrome and mothers of normally developing children (**Pisula, 1993**), as well as mothers of children with mental retardation and mothers of children with movement disturbances. Some individuals with autism have no language at all. Most do have the ability to speak and use language, but they do not appropriately integrate their language abilities into social interaction or emotional attachment. Approximately half of children with autism fail to develop functional speech, but only a small percentage are completely nonverbal. This inability to communicate in a functional manner may be the most handicapping of any of the symptoms of the disorder (**Schreibman, 2000**). Controversy with interventions for teaching language and communication skills to children with autism continues till date. The reason for disagreement about effective instructional approaches and best practice is directly related to the variation among language development theories. Those who advocate a more direct

approach believe that language is acquired through reinforcement and imitation(Scheuermann and Webber, 2002).

Comparison of Characteristics between Autism, Asperger's Disorder and PDD-NOS

Characteristic	Presentation in Autism	Presentation in Aspergar Disorder	Presentation in PDD-NOS
Cognitive and Intellectual Ability	More individuals display intellectual disabilities. Cognitive abilities range from gifted to severely impaired	More individuals display average to above average abilities. Cognitive abilities range from gifted to mildly impaired.	Individuals with PDD-NOS display abilities across the entire range of intellectual ability.
Social Interaction	Social skill deficits in all areas of interaction. Social skill errors and misunderstandings can present as problem behavior.	Social skill deficits in all areas of interaction. Social skill errors and misunderstandings can present as problem behavior or social language difficulties.	Individuals display social skill deficits, but may not meet full criteria in this category for either autism or Asperger's Disorder.
Communication Patterns	More individuals display late acquisition of language and lifelong language delays and	Most individuals acquire language on time, but display significant	Individuals display communication

<p>Patterns of Behavior</p>	<p>disorders including increased use of idiosyncratic and echolalic language. Most individuals have significant challenges displaying and understanding nonverbal communication.</p> <p>More individuals display unusual motor movements and stereotypes such as flapping hands, rocking, jumping, etc. Many individuals resist changes in routine and engage in non-functional rituals.</p> <p>Many individuals display challenging behavior including</p>	<p>challenges with the social use of language (also called pragmatics). Many display difficulties with reciprocity in communication and understanding and using Nonverbal communication.</p> <p>Many individuals converse about intense interests to the exclusion of reciprocal interaction with others. Some individuals display motor stereotypes, but to a lesser degree than those with autism. Many individuals resist changes in routine and engage in non-functional rituals.</p> <p>Many individuals display challenging</p>	<p>deficits, but may not meet full criteria in this category for either autism or Asperger’s Disorder.</p> <p>Individuals may display restricted and stereotyped patterns of behavior, but may not meet full criteria in this category for either autism or Asperger’s Disorder.</p>
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<p>Secondary Characteristics</p>	<p>aggression, self-injurious behavior, darting or wandering away, and over activity. Some individuals with higher intellectual abilities may also experience anxiety disorders and depression. Many individuals also display varying patterns of hyper responsiveness and hypo responsiveness to sensory stimulation.</p>	<p>behavior including aggression, self-injurious behavior, darting or wandering away, and over activity. Many Individuals may also experience anxiety disorders and depression. Many individuals also display varying patterns of hyper responsiveness and hypo responsiveness to sensory stimulation.</p>	<p>Some individuals display challenging behaviour including aggression, Self injurious, behavior, darting or wandering away, and over activity. Some individuals with higher intellectual abilities may also experience anxiety disorders and depression. Many individuals also display varying patterns of hyper responsiveness and hypo responsiveness to sensory stimulation.</p>
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Table 1.2 Comparison of Characteristics between Autism and Asperger's

(Schall and McDonough, 2009)

Causes of Autism

The available data suggest that autism results from different sets of causal factors—including genetic, neurobiological, and environmental that manifest in characteristic behavioral symptoms.

1. Genetic Risk Factors:

It is largely agreed that ASD is the result of heritable genetic differences and mutations. Findings in support of a genetic link include research results showing that ASD is more common in boys than girls due to genetic differences associated with the X chromosome (**Chakrabarti and Fombonne, 2005**). Almost 20% of infants with an older biological sibling with ASD also developed ASD; the risk for developing ASD was greater if there was more than one older affected sibling (**Ozonoff et al. 2011**).

2. Neurobiological Factors:

Abnormalities in the genetic code may result in abnormal mechanisms for brain development, leading in turn to structural and functional brain abnormalities, cognitive and neurobiological abnormalities, and symptomatic behaviors. (**Williams, 2012**).

Neurobiological differences associated with a diagnosis of ASD include-

- Problems with genetic code development involving multiple brain regions, including frontal and anterior temporal lobes, caudate, and cerebellum (**Abraham and Geschwind, 2010**).

Structural and functional abnormalities of the brain includes-

- Increased gray matter in the frontal and temporal lobes (**Smith and Piven, 2006**).
- Decreased white matter compared with gray matter by adolescence (**Volkmar, et.al. 2004**).
- Anatomical and functional differences in the cerebellum and in the limbic system (**Volkmar et al., 2004**).

Differences in the brain's response to the environment includes-

- Decreased neural sensitivity to dynamic gaze shifts in infancy (**Elsabbagh et. al., 2012**).
- Preference for non-social versus social processing and hemispheric asymmetries in event-related potentials (**McCleery, et.al.2009**).
- Disruptions in normative patterns of social neurodevelopment that contribute to a diminished attention to social stimuli (**Jones, et.al.2008**).

3. Environmental Factors

Given the complexity of autism risk, researchers have begun to investigate how pre- and post-natal environmental factors (e.g., dietary factors, exposure to drugs and environmental toxicants) interact with genetic susceptibility to ASD. A number of environmental exposures have been identified for future study, including lead, polychlorinated biphenyls (PCBs), insecticides, automotive exhaust, hydrocarbons, and flame retardants (**Landrigan,et.al.2012**).

Rudy (2008) suggested that the disruption of normal brain could be caused by defects in genes that control brain growth which is responsible for regulating how the neurons in the brain communicate with each other.

It has been a common saying that autism runs in families. Siblings of people with autism are more likely to be autistic and twins are more likely to share autistic traits. These statements, therefore, suggest that there is a genetic component to autism, which does not necessarily mean that a single gene or genetics is the only risk factor for autism.

The National Institute of Health (NIH) Report (2008) on the possible causes of autism has continued to advance various studies on autism and discovered a wide range of structural and chemical differences in the brains of children of school age and adults with autism. There are various causes that may contribute to autism. For example, it may be that certain children are genetically more susceptible to certain types of food allergies, or more likely to react badly to certain environmental toxins.

National Institute of Mental Health reports which indicated that 75%-80% of people with autism are mentally retarded to some extent. With this considerable percentage, it is believed

that those with Aspergers Disorder may have needs but to certain extent a sound mental disposition that may allow them the opportunity to do school work that requires mental alertness. In some cases, children with Asperger's Syndrome who received early intervention have done very well in gradual transitioning to a mainstream or typical classroom.

Children with autism lack two basic skills that are essential to learning:

(1) Imitation skills, which are the ability to watch another person do an action and imitate that action. It is of course obvious to claim that much of what a young child learns to do, especially a child who lacks expressive or receptive language skills, is through imitation.

(2) Joint attention skills, which are the ability to focus attention on something that is pointed out to the child by another.

Sensory and perceptual impairments can lead to an under sensitivity or oversensitivity to noise, smell, taste, light, touch, or movement, fine and gross motor difficulties, poor organisational skills, and difficulties in managing the time and sequence of activities.

Red Flags/ Early Signs of Autism

The five major internationally recognised red flags or early signs for autism are:

- Does not babble or coo by 12 months of age.
- Does not gesture (point, wave, grasp, etc.) by 12 months of age.
- Does not say single words by 16 months of age.
- Does not say two-word phrases on his or her own (rather than just repeating what someone says to him or her) by 24 months of age.
- Has any loss of any language or social skill at any age

(Fillipek et al.2000)

Symptoms of Autism

- Repetitive behaviors (may want to watch the same program over and over again).
- Delayed speech & language development (non-verbal, especially by age 3).
- Lack of imitation of others or imaginative play.

- Hypersensitivity to light & sound (covers ears when music is played or covers eyes when going outside).
- Self-stimulatory behaviors (e.g., rocking, jumping up and down, hand flapping).
- Echolalia (Repetition or echoing of a word or phrase just spoken by another person).
- Unusual emotional responses (inappropriate laughing or crying). Frequent temper tantrums /meltdowns. Responds adversely to physical affection, hugs, kisses, etc. shows no interest in making friends.
- Self-injurious Behavior (head banging, scratching/biting self).

(<http://www.autismkey.com/autism-symptoms/>)

Helping the Child with ASD to Interact Socially

Autism syndrome disorder children experience the isolation in social interaction activities since other peers views them as strange. Children with autism may be disliked and intentionally left out of activities or opportunities to interact with others. Efforts can be made however to decrease social isolation by using peers who have developed skills needed to assist others when they struggle in social situation. Different approach and common strategies used to assist in improving social interaction are as follows:-

Peer-mediated Approaches are efforts that attempt to increase the networks of friends to students with autism and assisting in providing the opportunities to learn and practice a variety of social skills within naturally occurring context like play ground.eg peers may be used to teach how to play new game. It provides structure for students with autism, which adds a sense of predictability (**Sansosti 2010**).

Sharing Attention Autistic children rarely make attempt to share things like toys. They likely use another person as stool by pulling or pushing someone for the thing they need. These children need to be taught to share in social interaction situation. Teacher should focus more on participating with children rather than giving directions to them.

Preventing Withdraw Autistic children some time seem to be not interested in others this is because they fail to understand real who to interact to. The use of intensive method for encouraging interaction should be used. Sometime the child need short period of medication or stress reducing activity to help him/her to lift the mood due to depression while

educational and behavior method are used to help child develop interest in others. The intensive interaction motivate the child to join and choose activity in a loving and accepting way if situation and activity is chosen well can avoid withdrawal (**Jordan, 1999**).

Friendship Autistic children make true friendship and they have preferences as to their comparisons. Staffs should be sensitive when constructing social groups and how far should encourage friendship. Teachers and care takers they should help the child to understand others and how to relate with others. Child needs experience to do things which she enjoys with others and there should be continues program of teaching the child how to learn in social context (**Jordan,1999**). “Circle of friends” is an intervention for students who are socially disconnected and helping individual with autism to build relationships with peers. This is very helpful in increase their sense of belonging within the social world. If a circle of friends network is used the educators should follow a few steps to ensure the safety of the student. This will produce positive development of social interaction (**Sansosti, 2010**).

Teaching and caring relationship should be developed among teachers care taker parents and the child. This is important as it stimulates and motivates the child for further learning. Working in cooperation together with the child can improve and develop relationship.

Diagnosis

There has been limited research discussing the tools for screening for Autism spectrum disorders (ASD). These are some diagnostic and screening instruments for the disorder — Autism Diagnostic Observation Schedule (ADOS), Autism Diagnostic Interview-Revised (ADI-R), Autism Diagnostic Observation Schedule(CASD)Modified Checklist for Autism in Toddlers (M-CHAT), Communication and Symbolic Behaviour Scales(CSBS), Autism Treatment Evaluation Checklist (ATEC), Autism Spectrum Screening Questionnaire(ASSQ), Social Responsive Scale (SRS) and Social Communication Questionnaire (SCQ). The Checklist for Autism in Toddlers (CHAT) was designed to identify 18 month old children at risk of ASD.

Baird *et al.* (2000)found that the majority of children diagnosed with ASD on screening at 18 months with the Checklist for Autism in Toddlers (CHAT). The modified C HAT (M-

CHAT) is a parent report version of the CHAT designed to be used as part of clinician led child health surveillance, with 18-24 month old children. A revised version of CHAT, the Modified Checklist for Autism in Toddlers (M-CHAT), is now the most frequently used instrument for early screening for ASD. **(Robins et.al. 2001).**

Autism Diagnostic Observation Schedule(ADOS) and the Autism Diagnostic Interview-Revised (ADI-R) the gold standard tests for diagnosing the disorder, the ADI-R, a parent interview, reliably assesses all three original domains: social deficits, communication and

language deficits, and restricted and repetitive behaviors. ADOS, which are based on clinical interaction and observation, have traditionally been less helpful in identifying repetitive and restricted behaviours. The most popular screening tool for autism is the Ages and Stages Questionnaire: Social-Emotional (ASQ:SE), a 15-minute test for parents of children 3 months to 3 years of age. Second most popular Modified Checklist for Autism in Toddlers (M-CHAT), a revised version of the Checklist for Autism in Toddlers (CHAT), the first test to screen for early signs of the disorder.

M-CHAT has been studied in both high-risk (children referred for diagnostic assessment) and low-risk samples (children attending routine visits to well-baby Clinics), performing more accurately in high-risk than low-risk samples.**(Pandey , et al.2008).**

Information obtained from low-risk samples is limited by the fact that assessments were largely confined to children who screened positive. Limited efforts have been made to identify false negatives, that is, children who are not identified in the screening but who later receive an ASD diagnosis. (**Rosenbaum , 2011**)

Methods of Assessment

Initial assessment

Important information can be gathered at this stage that may suggest the need for specialist assessment. Those involved in carrying out the initial assessment should be aware of the core features of ASD as well as of the wide range of different possible presentations, depending on

the child's level of communication and intellect, personality, gender differences, family and educational supports.

Specialist assessment

The aim of specialist assessment is to gather and record information that enables diagnosis and to formulate a multiagency management plan, leading to the development of an appropriate programme of supportive intervention. Such an assessment is necessarily comprehensive and may take place over a period of time. A diagnosis of ASD may be seen as a life long 'label'. For this reason, it is of equal importance with clinical diagnosis. Specialist healthcare professionals must ensure that they are sufficiently informed and experienced to confidently diagnose in the majority of cases and that they collaborate, where possible, with relevant multiagency.

The process of assessment and diagnosis aims to review functioning in relevant domains, make diagnoses as appropriate and facilitate seamless, multiagency intervention. It should acknowledge that other conditions (for example, specific language impairment in a three year-old, or first onset depression in a 13 year-old) may present in a superficially similar way to ASD and also that there is significant potential for comorbidity. **(Le Couteur ,2003)**

The Autism Diagnostic Interview – revised(ADI-R)has been shown to be a reliable diagnostic instrument. **(Noterdaeme, et.al.2000)**.It should be used with the Childhood Autism Rating Scale(CARS)which is an older instrument which encompasses history and observation of spontaneous behaviours relevant to autism. **(Rellini , et.al.2004)**.

The Autism Diagnostic Observation Schedule–Generic (ADOS-G) has been shown to be a reliable diagnostic instrument and can be used to supplement clinical history. It provides standard contexts to elicit relevant social and communicative behaviours, rather than rely on what is spontaneously manifested by a child or young person. ADOS-G has an excellent diagnostic validity for ASD versus non-ASD conditions, if controlled for expressive language level (**Lord, et al.2000**).

RATIONAL OF THE STUDY

Autism is a complex neurological disorder that affects the functioning of the brain which is characterized by impairments in communication and social interaction, and restricted, repetitive and stereotypic patterns of behaviour, interests, and activities.

Review of literature provided an insight about the gap lying in the researches related to Autism. It was observed that through many researches have been conducted on Autistic children studying different domains, regarding teaching learning material used etc. but the concept of development of TLM which was enclosed and easy to handle was found in very less studied.

Presently variety of teaching learning materials are available that are used to deal with children having autism. The available TLM in the market are quiet costly. In this research the researcher wants to explore-

- Types of special TLM's available for children with Autism.
- Whether these special TLM's were available in the schools dealing with children with Autism.
- If available, whether teachers were able to use them and how frequently they were using them?

It was also observed that though there are sufficient TLM available in market but they were quiet costly even not affordable by low income group families. Many times schools, NGO's having Autistic children, do not purchase specific TLM that are developed for Autistic children. Studying all these issues the researcher divided to prepare low cost teaching learning material according to the need of children based on different domains.

The researcher wanted to design low cost TLM kit which could be easily available to institutions and parents having Autistic children. The present study mainly focused to improve Social, communication and Behaviour problem of children with autism by using low cost Teaching Learning Materials.

This piece of research aimed to investigate child perspectives of the use of teaching materials for children with autism in across different NGOs. This research has provided valuable knowledge into the use of TLM in an autism specific NGOs. The research can conclude that low cost TLM have a significantly positive affect on children with autism and can help them in many areas which they may struggle. The use of these types of TLM will target the particular domain and this can help in the improvement of the same.

These TLM will be beneficial for the teachers and parents as well. Teachers can select a particular TLM from the kit and can practice it with a child depending on the domain which needs improvement.

Parents who can't afford high budget TLM can use these with their children. Moreover, as these TLM's are made from waste materials, they can be prepared at home also and can be used effectively with children having autism.

Low cost TLM can unmistakably help children not only communicate, but also provide them with necessary skills to initiate and sustain social interactions with their peers.

OBJECTIVES

- To identify children with Autism in Lucknow city.
- To explore Teaching Learning Material used by various institutes having children with Autism.
- To design low cost Teaching Learning Material for children with Autism.
- To check the acceptance of developed low cost Teaching Learning Material by children and teacher.
- To study the impact of developed low cost Teaching Learning Material on children with Autism.

LIMITATIONS

- The research was restricted to Lucknow city.
- For giving intervention children having mild , moderated Autism were selected
- The intervention period was restricted to three months.

HYPOTHESIS

Ho1: There exists no difference between categories of autism across gender

Ho2: There exists no relation between category of autism and Age group.

Ho 3: There is no significant difference between level of autism and gender.

Ho 4: There is no significant difference between level of autism across age group.

Ho 5: There is no significant difference between domains and gender

Ho 6: There is no significant difference between domains and age group

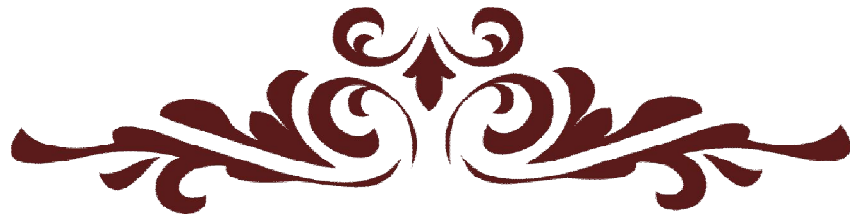
Ho7: There exists no significant difference between category of Autism among control and case group before intervention

Ho 8: There is no significant difference between category of autism in control and case after intervention

Ho 9: There is no significant difference between level of autism in case and control groups post intervention

Ho.10 : There is no significant difference in scores on domains of autism after intervention

Ho11: There is no impact of Teaching Learning Materials on children with Autism.



CHAPTER-2
LITERATURE REVIEW



CHAPTER- 2**REVIEW OF LITERATURE**

A “**literature review**” may constitute an essential chapter of a thesis or dissertation, or may be a self-contained review of writings on a subject (such as a journal article). In either case, its purpose is to place each work in the context of its contribution to the understanding of the subject under review, describe the relationship of each work to the others under consideration, identify new ways to interpret, and shed light on any gaps in, previous research, resolve conflicts amongst seemingly contradictory previous studies, point the way forward for further research, place one's original work (in the case of theses or dissertations) in the context of existing literature. One of the most satisfying aspect of the literature review is the contribution it makes to the new knowledge, insight and general scholarship of the researcher. In this chapter the Literature reviewed has been presented in a systematic manner, according to relevant objective of the research, so that it would be easy to relate the previous finding and to understand the basic structures of the research problem.

The literature pertaining to the study entitled “**Evaluation and Designing of TLM (Teaching Learning Material) for children with Autism**” was reviewed under the following headings:

- **Researches related to Autism**
- **Researches related to the TLM used for Autistic children**
- **Researches related to study the impact of TLM on Autistic Children**

Research related to Autism

Schreibman, (2000) Autism prevalence rates currently range from 10 to 15 cases per 10,000. It is not clear if the actual prevalence of autism is increasing, or if the increased frequency of diagnosis has resulted from wider recognition of the disorder and especially recognition of the full range of pervasive developmental disorders. Either way, autism is no longer considered rare, occurring more commonly than Down's syndrome, cystic fibrosis, and several childhood cancers.

Fombonne (2003) found in a recent review of epidemiological studies reports that, autism is associated with intellectual disability in about 70% of the cases and is over represented amongst males (with a male/female ratio of 4.3:1).

Billsted et al. (2003) undertook a population-based 13-22 year follow up study of individuals diagnosed in childhood, N=120, (83 males, 37 females) of whom 78 had a diagnosis of autism and 42 a diagnosis of atypical autism/autistic-like conditions. 20% of individuals with autism had IQs over 70%, whilst 14% of those with atypical autism had IQs over 70%.

Muhle et al. (2004) confirmed DeFrancesco's findings but with different percentages: twin studies reported 60% concordance for classic autism in monozygotic twins vs. 0% in dizygotic twins, the higher monozygotic concordance attesting to genetic inheritance as the predominant causative agent. Re-evaluation for a broader autistic phenotype that included communication and social disorders increased concordance remarkably from 60–92% in monozygotic twins and 0–10% in dizygotic pairs. This suggests that interactions between multiple genes cause “idiopathic” autism, but epigenetic factors and exposure to environmental modifiers may contribute to variable expression of autism-related traits. Data from whole genome screens in multiplex families suggest interactions of at least 10 genes in causation of autism.

National Institute of Neurological Disorders and Stroke Fact Sheet (2008) estimated, three to six children out of every 1,000 given births a year will have autism. With this number, male children are four times more likely to have autism than females.

The Centre for Disease Control (2009) reported an average increase of 57% from 2002 to 2006. In 2006, they estimated that 1 in 110 children in the United States had an autism spectrum disorder, with males being disproportionately affected at a rate of 1 in 70 (CDC, 2009).

Grether et al. (2009) Found that a 10-year increase in maternal age was associated with a 38% increase in the odds ratio for autism, and a 10-year increase in paternal age was associated with a 22% increase. Maternal and paternal age effects were of greater magnitude among firstborn compared to later-born children.

Shelton et al. (2010) Emphasized that the father's age conferred an increased risk only when mothers were < 30 years old. The trend toward delaying childbearing contributed about a 4.6% increase of autism over the decade.

Centers for Disease Control and Prevention (2011) Over the past decade and worldwide, estimates of increases between 50% to over 2000% in cases of Autistic Disorder diagnoses have been charted. **Elsabbagh, M., et al. (2012)** Global data on the prevalence of disorders that now fall under the term ASDs had been available before 2013. In a 2012 review that compared prevalence data from different parts of the world (excluding sub-Saharan Africa), the researchers estimated the median global prevalence of 17/10,000 (approx. 1 in 588) for autistic disorder, and 62/10,000 (approx. 1 in 161) for all pervasive developmental disorders; while suggesting that the increase in estimates over time and the variability between countries and regions may be linked to diagnostic switching, the broadening diagnostic criteria, service availability and the increasing global autism awareness.

Werling DM, Geschwind DH (2013): ASDs have also been observed to have a higher prevalence in males, compared to age-matched females; in a 4:1 ratio. This observation has been consistent across populations, regions and time; strongly suggesting the involvement of sex-specific biological factors in ASD aetiology. Genetic studies have demonstrated that females are protected from the effects of *de novo* and heritable ASD risk variants, with suggestions that sex hormones or sex chromosomal genes may modulate these genetic variations.

Raina SK, et al 2017- Stated that India had a paucity of community-based population studies for autism; although there were a number of hospital-based autism clinical assessment studies. However, in a 2017 population-based study (of 28, 078 children aged between 1 and 10 years, cutting across geographical regions that represent rural, urban, and tribal populations in India) using the Hindi version of the Indian Scale for Assessment of Autism; a prevalence of 0.15% (1 in 667) was reported, with a male sex predilection. Also, a high socioeconomic status increased the likelihood of an ASD diagnosis. The prevalence of ASD in the study was observed to be higher amongst children aged between 4 and 10 years with majority of them diagnosed with mild autism; while amongst children aged between 1 and 7

years, the diagnosis of moderate autism was prevalent. This was however attributed to families delaying presentations till the onset of delayed motor and speech development. In an earlier study, the same authors (sampling 11,000 children within the same age range, and from the same region) reported a prevalence of 0.0009 % (1 in 1100), with low socioeconomic status correlating positively with autism.

Rudra A. et al.(2017):Roughly 23 of every 10,000 children in India have autism, according to the first rigorous estimate of the country's autism prevalence. Chakrabarti and his colleagues looked at autism features in more than 11,000 children in Kolkata, a metropolis in eastern India. They relied on a series of questionnaires completed by parents and teachers. They then clinically assessed a small proportion of the children, and found six who meet the criteria for autism.

Raina SK, et al. (2017): Recent estimated prevalence of ASD in India ranges from 0.15% to 1.01% in various studies, depending on the screening method used, and the areas surveyed [4,5]. In the INCLLEN study, the prevalence of ASD (then termed as PDD) was 1 in 125 in children 3-6 years and 1 in 85 in children 6-9 years of age. The prevalence in rural areas was 0.90%, 0.6% in hilly regions, 1.01% in urban areas, 0.1% in tribal areas and 0.61% in the coastal regions.

Research related to the TLM used for Autistic Children

Stevenson et al. (2000) used an audio taped script to increase the social interactions of four students, ages 10–15. Every participant was able to produce high levels of unscripted responses, and the results were maintained after the scripts were faded.

Thiemann and Goldstein (2001) used Social Stories with text cards, visual cues, and video feedback to increase the social behaviors of five learners with autism. The targeted social behaviors included contingent responses, securing attention, commenting, and requesting. The effects of Social Stories were evaluated using a multiple-baseline-across-skills design. Small group instruction was done with two typically developing peers and the children with autism. The results indicated that Social Stories effectively increased the targeted social behavior of the learners with autism. In addition, two learners demonstrated generalization to other social skills. This was encouraging, even though these effects may have been caused by

the similarity of the targeted skills. Although the data on acquisition were encouraging, there was a general lack of maintenance across skills and learners.

Howard-Jones (2002) reported that children produced more colourful and complex art after being allowed to play, compared to children who first followed a structured exercise. Fifty-two English school children six to seven years old were randomly assigned to two groups. The first group was allowed to play for 25 minutes, while the other group copied text from the board. All children were then asked to produce a collage of a creature, using a controlled range of tissue-paper materials. Ten judges assessed the creative quality of the resulting work. The range of colours and total number of pieces used by each child was recorded. The results revealed a significant positive effect of unstructured play upon creativity when four to five year old children.

Charlop et al., (2003) said that literature on teaching of perspective taking is limited. Two studies have used video modelling to teach perspective taking). In these studies, children with autism ranging in age from 6 to 13 years old were taught to answer questions by watching videos of others answering the questions correctly. They used three false-belief tasks, referred to in the literature as the Sally-Ann task, the M&M's task, and the hide-and-seek task. As an example, in the Sally-Ann task, Ann moves a ball belonging to Sally from a basket to a box. The child is asked where Sally will look for the ball when she re-enters the room. Children with autism will usually not demonstrate awareness that Sally's knowledge base is different from Ann's and will not factor in the difference in their observation of the object's movement. In other words, people with autism assume that Sally will answer based on the reality of the object's location, not on the basis of her experience. In this study, training was provided on each task until the children were able to demonstrate generalization of the skill on a similar example. All three participants were able to learn the tasks and correctly answer questions on similar tasks. Only two participants were able to pass the post test (an untrained Sally-Ann task) at the conclusion of the training.

Kasari et al. (2006) assigned children to one of three experimental groups: a joint attention intervention group, a symbolic play intervention group, and a control group. The groups differed in their primary intervention goals, focusing on teaching either joint attention or

symbolic play. Sessions were conducted daily for 30 minutes for 5–6 weeks. Improvements in joint attention and joint engagement were found for both treatment groups as compared with the control group, and they were generalized from the instructor to the child's caregiver. The authors recommended that early intervention programs should incorporate play and joint attention into their targets of intervention.

Humphrey and Wakeford (2006) showed that block play helped children improve motor skills (by picking up blocks), overcome their mild sensory difficulties (by learning to tolerate the texture of the blocks), and increase their social interaction (by learning to take turns playing with the blocks).

Christakis (2007) Playing with blocks promotes language development. In one study, children aged one and a half to two and a half who were provided with sets of moulded plastic building bricks with which to play had significantly higher language scores six months later, compared with a control group.

Kasari (2008) the authors compared the effects of different interventions (joint attention intervention and symbolic play intervention) on expressive language development in 3- and 4-year-old learners with autism. They found that children in both the joint attention and the symbolic play intervention groups made gains in expressive language relative to the control group. In addition to the initial improvements, the effects grew stronger across time (12-month follow-up compared with the control group). This suggests that there may be significant benefits to including training on joint attention and symbolic play when designing interventions for young children with autism.

Anderson (2008) Suggested that active play has the potential to make a valuable contribution to children's overall physical activity, whilst providing additional cognitive, social and emotional benefits. Concentrate on one task, hyperactivity, and impulsivity. It is the fastest- Yet international surveys find that children do not engage in the recommended levels of physically active play. A US survey of four to twelve year olds found low levels of active play (less than six times per week) and high levels of screen time (more than two hours per day). 37% had low levels of active play, and 65% had high screen time.

Leaf et al; (2012) found that social stories only had a 22% success rate on learning social skills unlike the teaching interaction procedure which had a 100% success rate.

Wheeler, (2007) Visually organized and systematic presentation of simple tasks aids development of conceptual skills as the children are able to process information better. Oral instructions augmented by visual cues strengthen cooperation and understanding of daily living activities. Pre teaching of such tasks is useful. Pre teaching consists of providing clear reminders to the learner before the skill is to be used.

The authors used picture cards and symbols to denote steps of selected daily living activities. These were pre taught and later used as recall aids when children were asked to do the activities. This visual support enhanced memory and improved independence in task performance. Similarly, work systems, visual clarity, visual organization and visual instructions contributed to the positive change in children's score from pre to post test in pre vocational and self engagement activities. Independent functioning in the four sub variables was evident as children maintained the performance level.

Lal (2010) used pictures, symbols, colours and objects to indicate the task at hand. For a shape sorting task, each shape would be placed in a separate bowl. This would make the task visually clear to the child who when given a collection of shapes, would know what was expected of him/her. This visual structure enhanced independent work behaviour. Sorting tasks had visually clear shapes or beads that improved visual discrimination easier. Use of trays and bowls for keeping the materials rather than spreading materials out on table, helped visual organization. They are helpful because they provide instructions in the way that is easiest for children with autism to understand. The bead stringing task visual instructions included a partial model of the activity to be done and a picture cue for the pattern to be followed. Visually presented stimuli enable the children to process information more efficiently.

Researches related to study the impact of TLM on Autistic children

Ozonoff and Cathcart (1998) reported that the parents of young children with autism were taught to use TEACCH instructional methods in the home. In contrast with a no-treatment control group, the children whose parents used TEACCH methods in the home showed greater improvement in a variety of skills over a 4-month interval.

Hungelmann (2001) evaluated a home program in which parents of children with autism were taught how to implement structured teaching in the home. The study included baseline sessions, treatment sessions, home visits and follow up sessions. Results indicated that children demonstrated significant gains in task mastery as they progressed through the TEACCH program. Parents who participated perceived the program as an effective means to remediate their child's deficits.

Malhotra, et al. (2002) published the results of a study conducted with parents of children with autism. The treatment methods were drawn from TEACCH protocol. The parents were taught how to use behavioural strategies for enhancing eye contact, reduction of maladaptive behaviour, structuring time, activities, and physical environment. Parents were trained in using the techniques, educated about the nature of their children's disorder, and counselled to deal with the emotional fall out of the diagnosis. Subsequently, 5 children were given TEACCH based intervention for 3 to 6 sessions of 45 to 60 minutes each. Results showed that the parents found the intervention helpful for the children and themselves.

Lobo & Winsler (2006) revealed that the children who assigned to a dance group that met twice a week at school for eight weeks had stronger improvements from pre- to post-assessment in parent- and teacher-reported social skills, such as pro-social behaviors and cooperation. These children also showed strong reductions in internalizing (shy, anxious behavior) and externalizing (aggressive behavior) problems. Such effects were significantly stronger when compared with those for a control group.

Nicolopoulou et al., (2009) found the children who participated in a drama-based education program saw decreases particularly in disruptive behavior and they experienced improvements in self-regulatory behaviors, compared with children who did not participate in

the drama-based education program. However, there were no significant changes in pro-social behavior over the school year

Drake & Winner, (2013) stated that the children aged six-to-eight and ten-to-12 who were included in the same study were instructed to engage in drawing a house to distract them after being asked to think of a past event that made them feel upset or disappointed, they were better able to improve their mood—compared with other children who were instructed to draw the negative event, or children who were instructed to copy another drawing.

Vlismas et al. (2013) revealed the mothers who engaged with their infants in a five-week music and movement program were more likely to increase their reported quality of attachment with their child over time, compared with mothers in control groups who either did not get an intervention or who participated in social play that did not include music.

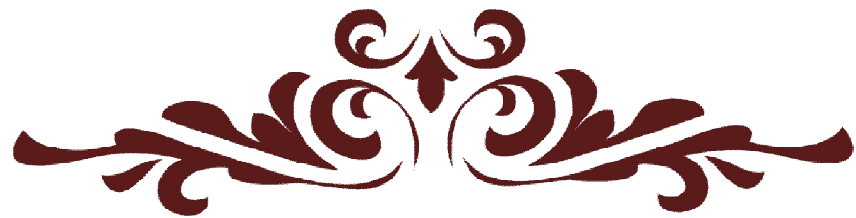
Brown & Sax, (2013) Compared with a matched-control group, toddlers in an arts integration program comprised of daily music, creative movement (dance), and visual arts displayed improvements in teacher-rated positive and negative emotion regulation over the course of the school year .

Ritblatt, Longstreth, Hokoda, Cannon, & Weston, (2013) Toddlers participating in a four-to-eight month, classroom-based music education program to promote school readiness were more likely to increase their level of teacher-reported social cooperation, interaction, and independence over the school year, compared with a control group who did not receive a music education program.

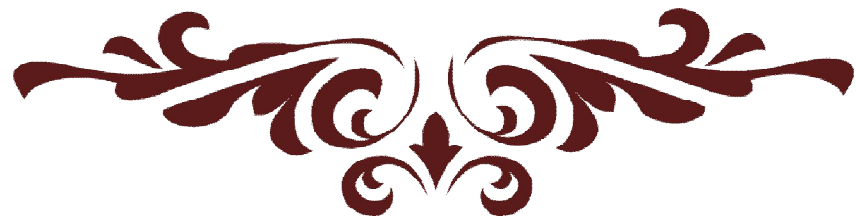
Muniz et al.,(2014) For studies involving visual arts, parents who reported using toys for building things, like blocks, with their child “a few times a week” or more had a higher likelihood of also reporting that their child had strong and sophisticated social skills, compared with parents who reported playing with blocks with their child less frequently .

Muniz et al., (2014) In a nationally representative study sample, parents who reported singing to their child at least three times per week had a higher likelihood of also reporting that their child had strong and sophisticated social skills, such as pro-social behaviors, compared with parents who reported singing to their child less than three times per week 5.

Muniz et al., (2014)In one case, children who played with their parents at least “a few times a week” in more than one family routine (such as singing and playing with toys for building things) had more sophisticated social-emotional skills than children who did those activities less frequently



CHAPTER-3
MATERIALS AND
METHODS



CHAPTER- 3

MATERIALS AND METHODS

Research methodology is the process used in research to collect data. It includes from where the data was collected, and what methods were employed in collecting data. Furthermore, it includes procedure on how to process the data. (Kothari 1991)

This part contains presentation of research methods used in data collection and covers research design, sampling design and procedure, tools and methods used for data collection and data analysis.

In order to execute the inquiry and achieve desired objectives, a systematic approach was adopted in selection of sample, identification of variable, their measurement and statistical tool used in analysing the data. In order to facilitate systematic approach, following sections were formed:

3.1 Research design

3.2 Phase wise plan of work

3.3 Conceptual framework

3.4 election of variables

3.5 Operational definition

3.6 Selection, construction and description of tool

3.7 Selection of sample

3.8 Data collection procedure

3.9 Data processing and analysis

3.1Research design

A research design is the specification of methods and procedure for acquiring the information needed. Research design includes systematic arrangement of conditions for collection and

analysis of data in a way that aims to combine/reframe research objectives under-taking economical procedures. Consideration of research design is important because it governs the analysis part of data the most. In the present study, exploratory cum experimental research design were chosen. Exploratory research design was chosen to explore the percentage of challenged children having autism studying in different types of NGOs and teaching learning material used by the teachers to teach them. On the other hand experimental research design was planned to know the acceptability of the low cost teaching learning materials prepared by researcher from teachers and students and to study the impact of low cost teaching learning materials on children having Autism.

3.2 Phase wise plan of work

Phase I: Selection of NGO and children with autism.

Phase II: Assessment of severity of Autism among Children.

Phase III: Assessment of TLM used by teachers indifferent NGO's

Phase IV: Development of low cost TLM

Phase V: Acceptance of developed TLM from children and teachers

PhaseV1: Intervention

PhaseV11: Post intervention

Phase V111: Tabulation and Analysis of data by using various statistical tools

3.3 Conceptual framework

Conceptual framework in the study depicts the relation of deferent variables with objectives of the study. It deals about researcher's own concepts to conduct the research in an original way. The conceptual framework was established on the basis of research topic, possible areas to fulfil the objectives and theoretical framework. Since the topic was "Evaluation and Designing TLM (Teaching Learning Material) for Children with Autism" so the demand of the study was supposed to be those factors which exactly fulfil the objectives.

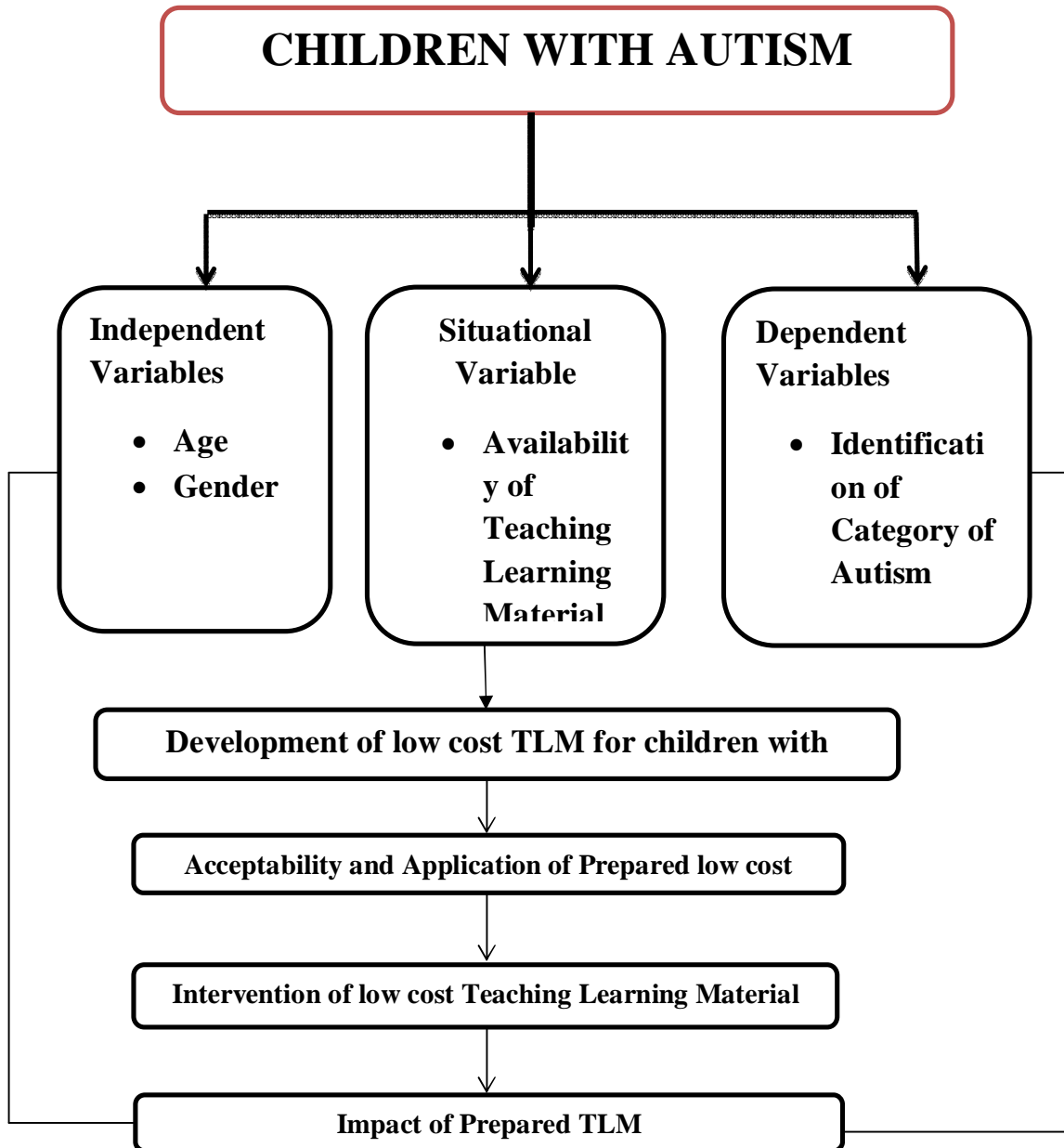


Figure 3.1: Conceptual Framework

3.4 Selection of variables

A variable as the name implies, is something which varies. In other words variables are the characteristics or conditions that are manipulated, controlled or observed by the researcher. Variables under study were categorized into three groups viz. dependent variables,

independent variables and situational variables. The schematic representation of the variables used in the study is given in Fig 3.2.

3.4.1 Dependent variables

Dependent variable is what we measure in the study. It is the variable which is affected by one or other variables and responds to independent variables. Following dependent variables were identified in the study:

- **Category of Autism among children**
- **Impact of low cost TLM**

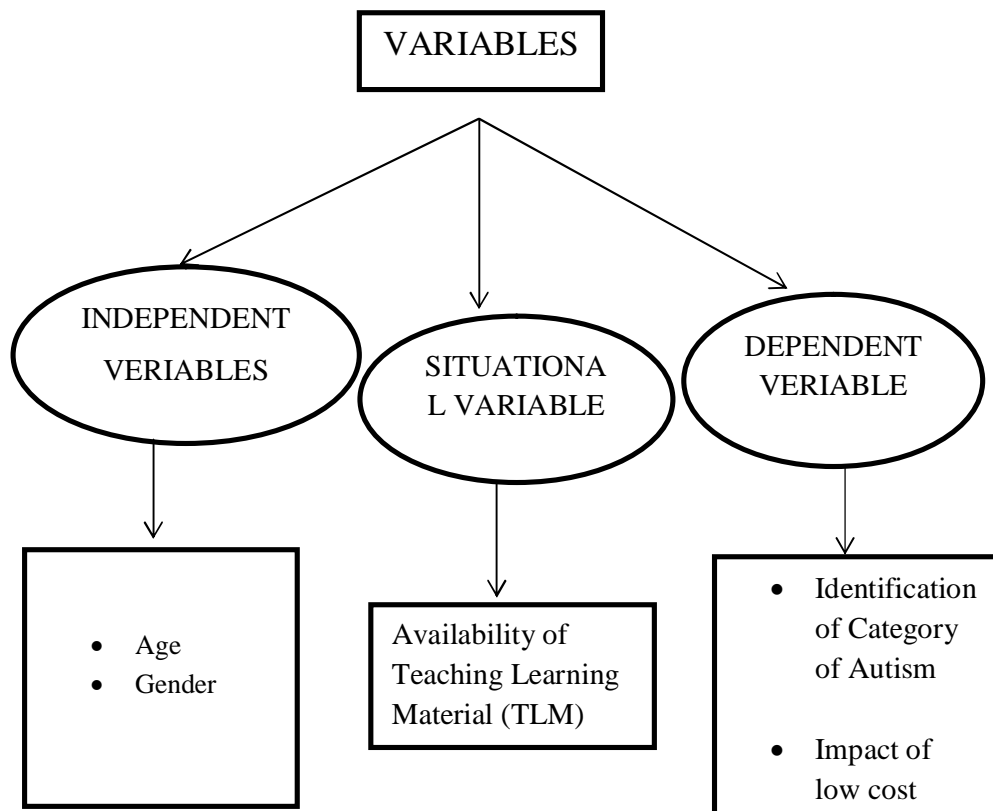


Fig: 3.2 Schematic presentation of the variables

3.4.2 Independent Variables

The Independent Variable is one which we have under control and which affect the dependent variables like age, gender, where researcher has no control over these variable.

a- Age

Age was measured in terms of completed year of age at the time of study. This was divided into two categories with minimum age 5 years and maximum 12 years.

The ranges were as:

- a. 5-8 years
- b. 9-12years

b- Gender

Gender was studied as number of boys and girls respondents considered for the study. Gender was categorized as:

- a- Boy
- b- Girl

3.4.3 Situational Variable

It includes the availability of TLM in different NGO's

3.5 Operational definitions

Certain concepts were operationally defined for the measurement of variables in the present study. These were as follows:

1-Autism- Autism spectrum disorder (ASD) is a neuro-developmental condition characterized by impairments in social reciprocity and communication and restricted, repetitive patterns of behaviour. It is highly heritable, persists across the lifespan, and affects approximately 1% of the population (**Pinborough and Zimmerman, 2007**). One striking and consistent feature of ASD is that it is more commonly diagnosed in boys than in girls.

2-Intervention

Intervention comes from the Latin word *intervenire* meaning "to come between interrupt". An intervention is the act of inserting one thing between others, like a person trying to help.

3-TLM (Teaching Learning Material)-

TLM is a commonly used acronym that stands for "teaching/learning materials." Broadly, the term refers to a spectrum of educational materials that teachers use in the classroom to support specific learning objectives, as set out in lesson plans. These can be games, videos, flashcards, clay model, visual aids, posters, mask and more.

3.6 Selection, Construction and Development of tool:

In the qualitative research, the collection of relevant data is a challenging job which can be made possible only by using appropriate tool for the data collection. In the process of data collection, following tools were used in the present study:

- **Indian Scale for Assessment of Autism by National Institute for the Mentally Handicapped (Ministry of Social Justice and empowerment Govt. of India)**
- **Observation sheet**
- **Low cost TLM (Teaching Learning Material) for children with Autism.**
- **Checklist**
- **Experimental Table**

Indian Scale for Assessment of Autism: As the study focus on improvement practices for Autistic children, for which, it was necessary to identify the Autistic children and levels of autism among them, so Indian scale for Assessment of Autism was used. The scale was used to screen out autistic children. The scale consist of 60 statements which are divided under six domain such as Social Relationship and Reciprocity, Emotional Responsiveness, Speech- Language and Communication, Behaviour Patterns, Sensory Aspects and Cognitive Component. To assign the category for autism interpretation were made for different categories were as follows:

S. No.	Percentile	Categories
1.	< 70	No Autism
2.	70 to 106	Mild Autism
3.	107 to 153	Moderate Autism
4.	>153	Severe Autism

Table 3.1 Scores to identify category for the children with Autism

Standardization:

Each individual item of ISAA (Indian Scale for Assessment of Autism) was correlated with total scores to determine validity of test items. All the items in the scale were significantly correlated, thus all the 40 items were valid.

Validity:

Mean scores of the group 103.4 were found to be significantly higher than those of MR and other group (16.7) and normal (42.5). The mean differences were statistically significant ($p < 0.001$). Similar trends were observed on CARS. The mean values for each of the six domain of ISAA were statistically different among the three study groups. This indicates that ISAA clearly differentiates between autistic and non –autistics persons, thus establishing its validity.

Criterion test validity

The criterion test validity of ISAA was determined by comparing total scores on ISAA with those of CARS using Pearson Product Moment Correlation. The resulting correlation value of $r = 0.77$ ($p < 0.001$) was obtained which shows ISSA has high degree of validity.

Reliability:**Internal Consistency Reliability**

Cranach's coefficient alpha, indicating stability of responses across items based on inter correlations between items or domains, was used to calculate internal consistency reliability of ISAA. The alpha coefficient obtained was 0.93 ($p < 0.001$) for autism group indicating high degree of internal consistency.

Inter-rater Reliability

Inter-rater reliability was calculated using Pearson Product Moment Correlation between two raters who independently administered and scored ISAA on 67 randomly selected children (about 17% of the sample). Correlation between raters varied from 0.62 to 0.81 in different domain. A high degree of inter-rater reliability was observed on different domains. The global score had good reliability of 0.83.

Test-Retest Reliability

In order to assess test-retest reliability, 120 subjects (30% of sample) from autism group were retested after three months. Correlation ranged from 0.60 to 0.85 in various domains and for the total score it was 0.83 ($p < 0.001$). These results indicate that test retest reliability of ISAA is good.

Norms for Interpretation of ISAA scores

After the child has been rated on each of the 40 items, a total score is computed by adding the 40 individual items scores. The total ISAA scores may range from 40 to 200, where in low score of 40 represents normal limits and a high of 200 indicate sever degree of autism.

A diagnostic categorization of ISAA score based on the ROC cut off score of 70. Using this cut off level, individual falling below the score of 70 are categorized as non-autistic while those with score of 70 and above are categorized as autistic.

To arrive at the taxonomy of ISSA the, score of 376 children from autism group were analysed. The mean score was found to be 106.09, range being 70.0 to 181.0 as given below.

	N	Minimum	Maximum	Mean	S.D
ISAA Total	376	70.0	181.0	106.09	23.5

Table 3.2 Diagnostic categorization of ISAA score

Score ranging cut off score to mean score (70 to 106) has been classified as mild autism, scores from to Mean+ 2SD (106 to 153) as moderate autism and score above mean + 2SD (>153) as sever autism, as presented in table 3.3.

ISAA Scores	Degree of Autism
<70	Normal
70 to 106	Mild Autism
107 to 153	Moderate Autism
>153	Sever Autism

Table 3.3: Norms of ISAA for Diagnosis of Autism

Observation sheet:

To find the TLM evaluate and used by teachers in different NGO's.

Low cost TLM: for Intervention

It includes the items for children which were prepared by the researcher using the materials which were easily available and were not costly. This helped the researcher to prepare low cost TLM. The items were according to strengthen different domain.

Checklist:

Checklist was developed to know the acceptability of the low cost TLM (Teaching Learning Material) by teachers and children with Autism.

Experimental Table:

Experimental tables were prepared to take pre-post data from children after intervention.

TLM (Teaching Learning Material):

The intervention Teaching Learning material was designed using low cost materials along with waste materials to improve the skills and behaviour of challenged children identified as autism by increasing attention span and comprehension. The learning material was divided in to different areas like social development, communication development, behaviour development, sensory aspects and cognitive component.

The low cost TLM included creative activity book, buttoning, puppets, stories, mask, puzzle, beads and blocks.

The TLM was shown to the subject experts. Variety of activities were included to help children for better understanding and retention. The TLM developed with the aim of skill development in children with Autism for better life.

Development of Intervention Teaching Learning Materials: The steps taken to develop the module are given below:

- Selection of topic
- Preparation of the material

- Formulation of broad objectives
- Development of Product
- Assessment

Selection of topic:

It was decided to develop Teaching Learning Materials for autistic children related to different domains like social interaction, impaired communication, behaviour problem, sensory aspect and cognitive component.

Preparation of the Material:

Collection of relevant materials required for the preparation of intervention Teaching Learning Material was the second step taken by the researcher. The material referred to availability of low cost material and waste material which had to be further compiled to be figured out in the form of a developed material. Each item was prepared with an objective. Each item was put in separate box and then all the boxes were placed in a bag. Prior consultations from the experts were taken for each item before preparing it.

Formulation of Broad Objectives:

The materials were prepared with the aim to improve social interactive skills, communication, behaviour pattern, sensory aspects and concentration of children with Autism.

Development of Product: After the formulation of objectives the low cost material suitable for the attainment of objectives was developed. The materials developed were divided according to their usefulness in strengthening different domains.

Selected low cost materials are categorized as follows:-

Teaching Learning Materials for Social and Cognitive Development

- Threading the beads
- Booklet for Social development

- Game for shape and colour
- Buttoning

Teaching Learning Material kit for sensory aspect development

- Pattern identification through Clay plates

Teaching Learning Material for Behaviour development

- Story book

Teaching Learning Materials for Communication Development

- Creative activity book
- Sentence formation
- Mask

Appearance of Final Material –A great care was taken in preparation of final material to ensure that the end product is:

- Colourful
- Attractive
- Easy to use
- Safe to use
- Low cost
- Simple and easy to handle
- Easy to use with children
- Acceptable by children
- Economical in terms of cost effective efforts and time



Teaching Learning Materials for Fine motor development and colour concept



Different Texture for sensory development

Book for Social development



Book for development of Creative activity

Plate A: Prepared low cost TLM

Assessing the Efficacy of Developed Material:

Developed material was administered on small group of autistic children. The exercise was continued for a period of three months. During each session the researcher was present to observe that the instructions were meticulously followed by the children and to assist wherever needed. To gauge their understanding of the subject matter, post test was administered thereafter. The score of the post-test were compared with their pre achievement score.

Pilot study:

The pilot study was accomplished with 30 respondents to check the appropriateness of measuring tools. Minor changes were made in the tools on the basis of pilot study and then the same was finalized to collect final data.

3.7 Selection of Sample

3.7.1 Selection of Locale:

The present study was conducted in Lucknow city of Uttar Pradesh. Nine NGOs were selected from Lucknow city who from working with Autistic children. The selected NGOs were: Pysum, Samarpan, Chetna, Parvarish, Navdeep, Shubh Lakshya, Asha, Touch and Care and Jingle Bell. The selection of NGO's was done purposively.

3.7.2 Sampling Design:

Snow Ball sampling cum Purposive sampling design was used to select the NGO and sample required for the study. Snow ball sampling technique was used to identify NGOs who were working with autistic children and Purposive random sampling technique was used to select autistic children from selected NGOs.

3.7.3 Sample size:

A sample size is a definite plan for obtaining a sample from a given population keeping in view nature of universe, nature of study, sampling technique, size of population etc. 100 respondents were selected from different selected NGOs using purposive random sampling.

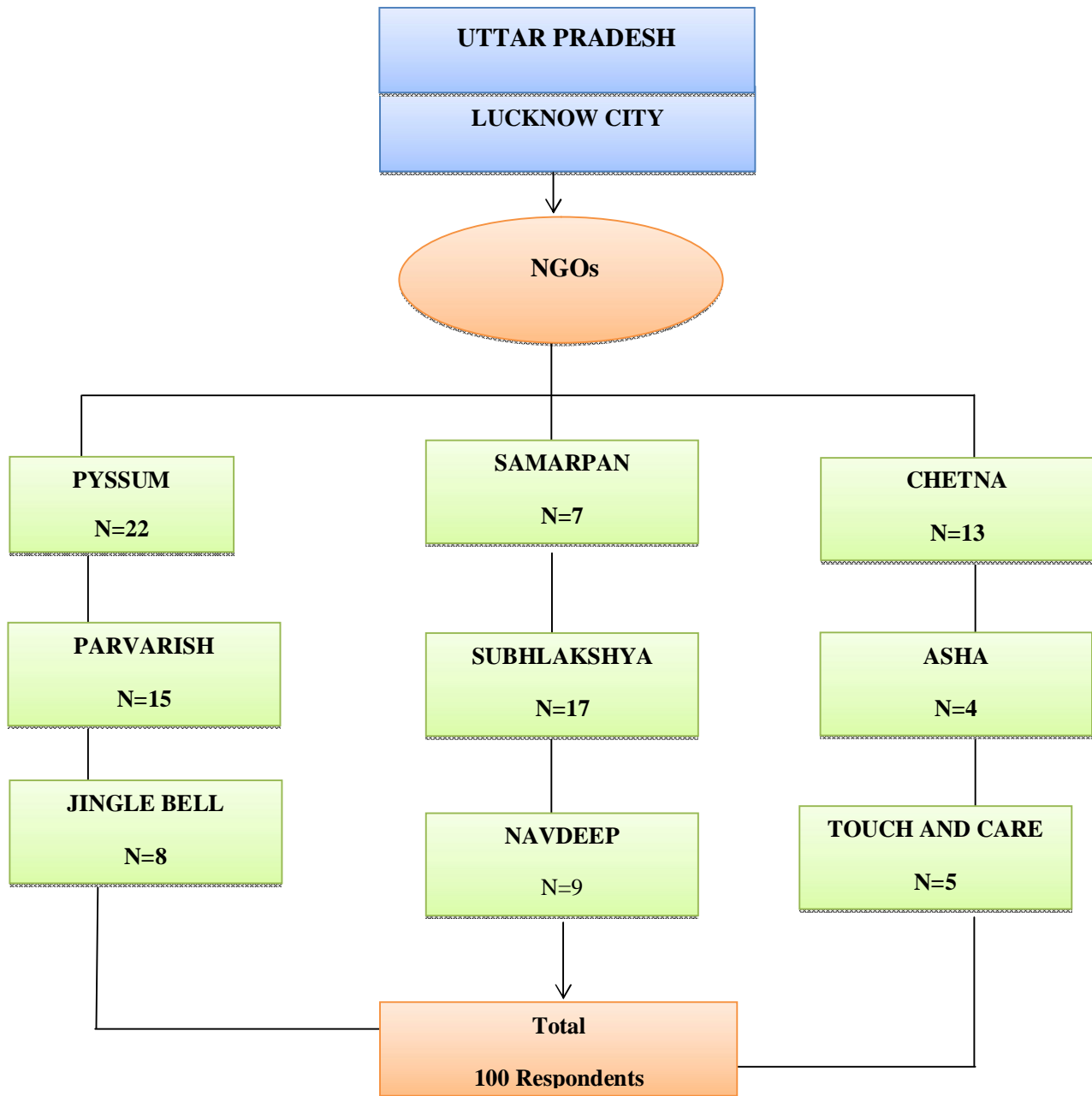


Fig: 3.3 Schematic Presentation of the Sample

Criteria for selection of samples:

The researcher specifies the characteristics of the population under study by detailing inclusion and exclusion criteria. Inclusion criteria are characteristics that each sample element

must possess to be included in the sample. Exclusion criteria are characteristics that a participant may possess that do not permit them to participate in the study. The study involves:

Inclusive criteria:

- Children scoring 70 to 106 marks on diagnostic test of Mild autism
- Children scoring 107 to 153 marks on diagnostic test of Moderate autism
- Children scoring >153 marks on diagnostic test of Sever autism
- Teachers who were willing to participate.
- Teacher who were present at the time of study.
- Children who were willing to participate.

Exclusive criteria:

- Children scoring < 70% on diagnostic test of No Autism
- Principle/Head of the NGOs

From the sample of 100 children who were searched as autistic children, 40 children were selected for experimental group and other 40 children were selected for control group.

Group	Mild	Moderate	Total
Experimental group	24	16	40
Control group	21	19	40
Total			80

Table 3.4: Category of Autism among Experimental and Control groups

3.8 Data Collection Procedure:

To fulfil the intended objectives, it is necessary to collect the information as data. The steps used for data collection were as follows:

- a) Step I: The investigator obtained permission from respective authority to conduct the study.

- b) Step II: The investigator introduced herself to NGO personnel's (Teacher, Psychologist) and explained the objectives and steps to be used to conduct the study.
- c) Step III: The ISAA (Indian Scale for Assessment of Autism) was administered on the subjects to identify autistic children. The identified autistic children were divided in to two groups (experimental/case and control group).
- d) Step IV: Intervention was given to the experiment/ case group.
- e) Step V: Post test was conducted on identified respondents (both experimental/case and control) to check the effectiveness of low cost TLM (Teaching Learning Material) prepared for intervention.

3.9 Data processing and analysis

The data was first coded, tabulated and decoded then analysed by applying descriptive as well as relational statistical in order to get the inferences. To make analysis easy, the categorization of data was done on the basis of:

- I. Background characteristic which include age of the respondent, sex of the respondents and teaching material used by teachers, knowledge of teacher about autism.
- II. Assessment of Autism using Scale.
- III. Experimental data

Symbolic representation of pre-test- post-test design

Pre-test	Treatment	Post-test
O1	X	O2

Table 3.5 Symbolic representation of pre-test and post-test design

O1: Measurement of level of autism before administering treatment.

X: Treatment with innovative low cost TLM's

O2: Measurement of level of autism after administering treatment.

3.9.1 Coding and Tabulation of collected data

The information collected was coded into the coding sheets and was then transferred into tabular form. It included the following:

- I. Personal profile of respondents.
- II. Identification of children having Autism with different severity.
- III. Teaching material used by the teachers.
- IV. Acceptability of prepared low cost TLM from children and teachers.
- V. Intervention of the prepared low cost TLM (Teaching Learning Material)
- VI. Testing of hypothesis

3.9.2 Statistical analysis:

The data was analysed using statistical Package for Social Sciences, (SPSS) Version 20.0.

1. **Mean:** To obtain the mean, the individual observation were first added together and the divided by the number of observation. The operation of adding together or summation is noted by the sign \sum .

The individual observation is denoted by the sign X, number of observation denoted by n, and the mean by \bar{x}

$$\bar{X} = \frac{\sum X}{N}$$

2. **Standard Deviation:** It is denoted by the Greek letter

$$\sigma = \sqrt{\frac{\sum (X - \bar{X})^2}{n}}$$

3. Chi square Test:

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where O = Observed Frequency

E=Expected Frequency

4. **Analysis of Variance (ANOVA):** The ANOVA test was used to compare the within group and between group variance amongst the study groups. Analysis of variance of different study groups at particular time interval revealed the differences amongst them. ANOVA provided “F” ratio, where a higher “F” value depicted a higher inter group difference.

Differences	Sum of squares	df	Mean square	F
Between Groups	A	N ₁	X=A/N ₁	X/Y
Within Groups	B	N ₂	Y=B/N ₂	

5. Paired t-test:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

where

$$S^2 = \frac{(N_1 - 1)SD_1^2 + (N_2 - 1)SD_2^2}{N_1 + N_2 - 2}$$

where \overline{X}_1 , \overline{X}_2 are means of group 1 and group2

N_1, N_2 are number of observation group 1 and group 2

SD_1, SD_2 are standard deviation in group 1 and group 2

6. Level of Significance: “p is level of significance

$p > 0.05$	Not significant
$p < 0.05$	Significant
$p < 0.01$	Highly significant
$p < 0.001$	Very highly significant

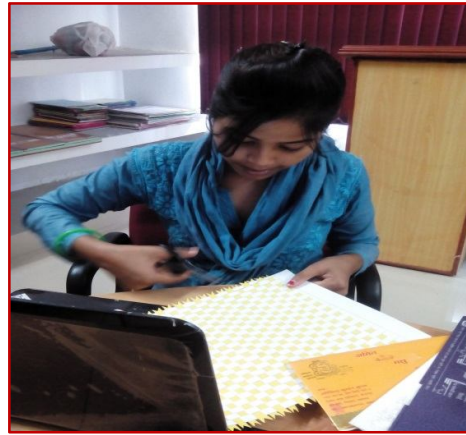
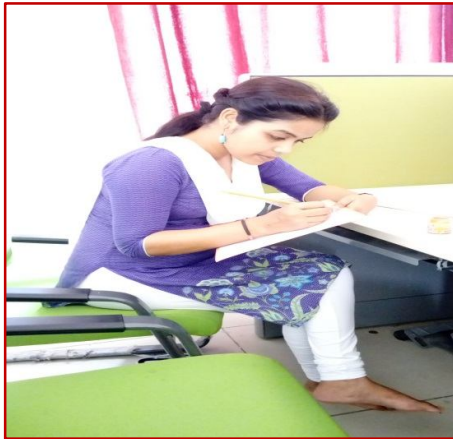
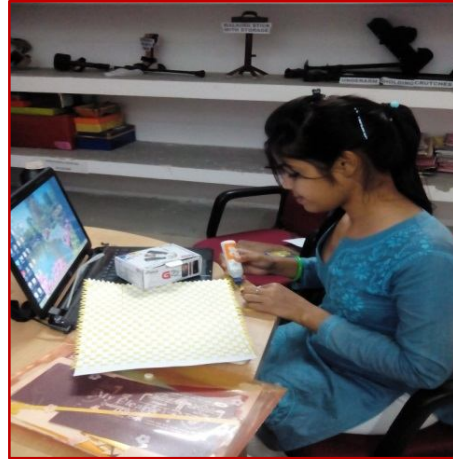


Plate B- Preparation of TLM (Teaching Learning Material)

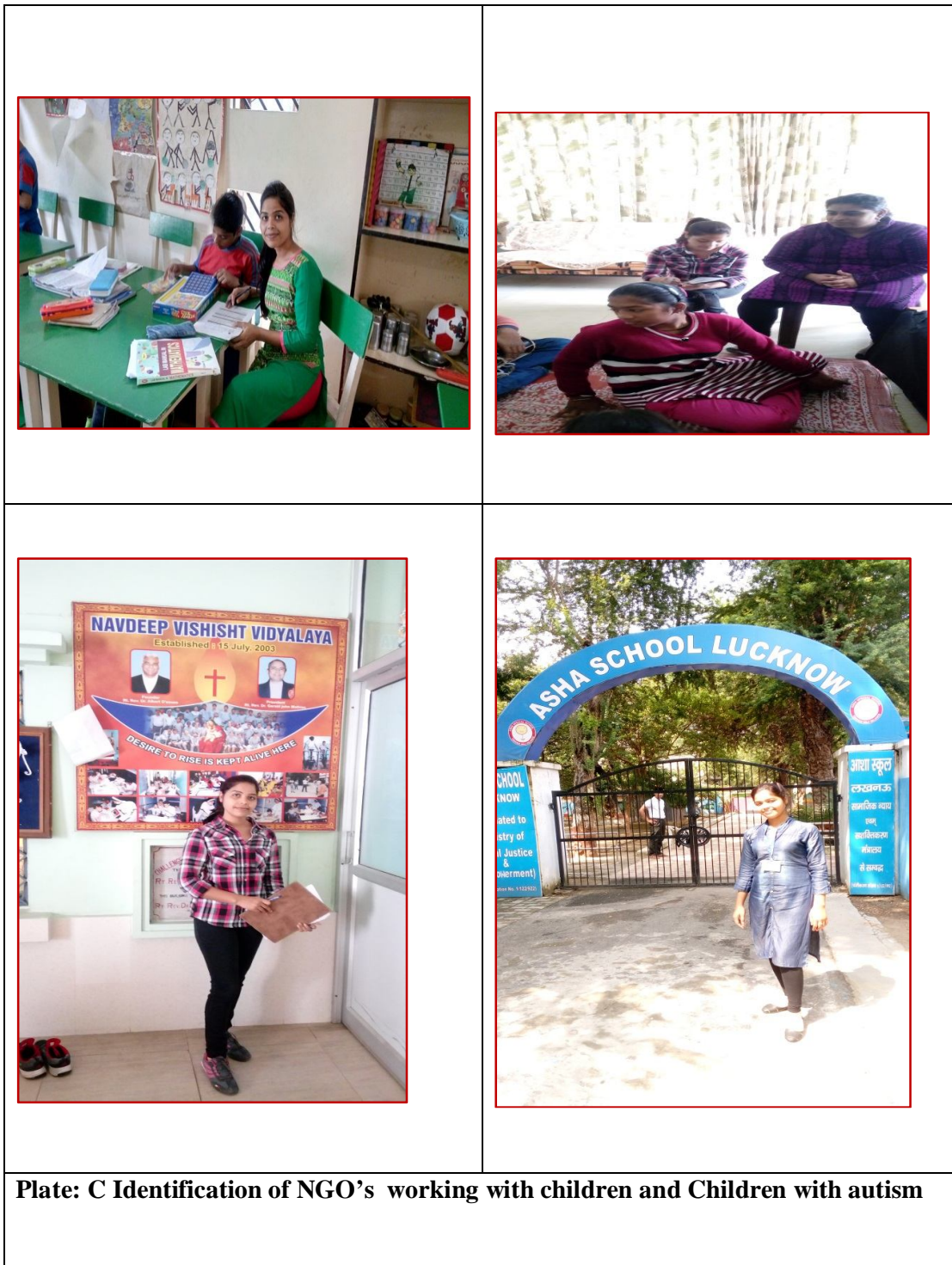
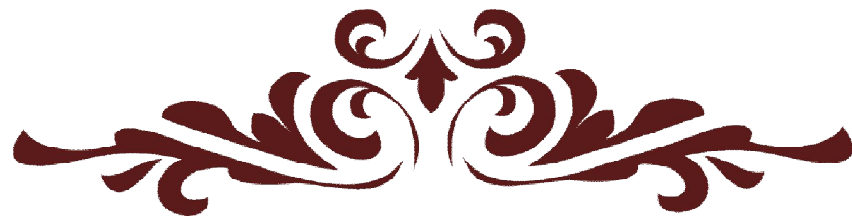




Plate: D- Intervention session with low cost TLM



CHAPTER-4
RESULTS AND
DISCUSSION



CHAPTER-4**RESULTS AND DISCUSSION**

The facts and finding on the study, as obtained on the analysis of the data collected through interview schedule, standardized scale, tests and experimental work are described in this chapter. For systematic presentation data is reported under following sections:

Section 4.1 General Profile of Respondents**Section 4.2 Description of available TLM (Teaching Learning Material) in NGOs****Section 4.3 Distribution of respondents on the basis of category of Autism (Pre-intervention)****Section 4.4 Description of Randomization and Intervention****Section 4.5 Description of acceptability of Low cost teaching Learning Material (TLM) by teachers and Children.****Section 4.6 Distribution of respondents on the of category of Autism (post- intervention)****Section 4.7 Impact of Low cost Teaching Learning Material (TLM) on children with Autism (Post- intervention)**

The present study was carried out with the aim to prepare and use low cost Teaching Learning Material and assess their effect on different domains of children with Autism.

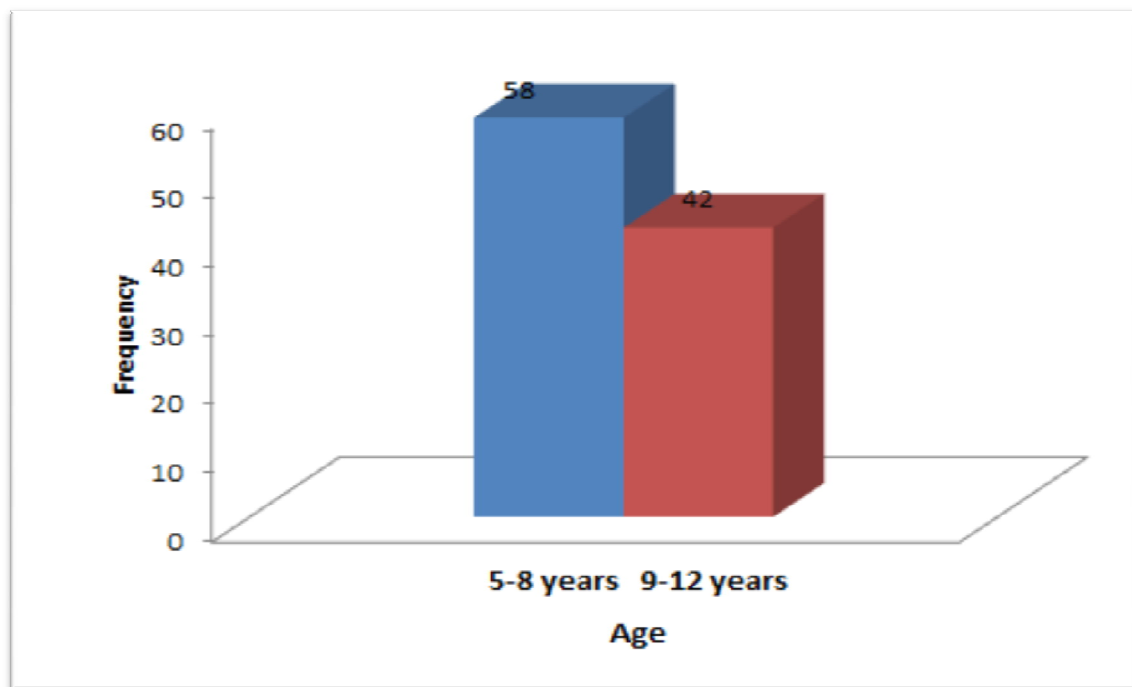
Section 4.1: General Profile of Respondents

The general profile of respondents was collected using pre designed interview schedule. Data collected was presented in the form of descriptive statistics that is frequency and percentage.

Table 4.1: Description of respondents according to Age and Gender**N=100**

S. No	Characteristics	Frequency (%)
1	Age	
	5-8 Years	58(58.0)
	9-12 Years	42(42.0)
2	Gender	
	Boy	90(90.0)
	Girl	10(10.0)

Results in table 4.1 showed that more than half of respondents (58.0percent) were of age 5-8 years while (42.0percent) respondents were of age group 9-12 years. Most of the respondents (90.0percent) were boys and only few (10.0percent) were girls. The results were found at par with the findings of **Werling and Geschuind 2013**.

**Fig 4.1 Distribution of Children according to age**

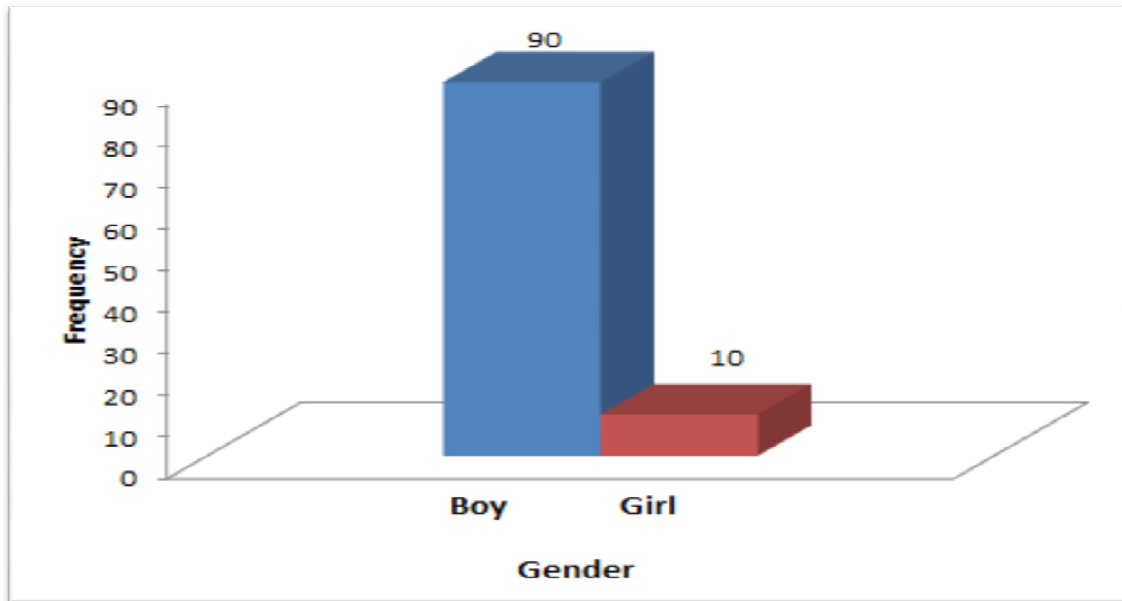


Fig 4.2 Distribution of Children according to Gender

Section 4.2: Description of available Teaching Learning Material in NGO's

The information regarding available TLM in NGO's used for Autistic children was gathered with the help of observation sheet and data collection was reported in the form of frequency and percentage.

Table 4.2: Description of available TLM (Teaching Learning material) used for children with Autism in different NGOs (N=9)

S. No	Teaching Learning Materials in Different NGO's	Available Frequency (%)	Not Available Frequency (%)
1.	Fruit Chart	9 (100.0)	-
2	Transportation chart	9(100.0)	-
3	Vegetable chart	9(100.0)	-
4	Transportation card	6(66.6)	3(33.3)

5	Animal picture card	6(66.6)	3(33.3)
6	Peg board and beads	6(66.6)	3(33.3)
7	Counting board with beads	6(66.6)	3(33.3)
8	Artificial fruits and vegetables	6(66.6)	3(33.3)
9	Cereals	3(33.3)	6(66.6)
10	Crayon colour and white papers	8(88.8)	1(11.1)
11	Ball of different colours	8(88.8)	1(11.1)
12	Therapy Ball	4(44.4)	5(55.5)
13	Puzzles	9(100.0)	0(0.0)
14	Water colour	7(77.7)	2(22.2)
15	Beads and thread	9(100.0)	0(0.0)
16	Plastic blocks	4(44.4)	5(55.5)
17	Cloth puppet	4(44.4)	5(55.5)
18	Flash card	2(22.2)	7(77.7)
19	Musical toy	1(11.1)	8(88.8)
20	Toy with Lights	1(11.1)	8(88.8)
21	Sand tub with toys	1(11.1)	8(88.8)
22	Artificial animal	1(11.1)	8(88.8)

Table No 4.2 discussed the distribution of available TLM (Teaching Learning material) for children with autism in different NGOs. Results showed that the teaching learning materials like Fruit Chart, Transportation chart, Vegetable chart, Puzzles and Beads and Thread were available in each NGOs, while other TLM such as Transportation card ,Peg board and beads,

Counting board with beads, Artificial fruits and vegetables were available in 66.6 percent of NGOs.

Section 4.3: Distribution of respondents on the basis of category of Autism (Pre-intervention).

Indian scale for assessment of autism was applied to find the category and level of autism among children. The results were tabulated using descriptive statistics in terms of frequency and percentage.

Table 4.3.1: Distribution of respondents on the basis of Category of Autism (N=100)

S. No	Category of autism	Frequency (%)
1	Mild	55(55.0%)
2	Moderate	43(43.0%)
3	Severe	2(2.0%)

Data in table 4.3 revealed distribution of respondents on the basis of category of autism. Results showed that more than half (55.0%) of the respondents had mild autism while 43.0percent respondents had moderate autism and very few respondents (2.0%) were having severe autism.

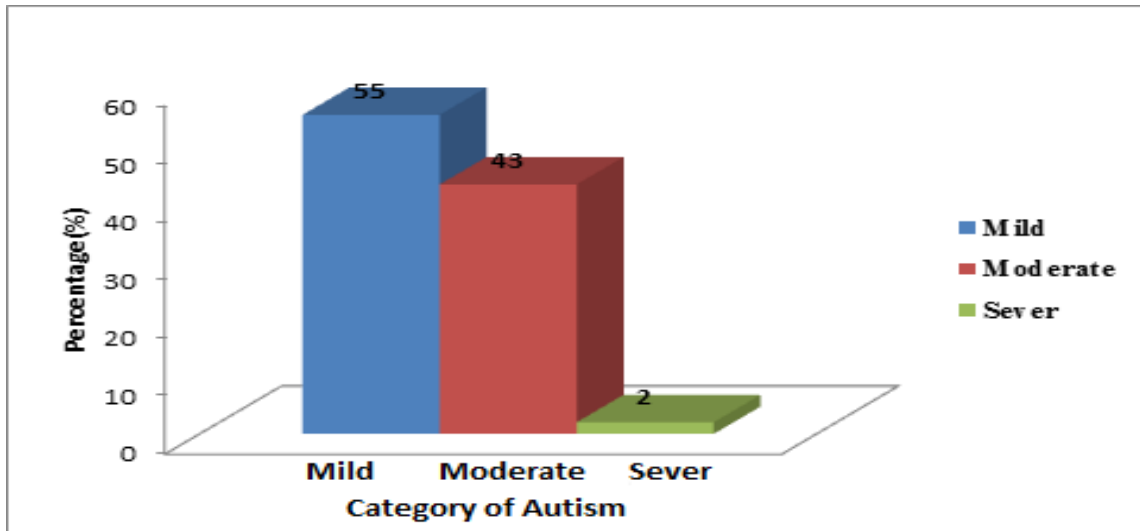


Fig: 4.3.1 Distribution of respondents on the basis of Category of Autism

Table 4.3.2 Distribution of respondents on the basis of category of Autism across Gender

S.NO	Category of Autism	Respondents N=100	
		Boys (N=90)	Girls (N=10)
1	Mild autism	50 (55.5)	5(50.0)
2	Moderate autism	38(42.2)	5(50.0)
3	Severe autism	2(2.2)	0

Result depicted in table No.4.4 discussed distribution of respondents on the basis of category of Autism across gender, Results showed that more than half (55.0%) boys and (50.0%) girls had mild Autism while (42.2%) boys and (50.0%) girls had moderate Autism and very few (2.0%) boys had severe Autism. None of the girls were found suffering from severe Autism.

Ho1: There exists no difference between categories of autism across gender

Table 4.3.3 Distribution of respondents according to the categorical scores with Gender

Gender	Category of autism			df	Chi square	Conclusion
	Mild	Moderate	Severe			
Boy	50	38	2	2	.399	N.S
Girl	5	5	0			

p>0.05

Chi square value shown in table 4.4 was found non significant at 5% level of significance. Thus null hypothesis was rejected which means that there was no significant difference between category of autism and gender.

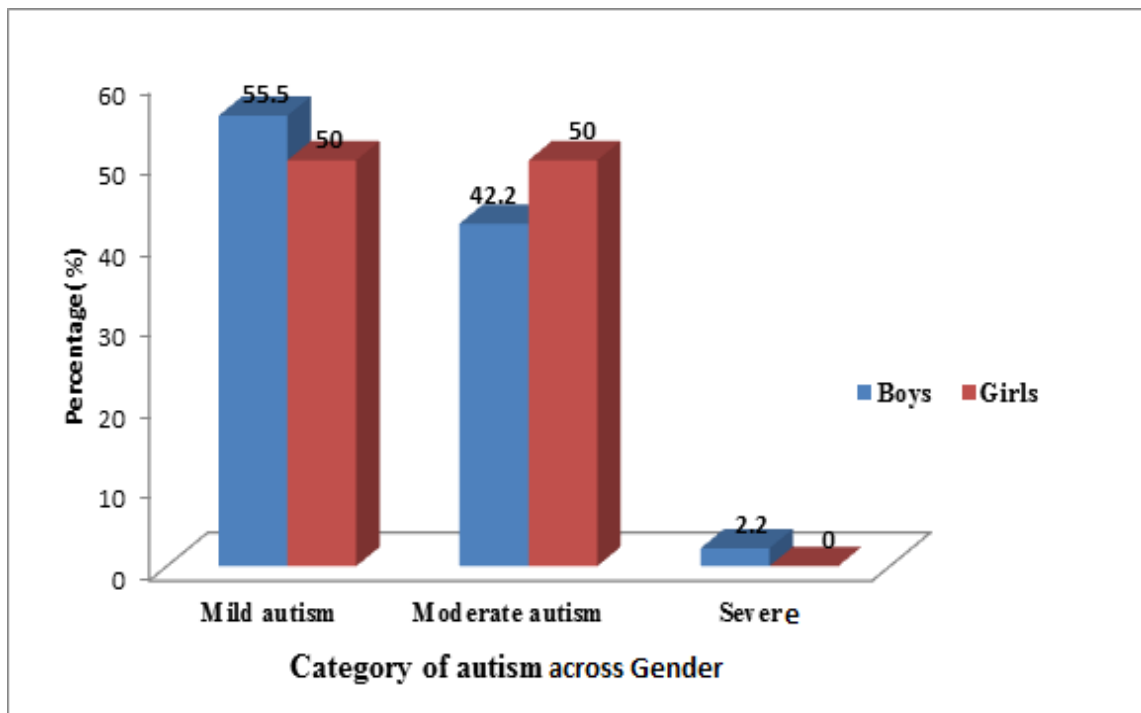


Fig 4.3.2 Distribution of respondents according to category of Autism across Gender

Table 4.3.4 Distribution of respondents on the basis of category of Autism across Age group

S.NO	Category of Autism	Respondents N=100	
		5-8 Year (N=58)	9-12 Year (N=42)
1	Mild autism	35(60.3)	20(47.6)
2	Moderate autism	21(36.2)	22(52.3)
3	Severe autism	2(3.4)	0

Data in table 4.3.4 showed distribution of respondents on the basis of category of Autism across different age groups. Results showed that 60.3percent respondents belonged to age group of 5-8 years and 47.6 percent respondents belonged to age group of 9-12 years had mild autism while 36.2 percent respondents of age group of 5-8 year and 52.3percent respondents of age group 9-12 year had moderate autism. Very few 3.4 percent respondents belonging to age group 5-8 year had sever autism. None of the respondent of age group 9-12 years had severe autism. The result were found at par with the finding of **Raina Sk,et al 2017**.

Ho2: There exists no relation between category of autism and Age group.

Table 4.3.5Differences in category of Autism across Age as per Chi square

Age	Category of autism			df	Chi square	Conclusion
	Mild	Moderate	Severe			
5-8 year	35	21	2	2	0.161	N.S
9-12 year	20	22	0			

$p > 0.05$

Table3.3.5 discussed the differences between categories of Autism across age groups using Chi- square. Results showed that as $p > 0.05$ thus, null hypothesis was accepted stating that there exists no significant differences in category of autism across age groups. Mean values also showed the same. Thus it was concluded that though results have shown that respondents

of age 5-8 year suffer more from mild Autism, but regarding categories of autism, where it is mild, moderate or severe, no significant differences across age group were found.

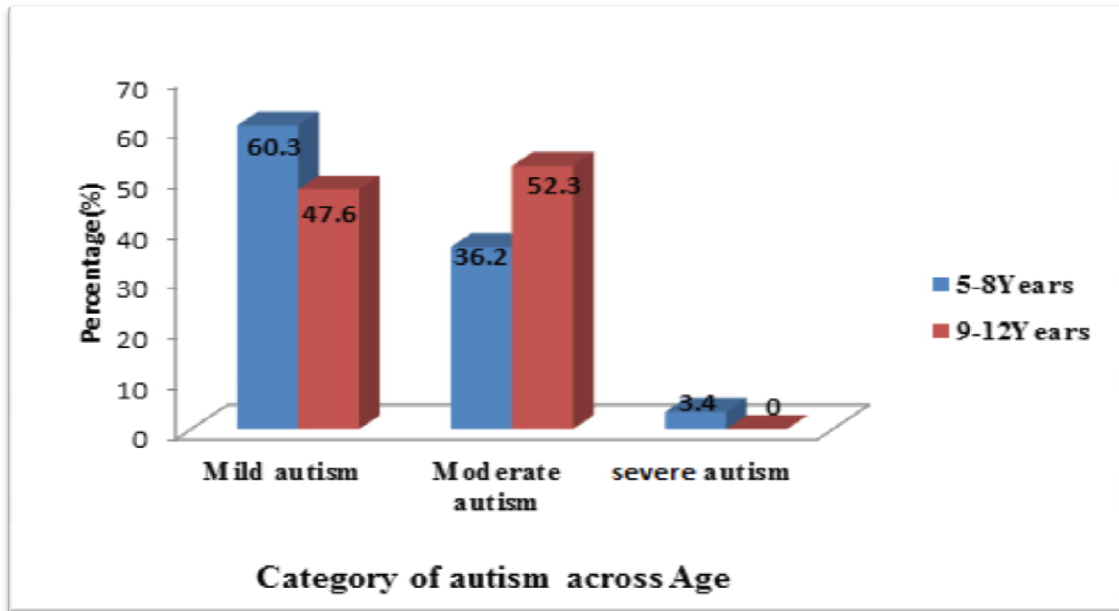


Fig 4.3.3 Distribution of respondents according to category of autism across age group

Table 4.3.6 Distribution of respondents on the basis of Level of Autism

S.No.	Level of Autism	Respondents N=100 Frequency (%)
1	Mild autism	
	70-82	20(20.0)
	83-94	12(12.0)
	95-106	21(21.0)
		53(53.0)
2	Moderate autism	
	107-122	20(20.0)
	123-138	22(22.0)
	139-153	3(30.0)
		43(43.0)
3	Severe autism	
	More than 153	2(2.0)

Table 4.3.6 discussed distribution of respondents on the basis of scores obtained on the Autism scale. The level of autism was categorized as mild, moderate and severe. Results showed that 53.0 percent respondents had mild autism. The scores obtained varied from 70-106. It was also noticed that 20.0 percent respondents scored between 70-82, while 12.0 percent respondents scored between 83-94 and 21.0 percent respondent scored between 95-106. Results also showed that 45.0 percent respondents were having moderate autism. The score obtained varied from 107-153. It was also noticed that 20.0 percent respondents scored between 107-122, while 22.0 percent respondents scored between 123-138 and 30.0 percent respondents scored between 139-153. Very few respondents 2.0 percent were having severe autism and their score obtained were more than 153.

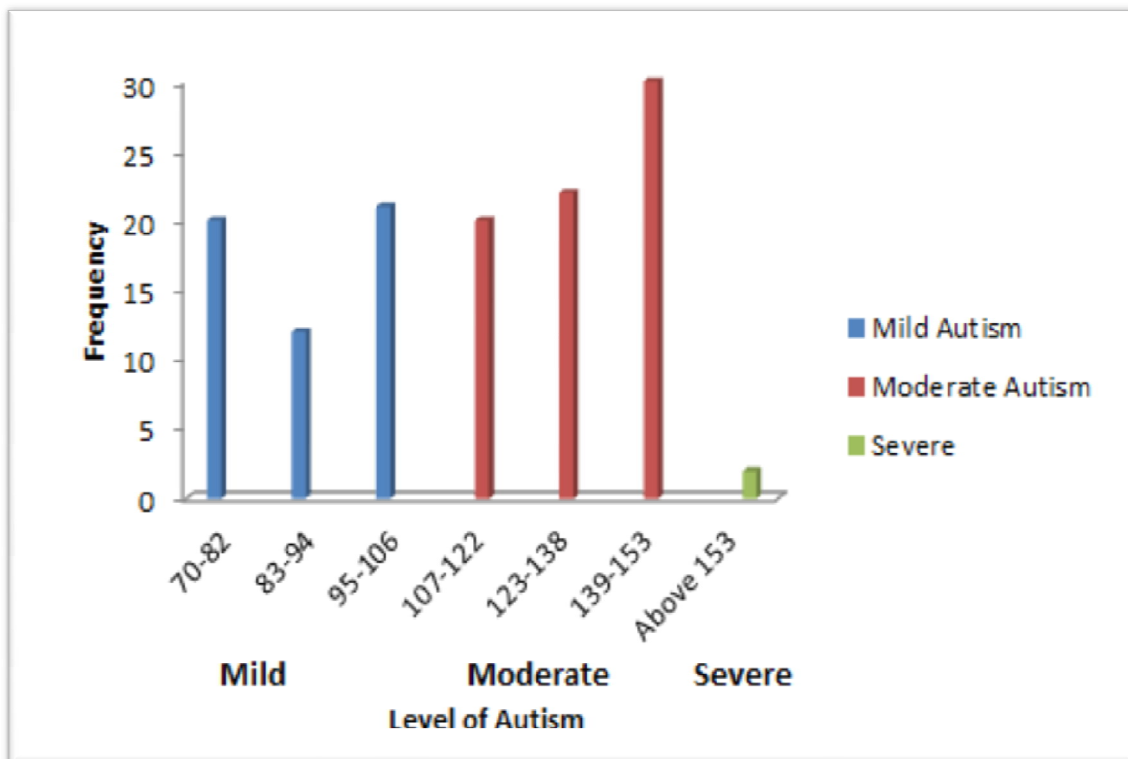


Fig 4.3.4 Distribution of respondents according to the Level of Autism

Table4.3.7:Distribution of respondent according to Level of Autism across Gender

S.NO	Level of Autism	Respondents (N=100)	
		Boys (N=90) Frequency (%)	Girls(N=10) Frequency (%)
1	Mild autism	48 (53.2)	5(50.0)
	70-82	20(22. 2)	0
	83-94	11(12. 2)	1(10.0)
	95-106	17(18.8)	4(40.0)
2	Moderate autism	40(44.3)	5(50.0)
	107-122	17(18.8)	3(30.0)
	123-138	20(22.2)	2(20.0)
	139-153	3(3.3)	0
3	Severe	2 (2.2%)	-
	More than 153		

Results in table 4.3.7 showed distribution of respondents according to level of autism across gender. Data revealed that 53.2 percent boys and 50 percent girls were having mild autism, where 22.2 percent boys score range from 70-82, while 12.2 percent boys 10.0 percent girls score ranged from 83-94,while 18.8 percent boys and 40 percent girls score ranged from 95-106.

In moderate category, 44.3 percent boys and 50.0 percent were reported girls. It was seen that 18.8 percent boys were and 30.0 percent girls scored between 107-122,while 22.2 percent boys and 20.0 percent girls score ranged from 123-138.Only 44.3 boys scores ranged from 139-153.In severe category only 2.2 percent boys scored more than 153.

Ho 3: There is no significant difference between level of autism and gender.

Table 4.3.8: Differences in level of autism across gender

(A)

Category	Mean	df	P	Conclusion
Levels of Autism				
Mild				
Boy	1.94	1,51	0.037	S
Girl	2.80			

$F(1,51) = 4.568, P < 0.05$

Results in table 4.3.8 depicted that as $p < 0.05$, thus null hypothesis was rejected, which means that there was significant difference in the mild level of autism across gender. Mean values also depicted the same.

(B)

Category	Mean	df	P	Conclusion
Levels of Autism				
Moderate				
Boy	1.65	1,43	0.0397	S
Girl	2.40			

$F(1,43) = 0.733, p > 0.05$

Result depicted that as $p < 0.05$, thus null hypothesis was rejected, which means that there is significant difference in the mild level of autism across gender. Mean values also depicted the same.

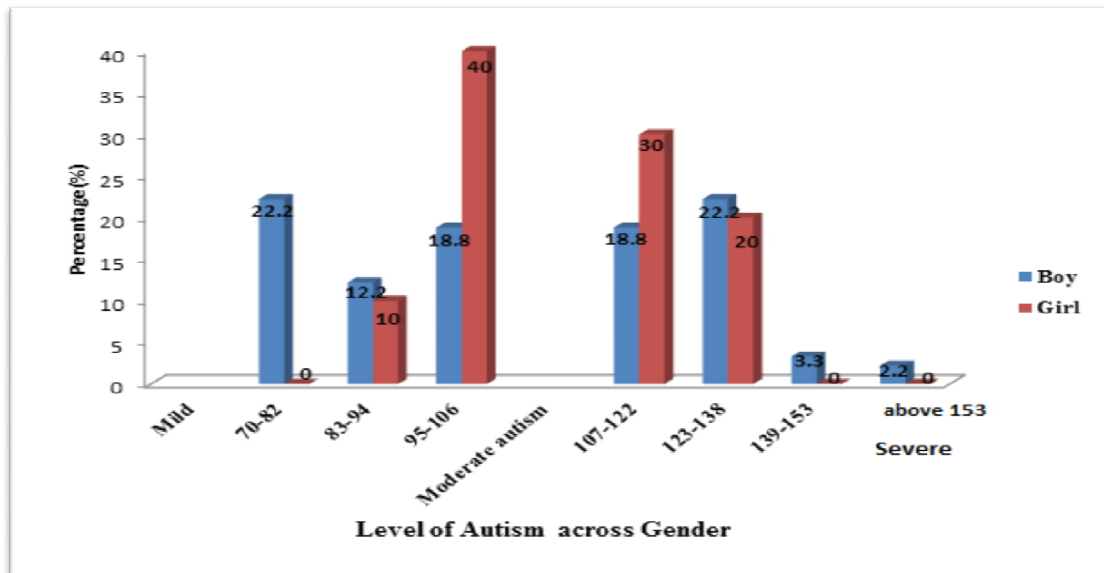


Fig 4.3.5 Distribution of respondents according to Level of autism across gender

Table 4.3.9: Distribution of respondent’s level of autism across Age

S.NO	Level of Autism	Respondents (N=100)	
		5-8 Year (N=58) Frequency (%)	9-12 Year(N=42) Frequency (%)
1	Mild autism	33 (56.7)	20(47.5)
	70-82	14(24.1)	6(14.2)
	83-94	7(12.0)	5(11.9)
	95-106	12(20.6)	9(21.4)
2	Moderate autism	40(68.8)	22(52.2)
	107-122	17(29.3)	11(26.1)
	123-138	20(34.4)	10(23.8)
	139-153	3(5.1)	1(2.3)
3	Severe	2(3.4)	-
	More than 153		

Table 4.3.9 showed distribution of respondents according to level of autism across age. Data revealed that 56.7 percent respondents age between 5-8 years and 47.5 percent respondents age between 9-12 were having mild autism, where 24.1 percent respondents age between 5-8 years and 14.2 percent respondents age between 9-12 years score ranged from 70-82, while 12.0 percent respondents aged between 5-8 years and 11.9 percent respondents aged between 9-12 years scores ranged from 83-94, while 20.6 percent and respondents aged between 5-8 year and 21.4 percent respondents aged between 9-12 year scores ranged from 95-106.

In moderate category 68.8 percent respondents aged between 5-8 year and 52.2 percent respondents aged between 9-12 years. It was seen that 29.3 percent respondents aged between 5-8 year and 26.1 percent respondents aged between 9-12 year scored between 107-122, while 34.4 percent and respondents age between 5-8 year and 23.8 percent respondents aged between 9-12 years scores ranged from 123-138, while 5.1 percent respondents age between 5-8 year and 2.3 percent respondent age between 9-12 year scores ranged from 139-153.

In severe category only 3.4 percent respondent aged between 5-8 years scored more than 153.

Ho 4: There is no significant difference between level of autism across age group.

Table 4.3.10 (A) Distribution of respondent according to Level of autism across Age groups.

(A)

Category	Mean	df	F	P	Conclusion
Levels of Autism					
Mild					
5-8					
9-12	1.94 2.15	1,51	0.697	0.408	N.S

$F(1,51)=0.697, P>0.05$

In table 4.3.10 (A) results depicted as $p>0.05$ thus null hypothesis was accepted, which means that there was no significant difference between the mild level of autism across age.

(B)

Category	Mean	df	F	P	Conclusion
Levels of Autism					
Moderate					
5-8	1.70	7,43	0.668	0.418	N.S
9-12	2.55				

$F(1,43)=0.668, p>0.05$

Results in table 4.3.10 (B) depicted that as $p>0.05$ thus null hypothesis was accepted, which means that there was no significant difference between Moderate level of autism across age group.

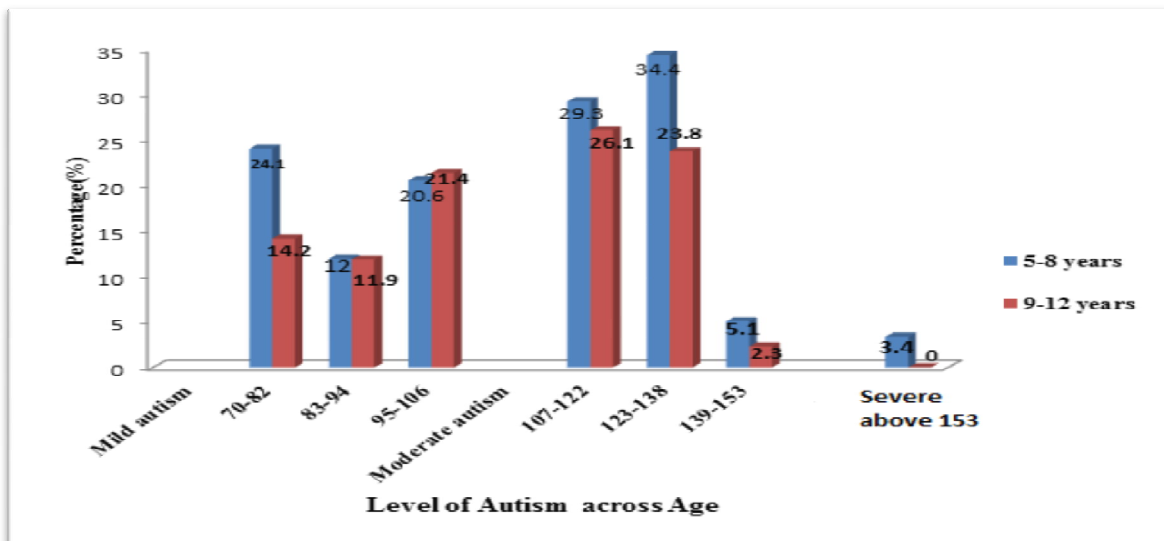


Fig 4.3.6 Distribution of respondents on Level of autism across age group

Table 4.3.11: Distribution of respondents on the basis of Social Relationship and Reciprocity domains across gender

S. N	ITEM	Rarely		Sometimes		Frequently		Mostly		Always	
		Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
1	Has poor eye contact	22 (24.44)	1 (10)	18 (20)	4 (40)	19 (21.11)	1 (10)	21 (23.33)	3 (30)	10 (11.11)	1 (10)
2	Lack Social smile	24 (26.66)	3 (30)	18 (20)	1 (10)	15 (16.66)	1 (10)	26 (28.88)	4 (40)	7 (7.77)	1 (10)
3	Remain aloof	4 (4.44)	0	21 (23.23)	1 (10)	9 (10)	0	35 (38.88)	6 (60)	21 (23.33)	3 (30)
4	Does not reach out of other	16 (17.77)	2 (20)	20 (22.22)	0	21 (23.33)	4 (40)	28 (33.11)	3 (30)	5 (5.50)	1 (10)
5	Unable to relate to people	19 (21.11)	1 (10)	16 (17.77)	2 (20)	21 (23.33)	1 (10)	26 (28.88)	4 (40)	8 (8.88)	2 (20)
6	Unable to respond to social cues	12 (13.33)	0	19 (21.11)	1 (10)	29 (32.22)	2 (20)	23 (25.55)	6 (60)	7 (7.77)	1 (10)
7	Engage in solitary and repetitive play activities	27 (30)	2 (20)	18 (20)	3 (30)	18 (20)	5 (50)	16 (17.77)	0	11 (12.22)	0
8	Unable to take turn in social interaction	14 (15.55)	1 (10)	15 (16.66)	1 (10)	16 (17.77)	0	28 (31.11)	3 (30)	17 (18.88)	5 (50)
9	Does not maintain peer relationship	13 (14.44)	0	11 (12.22)	2 (20)	15 (16.66)	0	19 (21.11)	2 (30)	32 (35.55)	6 (60)

Table 4.3.11 discussed distribution of respondents on the basis Social relationship and reciprocity across gender. Data showed that 24.4percent boys rarely had poor eye contact and 23.3 percent boys mostly had poor eye contact. While 40.0percent girls sometimes had poor eye contact, while 30.0percent girls mostly had poor eye contact. It was seen that 28.8percent boys and 40.0percent girls mostly lack social smile, while 38.8percent boys and 60.0percent girls mostly remained aloof. Results also showed that 33.1percent boys mostly does not reach out of other and 40percent girls frequently does not reach out of other, while 40.0 percent girls and 28.8 percent boys both mostly unable to relate to people. Results showed that 32.2 percent boys frequently were unable to respond to social cues and 60.0 girls mostly were unable to respond to social cues whereas 30.0 percent boys rarely and 50.0percent girls frequently engage in solitary and repetitive play activities. Data depict that 31.11 percent

boys mostly were unable to take turn in social interaction and 50.0 percent girls always were unable to take turn in social interaction while 35.5 percent boys and 60.0 percent girls both mostly does not maintain peer relationship.

Table 4.3.12: Distribution of respondents on the basis Emotional Responsiveness domain across Gender

S. N	ITEMS EMOTIONAL RESPONSIVENESS	Rarely		Sometimes		Frequently		Mostly		Always	
		Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
10	Shows inappropriate emotional response	20 (22.22)	1 (10)	38 (42.22)	4 (40)	14 (15.55)	4 (40)	14 (15.55)	0	4 (4.44)	1 (10)
11	Shows exaggerated emotions	29 (32.22)	2 (20)	33 (36.66)	3 (30)	17 (18.88)	4 (40)	10 (11.11)	1 (10)	1 (10)	0
12	Engage self-stimulating emotion	27 (30)	3 (30)	37 (41.11)	3 (30)	13 (14.44)	1 (10)	10 (11.11)	3 (30)	3 (3.33)	0
13	Lack fear of danger	12 (13.33)	0	16 (17.77)	0	7 (7.77)	1 (10)	27 (30)	2 (20)	28 (31.11)	7 (70)
14	Excited or agitated for no apparent reason	21 (13.33)	3 (30)	36 (40)	3 (30)	13 (14.44)	3 (30)	18 (20)	1 (10)	2 (2.22)	0

Table 4.3.12 discussed the distribution of respondents on emotional responsiveness across gender. Results showed that 42.2 percent boys sometimes expressed inappropriate emotional response and 40.0 percent girls frequently expressed inappropriate emotional response. It was seen that 36.6 percent boy sometimes showed exaggerated emotions and 40.0 percent girls frequently shows exaggerated emotions while 41.1 percent boy sometimes engaged in self-stimulating emotion and 30.0 percent girls rarely, sometimes and mostly engaged in self-stimulating emotion. Results depicted that 31.1 percent boys and 70.0 percent girls both always lacked fear of danger. Data showed that regarding 40.0 percent boys sometimes got excited or agitated for no apparent reason and 30.0 percent girls sometimes got excited or agitated for no apparent reason.

Table 4.3.13: Distribution of respondents on the basis of Speech-Language and Communication domain across Gender

S. N	ITEMS SPEECH AND COMMUNICATION	Rarely		Sometimes		Frequently		Mostly		Always	
		Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
15	Acquired speech or lost it	45 (50)	10 (100)	14 (15.55)	0	15 (16.66)	0	13 (14.44)	0	3 (3.33)	0
16	Has difficulty in using non-verbal language	32 (35.55)	3 (30)	29 (32.22)	3 (30)	6 (6.66)	0	14 (15.55)	3 (30)	9 (10)	1 (10)
17	Engage in stereotyped language	52 (57.77)	8 (80)	10 (11.11)	1 (10)	7 (7.77)	0	14 (15.55)	1 (10)	7 (7.77)	0
18	Engage in echolalia speech	19 (21.11)	1 (10)	35 (38.88)	6 (60)	23 (25.55)	1 (10)	10 (11.11)	2 (20)	3 (3.33)	0
19	Produce unusual noise	25 (27.77)	3 (30)	31 (34.44)	3 (30)	18 (20)	2 (20)	15 (16.6)	2 (20)	1 (1.11)	0
20	Unable to initiate conversation with other	15 (16.66)	0	14 (15.55)	0	9 (10)	1 (90)	11 (12)	2 (20)	41 (45.55)	7 (70)
21	Use jargon or meaningless word	64 (71.11)	7 (70)	10 (11.11)	2 (20)	9 (10)	0	6 (6.66)	1 (10)	1 (1.11)	0
22	Use pronoun reversals	71 (78.88)	8 (80)	11 (12.22)	2 (20)	6 (6.66)	0	2 (2.22)	0	0	0
23	Unable to grasp pragmatic of communication	19 (21.11)	2 (20)	14 (15.55)	1 (10)	9 (10)	10 (100)	22 (24.22)	2 (20)	26 (28.88)	4 (40)

Table No 4.3.13 discussed the distribution of respondents on speech-language and communication domain. Results showed that 50.0 percent boys and 100 percent girls rarely acquired speech or lost it. Results showed that 35.5 percent boys and 30.0 percent girls rarely had difficulty in using non-verbal language. Data showed that 57.7 percent boy and 80 percent girls both were rarely engage in stereotyped language. 38.8 percent boys and 60.0 percent girls both are sometimes engage in echolalia speech, while data showed that 30.0 percent girls rarely, sometimes and 34.4 percent boys sometimes produced unusual noise. Data showed those 45.5 percent boys frequently and 70.0 girls always were unable to initiate conversation with other. Result showed that 71.1 percent boys and 70.0 girls both are rarely use jargon or meaningless word. Result showed that 78.8 percent boys and 80.0 girls both are

rarely use pronoun reversals and result showed that 100percent girls frequently and 28.8 percent boys always were unable to grasp pragmatic of communication.

Table 4.3.14: Distribution of respondents on the basis Behaviour Patterns Area Distribution of respondents according to Gender

S. N	ITEMS BEHAVIOUR PATTERNS	Rarely		Sometimes		Frequently		Mostly		Always	
		Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
24	Engage is stereotype and repetitive motor mannerism	31 (34.44)	2 (20)	13 (14.44)	2 (20)	9 (10)	1 (10)	24 (24.66)	3 (30)	813 (14.44)	2 (20)
25	Shows attachment to inanimate objects	7 (7.77)	0	11 (12.22)	0	25 (27.77)	4 (40)	21 (2.33)	4 (40)	26 (28.88)	2 (0)
26	Shows hyperactivity/restlessness	28 (31.03)	1 (10)	13 (14.44)	3 (30)	12 (13.33)	2 (20)	26 (28.88)	2 (20)	11 (12.22)	2 (20)
27	Exhibits aggressive behaviour	30 (33.33)	2 (20)	17 (18.88)	2 (20)	16 (17.77)	3 (30)	19 (21.11)	1 (10)	8 (8.88)	2 (20)
28	Throws Tamper-tantrums	28 (31.11)	2 (20)	20 (22.22)	2 (20)	10 (11.11)	2 (20)	18 (20)	2 (20)	14 (15.55)	2 (20)
29	Engages in self - injurious behaviour	53 (58.88)	7 (70)	19 (21.11)	1 (10)	5 (5.55)	1 (10)	9 (10)	1 (10)	4 (15.55)	0
30	Insist on sameness	60 (66.60)	9 (90)	19 (21.11)	0	6 (6.66)	1 (10)	5 (5.55)	0	-	-

Table 4.3.14 discussed distribution of respondents on the basis of behaviour pattern across gender. Results showed that 34.4 percent boys rarely engage is stereotype and repetitive motor mannerism and 20.0 percent girls rarely, sometimes, frequently, mostly and always engage is stereotype and repetitive motor mannerism, while 28.8 percent boys always showed attachment to inanimate objects and 40.0 percent girls frequently and mostly showed attachment to inanimate objects .The results showed that 31.0 percent boy rarely showed hyperactivity/restlessness and 30.0 percent girls sometimes shows hyperactivity/restlessness. Result depicted that 33.3 percent boys rarely exhibited aggressive behaviour and 30.0 percent girls frequently exhibited aggressive behaviour. It was seen that 31.1 percent boys rarely throws Tamper- tantrums and 20.0 percent girls rarely and sometimes throws Tamper-tantrums. Results revealed that 58.8percent boys and 70.0 girls both are rarely engage in self

-injurious behaviour. Results showed that 70.0 percent boys and 90.0 girls both are rarely insist on sameness.

Table 4.3.15: Distribution of respondents on the basis Sensory Aspect domain across Gender

S. N	ITEMS SENSORY ASPECT	Rarely		Sometimes		Frequently		Mostly		Always	
		Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
31	Unusually sensitive to sensory stimuli	28 (31.11)	2 (20)	36 (40)	2 (20)	19 (21.11)	6 (60)	6 (6.66)	0	1 (1.11)	0
32	Stare in to space for long time	30 (33.33)	5 (50)	12 (13.33)	1 (10)	11 (12.22)	1 (10)	22 (14.44)	2 (24.44)	15 (16.66)	1 (10)
33	Has difficulty to tracking objects	19 (21.11)	1 (10)	28 (31.11)	3 (30)	17 (18.88)	3 (30)	17 (18.88)	2 (20)	9 (10)	1(10)
34	Has unusual vision	32 (35.55)	1 (10)	19 (21.11)	4 (40)	18 (20)	2 (20)	17 (18.88)	3 (30)	4 (4.44)	0
35	Insensitive to pain	20 (22.22)	0	21 (23.33)	1 (10)	7 (7.77)	1 (10)	22 (24.44)	5 (50)	20 (22.22)	3 (30)
36	Responds to objects/people unusually by smelling touching or tasting	50 (55.55)	9 (90)	7 (7.77)	1 (10)	10 (11.11)	0	18 (20)	0	5 (5.55)	0

Table 4.3.15 discussed the distribution of respondents on the basis of sensory aspect across gender. Results showed that 40.0 percent boys sometimes shows unusually sensitive to sensory stimuli and 60.0 percent girls frequently shows unusually sensitive to sensory stimuli. While 33.3 percent boys rarely stare in to space for long time and 50.0 percent girls rarely stare in to space for long time .It was seen that 31.1percent boy rarely and 30.0 percent girls sometimes and frequently has difficulty to tracking objects. Results depicted that 35.5 percent boys rarely and 40.0 percent girls are sometimes has unusual vision. Results showed that 24.4 present boys and 50.0 percent girls both were mostly had Insensitive to pain. While 50.0 percent boys and 90.0percent girls both were rarely responds to objects/people unusually by smelling touching or tasting.

Table 4.3.16: Distribution of respondents on the basis Cognitive component domain across Gender

S. N	ITEMS COGNITIVE COMPONENT	Rarely		Sometimes		Frequently		Mostly		Always	
		Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl
37	Inconsistent attention and concentration	12 (13.33)	0	16 (17.77)	0	6 (6.66)	4 (40)	23 (25.55)	0	3 (36.66)	6 (60)
38	Shows delay in responding	15 (16.66)	0	12 (13.33)	1 (10)	12 (13.33)	0	20 (22.22)	6	31 (34.44)	3 (30)
39	Has unusual memory of some kind	34 (47.77)	5 (50)	37 (41.11)	5 (50)	4 (4.44)	0	5 (5.55)	0	1 (1.11)	0
40	Has "savant" ability	48 (53.33)	8 (80)	3 (3.33)	0	2 (2.22)	1 (10)	20 (22.22)	1 (10)	1 (18.88)	0

Table 4.3.16 discussed the distribution of respondents on the basis of cognitive component across gender. Results showed that 25.5 percent boys mostly had inconsistent attention and concentration and 60.0 percent girls' always inconsistent attention and concentration. While 34.4 percent boys always had shown delay in responding and 60.0 percent girls mostly shows delay in responding. The results showed that 41.1 percent boy sometimes and 50.0 percent girls rarely and sometimes Has unusual memory of some kind. Results depict that 53.3 percent boys and 80.0 percent girls both are rarely has "savant" ability.

Table 4.3.17: Distribution of respondents on the basis Social Relationship and Reciprocity domain across Age group

S. N	ITEMS SOCIAL RELATIONSHIP AND RECIPROCITY	Rarely		Sometimes		Frequently		Mostly		Always	
		5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year
1	Has poor eye contact	13 (22.41)	10 (23.80)	13 (22.41)	8 (19.04)	12 (20.68)	8 (19.04)	12 (20.68)	13 (30.95)	8 (13.79)	3 (5.17)
2	Lack Social smile	18 (31.03)	9 (21.42)	9 (15.51)	10 (23.80)	6 (10.34)	10 (23.80)	20 (34.48)	10 (23.80)	5 (8.62)	3 (7.14)
3	Remain aloof	3 (5.17)	1 (2.38)	11 (18.96)	11 (26.19)	6 (10.34)	3 (7.14)	22 (37.93)	19 (45.23)	16 (27.58)	8 (19.04)
4	Does not reach out of other	12 (20.68)	6 (14.28)	9 (15.51)	11 (26.19)	18 (31.03)	7 (16.6)	14 (24.13)	16 (38.09)	5 (8.62)	2 (4.76)

5	Unable to relate to people	11 (18.96)	9 (21.42)	11 (18.96)	7 (16.66)	13 (22.41)	8 (19.04)	15 (25.86)	16 (38.09)	8 (13.49)	12 (28.57)
6	Unable to respond to social cues	6 (10.34)	6 (14.28)	10 (17.24)	11 (26.19)	19 (32.75)	12 (28.57)	19 (32.75)	10 (23.80)	4 (6.89)	3 (7.14)
7	Engage in solitary and repetitive play activities	18 (31.03)	10 (23.80)	11 (18.96)	11 (26.19)	15 (25.86)	9 (21.42)	7 (12.06)	8 (19.04)	7 (12.06)	4 (9.52)
8	Unable to take turn in social interaction	7 (12.06)	9 (21.42)	12 (20.68)	4 (9.52)	9 (15.51)	7 (16.66)	15 (25.86)	16 (38.09)	15 (25.86)	6 (14.28)
9	Does not maintain peer relationship	4 (6.89)	10 (23.80)	9 (15.51)	3 (7.14)	10 (23.8)	5 (11.90)	14 (24.13)	6 (14.28)	21 (36.20)	18 (42.85)

Table 4.3.17 discussed the distribution of respondents on social relationship and reciprocity across age. Data showed that regarding 22.4 percent respondent's age between 5-8 year rarely had poor eye contact and 30.9 percent respondent's age between 9-12 year mostly had poor eye contact. While 34.4 percent respondent's age of 5-8 year mostly lacked social smile and 23.8 percent respondents age of 9-12 year sometimes and mostly lacked social smile. While 37.9 percent respondent's age of 5-8 year and 54.2 percent respondent's age of 9-12 year both are mostly remained aloof. Results also depicts that 31.0 percent respondents age of 5-8 year frequently and 38.0 percent respondents age of 9-12 year mostly does not reach out of other. It was seen that 25.8 percent respondent's age of 5-8 year and 38.0 percent respondents age of 9-12 year both are mostly unable to relate to people. Results also showed that 32.7 percent respondents' age of 5-8 year and 28.5 percent respondents age of 9-12 year both are frequently unable to respond to social cues. Results showed that 31.0 percent respondent's age of 5-8 year rarely engaged in solitary and repetitive play activities and 26.1 percent respondents age of 9-12 year sometimes engaged in solitary and repetitive play activities. While 25.8 percent respondents age of 5-8 year mostly, always Unable to take turn in social interaction further 38.0 percent respondents age between 9-12 year always Unable to take turn in social interaction While 36.2 percent respondents age of 5-8 year and 42.8 percent age of 9-12 year both are always does not maintain peer relationship.

Table4.3.18: Distribution of respondents on the basis of Emotional Responsiveness domain across Age group

S. N	ITEMS	Rarely		Sometimes		Frequently		Mostly		Always	
		5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year
10	Shows inappropriate emotional response	15 (25.86)	6 (14.28)	28 (48.27)	13 (30.95)	6 (10.34)	12 (28.67)	4 (6.89)	10 (23.80)	4 (6.89)	1 (2.38)
11	Shows exaggerated emotions	18 (31.03)	13 (30.41)	25 (43.10)	11 (26.19)	10 (17.24)	11 (26.19)	4 (6.89)	7 (16.66)	1 (1.72)	0 (-)
12	Engage in self - stimulating emotion	19 (22.35)	11 (26.19)	27 (46.55)	13 (30.41)	6 (10.34)	8 (19.04)	3 (5.17)	10 (23.80)	3 (7.14)	0 (-)
13	Lack fear of danger	6 (10.34)	6 (14.28)	9 (21.49)	7 (16.66)	5 (8.62)	3 (7.14)	17 (29.31)	12 (28.57)	21 (36)	14 (97.61)
14	Excited or agitated for no apparent reason	15 (25.86)	9 (21.49)	26 (44.82)	13 (30.95)	7 (12.06)	9 (21.49)	8 (13.79)	11 (26.19)	2 (3.44)	0 (-)

Table 4.3.18 discussed the distribution of respondents on emotional responsiveness across age. Results showed that 48.2 percent respondent's age of 5-8 year and 30.0 percent respondents between the age of 9-12 year both are sometimes showed inappropriate emotional response. While 43.1 percent respondents between age of 5-8 year sometimes showed exaggerated emotions and 30.4 percent respondents between age of 9-12 year rarely showed exaggerated emotions. Results showed that 46.5 percent respondent's age of 5-8 year and 30.4 percent age of 9-12 year both are sometimes engaged in self-stimulating emotion. Results depict that 36 percent respondent age of 5-8 year and 97.6 percent respondents both are always lacked fear of danger. While 44.8 percent respondents age between 5-8 year and 30.9 percent respondents both are sometimes excited or agitated for no apparent reason.

Table 4.3.19: Distribution of respondents on the basis of Speech-Language and Communication domain across Age group

S. N	ITEMS SPEECH AND COMMUNICATION	Rarely		Sometimes		Frequently		Mostly		Always	
		5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year
15	Acquired speech or lost it	13 (22.41)	24 (57.14)	10 (17.24)	4 (9.52)	9 (15.51)	6 (14.28)	6 (10.36)	7 (16.66)	2 (3.44)	1 (2.38)
16	Has difficulty in using non-verbal language	19 (32.75)	16 (38.09)	22 (37.93)	10 (23.80)	1 (1.72)	5 (11.90)	8 (13.79)	9 (21.42)	8 (13.79)	2 (4.76)
17	Engage in stereotyped language	39 (67.24)	21 (50)	5 (8.62)	6 (14.28)	4 (6.89)	3 (7.14)	5 (8.62)	10 (23.80)	5 (8.62)	2 (4.76)
18	Engage in echolalic speech	12 (20.68)	8 (19.04)	25 (43.10)	16 (38.09)	13 (22.41)	11 (26.19)	5 (8.62)	7 (16.66)	3 (7.14)	0 (97.61)
19	Produce unusual noise	21 (36.20)	7 (16.66)	16 (27.58)	18 (42.85)	11 (18.96)	9 (21.49)	9 (15.51)	8 (19.04)	1 (1.72)	0 (-)
20	Unable to initiate conversation with other	8 (13.79)	7 (16.66)	10 (17.24)	4 (9.52)	2 (3.44)	8 (19.44)	9 (15.51)	4 (9.52)	29 (50)	19 (45.23)
21	Use jargon or meaningless word	42 (72.41)	29 (69.04)	6 (10.34)	6 (14.28)	5 (8.62)	4 (9.52)	4 (6.89)	3 (7.14)	1 (1.72)	0 (-)
22	Use pronoun reversals	47 (81.03)	32 (76.19)	6 (10.34)	7 (16.66)	4 (6.89)	2 (4.76)	1 (1.72)	1 (2.83)	0	0
23	Unable to grasp pragmatic of communication	11 (18.03)	10 (23.80)	6 (10.36)	9 (21.42)	8 (13.79)	2 (4.76)	16 (27.58)	8 (13.79)	17 (29.31)	13 (30.95)

Table 4.3.19 discussed the distribution of respondents on speech-Language and communication across age. Results showed that 22.1 percent respondent's age of 5-8 years and 57.1 percent respondent age of 9-12 years both are rarely Acquired speech or lost it. While 38.0 percent respondent age of 9-12 years rarely had difficulty in using nonverbal language and 39.9 percent respondent age group of 5-8 years sometimes had difficulty in using non-verbal language. Results showed that 67.2 percent respondents' age of 5-8 years and 50.0 percent respondent's age of 9-12 years both are rarely engage in stereotyped language. Results revealed that 43.1 percent respondents' age of 5-8 years and 38.0 percent respondent's age 9-12 years both are sometimes engage in echolalia speech. It was seen that 36.2 percent respondents age 5-8 years rarely produced unusual noise and 42.8 percent respondents age of 9-12 years sometimes produced unusual noise. Results showed that 50.0

percent respondent's age of 5-8 years and 45.2 percent respondents age 9-12 years both are always Unable to initiate conversation with other. While 72.4 percent respondent's age of 5-8 years and 69.4 percent respondents age of 9-12 years both are rarely Use jargon or meaningless word. Results showed that 81.3 percent respondent's age of 5-8 years and 76.19 percent respondent's age of 9-12 years both are rarely Use pronoun reversals. Results showed that 29.3 percent respondent's age of 5-8 years and 30.9 percent respondents age of 9-12 years both are always Unable to grasp pragmatic of communication.

Table 4.3.20 Distribution of respondents on the basis of Behaviour Patterns domain across Age group

S.N	ITEM	Rarely		Sometimes		Frequently		Mostly		Always	
		5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year
24	Engage is stereotype and repetitive motor mannerism	22 (37.93)	11 (26.19)	8 (13.79)	7 (16.66)	3 (7.14)	7 (16.66)	17 (29.31)	10 (23.80)	8 (13.79)	7 (16.66)
25	Shows attachment to inanimate objects	6 (10.34)	1 (2.38)	6 (10.34)	5 (11.90)	17 (29.31)	12 (28.57)	13 (22.41)	12 (28.57)	16 (27.58)	12 (28.57)
26	Shows hyperactivity/restlessness	18 (31.03)	11 (26.19)	12 (20.68)	4 (9.52)	5 (8.62)	9 (21.42)	14 (24.13)	14 (33.33)	9 (15.51)	4 (9.52)
27	Exhibits aggressive behaviour	21 (36.20)	11 (26.19)	12 (20.68)	7 (16.66)	6 (10.34)	13 (30.95)	12 (20.68)	8 (19.04)	7 (12.06)	3 (7.14)
28	Throws Tamper-tantrums	19 (32.75)	11 (26.19)	12 (20.68)	10 (23.80)	6 (10.34)	6 (14.28)	10 (17.24)	10 (23.80)	11 (18.96)	5 (11.90)
29	Engages in self - injurious behaviour	39 (67.24)	21 (50)	9 (21.42)	11 (26.19)	4 (6.89)	2 (4.76)	3 (5.17)	7 (16.66)	3 (5.17)	1 (2.38)
30	Insist on sameness	38 (65.51)	31 (73.80)	12 (20.68)	7 (16.66)	5 (8.62)	2 (4.76)	3 (5.17)	2 (4.76)	()	()

Table 4.3.20 discussed the distribution of respondents on the basis of behaviour pattern across age. Results showed that 37.9 percent respondents aged of 5-8 years and 26.1 percent respondents age of 9-12 years both are rarely engage is stereotype and repetitive motor

mannerism. While 29.3 percent respondents aged between 5-8 year's frequently showed attachment to inanimate objects and 28.5 present respondent ages between 9-12 year mostly, always showed attachment to inanimate objects. Results also showed that 31.0percent respondents aged between 5-8 year rarely showed hyperactivity/restlessness and 33.3 percent respondent age between 9-12 year mostly showed hyperactivity/restlessness. Results depicts that 36.2 percent respondent's age between 5-8 year rarely exhibited aggressive behaviour and 30.9 percent respondent age between 9-12 year frequently exhibited aggressive behaviour. While 32.7percent respondent's age between 5-8 year and 26.1 percent respondent aged between 9-12 year both are rarely Throws Tamper- tantrums. While 67.2 percent respondent's age between 5-8 year rarely and 50.0 percent respondent aged between 9-12year also rarely Engages in self -injurious behaviour. Result showed that 65.5 percent respondent's age between 5-8 year rarely and 73.8 percent respondent aged between 9-12 year both rarely insist on sameness.

Table 4.3.21 Distribution of respondents on the basis of Sensory Aspect domain across Age group

S. N	ITEM	Rarely		Sometimes		Frequently		Mostly		Always	
		5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year
31	Unusually sensitive to sensory stimuli	19 (32.75)	11 (26.19)	23 (39.65)	15 (35.71)	11 (18.96)	14 (12.06)	4 (6.89)	2 (4.76)	1 (1.72)	0
32	Stare in to space for long time	20 (34.48)	15 (35.71)	6 (10.34)	7 (16.66)	7 (12.06)	5 (11.90)	14 (24.13)	10 (23.80)	11 (18.96)	5 (11.90)
33	Has difficulty to tracking objects	15 (25.86)	5 (11.90)	17 (29.31)	14 (33.33)	9 (15.51)	11 (26.19)	11 (18.96)	8 (19.04)	6 (10.34)	4 (6.89)
34	Has unusual vision	20 (34.48)	13 (30.95)	13 (22.41)	10 (23.80)	12 (20.08)	8 (19.04)	9 (15.51)	11 (26.19)	4 (6.89)	0
35	Insensitive to pain	10 (17.24)	10 (23.80)	13 (22.41)	9 (21.42)	6 (10.34)	2 (4.76)	15 (25.86)	12 (28.57)	14 (70.68)	9 (21.42)
36	Responds to objects/people unusually by smelling touching or tasting	37 (63.79)	22 (52.38)	4 (6.89)	4 (9.52)	3 (5.17)	7 (12.68)	12 (20.68)	6 (14.28)	2 (3.44)	3 (7.14)

Table 4.3.21 discussed the distribution of respondents on the basis of sensory aspect across age. Data showed that regarding 39.6 percent respondent's age between 5-8 year and 35.7 percent respondents age between 9-12 year both are sometimes showed unusually sensitive to sensory stimuli, while 34.4 percent respondent's age between 5-8 year and 35.7 percent

respondents age between 9-12 year both are rarely Showed Stare in to space for long time .Results showed that 25.8 percent respondent’s age between 5-8 year rarely and 33.3 percent respondents age between 9-12 year showed sometimes has difficulty to tracking objects. Result depicts that 34.4 percent respondent's age between 5-8 year and 30.9 percent respondent aged between 9-12 year rarely has unusual vision. While 25.8 percent respondent's aged between 5-8 year and 28.5 percent respondent aged between 9-12 year mostly showed insensitive to pain. Results showed that 63.9 percent respondent’s age between 5-8 year and 52.3percent respondents age between 9-12 year both are rarely responds to objects/people unusually by smelling touching or tasting.

Table 4.3.22: Distribution of respondents on the basis Cognitive component domain across Age group

S.N	ITEM	Rarely		Sometimes		Frequently		Mostly		Always	
		5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year	5-8 Year	9-12 Year
37	Inconsistent attention and concentration	6 (10.34)	6 (14.28)	9 (15.51)	7 (12.06)	6 (10.34)	4 (9.52)	14 (24.13)	9 (21.42)	23 (39.65)	16 (38.09)
38	Shows delay in responding	11 (18.96)	4 (9.52)	6 (10.34)	7 (12.06)	8 (13.79)	4 (9.52)	16 (27.58)	10 (23.80)	17 (29.31)	17 (40.47)
39	Has unusual memory of some kind	32 (55.17)	16 (38.09)	20 (34.48)	22 (52.38)	3 (5.17)	1 (5.17)	3 (5.17)	2 (4.76)	0 (0)	1 (2.38)
40	Has “savant” ability	33 (56.89)	23 (54.76)	2 (3.44)	1 (2.38)	2 (3.44)	1 (2.38)	11 (18.96)	10 (23.80)	10 (17.24)	7 (16.66)

Table 4.3.22 Discussed the distribution of respondents on the basis of cognitive component across age results showed that 39.6 percent respondent’s age between 5-8 year and 38.0 percent respondents age between 9-12 year both showed always Inconsistent attention and concentration. While 29.3 percent respondent’s age between 5-8 year and 40.4 percent respondents age between 9-12 year both are always Showed delay in responding .The result

showed that 55.1 percent respondent's age between 5-8 year rarely and 52.3 percent respondents age between 9-12 year showed sometimes Has unusual memory of some kind. While 56.8 percent respondent's age between 5-8 year and 54.7 percent respondent's age between 9-12 year both are rarely has "savant" ability.

Table 4.3.23: Distribution of respondents on the basis of mean scores obtained on different Domain

S.No.	Domain	Mean score N=100
1	Social relationship and reciprocity	27.36
2	Emotional responsiveness	12.64
3	Speech Language and Communication	20.72
4	Behaviour Patterns	17.65
5	Sensory aspects	15.03
6	Cognitive component	11.21

Table 4.3.23 showed mean scores achieved by respondents on different domains. Result showed that the mean score under the category social relationship and reciprocity was 27.36 while mean score of emotional responsiveness was 12.64. Mean score of Speech was 20.27. Behaviour pattern has 17.65, while sensory aspect had 15.03 mean score and cognitive component had 11.21 average score. Maximum mean score was obtained social relationship domain and minimum mean score was obtained on cognitive component.

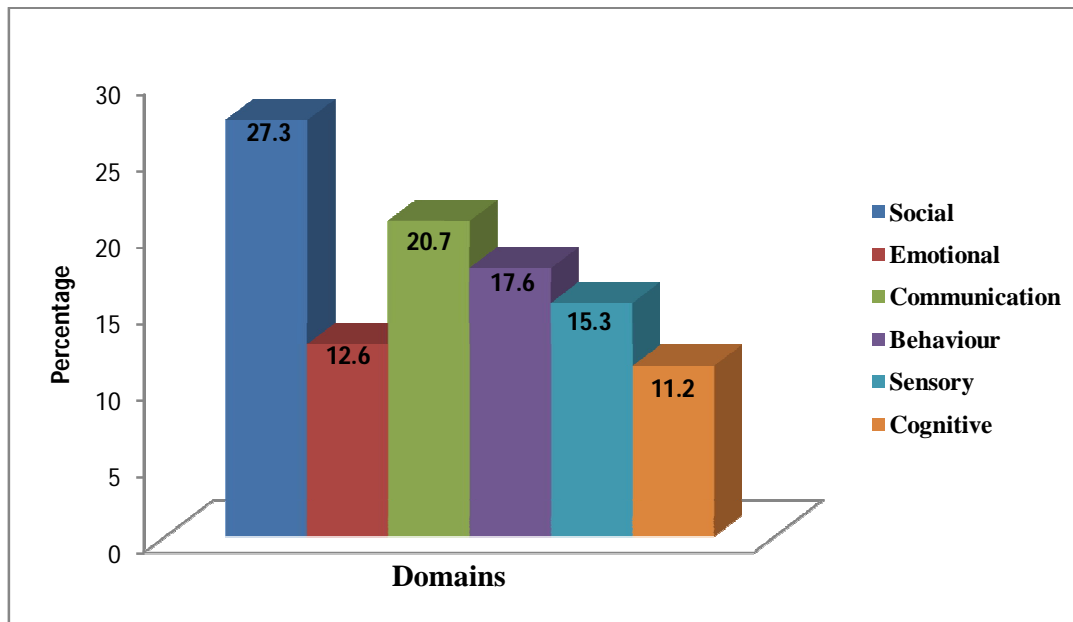


Fig 4.3.7 Mean score of respondents on different Domains

Table 4.3.24: Distribution of respondents on the basis of mean scores on different domains across Gender

S.NO	Parameter	Male	Female
1	Social relationship and reciprocity	27.0	30.6
2	Emotional responsiveness	12.5	14.2
3	Speech Language and Communication	20.7	20.5
4	Behaviour Patterns	17.5	18.7
5	Sensory aspects	14.9	15.4
6	Cognitive component	11.2	11.3

Table 4.3.24 discussed mean scores of different parameters across gender. Results showed that the mean score of boys was (27.0) and (30.6) of girls in the parameter of Social relationship and reciprocity, while mean score in area of Emotional responsiveness of boys

was (12.5) and of girls was 14.2. In the parameter of Speech Language and communication result showed the mean score of boys was (20.7) and (20.5) mean score of girls. On the basis of Behaviour pattern mean score of boys was (17.5) and of girls was (18.7). While the parameter of Sensory Aspects mean score of boys was (14.9) and (15.4) of girls and in the last Parameter of Cognitive component result showed that the mean score of boys was (11.2) and (11.3) of girls mean score. It was revealed that in all the components mean score of girls was more than boys.

Ho 5: There is no significant difference between domains and gender

Table 4.3.25: Mean scores of different domain across gender

Domain	Mean score	df	f	p	Conclusion
Social		(1,98)		.200	N.S
Boy	27.00		1.668		
Girl	30.60				
Emotional			1.387	.242	
Boy	12.52				
Girl	14.20				
Speech			0.027	.871	
Boy	20.74				
Girl	20.50				
Behaviour			0.395	.531	
Boy	17.53				
Girl	18.70				
Sensory			.718		

Boy	14.98		0.131		
Girl	15.40				
Cognitive			0.012	914	
Boy	11.20				
Girl	11.30				

Table 4.3.25 depicts that as $p > 0.05$ in all the domains, null hypothesis was accepted, thus no significance difference was found between domains across gender.

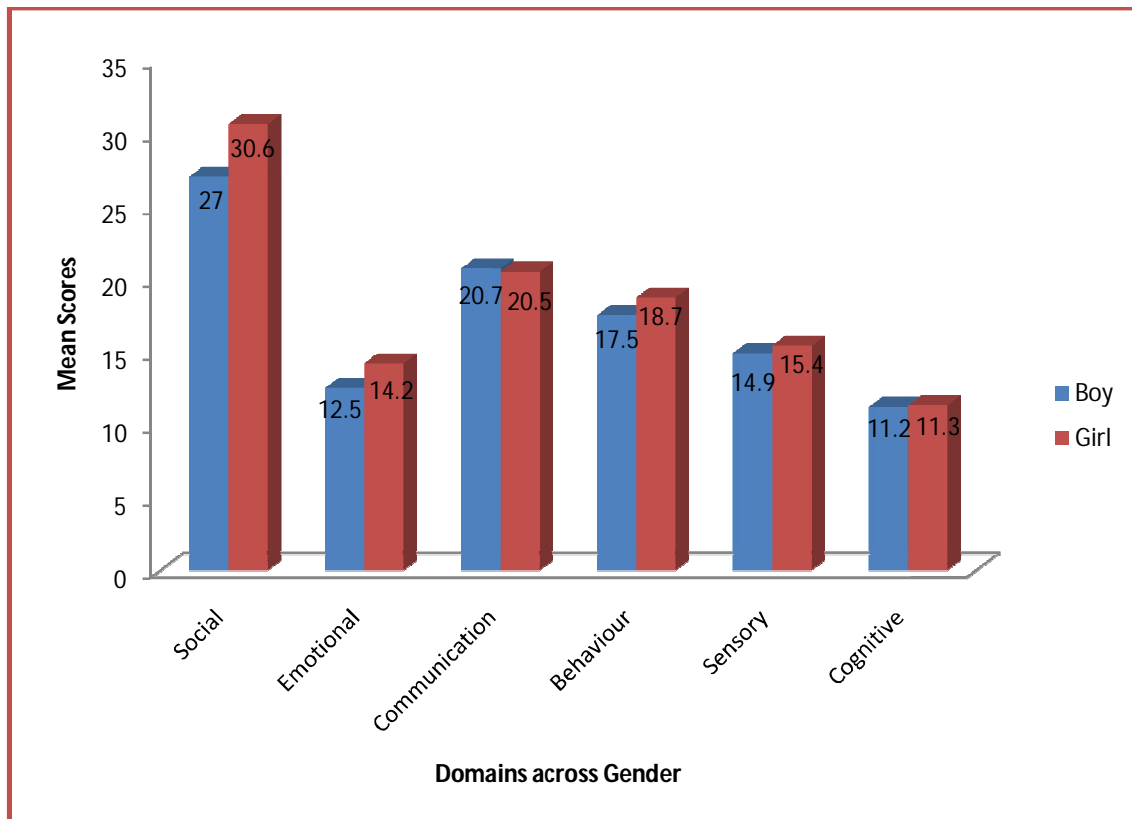


Fig 4.3.8 Distribution of respondents on different domains across gender

Table 4.3.25: Distribution of respondents on the basis of mean scores of different domains across Age groups**N=100**

S.No.	Parameter	5-8 Year	9-12Year
1	Social relationship and reciprocity	27.10	27.71
2	Emotional responsiveness	20.17	13.40
3	Speech Language and Communication	20.60	20.88
4	Behaviour Patterns	17.25	18.19
5	Sensory aspects	14.94	15.14
6	Cognitive component	11.01	11.47

Table 4.3.25 discussed mean score of different parameter across age and results showed that the mean score of respondents age of 5-8 year and 9-12 year was (27.10) and (27.71) respectively in the Social relationship and reciprocity domain, while mean score of respondents aged 5-8 years and 9-12 years was (20.17) and (13.40) respectively in emotional responsiveness domain. Under Speech Language and communication domain, result showed the respondent's age 5-8 year mean score was (20.60) and the respondents with the age of 9-12 year mean score was (20.88). On the basis of Behaviour Pattern respondents age 5-8 year mean score was (17.25) and (18.19) mean score was those respondents who belonged with the age of 9-12 year. Further the respondents age 5-8 year mean score was (14.94) and the respondents age of 9-12 year mean score was (15.14) in the parameter of Sensory Aspects

and the last parameter of Cognitive component the mean score of the respondents age of 5-8 year was (11.01) and (11.30) mean score was those respondents who was 9-12 year .

Ho 6: There is no significant difference between domains and age group.

Table 4.3.26: Mean scores of different domains across Age groups

Domain	Mean score	df	f	p	Conclusion
Social		(1,98)			N.S
5-8	27.10		0.128	.721	
9-12	27.71				
Emotional			2.039	.157	
5-8	12.71				
9-12	13.40				
Speech			0.093	.761	
5-8	20.60				
9-12	20.88				
Behaviour			0.684	.410	
5-8	17.25				
9-12	18.19				
Sensory			0.080	.778	
5-8	14.94				
9-12	15.14				
Cognitive		.676	.413		
5-8	11.01				
9-12	11.47				

In Table 4.3.26as $p > 0.05$ in all the domains null hypothesis was accepted thus it was concluded that no significant difference between mean scores on different domains across age group were seen.

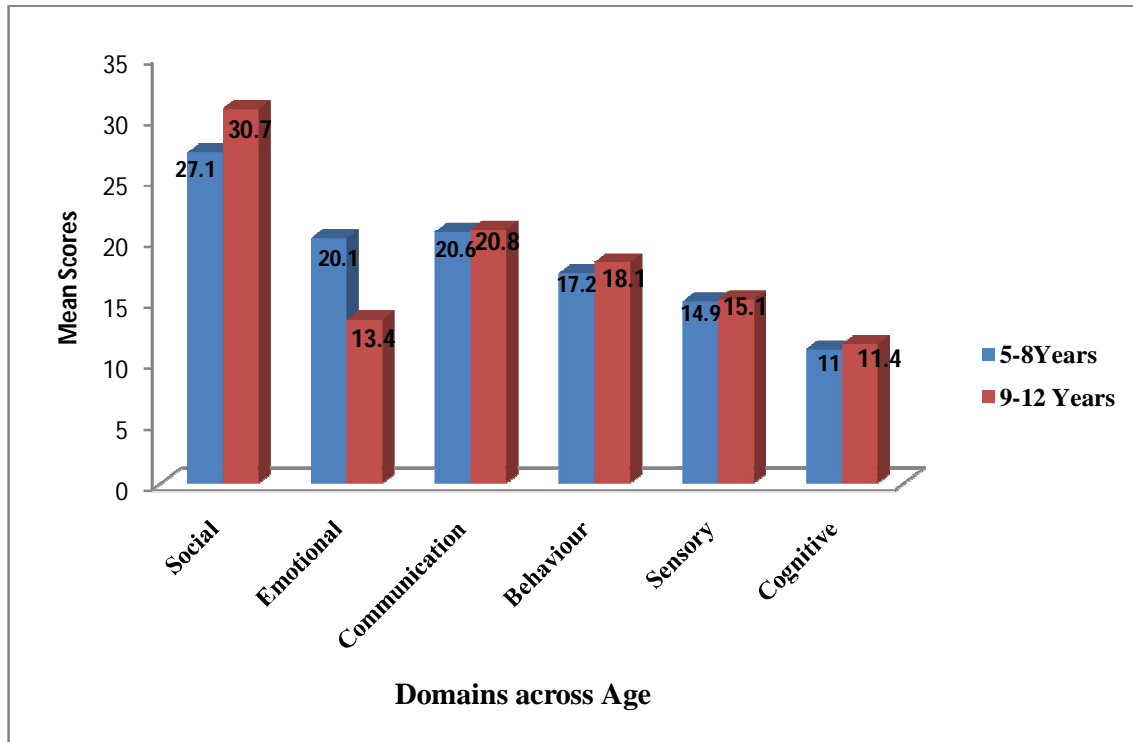


Fig 4.3.9 Distribution on different domains across age

Section 4.4: Description of Randomization and Intervention

Once the screening for Autism was over, student having mild and moderate Autism were identified and were selected for the IInd phase of the study which was the intervention study. The student were invited to participated in the in the second phase of the study. Total number of students in the second phase of study was 80. The intervention was planned as a randomized trial.

Table.4.4.1 General Profile of Respondents (Case and Control) before intervention

Characteristics	Frequency (%)	
	Control Group (N=40)	Case Group (N=40)
Gender		
Boy	35(87.5)	36(90.0)
Girl	5(12.5)	4(10.0)
Age		
5-8Year	21(52.5)	26(65.0)
9-12Year	19(47.5)	14(35.0)

Results in table 4.4.1 showed that more than half of respondents (87.5 percent) were boys and only few (12.5 percent) were girls and (52.5 percent) were of age 5-8 years while (47.5 percent) respondents were of age group 9-12 years in control group. The respondents who belong to Case group in which more than half of respondents (90.0 percent) were boys and only few (10.0 percent) were girls and (65.0 percent) were of age 5-8 years while (35.0 percent) respondents were of age group 9-12 years.

Table 4.4.2 Distribution of respondents on the basis of category of Autism among (Case and Control) before intervention

S.NO	Category of Autism	Respondents	
		Case (N=40) Frequency (%)	control (N=40) Frequency (%)
1	Mild autism	22(55.0)	21(52.5)
2	Moderate autism	18(45.0)	19(47.5)

Data in table 4.4.2 showed distribution of respondents on the basis of category of autism. Results showed that more than half 55.0percent of the respondents had mild autism while 45.0percent respondents had moderate autism in case group and 52.5percent respondents had mild autism while 47.5percent respondents had moderate autism.

Ho7: There exists no significant difference between category of Autism among control and case group before intervention

Table 4.4.3 Difference in category of Autism among (Case and Control) before intervention

Category of autism	Mean	df	f	sig	Conclusion
Control group	2.4750	1,78	82.46	.000	S
Case group	1.4500				

Result depicted in table 4.4.3 showed that as $p > 0.001$, thus null hypothesis was rejected, which means that there was highly significant difference in category of autism among control and case before intervention.

Table 4.4.4: Distribution of respondents on the basis of category of Autism and gender (Case and Control) before intervention

S.No.	Category of Autism	Respondents			
		Boy		Girl	
		Case (N=40) Frequency (%)	Control (N=40) Frequency (%)	Case (N=40) Frequency (%)	Control (N=40) Frequency (%)
1	Mild autism	20(50.0)	18(45.0)	2(5.0)	3(7.5)
2	Moderate autism	16(40.0)	17(42.5)	2(5.0)	2(5.0)

Table No. 4.4.4 discussed distribution of respondents on the basis of category of autism with gender. Results showed that half 50.0 percent boys in case group and 45.0 percent boys in control group had mild autism whereas (40.0) boys of case group and 42.5 percent of boys control group had moderate autism and 5.0 percent girls of case group while 7.5 percent girls of control group had mild autism and 5.0 percent girls of case group, While 5.0 percent girls of control group had moderate autism before intervention.

Table 4.4.5: Distribution of respondents on the basis of category of Autism and Age (Case and Control) before intervention

S.No.	Category of Autism	Respondents			
		5-8years		9-12years	
		Case (N=40) Frequency (%)	Control (N=40) Frequency (%)	Case (N=40) Frequency (%)	Control (N=40) Frequency (%)
1	Mild autism	15(37.0)	13(23.5)	7(17.5)	8(20.0)
2	Moderate autism	11(27.5)	8(20.0)	7(17.5)	11(27.5)

Table No. 4.4.5 discussed distribution of respondents on the basis of category of autism with age. Results showed that 37.0 percent respondents of case group and 23.5 percent respondents of control group showed mild autism with age of 5-8 years, whereas 27.5 percent of case group and 20.0 percent of control group with age of 5-8 years had moderate autism, while 17.5 percent of case group and 20.0 percent respondents of control group with age of 9-12 year had mild autism and 17.5 percent respondents of case and 27.5 percent respondents of control group had moderate autism age between 9-12 years.

Table 4.4.6: Distribution of respondent's on the basis of level of Autism (Case and Control) before intervention

S.No.	Level of Autism	Respondents	
		Case (N=40) Frequency (%)	Control (N=40) Frequency (%)
1	Mild autism		
	70-82	2 (5.0)	4(10.0)
	83-94	1(2.5)	7(17.5)
	95-106	7(17.5)	11(27.5)
2	Moderate		
	107-122	14(35.0)	7 (17.5)
	123-138	13(32.5)	9 (22.5)
	139-153	3(7.5)	2 (5.0)

Table 4.4.6 discussed distribution of respondents on the basis of Level of autism. Result showed that 5.0percent respondents had Mild level autism scored between 70-82, further 2.5percentrespondents scored between 83-94 and 17.5percent respondents scored between 95-106 also had mild level of autism in case group while 10.0percent of respondents had Mild level of autism scored between 70-82, 17.5percent respondents scored between 83-94, 27.5 percent respondents scored between 95-106 also had mild level of autism in control group. The distribution of respondents on the basis of moderate level of autism showed that 35.0percent respondents score between 107-122 , while 32.5 percent respondents scored between 123-138 and very few 7.5percent respondents scored between 139-153 had moderate level of autism in case group, whereas 17.5percent respondents scored between 107-122, 22.5percent respondents scored between 123-138 and very few 5.0percent of girls scored between 139-153 had moderate level of autism in control group.

Table 4.4.7: Distribution of respondent's level on the basis of level of Autism across gender (Case and Control) before intervention

S.No.	Level of Autism	Boys		Girls	
		Case Frequency (%)	Control Frequency (%)	Case Frequency (%)	Control Frequency (%)
1	Mild autism				
	70-82	2(5.0)	4(10.0)	0	0
	83-94	1(2.5)	6(15.0)	0	1(2.5)
	95-106	6(15.0)	9(22.0)	1(2.5)	2(5.0)
2	Moderate autism				
	107-122	12(30.0)	6(15.0)	0	1(2.5)
	123-138	12(30.0)	8(20.0)	2(5.0)	1(2.5)
	139-153	3(7.5)	2(5.0)	1(2.5)	0

Table 4.4.7 discussed distribution of respondents on the basis of Level of autism across gender. Result showed that 5.0percent boys scored between 70-82, 2.5 percent boys scored between 83-94 and 15.0percent boys score between 95-106 had mild level of autism in case group. While very few only 2.5percentgirl had Mild level of autism scored between 95-106 in case group whereas 2.5percentgirls scored between 83-94 and 5.0 percent girls scored between 95-106 had mild autism in control group. The distribution of respondents on the basis of moderate level of autism results showed that 30.0 percent boys scored between 107-122 , 30.0percentboys scored between 123-138 and very few 7.5percent boys scored between 139-153 had moderate level of autism in case group, whereas 15.0 percent boys scored between 107-122, 20.0 percent boys scored between 123-138,very few 5.0percenthad moderate level of autism according to control group, only5.0 percent girls score between 123-138 and very few 2.5 percent of score between 139-153 had moderate level of autism according to case group, whereas few 2.5percent girl scored between 107-122, 2.5percentof girls scored between 123-138 had moderate level of autism in control group.

Table 4.4.8: Distribution of respondent's level on the basis of level of Autism across Age (Case and Control) before intervention

S.NO	Level of Autism	5-8 Years		9-12Years	
		Case Frequency (%)	Control Frequency (%)	Case Frequency (%)	Control Frequency (%)
1	Mild autism				
	70-82	1(2.5)	3(7.5)	1(2.5)	1(2.5)
	83-94	1(2.5)	4(10.0)	-	3(7.5)
	95-106	4(10.0)	6(15.0)	3(7.5)	5(12.5)
2	Moderate autism				
	107-122	8(20.0)	3(7.5)	6(15.0)	4(10.0)
	123-138	9(22.5)	4(10.0)	4(10.0)	5(12.5)
	139-153	3(7.5)	1(2.5)	-	1(2.5)

Table 4. 4.8: discussed distribution of respondents on the basis of Level of autism across Age result showed that 2.5percent respondents score between 70-82, while 2.5percentrespondents with the score of 83-94 and 10.0 percent respondents with the score of 95-106 had mild level of autism with age of 5-8 years according to case group before intervention . The distribution of respondents on the basis of moderate level of autism result showed that 20.0 percent respondents score between 107-122, 22.5 percent respondents score between 123-138 and only 7.5 percent respondents score between 139-153 had moderate level of autism with age of 5-8 year according to case group before intervention. Whereas very few 2.5 percent respondents score between 70-82, 7.5percent respondents scores between 95-106 also had mild level of autism with age of 9-12 year according to case group before intervention, whereas only 2.5 percent respondents score between 70-82, while 7.5percent respondents with the score of 83-94 and 12.5percentrespondents with the score of 95-106 had mild level

of autism with age of 9-12years according to control group before intervention. The distribution of respondents on the basis of moderate level of autism result showed that 15.0 percent respondents score between 107-122 and 10.0 percent respondents score between 123-138 had moderate level of autism with age of 9-12 year according to case group before intervention. Whereas 10.0 percent respondents score between 107-122 and 12.5 percent respondents score between 123-138 and 2.5 percent respondents score between (139-153) had moderate level of autism with age of 9-12 year according to control group before intervention.

Section 4.5: Description of acceptability of TLM (Teaching Learning Material) by teachers and children

Table 4.5.1: Distribution of respondents on the basis of acceptability of low cost TLM (Teaching Learning Material) by Teachers

S. No.	TLM Teaching Learning Material	Acceptability by Teachers		
		Liked Frequency (%)	Partially Liked Frequency (%)	Disliked Frequency (%)
1	Paper Beads	10(100.0)		-
2	Booklet for Social Development	10(100.0)		-
3	Game for shape and colour	9(90.0)	1(10.0)	-
4	Buttoning	10(100.0)		-
5	Clay material	7(70.0)	3(30.0)	-
6	Story book	8(80.0)	2(20.0)	-
7	Creative activity book	10(100.0)		-
8	Sentence formation	7(70.0)	3(30.0)	-
9	Mask	10(100.0)		-

Table 4.5.1 discussed distribution of teachers on the basis of acceptability of low cost TLM (Teaching Learning Material) for children with autism. Results showed that the prepared Teaching Learning Material like Paper beads, Booklet for social Development, Buttoning, Creative activity book, Mask was 100.0 percent liked by teacher whereas Game for shape and colour was 90.0 percent liked, and Story book was 80.0 percent liked but 20.0 percent Partially liked by teacher and a kit for Sentence formation and clay materials were 70.0 percent liked and 30.0 percent partially liked by teachers.

Thus it was concluded that almost all the TLM were accepted by the teachers.

Table 4.5.2: Distribution of respondents on the basis of acceptability of low cost TLM (Teaching Learning Material) by Children.

S. No	Innovative Teaching Learning Material	Acceptability by Children		
		Liked Frequency (%)	Partially Liked Frequency (%)	Disliked Frequency (%)
1	Paper Beads	40 (100.00)	-	-
2	Booklet for Social Development	26 (65.0)	14 (35.0)	-
3	Game for shape and colour	38(95.0)	2(5.0)	-
4	Buttoning	40(100.0)		-
5	Clay material	31(77.5)	9(22.5)	-
6	Story book	27(67.5)	13(32.5)	-
7	Creative activity book	40(100.0)		-
8	Sentence formation	21(52.5)	16(40.0)	3(7.5)
9	Mask	40(100.0)		

Table 4.5.2 discussed acceptability of TLM by children. Results showed that 100.0 percent children liked paper beads, buttoning, creative activity book and mask, while 95.0 percent children liked game for shape and colour, 67.5 percent liked story book. Least liked was sentence formation. Thus it could be concluded that over all children accepted all the TLM's.

Section 4.6: Distribution of respondent's on the basis of category of Autism (Post intervention)

Table 4. 6.1: Distribution of respondents on the basis of category of autism pre and post intervention

S.NO	Category of Autism	Respondents	
		Pre intervention (N=40) Frequency (%)	Post intervention (N=40) Frequency (%)
1	Mild autism	22(55.0)	24(60.0)
2	Moderate autism	18(45.0)	16(40.0)

Table 4.6.1: discussed distribution of respondents on the basis of category of autism. Results showed that (55.0percent) of the respondents had mild autism before intervention while after intervention (60.0 percent) of the respondent came in category of mild autism whereas (45.0percent) respondents had moderate autism before intervention and after post intervention there were 40.0percent respondents.

Thus, the results showed that the intervention kit was effective.

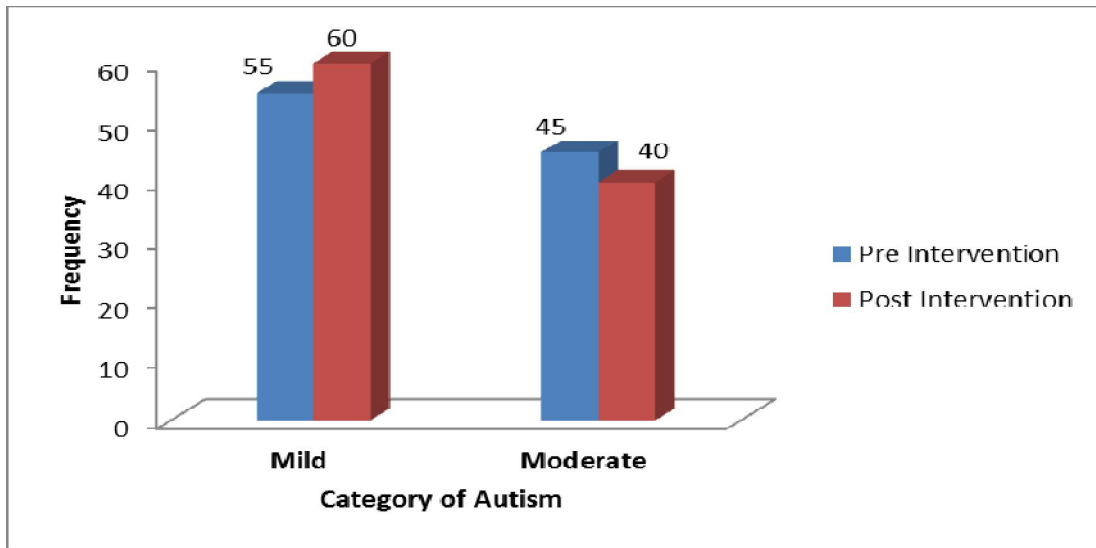


Fig: 4.6.1 Distribution of category on category of Autism(Pre-Post intervention)

Table 4.6.2: Distribution of respondents on the basis of category of autism across gender (pre and post intervention)

S.NO	Category of Autism	Respondents			
		Pre intervention (N=40) Frequency (%)		Post intervention (N=40) Frequency (%)	
		Boy	Girl	Boy	Girl
1	Mild autism	20(50.0)	2(5.0)	22(55.0)	2(5.0)
2	Moderate autism	16(40.0)	2(5.0)	14(35.0)	2(5.0)

Table 4.6.2 discussed distribution of respondents on the basis of category of autism with gender. Results showed that half 50.0 percent of the boys and few 5.0percent girls had mild

autism before intervention and after intervention more than half 55.0 percent of the boys and few 5.0percentof girls had mild autism, While 40.0percent of boys and 5.0percent of girls had moderate autism before intervention, after intervention 35.0percent of boy and 5.0percent of girls belonged to moderate category of autism.

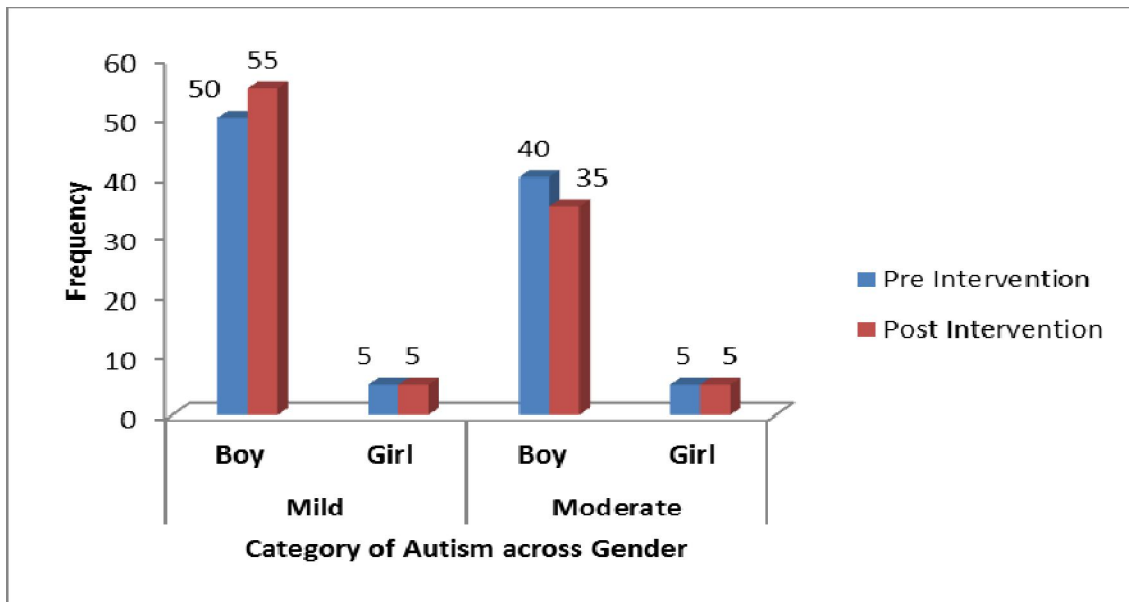


Fig: 4.6.2Distribution of respondents on the basis category of autism across gender (Pre-Post intervention)

Table 4.6.3Distribution of respondents on the basis of category of Autism across age (Pre -Post intervention)

S.NO	Category of Autism	Respondents			
		Pre intervention (N=40) Frequency (%)		Post intervention (N=40) Frequency (%)	
		5-8 year	9-12 year	5-8 year	9-12 year
1	Mild autism	15(37.5)	7(17.5)	16(40.0)	8(20.0)
2	Moderate autism	11(27.5)	7(17.5)	10(25.0)	6(15.0)

Table 4.6.3 Discussed distribution of respondents on the basis of category of autism with age results showed that 37.5 percent of respondents age of 5-8 year and 17.5 percent respondents age of 9-12 year had mild autism before intervention and after intervention 40.0 percent respondents age of 5-8 year and 20.0 percent respondents of age 9-12 year had mild autism after intervention, While 27.5 percent respondents age of 5-8 year and 17.5 percent of respondents age of 9-12 year had moderate autism before intervention, after intervention 25.0 percent respondent age of 5-8 year and 15.0 percent of respondents age of 9-12 year belonged to moderate category of autism.

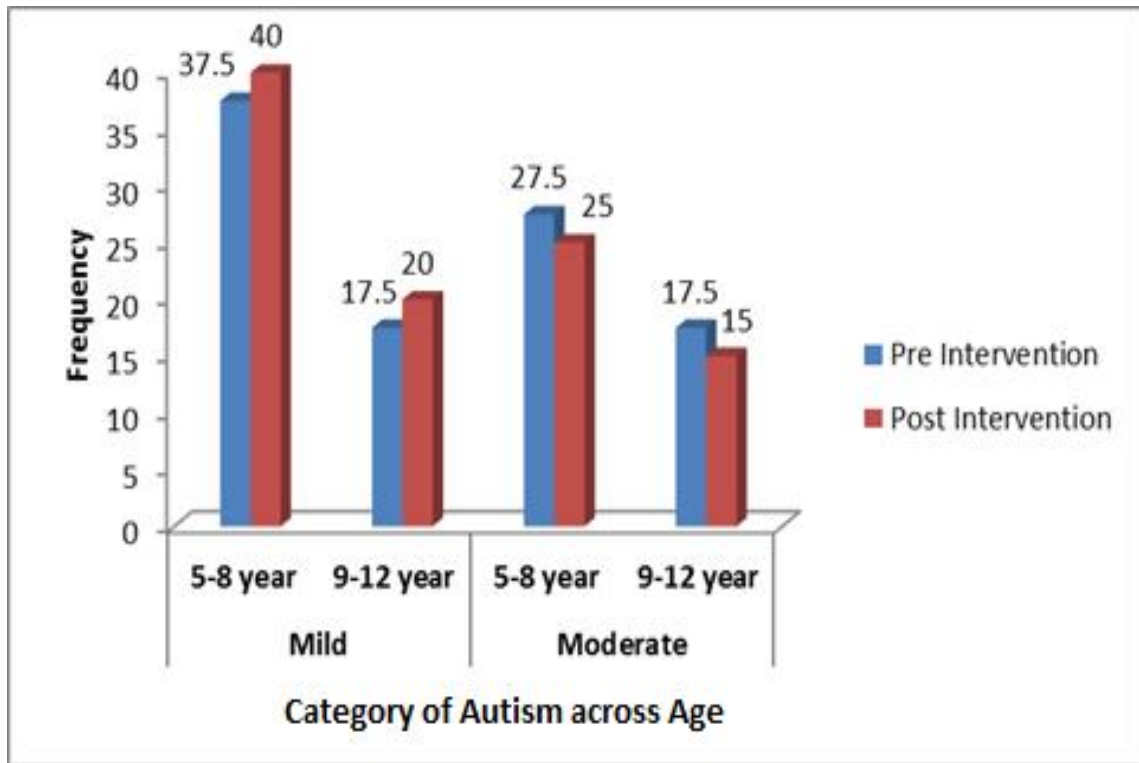


Fig 4.6.3 Distribution of respondents on the basis of category of Autism across age(pre and post intervention)

Table 4.6.4 Distribution of respondent's on the basis of level of Autism (pre and post intervention)

S.NO	Level of Autism	Respondents	
		Pre intervention (N=40) Frequency (%)	Post intervention (N=40) Frequency (%)
1	Mild autism	2 (5.0)	7(17.0)
	70-82	1(2.5)	11(27.5)
	83-94	7(17.5)	7(17.5)
	95-106		
2	Moderate autism	14(35.0)	14(35.0%)
	107-122	13(32.5)	1(2.5%)
	123-138	3(7.5)	-
	139-153		

Table 4.6.4: discussed distribution of respondents on the basis of Level of autism pre and post intervention. Results showed that percentage of children increased from 5.0 percent to 17.0 percent after intervention. Who scored between 70-82, while children who scored between 83-94 raised from 2.5 percent to 27.5 percent post intervention, but the no. of children remained the same who scored between 95-106 pre-post intervention. Similarly, the no. of children remained same who scored between 107-122. The no. of children who scored between 123-138 decreased after intervention. Thus, it was concluded that intervention had an impact on children.

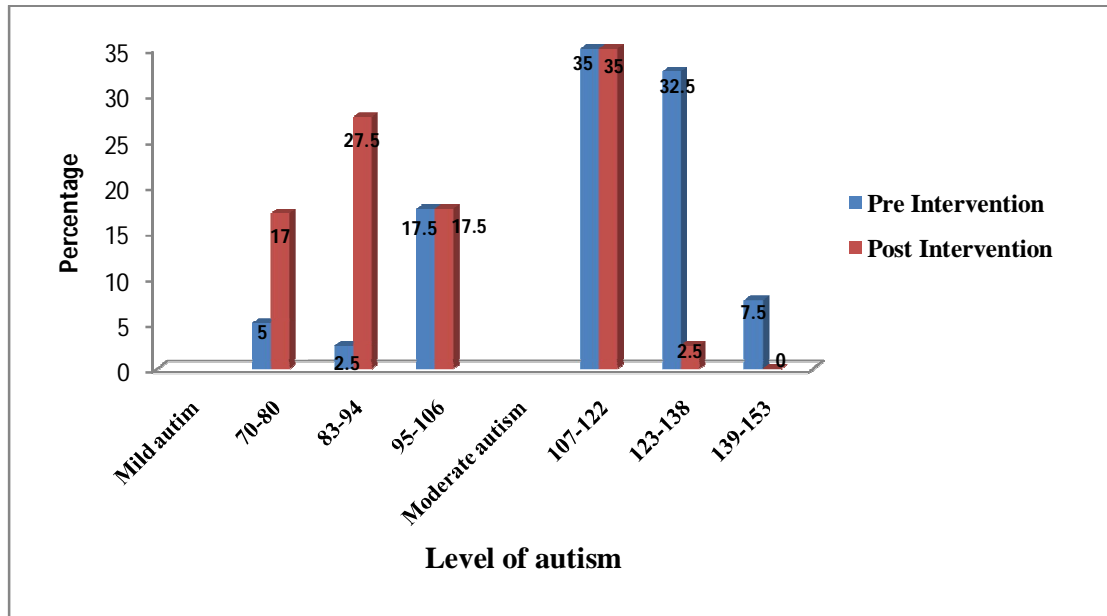


Fig 4.6.4 Distribution of Level of autism

Table 4.6.5: Distribution of respondent’s level on the basis of level of autism across gender (Pre-Post Intervention)

S.NO	Level of Autism	Boys		Girls	
		pre	Post	pre	post
		Frequency (%)		Frequency (%)	
1	Mild autism				
	70-82	2(5.0)	7(17.5)	-	-
	83-94	1(2.5)	10(25.0)	-	1(2.5)
	95-106	6(15.0)	6(15.0)	1(2.5)	1(2.5)
2	Moderate autism				
	107-122	12(30.0%)	12(30.0%)	-	2(5.0)
	123-138	12(30.0%)	1(2.5%)	2(5.0)	-
	139-153	3(7.5%)	-	1(2.5)	-

Table 4.6.5: showed that there was increase in the number of respondents (boys) after intervention in the mild autism category. Data showed that in the pre intervention 5.0percent boys scored 70-82 but post intervention the percentage of boys in their category was 17.5percent, similarly pre intervention 2.5percentage boys scored 83-94 but post intervention, the percentage was 25.0percent.

There was decrease in the percentage of respondents in mild autism category where the 15.0 percent boys scored between 95-106 pre intervention but only 15.0 respondents were found in this category post intervention.

Similarly there was decrease in the percentage of respondents in the moderate autism category also, where pre intervention 30.0percents boys scored 123-138, but post intervention the percentage was 2.5percents through the no. of respondents (boys) remain same scored 107-122. Post intervention also while no boys scored between 139-153 post intervention.

Similarly with girls 2.5percent girls scored between 83-94 and 95-106 respectively post intervention in mild autism category while only 5.0percent girls scored between 107-122 post intervention.

Table 4.6.6: Distribution of respondent on the basis of level of Autism across Age group (Pre-Post Intervention)

S.NO	Level of Autism	5-8years		9-12 years	
		Pre	Post	Pre	Post
		Frequency (%)		Frequency (%)	
1	Mild autism				
	70-82	1(2.5)	4(10.0)	1(2.5)	3(7.5)
	83-94	1(2.5)	9(22.5)	-	2(5.0)
	95-106	4(10.0)	4(10.0)	3(7.5)	3(7.5)
2	Moderate autism				
	107-122	8(20.0)	8(20.0)	6(15.0)	6(15.0)
	123-138	9(22.5)	1(2.5)	4(10.0)	-
	139-153	3(7.5)	-	-	-

Data in **Table 4.6.6** showed that there was increase in percentage of respondent belonging to age group of 5-8 year and 9-12 year children after intervention in the scores ranging from 70-

82,83-94.while no changes was seen in the percentage of respondents who scored 95-106 in both age groups. Similarly no changes was observed in the percentage of respondents who scored between 107-122 in both the age groups, but there was decreased in the percentage of the respondents in the age groups who scored 123-138 and 139-153 respectively post intervention.

Section 4.7: Impact of low cost TLM on children with Autism

Table 4.7.1: Distribution of respondents on the basis of category of autism in control and Case after -intervention

S.No.	Category of Autism	Respondents	
		Control N=40	Case (N=40)
1	Mild autism	21(52.5)	24(60.0)
2	Moderate autism	19(47.5)	16(40.0)

Table 4.7.1discussed distribution of respondents on the basis of category of autism post intervention. Results revealed that 52.5 percent and 60.0 percent respondents in control and case group had mild autism, while 47.5 percent and 40.0 percent respondents in control and case group had moderate autism post intervention. Thus, it was concluded that low cost TLM was effective.

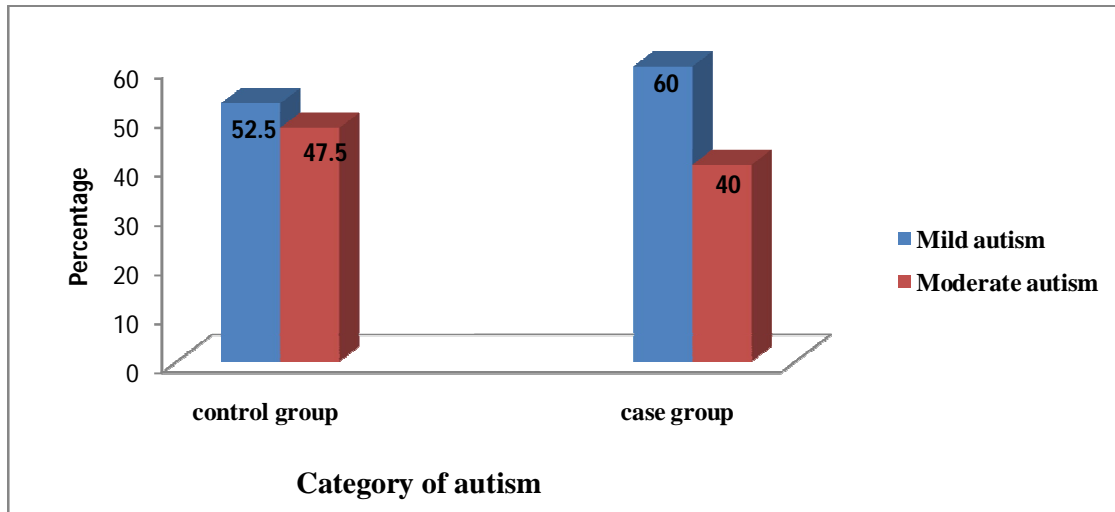


Fig 4.7.1: Distribution of respondents on the basis of category of autism in control and case group post intervention

Ho 8: There is no significant difference between category of autism in control and case after intervention

Table 4.7.2: ANOVA on the basis of category of autism in control and case post intervention

Category	Mean	df	f	sig	Conclusion
Control group	2.47	1,78	92,09	.000	S
Case group	1.40				

P< .001

Results depicted in table 4.7.2 that as $p < 0.001$, thus null hypothesis was rejected, which means that there is significant difference between category of autism, which meant that low cost TLM were effective.

Ho 9: There is no significant difference between level of autism in case and control groups post intervention

Table 4.7.3: ANOVA on the basis of level of autism among Control and Case after intervention.

(A)

Category	Mean	df	f	Sig.	conclusion
Levels of Autism					
Mild					
Control group	2.31				
Case group	2.00	1,45	1.991	.165	N.S

Results revealed that as $p > 0.01$ thus null hypothesis was accepted, which means that there is no significant difference between the mild level of autism among case and control group.

(B)

Category	Mean	df	f	Sig.	Conclusion
Levels of Autism					
Moderate					
Control group	1.72				
Case group	1.06	1.31	12.757	.001	S

Result depicted that as $p < 0.001$, thus null hypothesis was rejected, which means that there is significant difference in the moderate level of autism among case and control group. Mean value also depicts the same. Thus it could be conducted that low cost TLM were effective.

Table 4.7.4: Distribution of respondent on the basis of level of autism in Control and Case post intervention.

S.No.	Level of Autism	Respondents	
		control (N=40)	Case (N=40)
1	Mild autism		7(17.0%)
	70-82	4(10.0)	11(27.5%)
	83-94	7(17.5)	7(17.5%)
	95-106	11(27.5)	
2	Moderate autism		14(35.0)
	107-122	7(17.5)	1(2.5)
	123-138	9(22.5)	-
	139-153	2(5.0)	

Table 4.7.4 discussed distribution of respondents on the basis of Level of autism. Result showed that 10.0 percent of respondents from control group scored between 70-82, 17.5 percent of respondents scored between 83-94 and 27.5 percent of respondents scored between 95-106 in control group whereas 17.0 percent respondents from case group scored between 70-82, 27.5 percent respondents scored between 83-94, while 17.5 percent respondents scored between 95-106. Distribution of respondents on moderate level of autism showed that 17.5 percent respondents from control group scored between 107-122, while 22.5 percent respondents scored between 123-138 and very few 5.0 percent respondents scored between 139-153 where as 35.0 percent respondents from case group scored between 107-122, 2.5 percent respondents scored between 123-138 after intervention.

It could be concluded that in mild category the percentage of respondents in case group having lower scores increased, which showed that after using low cost TLM, there was improvement in children.

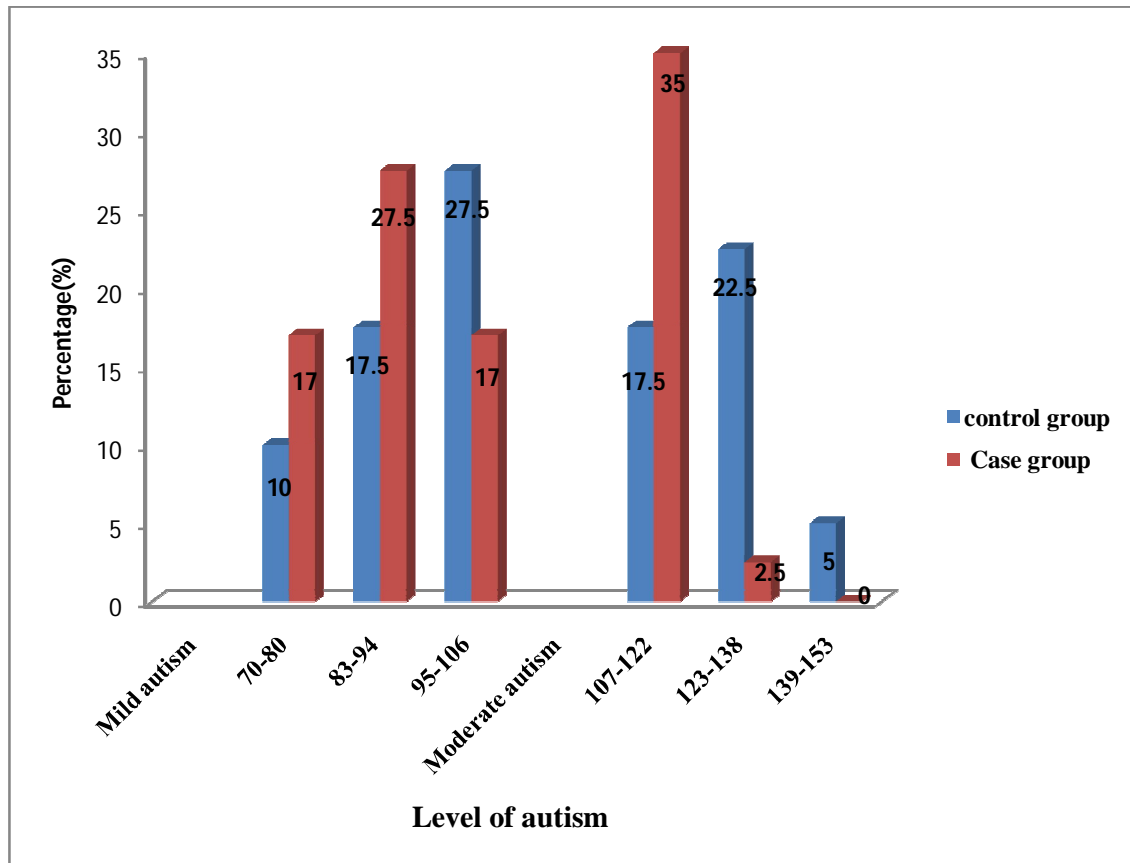


Fig: 4.7.4 Distribution of respondent on the basis of level of autism in Control and Case post intervention

Ho.10: There is no significant difference in scores on domains of autism after intervention

Table 4.7.5: ANOVA among domains of autism post intervention among control-case groups.

Domain	Mean	df	f	sig	Conclusion
Social		1,78	10.835	0.001	S
Control group	28.67				
Case group	23.40				
Emotion			81.792	.000	S
Control group	12.57				
Case group	20.30				
Speech			.056	.814	N.S
Control group	12.52				
Case group	20.30				
Behaviour			6.291	.014	S
Control group	17.65				
Case group	20.30				
Sensory		44.067	.000	S	
Control group	15.77				
Case group	11.50				
Cognitive		.070	.792	N.S	
Control group	11.82				
Case group	11.97				

Results in table 4.7.5 discussed differences in mean scores obtained in different domains post intervention. Data showed that as $p < .001$ in some domains like social, emotional, and sensory, while $p < 0.05$ in behaviours but $p > 0.05$ in speech and cognitive domains. Thus null hypothesis was partially rejected. Mean values also showed improvement in domains like social, emotional and sensory. Other domains like Speech and Cognitive were found non-significant. The reason could be the time period for which intervention was given.

Ho11: There is no impact of teaching Learning Materials on children with Autism

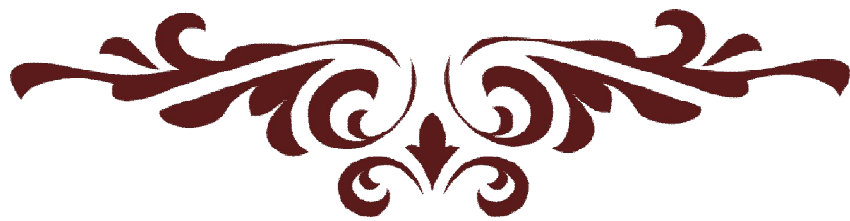
Table 4.7.6: Differences in means on different domain in case group

Domain	Mean	t	df	sig	Conclusion
Social					
Pre intervention Post intervention	3.75	8.923	39	.000	S
Emotion					
Pre intervention Post intervention	-6.77	-9.726		.000	
Speech					
Pre intervention Post intervention	1.35	5.995		.000	
Behaviour					
Pre intervention Post intervention	-1.85	-2.291		.027	
Sensory					
Pre intervention Post intervention	2.95	8.785	.000		
Cognitive					
Pre intervention Post intervention	-.625	-2.154	.038		

Table 4.7.6 discussed the impact of low cost TLM on children with autism on case group. Data showed that as $p < .001$ in some domain like Social Emotional, Speech and Sensory which meant that significant impact of TLM was seen in these domain, where as in domain like behaviour and cognitive as $p < .05$, impact of TLM was seen. Thus it could be concluded that impact of TLM was seen on children with Autism in all domains post intervention. The result were found at par with finding of **Lobo winsher (2006)** .



CHAPTER-5
SUMMARY
CONCLUSION



CHAPTER 5**SUMMARY CONCLUSION**

Autism was first identified in 1943 by Leo Kanner, an American psychologist. Kanner noticed distinctive, common characteristics within a subgroup of children in whom other mental disorders had been diagnosed originally. Kanner recognized the inability of this subgroup to relate in the ordinary way to other people and situations, and he described this behaviour as “extreme autistic aloneness” (Kanner, 1943).

The term autism is derived from the Greek word *Autos*: means SELF. Autism is a complex neurobehavioral disorder characterized by impairment in reciprocal social interaction, impairment in communication, and the presence of repetitive and stereotypic patterns of behaviors, interests and activities. The logo of Autism is puzzle, because Puzzle indicates the mystery and complexity of Autism; each puzzle piece indicates the child with Autism waiting to complete the picture and give it a meaning. Autism spectrum disorders (ASD) are complex neurodevelopment disorders that include deficits in social interaction, communication, and the presence of repetitive and restricted behaviors. The symptoms are generally present before the age of 3 years and may be accompanied by impairment in cognitive functioning, learning, attention, and sensory processing (Coplan, 2010).

Autism Spectrum Disorder (ASD), sometimes referred to as “autism”, is “a chronic disorder whose symptoms include failure to develop normal social relations with other people, impaired development of communicative ability, lack of imaginative ability, and repetitive, stereotyped movements” (Carlson, 2007).

Individuals with autism disorder have markedly different social and emotional actions and reactions than non-autistic individuals. For example, many autistic children do not seem to care whether or not they get attention from their parents. ASD also has an affect on IQ. While 30% of individuals with autism have an average or gifted IQ, 70% are considered mentally retarded (Sarason & Sarason, 2002,).

The present study was planned on the basis of following objectives:

- To identify children with Autism in Lucknow city.
 - To explore Teaching Learning Material used by various institutes having children with Autism.
 - To design low cost Teaching Learning Material for children with Autism.
 - To check the acceptance of developed low cost Teaching Learning Material by children and teacher.
 - To study the impact of developed low cost Teaching Learning Material on children with Autism
-
- Chapter 1 dealt with the introduction part. It includes the brief information about Autism, definitions of autism, various types of autism disorder, some eminent people with autism, characteristics of autism, myths and facts related to Autism disorder, symptoms of autism, causes of autism, diagnosis of autism, assessment methods of autism, rationale, objectives of research, limitations of the study and hypothesis.

Chapter 2 dealt with the review and literature of the study. Prior researches and studies related to the topic were studied to assess research gaps. Different views and researches of authors about the study were divided in various sections:

- Researches related to Autism
- Researches related to the TLM used for Autistic children
- Researches related to study the impact of TLM on Autistic Children

Chapter 3 dealt with the materials and methods as required to conduct the study. The study encompassed 100 respondents and data was collected from different NGOs for Lucknow. The NGOs selected in Lucknow were Subh Lakshya, Navdeep, Parvarish, Jinglebell, Samarpan, Pysum, Chetna, Ashacant school and Touch and care. Standardized scale (ISAA) along with checklist, observation sheet and experiment table were used to collect data. Statistical Analysis was done through descriptive statistics in the form of frequency, percentage, mean, SD and relational statistics in the form of ANOVA, paired t test and chi square.

Chapter 4 dealt with the results and discussion of the study. The collected data was presented in tabular and graphical form and the results were discussed extensively.

Major Findings of the Research:

- More than half of the respondents were between the age group of 5-8 years of the respondents were between the age group of 9-12 years.
- More than 90.0 % of respondents were boys while other 10% respondents were girls.
- More than 55.0% of the respondents had mild autism, 43.0% of the respondents had moderate autism and very few 2.0% had severe autism.
- More than half (55.5%) of the boys and 50.0% of girls had mild autism, 42.2% of the boys and 50% of girls had moderate autism and very few 2.0% of boys had severe autism. None of the girls were having severe autism. More than half of the respondents (60.3%) in the age group of 5-8 year and 47.6% of respondents in the age group of 9-12 year had mild autism. Less than half (36.2%) of the respondents of age group 5-8 year and 52.3% respondents of age group 9-12 year had moderate autism. Very few 3.4% respondents in age group of 5-8 year had severe autism.
- Regarding levels of Autism in mild category, 53.0 percent respondents were having mild autism and their scores varied from 70-106 in which 20.0 percent respondents scored between 70-82, while 12.0 percent respondents scored between 83-94 and 21.0 percent respondent scored between 95-106. Regarding level of Autism in moderate category, 45.0 percent respondents were having moderate level autism and their scores varied from 107-153 in which 20.0 percent respondents scored between 107-122, while 22.0 percent respondents scored between 123-138 and 30.0 percent respondents scored between 139-153. Very few respondent 2.0 percent were having severe autism and their score obtained were more than 153.
- Regarding level of autism in mild category across gender more than half (53.3 percent) boys and 50.0 percent girls were having mild level Autism and scores varied from 70-106, in which 22.2% only boys score between 70-82, while 12.2% boys and 10.0% girls score between 83-94 and 18.8% boys and 40.0% girls score between 95-106. Regarding level of autism in moderate category across gender 33.3 percent boys and 50.0 percent girls were having moderate level Autism scores varied from 107-153, in

which 18.8% boys and 30.0% girls score between 107-122, while 22.2% boys and 20.0% girls score between 123-138 and only 3.3% boy's score between 139-153. Regarding level of autism in severe category across gender very few 2.2% only boys had severe level autism score varied from more than 153. None of the girls were found in this category.

- Regarding level of autism in mild category across age more than 56.8 percent respondents of age groups 5-8 years and 47.6% percent respondents of age group 9-12 years were having mild level autism scores varied from 70-106, in which (24.1%) respondents of age 5-8 years and (14.2%) of age 9-12 year score between 70-82, while (12.0%) respondents of age 5-8 year and (11.9%) of respondents age 9-12 year score between 83-94 also (20.6%) respondents of age 5-8 year and (21.4%) respondents age of 9-12 year scores between 95-106. Regarding level of autism in moderate category across age more than 68.9% percent respondents of age group 5-8 years and were 52.3% percent respondents of age group 9-12 years were having moderate level autism scores varied from 107-153, in which (29.3%) respondents of age 5-8 year and (26.1%) respondents of age 9-12 year score between 107-122, while (34.4%) respondents of age of 5-8 year and (23.8%) respondents of age 9-12 year score between 123-138 and (5.1%) respondents age of 5-8 year and (1.3%) respondents age 9-12 year score between 139-153. Regarding level of autism in severe category across age very few 3.4% percent respondents of only age group 5-8 years were having severe autism.
- Mean scores of different parameter ranged from 27.36 - 11.31, where, social relationship and reciprocity category had highest score (27.36) while cognitive category had lowest score (11.31).
- The mean scores on different parameter showed that respondents of age group 9-12 years scored more than respondents of age group 5-8 years in all categories except emotional responsiveness, where 5-8 years respondents scored more.
- Regarding availability of TLM, it was concluded that most of the TLM mentioned in observation sheet were available in all the NGO's.

- Regarding category of autism pre and post intervention evaluation, 55.0percent of the respondents had mild autism before intervention, while after intervention 60.0percent of the respondent came in category of mild autism whereas (45.0percent) respondents had moderate autism before intervention and after post intervention there were 40.0percent respondents.
- Regarding category of autism, pre and post intervention evaluation across gender, (50.0%) of the boys and few (5.0%) girls had mild autism before intervention and after intervention more than half (55.0%) of the boys and few (5.0%) of girls had mild autism, While (40.0%) of boys and (5.0%) of girls had moderate autism before intervention, after intervention (35.0%) of boy and (5.0%) of girls belonged to moderate category of autism.
- Regarding category of autism, pre and post intervention evaluation across age (37.5%) of respondents of age 5-8 year and (17.5%)respondents of age 9-12 year had mild autism before intervention and after intervention (40.0%) respondents of age 5-8 year and (20.0%) respondents of age 9-12 year had mild autism, While (27.5%) respondents of age 5-8 year and (17.5%) of respondents of age 9-12 year had moderate autism before intervention, after intervention (25.0%) respondent of age 5-8 year and (15.0%) respondents of age 9-12 year belonged to moderate category of autism.
- Regarding level of autism in mild category pre and post intervention evaluation, (5.0%) of respondents had Mild level of autism score between 70-82, further (2.5%) of respondents score between 83-94 and (17.5%) of respondents score between 95-106 also had mild level of autism before intervention. After intervention (17.0%) of respondents had Mild level of autism score between 70-82, (27.5%) of respondents scores between 83-94, whereas (17.5%) respondents score between 95-106 also had mild level of autism after intervention.
- Regarding level of autism in moderate category pre and post intervention evaluation, (35.0%) respondents score between 107-122, while (32.5%) respondents score between 123-138 and very few (7.5%) of respondents score between 139-153 before intervention. After intervention (35.0%) respondents score between 107-122,while

(2.5%) respondents score between 123-138 had moderate level of autism after intervention.

- Regarding level of autism in mild category pre and post intervention evaluation across gender, increase in the number of respondents (boys) after intervention in the mild autism category, in the pre intervention 5.0percent boys scored 70-82 but post intervention the percentage of boys 17.5percent, similarly pre intervention 2.5percentage boys scored 83-94 but post intervention, the percentage was 25.0percent. There was decrease in the percentage of respondents in mild autism category where the 15.0 percent boys scored between 95-106 pre intervention but only 15.0 respondents were found in this category post intervention. Similarly 2.5percent girls scored between 83-94 and 95-106 respectively post intervention in mild autism category
- Regarding level of autism in moderate category pre and post intervention evaluation across gender there was decrease in the percentage of respondents in the moderate autism category also, pre intervention 30.0percents boys scored 123-138, but post intervention the percentage was 2.5percents through the no. of respondents (boys) remain same scored 107-122. Post intervention also while no boys scored between 139-153 post intervention. While only 5.0percent girls scored between 107-122 post interventions.
- Regarding level of autism in mild category pre and post intervention evaluation across age, (2.5%) respondents with both age group 5-8 years and 9-12 year belonged to Mild level of autism score between 70-82, while (2.5%) respondents of age 5-8 year score between 83-94, (10.0%) respondents of age 5-8 year , (7.5%) respondents age of 9-12 year with the score of 95-106 before intervention. After intervention (10.0%) respondents age 5-8 years, (7.5%) respondents age of 9-12 year had Mild level of autism score between 70-82, further (22.5%) respondents of age 5-8 year and (5.0%) respondents of age 9-12 year score between 83-94 while (10.0%) respondents age of 5-8 year and (3.5%) respondents age of 9-12 year scores between 95-106.
- Regarding level of autism in moderate category pre and post intervention evaluation across age, (20.0%) respondents of age 5-8 year, (15.0%) respondents of age 9-12 year score between 107-122, while (22.5%) respondents of age 5-8 year and (10.0%)

respondents age of 9-12 year score between 123-138 and only (7.5%) respondents age of 5-8 year had moderate level of autism before intervention. After intervention (20.0%) respondents of age 5-8 year and (15%) of age 9-12 year score between 107-122, (2.5%) respondents only age group 5-8 year score between 123-138.

- Mean scores of different parameter pre intervention ranged from higher to low(27.15-11.35) social relationship and reciprocity category had higher score 27.15 while cognitive category had lowest score 11.35 ,even all the parameters like emotional responsiveness mean score 13.52, Speech Language and Communication mean score 21.65, Behaviour pattern has 18.45and sensory aspect had 14.45 mean score. Mean score of different parameter of post intervention ranged from higher to low (23.40-11.97)social relationship and reciprocity category had higher score 23.40 while sensory aspects category had lowest score 11.50 ,even all the parameters like emotional responsiveness mean score 20.30, Speech Language and Communication mean score 20.30, Behaviour pattern has 20.30 and cognitive component had 11.97 mean score.
- Mean scores of different parameter pre intervention across gender, boys ranged from higher to low(26.86-11.30) and girls (29.75-11.75) boys in social relationship and reciprocity category had higher score 27.15 and girls 29.75, while cognitive category had lowest score 11.30 of boys and 11.75 of girls. Even all the parameter like emotional responsiveness mean score of boys 13.19 and 16.50 of girls, Speech Language and Communication mean score of boys 21.75 and girls 20.75, Behaviour pattern mean score of boys 18.25and girls 20.25, sensory aspect boys had 14.27 mean score and girls 16.00. Mean score of different parameter of post intervention ranged from higher to low (23.40-11.97) social relationship and reciprocity category boy s had higher score 23.16 and girls 25.50, while cognitive category boys had lowest score 11.8 and girls had lowest score 10.5 in sensory aspect, even all the parameters like emotional responsiveness, Speech Language and Communication and Behaviour pattern boys mean score was 20.41 and girls had 19.25 mean score , sensory aspect mean score of boys was 11.61,cognitive component girl had mean score 12.7 .
- Mean scores of different parameter in pre intervention across age, which was divided in two group among 5-8year and 9-12 years and score ranged from highest to low

(28.19- 25.21 highest score) and (11.26 -11.50 low score). The respondents of age 5-8 year score (28.19) and (25.21) score of age 9-12 year had highest score in social relationship and reciprocity ,while respondents of age 5-8 years had lowest score 11.26 in cognitive category and 11.50 score was age 9-12 year. Even all the parameter like emotional responsiveness mean score of respondents of age 5-8 year was 12.65 and respondent of age 9-12 year score was 15.14, category of Speech Language and Communication the mean score of respondents of age 5-8 years was 21.11, Behaviour pattern category respondents mean score of age 5-8 was 18.03 and Sensory aspect had mean score 14.52 of respondents age 5-8 years and 14.21 mean score was 9-12 years. After intervention the score ranged from highest to low (24.23 age between 5-8 year highest score, 21.85 age between 9-12 year) and (11.46 age year between 5-8 year low score ,11.57 age between 9-12 year). The respondents of age 5-8 year score (24.23) and (21.85) score of age 9-12 year had highest score in social relationship and reciprocity ,while respondents of age 5-8 years had lowest score 11.46 in sensory aspects and 11.57 score was age 9-12 year. Even all the parameter like emotional responsiveness, Speech Language and Communication, Behaviour pattern mean score of respondents of age 5-8 year was 19.80 and respondent of age 9-12 year score in same category was 21.21 and cognitive category had mean score 11.73 of age 5-8 years and 12.42 mean score was 9-12 years.

- Regarding acceptability of low cost TLM by teachers and children, it was concluded that almost all the low cost TLM were accepted by both teachers and children.
- Regarding category of autism 26.3% of the respondents had mild autism while 23.8 percent respondents had moderate autism post intervention in case group.
- Regarding category of autism across gender, more than half (45.0%) of the boys and (7.5.0%) of girls had mild autism While (42.5%) of boys and (5.0%) of girls had moderate autism post intervention in case group.
- Regarding category of autism across different age group, 32.5 percent respondents belonging to age of 5-8 years and 20.0% respondents belonging to age group of 9-12 years had mild autism while 20.0% respondents of age group 5-8 year and 27.5% respondents of age group 9-12 year had moderate autism post intervention in case group.

Results after testing of various hypotheses revealed that

- No significant difference was found in the percentage of respondents belonging to different gender in the category of Autism.
- No significant difference was found in the percentage at respondent belonging to different age groups in terms of category of Autism.
- Significant difference was seen in term of level of autism across gender.
- Significant difference was seen in term of level of autism across different age group.
- No significant differences were observed in different domains across gender.
- No significant differences were observed in different domains across different age groups.
- Highly significant differences were observed in category of autism in case group post intervention.
- Highly significant differences were seen in different domain post intervention after using the low cost TLM

RECOMMENDATION:

1. Same type of research may be conducted on large sample.
2. Case study or longitudinal study may be done to see the impact of TLM's.
3. Impact of other parameters like external environment, parent child relationship, teacher child relationship etc. on the performance of autistic child may be studied.
4. More TLM's could be prepared for a single domain and their impact could be studied.

IMPLICATION:

1. The results of the study may be beneficial for the teachers who are dealing children with Autism.
2. Low cost TLM could be prepared by the parents and can be used with the children having Autism at home also.
3. Domain specific TLM's mostly liked and accepted by the children with Autism could be used frequently by the teachers and parents to strengthen a particular domain.
4. The results could be used by stalk holders or policy makers in framing beneficial programmes for children with special need.

CONCLUSION

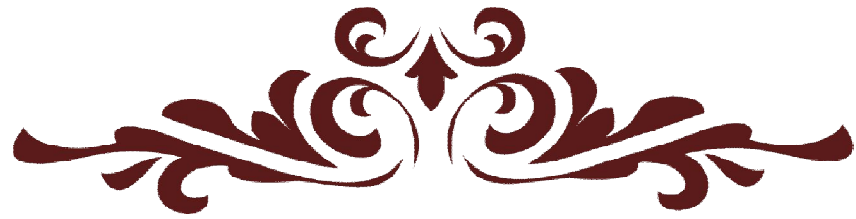
Results revealed that boys suffered more compared to girls from Autism. Early age group had high percentage of Autistic children.

The low cost teaching learning material was accepted by children with autism and teacher. Improvement was seen in the children post intervention in terms of category of Autism. More students were seen in mild category compared to pre intervention in case group.

As the intervention was given for 3 months only, thus, improvement was seen at micro level that is, the shift in percentage of children was seen in different levels of category from moderate to mild.

Major improvement was seen in social interaction, emotional, speech and sensory domains.

Thus, it was concluded that the use of low cost teaching learning material was liked by both children with Autism and Teachers and its use effective in terms of improvement in different level of autism and different domains.



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LIST OF AVAILABLE MATERIAL IN THE NGOS

NAME OF NGO-

S.NO	Available materials	Available	Not available
1	Fruit chart		
2	Transportation chart		
3	Vegetable chart		
4	Transportation cards		
5	Animal picture cards		
6	Peg board and Beads		
7	Counting board with beads		
8	Artificial fruits and vegetable		
9	Cereals		
10	Crayon colour and white papers		
11	Ball of different colours		
12	Therapy Ball		
13	Puzzles		
14	Water colour		
15	Beads and Thread		
16	Plastic blocks		
17	Cloth puppet		
18	Flash card		
19	Musical toy		
20	Toy with Lights		
21	Sand tub with toys		
22	Artificial animal		

Acceptability of TLM (Teaching Learning Material) by Children

Name -

Age -

Gender-

S.NO	TLM (Teaching Learning Material)	Acceptability by Children		
		Liked Frequency (%)	Partially liked Frequency (%)	Disliked Frequency (%)
1	Paper Beads			
2	Booklet for Social Development			
3	Game for shape and colour			
4	Buttoning			
5	Clay material			
6	Story Book			
7	Creative activity Book			
8	Sentence formation			
9	Mask			

Acceptability of TLM (Teaching Learning Material) by Teacher

S.NO	TLM (Teaching Learning Material)	Acceptability by Teacher		
		Liked Frequency (%)	Partially liked Frequency (%)	Disliked Frequency (%)
1	Paper Beads			
2	Booklet for Social Development			
3	Game for Shape and colour			
4	Buttoning			
5	Clay material			
6	Story Book			
7	Creative activity Book			
8	Sentence formation			
9	Mask			

Acceptability of Innovative TLM (Teaching Learning Material) by Teacher

Name - Experience

Age - Education

Sex-

S.NO	TLM (Teaching Learning Material)	Liked	Partially liked	Disliked
1	Paper Beads			
2	Booklet for Social Development			
3	Game for Shop and colour			
4	Buttoning			
5	Clay material			
6	Story Book			
7	Creative activity Book			
8	Sentence formation			
9	Mask			



**National Institute
for the Mentally
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(Ministry of Social Justice and
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Manovikasnagar,
Secunderabad - 500 009.

INDIAN SCALE FOR ASSESSMENT OF AUTISM

Name of the child Gender Date

D.O.B. Age Examiner

Directions :

Below are given 40 statements which are divided under six domains, please tick (✓) mark the appropriate rating for each item of the scale by observing the child and by interviewing the parents in order to assess Autism.

Refer to the guidelines given in the manual for making observations and ratings.

ITEMS	Rarely Upto 20% Score 1	Sometimes 21 - 40 % Score 2	Frequently 41 - 60% Score 3	Mostly 61- 80 % Score 4	Always 81-100% Score 5
SOCIAL RELATIONSHIP AND RECIPROCITY					
1 Has poor eye contact					
2 Lacks social smile					
3 Remains aloof					
4 Does not reach out to others					
5 Unable to relate to people					
6 Unable to respond to social/environmental cues					
7 Engages in solitary and repetitive play activities					
8 Unable to take turns in social interaction					
9 Does not maintain peer relationships					
EMOTIONAL RESPONSIVENESS					
10 Shows inappropriate emotional response					
11 Shows exaggerated emotions					
12 Engages in self-stimulating emotions					
13 Lacks fear of danger					
14 Excited or agitated for no apparent reason					
SPEECH-LANGUAGE AND COMMUNICATION					
15 Acquired speech and lost it					
16 Has difficulty in using non-verbal language or gestures to communicate					
17 Engages in stereotyped and repetitive use of language					
18 Engages in echolalic speech					
19 Produces infantile squeals/ unusual noises					
20 Unable to initiate or sustain conversation with others					
21 Uses jargon or meaningless words					
22 Uses pronoun reversals					
23 Unable to grasp pragmatics of communication (real meaning)					
BEHAVIOUR PATTERNS					
24 Engages in stereotyped and repetitive motor mannerisms					
25 Shows attachment to inanimate objects					
26 Shows hyperactivity/ restlessness					
27 Exhibits aggressive behavior					
28 Throws temper tantrums					

ITEMS	Rarely Upto 20% Score 1	Sometimes 21 - 40 % Score 2	Frequently 41 - 60% Score 3	Mostly 61- 80 % Score 4	Always 81-100% Score 5
29 Engages in self-injurious behavior					
30 Insists on sameness					
SENSORY ASPECTS					
31 Unusually sensitive to sensory stimuli					
32 Stares into space for long periods of time					
33 Has difficulty in tracking objects					
34 Has unusual vision					
35 Insensitive to pain					
36 Responds to objects/people unusually by smelling, touching or tasting					
COGNITIVE COMPONENT					
37 Inconsistent attention and concentration					
38 Shows delay in responding					
39 Has unusual memory of some kind					
40 Has 'savant' ability					

Classification	No Autism < 70	Mild Autism 70 to 106	Moderate Autism 107 to 153	Severe Autism > 153
Total score				

Assessment of autism among children across age

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ABSTRACT

Background: Autism spectrum disorder (ASD) is characterized by impairment in social interactions and communication and restricted, repetitive, and stereotyped patterns of behaviour. ASD symptoms are often noted early in life and diagnosis can occur as early as 2 years of age. 'ASD' Autism Spectrum Disorder, refer to a category of developmental disabilities with problems in initiating and maintaining social interaction, problems in communication and the use of idiosyncratic language and repetitive motor mannerism. **Objective:** With this background, this study was carried out with the objectives to assess category of Autism among children across age. **Methods:** A standardized scale "Indian Scale for Assessment of Autism" used to assess category of autism among children. Total 100 children from different NGOs working for special children were selected for the study. In the present study descriptive statistics like frequency, percentage, mean and standard deviation were used to analyse. The data and relational statistics like Chi square test were used to analyse the data. **Result:** It was found that more than half 60.3 per cent respondents belonging to age of 5-8 years and 47.6% respondents belonging to age group of 9-12 years had mild autism, While 36.2% respondents age group of 5-8 year and 52.3% respondents age group of 9-12 year had moderate autism, Very few (3.4%) respondents age group of 5-8 year had severe autism. Results of hypothesis testing revealed that as the $p > 0.05$ thus, the null hypothesis was accepted stating that there exists no significant difference in category of autism across age.

Key Words : Autism, Age, Children

INTRODUCTION

Autism spectrum disorder (ASD) is characterized by impairment in social interactions and communication and restricted, repetitive, and stereotyped patterns of behaviour. ASD symptoms are often noted early in life and diagnosis can occur as early as 2 years of age (American Psychiatric Association, 1994 and Charman and Baird, 2002).

The term autism is derived from the Greek word *Autos*: means self. Autism is a behaviourally-defined condition, but is caused by brain dysfunctions that affect the developing brain's ability to handle information. Autism is a neurodevelopmental disorder. The different way of processing information, such as perceiving, processing and interpreting information, learning new things and behaving in a well-adapted way, leads to the behavioural deviations that can be observed. The

majority of children with autism also have a learning disability (mental retardation) and have average intelligence

'ASD' Autism Spectrum Disorder, refer to a category of developmental disabilities with problems in initiating and maintaining social interaction, problems in communication and the use of idiosyncratic language and repetitive motor mannerism (American Psychiatric Association, 1994).

ASD (Autism Spectrum Disorder) is used as an umbrella term which includes-

- Autism disorder,
- Asperger disorder
- Childhood disintegrative disorder,
- Rett disorder

- Pervasive developmental disorder – not otherwise specified (American Psychiatric Association, 1994; American Psychiatric Association, 2000; Charman and Baird, 2002; Chawarska *et al.*, 2007; Fombonne, 2003).

Children with Autism Disorder can appear to have little or no interest in making friends or establishing relationships with others and appear more interested in objects than people. (American Psychiatric Association, 2000).

Asperger's Disorder is characterized by highly impaired social skills, children with Asperger's develop typical communication skills in the first few years of life and do not understand social rules and might lack empathy for others (American Psychiatric Association, 2000).

Childhood disintegrative disorder is characterised by deterioration in cognitive, language and social functioning following a period of at least two years of normal development. The child with Childhood Disintegrative Disorder loses previously acquired skills such as language, social skills, bowel or bladder control, play and motor skills.

Rett's disorder appears only in females and is characterised by deteriorating cognitive and physical development usually occurring between 6 and 12 months of age. Some of their characteristic behaviors include: loss of speech, repetitive hand-wringing, body rocking, and social withdrawal. Those individuals suffering from this disorder may be severely to profoundly mentally retarded.

A child with PDD-NOS (Pervasive developmental disorder – not otherwise) specified has severe impairment in verbal or non-verbal communication skills or displays unusual behaviors, interests, and activities (American Psychiatric Association, 2000).

Children with impairments in nonverbal communication, imaginary play, repetitive motor behaviors, and inflexibility in routines were more likely to be diagnosed at a younger age

Children with deficits in conversational ability, idiosyncratic speech and relating to peers were more likely to be diagnosed at a later age (Maenner *et al.*, 2013).

There is evidence to suggest that diagnostic features of ASD are evident in very young children. Most families/caregivers report observing symptoms within the first 2 years of life and typically express concern by 18 months of age. Studies of children with ASD have found

- parental reports of abnormalities in their children's language development and social relatedness were first noticed at about 14 months of age (Chawarska *et al.*, 2007);
- displays of significantly fewer joint attention and communication behaviors at 1 year of age than shown by their typically developing same-age peers (Osterling and Dawson, 1994; Zwaigenbaum *et al.*, 2005; Watson *et al.*, 2013; Werner and Dawson, 2005)
- demonstrated atypical eye contact, passivity, decreased activity level, and delayed language by 12 months of age (Zwaigenbaum *et al.*, 2005);
- subtle differences in sensory-motor and social behaviors as well as differences in the use of

communicative gestures by 9 to 12 months of age (Watson *et al.*, 2013)

Autism-specific symptoms was associated with earlier diagnosis. Two additional studies found that developmental regression was associated with earlier diagnosis, defined in one study as moderate to severe social or communication skill loss before the age of 3 years, and in the other as a period of typical development in the first 1–2 years of life followed by a loss of previously acquired skills. (Hertz-Picciotto and Delwiche, 2009).

Among studies reporting age at diagnosis for autistic disorder (n = 24), mean and median ages ranged from 32 to 89 months and 34 to 88 months, respectively. Age at diagnosis for Asperger's disorder (n = 16), mean and median ages ranged from 45 to 134 months and 89 to 116 months, respectively. Age at diagnosis for PDD-NOS (n = 13), mean and median ages ranged from 40 to 111 months and from 48 to 77 months, respectively (Hertz-Picciotto and Delwiche, 2009).

Seven studies assessed the mean or median age at which a specific diagnosis of "ASD" (*i.e.* "ASD-NOS," "general ASD," etc.) was assigned; mean and median age at diagnosis estimates ranged from 42 to 78 months and from 36 to 106 months, respectively. The "ASD-NOS" category was used in the Shattuck *et al.* study. Among studies that reported combined estimates for all ASDs (n = 27), mean and median estimates ranged from 38 to 120 months and from 36 to 82 months, respectively (Hertz-Picciotto and Delwiche, 2009).

Objective:

To assess category of Autism among children across age.

Hypothesis:

There exists no significant difference between categories of Autism among children across age.

METHODOLOGY

An exploratory research design was used for the study. This study was carried out on children with Autism in Lucknow city. Nine Non-government organisations (NGO's) working with Autistic children were first identified, then children enrolled in these NGO's were selected for the study. Total 100 children were selected through purposive random sampling technique for the study. Standardized tool Indian Scale for assessment of Autism by National Institute for the Mentally Handicapped (Ministry of social justice and Empowerment Government of India) was used to collect data from selected sample. The Statistical analysis was done by SPSS version 20. In the present study descriptive statistics like frequency, percentage, mean and standard deviation and relational statistics like f-test were used to analyse the data.

Study tools :

The survey tools (Indian scale for Assessment of Autism) were developed to capture information on children with autism. This scale contain 40 statements which are divided under six domains like Social Relationship and Reciprocity, Emotional Responsiveness, Speech Language and Communication, Behaviour Pattern, Sensory Aspect and Cognitive Component. Each questions provided respective score (Rarely upto 20% Score 1, Sometimes 21 - 40% Score 2, Frequently 41 – 60% Score 3, Mostly 61-80% Score 4, Always 81-100% Score 5). First domain is Social Relationship and Reciprocity were presented as 9 questions with dichotomous response formats. For example: Has poor eye contact? with the separate tick box response for the question etc. This measure

focused on ability of eye contact of children. So each domain contains questions accordingly and present. At the last total score of respondent present the category of autism (No Autism<70, Mild Autism 70-106, Moderate 107 -153, Sever Autism > 153.

RESULTS AND DISCUSSION

Results in Table 1 depicted frequency and percentage distribution of respondents across age. From the data it was revealed that from the total sample, 58per centrespondent of age between 5-8 years and 42per centrespondentswere age between 9-12 years having Autism. This meant that majority of respondents were age between 5-8 years

Table 1 : Frequency distribution of respondents having Autism on the basis of age

Age	Frequency	Percentage
5-8 Years	58	58.0%
9-12Years	42	42.0%
Total	100	100.0%

Distribution of respondents on the basis of category of Autism across age :

Table 2 discussed distribution of respondents on the basis of category of autism across different Age group, Results showed that 60.3per cent respondents belonging to age of 5-8 years and 47.6% respondents belonging to age group of 9-12 years had mild autism While 36.2% respondents age group of 5-8 year and 52.3% respondents age group of 9-12 year had moderate autism, Very few (3.4%) respondents age group of 5-8 year had sever autism.

Table 2 : Frequency distribution of respondents on the basis of category of Autism across age (N=100)

Sr. No.	Category of Autism	Respondents	
		5-8 Year (N=58)	9-12 Year (N=42)
1.	Mild autism	35(60.3%)	20(47.6%)
2.	Moderate autism	21(36.2%)	22(52.3%)
3.	Sever autism	2(3.4%)	0

Testing of hypothesis

Ho1: There exists no significant difference between categories of autism among children across age.

Table 3 discussed the differences between categories of Autism acrossage group using Chi-square test. Results showed that as the $p>0.05$ thus, null hypothesis was accepted stating that there exists no significant differences in category of autism across age group. Mean values also showed the same. Thus it was concluded that though results have shown that respondents of age 5-8 year suffer more from mild Autism, but regarding categories of autism ,where it is mild, moderate or severe no significant differences across age group were found.The results were found at par with American Psychiatric Association.(1994). American Psychiatric Association Diagnostic and

Table 3 : There is no association between category of autism and age of respondents

Age	Category of autism			df	Chi square	Conclusion
	Mild	Moderate	Severe			
5-8 year	35	21	2	2	0.161	NS
9-12 year	20	22	0			

$P>0.05$

Statistical Manual of Mental Disorders (4th ed.), and Diagnosis of autism spectrum disorder in 2- and 3-year-old children 2002.

Conclusion :

Autism spectrum disorder (ASD) is characterized by impairment in social interactions and communication and restricted, repetitive, and stereotyped patterns of behaviour. ASD symptoms are often noted early in life and diagnosis can occur as early as 2 years of age. Autism is a neurodevelopmental disorder. In conclusion I have found that the autism is not occur at any specific age.

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ASSESSMENT OF LEVEL OF AUTISM AMONG CHILDREN ACROSS GENDER

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ABSTRACT

*Autism spectrum disorder (ASD) is characterized by impairment in social interactions and communication and restricted, repetitive, and stereotyped patterns of behaviour. ASD symptoms are often noted early in life and diagnosis can occur as early as 2 years of age ‘ ASD’ Autism Spectrum Disorder, refer to a category of developmental disabilities with problems in initiating and maintaining social interaction, problems in communication and the use of idiosyncratic language and repetitive motor mannerism.***Objective:** With this background, this study was carried out with the objectives to assess the level of Autism among children across gender. **Methods:** A standardized scale “Indian Scale for Assessment of Autism” used to assess category of autism among children. Total 100 children from different NGOs working for special children were selected for the study. In the present study descriptive statistics like frequency, percentage, mean and standard deviation were used to analyse. The data and relational statistics like f-test were used to analyse the data. **Results:**It was found that more than half (55.0%) of the respondents had mild autism, where, 51.1% were boys and 5.0% were girls while (43.0%) respondents had moderate autism in which 42.2% were boys and 5.0% were girls. Very few respondents (2.0%) belonged to sever autism category and all were boys. Result depicted that as $p < 0.05$, thus null hypothesis was rejected, which means that there is no significant difference in the mild level of autism across gender and Result revealed that as $P > 0.05$, thus null hypothesis was accepted, which means that

there is no significant difference between the moderate level of autism across gender. Mean value also shows the same.

Conclusion: The present study showed that Autism is much more prevalent in male than female but category of autism is not gender oriented.

Keywords: *gender, Autism, children.*

INTRODUCTION

Autism was first defined by psychiatrist Leo Kanner more than 60 years ago, but it has only been seen in the last fifteen years that public interest in this developmental disorder has increased.

Autism spectrum disorder (ASD) is characterized by impairment in social interactions and communication and restricted, repetitive, and stereotyped patterns of behaviour. ASD symptoms are often noted early in life and diagnosis can occur as early as 2 years of age [1, 3].

The term autism is derived from the Greek word *Autos*: means **self**. Autism is a behaviourally-defined condition, but is caused by brain dysfunctions that affect the developing brain's ability to handle information. Autism is a neuro developmental disorder. The different way of processing information, such as perceiving, processing and interpreting information, learning new things and behaving in a well-adapted way, leads to the behavioural deviations that can be observed. The majority of children with autism also have a learning disability (mental retardation) and have average intelligence

'ASD' Autism Spectrum Disorder, refer to a category of developmental disabilities with problems in initiating and maintaining social interaction, problems in communication and the use of idiosyncratic language and repetitive motor mannerism.[1]

ASD (Autism Spectrum Disorder) is used as an umbrella term which include-

- Autism disorder,
- Asperger disorder
- Childhood disintegrative disorder,
- Rett disorder
- Pervasive developmental disorder – not otherwise specified.[1-4]

Children with Autism Disorder can appear to have little or no interest in making friends or establishing relationships with others and appear more interested in objects than people. [2]

Asperger's Disorder is characterized by highly impaired social skills, children with Asperger's develop typical communication skills in the first few years of life and do not understand social rules and might lack empathy for others. [2]

Childhood disintegrative disorder is characterised by deterioration in cognitive, language and social functioning following a period of at least two years of normal development. The child with Childhood Disintegrative Disorder loses previously acquired skills such as language, social skills, bowel or bladder control, play and motor skills.

Rett's disorder appears only in females and is characterised by deteriorating cognitive and physical development usually occurring between 6 and 12 months of age. Some of their characteristic behaviors include: loss of speech, repetitive hand-wringing, body rocking, and social withdrawal. Those individuals suffering from this disorder may be severely to profoundly mentally retarded.

A child with PDD-NOS (Pervasive developmental disorder – not otherwise) specified has severe impairment in verbal or non-verbal communication skills or displays unusual behaviors, interests, and activities. [2]

Prevalence figures for presentation of ASD (Autism Spectrum Disorder) in boys and girls have consistently shown that ASD (Autism Spectrum Disorder) is more common in boys. Typically the literature suggests a ratio of 4: 1 for classic autism and 9:1 for AS. [6]

Studies have reliably documented greater prevalence of attention deficit/hyperactivity disorder and other developmental conditions in males compared to females. [14]

Some studies have documented a higher incidence of intellectual impairment in girls with autism than in boys. Six times as many males as females with autism have normal intellectual ability. This ratio drops significantly, to less than two to one, in children with moderate to severe intellectual impairments. Sex differences are inconsistent after controlling for IQ. [7]

The literature has some disparities in identifying clear differences between males and females with ASD (Autism Spectrum Disorder), females with an ASD (Autism Spectrum Disorder)

diagnosis and IQ scores within the average range show increased functional social behavior compared to males with ASD.[10-11]

This interaction with IQ may be compounded by a lower mean IQ in the girls with ASD(Autism Spectrum Disorder) that are identified in scientific research studies compared to the males, further exaggerating the sex bias.[14]

Gender differences in the ASD phenotype remain poorly understood. Boys with ASD evidence more stereotyped and repetitive behaviors. Toddler girls with ASD had more severe communication impairments than males. [9]

Females with ASD also show less repetitive behaviors compared to males.[12]

Males may show more of the behaviors that trigger a clinical evaluation, such as hyperactivity and aggression.[13]

ASDs are almost 5 times more common among boys than girls. Girls are less likely to be diagnosed with autism than boys, unless they also have intellectual or behavioral problems.[5]

Objective: To assess level of Autism among children across gender.

Hypothesis: There exists no significant difference between level of Autism among children across gender.

MATERIAL AND METHODS

An exploratory research design was used for the study. This study was carried out on children with Autism in Lucknow city. Nine Non –government organisations (NGO’s) working with Autistic children were first identified, then children enrolled in these NGO’s were selected for the study. Total 100 children were selected through purposive random sampling technique for the study. Standardized tool Indian Scale for assessment of Autism by National Institute for the Mentally Handicapped (Ministry of social justice and Empowerment Government of India) was used to collect data from selected sample. The Statistical analysis was done by SPSS version 20. In the present study descriptive statistics like frequency, percentage, mean and standard deviation and relational statistics like f-test were used to analyse the data.

STUDY TOOLS

The survey tools (Indian scale for Assessment of Autism) were developed to capture information on children with autism. This scale contain 40 statements which are divided under six domains like Social Relationship and Reciprocity, Emotional Responsiveness, Speech Language and Communication, Behaviour Pattern, Sensory Aspect and Cognitive Component. Each questions provided respective score (Rarely upto 20% Score 1, Sometimes 21 - 40% Score 2, Frequently 41 – 60% Score 3, Mostly 61-80% Score 4, Always 81-100% Score 5). First domain is Social Relationship and Reciprocity were presented as 9 questions with dichotomous response formats. For example: Has poor eye contact? with the separate tick box response for the question etc. This measure focused on ability of eye contact of children. So each domain contains questions accordingly and present. At the last total score of respondent present the category of autism (No Autism<70, Mild Autism 70-106, Moderate 107 -153, Sever Autism > 153.

RESULTS AND DISCUSSION

Table 1. Frequency distribution of respondents having Autism on the basis of gender

Gender	Frequency	Percentage
Boy	90	90.0
Girl	10	10.0
Total	100	100.0

Results in table 1 depicted frequency and percentage distribution of respondents across gender. From the data it was revealed that from the total sample, 90 percent boys and 10 percent girls were having Autism. This meant that majority of respondents were boys. The results were found at par with American Psychiatric Association Diagnostic and Statistical Manual 5thed, (2013).

Table2. Frequency distribution of respondents on the basis of category of Autism across gender

Category of Autism	Gender of Respondents		Total N=100 F (%)
	Boy N=90	Girl N=10	
Mild autism	50 (51.1)	5(50.0)	55 (55.0)
Moderate autism	38(42.2)	5(50.0)	43(43.0)
Sever autism	2 (2.2)	0 (0.0)	2 (2.0)

Table No.2 discussed distribution of respondents on the basis of category of autism and gender. Results showed that more than half (55.0%) of the respondents had mild autism, where, 51.1% were boys and 5.0% were girls while (43.0%) respondents had moderate autism in which 42.2% were boys and 5.0% were girls. Very few respondents (2.0%) belonged to sever autism category and all were boys.

Table-3:Distribution of respondents on the basis of Level of Autism

S.NO	Level of Autism	Respondents N=100
1	Mild autism	
	70-82	20(20.0%)
	83-94	12(12.0%)
	95-106	21(21.0%)
	Total	=53(53.0%)
2	Moderate autism	
	107-122	20(20.0%)
	123-138	22(22.0%)
	139-153	3(30.0%)
	Total	=45(45.0%)
3	Sever autism	
	More than 153	2(2.0%)
	Total	=2(2.0%)

Table 3: discussed distribution of respondents on the basis of scores obtained on the Autism scale. The level of autism was categorized as mild, moderate and sever. Results showed that 53.0percent respondents had mild autism. The scores obtained varied from 70-106. It was also noticed that 20.0percent respondents scored between 70-82, while 12.0percent respondents scored between 83-94 and 21.0percent respondent scored between 95-106. Results also showed that 45.0percent respondents were having moderate autism. The score obtained varied from 107-153.It was also noticed that 20.0percent respondents scored between 107-122, while 22.0percent respondents scored between 123-138 and 30.0percent respondents scored between 139-153.Very few respondent 2.0percent were having sever autism and their score obtained were more than 153.

Testing of Hypothesis-

Ho 1: There is no significant difference between level of autism and gender.

Table 4: Distribution of respondent's level of autism across Gender

Category	Mean	df	P	Conclusion
Levels of Autism				
Mild				
Boy	1.94	1,51	0.037	S
Girl	2.80			

$F(1,51) = 4.568, P < 0.05$

Result depicted that as $p < 0.05$, thus null hypothesis was rejected, which means that there is no significant difference in the mild level of autism across gender.

Category	Mean	df	P	Conclusion
Levels of Autism				
Moderate				
Boy	1.65	1,43	0.0397	N.S
Girl	2.40			

$F(1,43) = 0.733, p > 0.05$

Result revealed that as $P > 0.05$, thus null hypothesis was accepted, which means that there is no significant difference between the moderate level of autism across gender. Mean value also shows the same.

Table 5: Distribution of respondent's level of autism across Gender

S.NO	Level of Autism	Respondents (N=100)	
		Boys (N=90)	Girls (N=10)
1	Mild autism		
	70-82	20(22.2%)	0
	83-94	11(12.2%)	1(10.0%)
	95-106	17(18.8%)	4(40.0%)
	Total	48(53.3)	5(50.0%)
2	Moderate autism		
	107-122	17(18.8%)	3(30.0%)
	123-138	20(22.2%)	2(20.0%)
	139-153	3(3.3%)	0

	Total	30(33.3)	5(50%)
3	Severe More than 153	2 (2.2%)	-

Result in table 4.7 showed level of autism across gender. Data showed that 53.3percent boys and 50.0percent girls were having mild Autism. While 33.3percent boys and 50.0percent girls were having moderate Autism. Very few only 2.2percent boys had severe autism.

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