



MAKERERE

UNIVERSITY

**COMMUNICATION DIFFICULTIES IN CHILDREN AGED THREE TO
FOURTEEN YEARS HAVING AUTISM SPECTRUM DISORDER WITH
LEARNING DISABILITY AT HEARTS HOME UGANDA, BUZIGA**

BY

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APPROVAL

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DECLARATION

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DEDICATION

I would like to dedicate this work to the almighty God who has seen me through this course, my loving and ever supporting family and friends, course mates for the team work. I would also like to dedicate this work to Mrs. Namasembe Rashida for guidance, support and encouragement.

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LIST OF ABBREVIATIONS

ASD: Autism spectrum disorder

NJCLD: National joint committee of learning disability

ADHD: Attention deficit hyperactive disorder

ASHA: American speech-language-hearing association

ABSTRACT

Objective: To find out the communication difficulties in children aged 3-14 years having ASD with learning disability at Hearts Home Uganda, Buziga

Method: A descriptive cross sectional study was carried out at Hearst Home Uganda a school of children with special needs with a total of 28 children under study using questionnaires and observations were used to collect data.

Results: All the children (100%) were not able to read, write and do mathematics. In the study, 78.57% of the children were not able to produce intelligible speech, 22 children used inappropriate facial expressions as a form of communication. Results further showed that 64.25% of the children didn't use words to express themselves, the 35.75% that used words were imageable, and 71.42% of the children used self-injurious behaviors in attempts to communicate.

The prevalence of communication difficulties in occurrence with ASD was higher in males than females at a ratio of 3.5:1

Conclusion: Most of the children exhibited communication difficulties that affected their learning capabilities that is reading, writing and mathematics thus need for the ministry of health to increase awareness about communication difficulties and sensitization of general population about need to seek speech and language services.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Communication difficulty

This is a disorder that affects an individual's ability to comprehend, or apply language or speech to engage in discourse effectively with others. It may be evident in the processes of hearing, language or speech. It ranges in severity from mild to profound which may be acquired or developmental

Learning disability is a common condition affecting 1-2.5% of general population in western world.[1, 2]

The learning disability concept originated from America in 1960's.

It was defined by the national joint committee of learning disability (NJCLD) as a generic term referring to the heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing and reasoning or mathematical abilities.[3]

A learning disability is a reduced intellectual ability and difficulty with everyday activities. People tend to take longer to learn and may need support to develop new skills, understand complicated information and interact with other people.

The learning disability is a neurodevelopmental condition that continuously affect academic skills.[4]

Learning disability is largely due to genetic factors including chromosomal abnormalities, copy number variants, single gene disorders which are autosomal dominant and other environmental factors that can either be antenatal, perinatal and postnatal including rubella virus, teratogens, birth asphyxia and prematurity among others.[2]

The learning disability is identified after ruling out vision and hearing. Then identified using the psycho educational assessments determining child's significant discrepancy between potential

and performance capability and academic achievement. (Publication of White swan foundation on 23rd January 2015)

The learning disability most times occurs with comorbidities like ASD, intellectual disability, ADHD and anxiety disorders.

The development of communicative skills is not only delayed due to learning disability but is also a deviant as a result of autism. Although these conditions are closely linked, they cannot be placed into one diagnostic category.[5]

Central coherence theory offers the last potential for explaining behavioral features in the event of comorbidity of autism and learning disability since problems encountered in theory of mind and executive functioning can also be the result of learning disability.[6]

Children with learning disability present with issues in reading and writing and encounter the following issues like auditory and visual memory problem, motor coordination, sustaining attention and focus, auditory and visual perception, and inhibiting impulse.[7]

The problem individuals with autism encounter when integrating stimuli they feel, taste, smell, see and hear have a huge impact on the sense making and thus communication.[8]

Autism spectrum disorder is defined as a lifelong neurodevelopmental disability whose symptoms present in early developmental period and that causes clinically significant impairment in social, occupational or the other important areas of current functioning. It's further noted that beyond these core symptoms, children tend to exhibit symptoms of the other neurodevelopmental disorders and the main one is the learning disability[9].

Autism disorder is a pervasive developmental disorder characterized by a qualitative impairment in reciprocal social interaction, qualitative impairment in verbal and nonverbal communication and a restricted repetition of activity that manifests during childhood.[10]

The communicative capabilities of people with autism are impaired and limited in significant ways. The problems are characterized by lack of intentionality and symbol formation, which indicates that deviant development of communication in autism is associated with a specific cognitive style. In areas of comorbidity of autism and learning disability, the communication problems are aggravated.[11]

The dual diagnosis of autism and learning disability implies a complex communication problem and qualitative impairment in verbal and nonverbal communication is generally recognized as a key feature of autism.[12]

The severity of autistic symptomatic varies according to the level of learning disability and thus conversely some children with learning disability display autistic features without fulfilling the criteria for diagnosis of autism.[13]

As well as 50-60% of individuals with severe to profound learning disability display triads of impairments in social interaction, verbal and nonverbal communication and imagination that is typical in autism.[14]

The communication difficulties due to the autism spectrum disorder and learning disability then present as inability to receive, send, process and comprehend concepts or verbal, nonverbal and graphic symbol systems.

1.2 Problem statement

The comorbidity of autism and learning disability are on an increase and thus affecting communication almost equally as most studies have brought it out.[6] Inclusive schools have been set up to accommodate children with autism. This has helped to improve on their social interaction and communication the study will mainly look at how autism together with learning disability present with communication difficulties and increasing on knowledge on what ought to be done to manage the increasing problems of communication issues in the children.

1.3 Justification

The study will be done at Hearts Home Uganda in Buziga Salama. This is a school for children with special needs such as children with autism spectrum disorders and other difficulties. The school thus offers best grounds for the study.

The study may improve on the understanding of the communication difficulties present in children with ASD who also have learning difficulties and their presentation.

The study will provide more information that will improve and aid in laying of strategies on how children with learning difficulty and ASD ought to be helped in the day today communication with other people.

1.4 Study objectives

1.4.1 General objective

1. To study the communication difficulties in children aged 3 to 14 years having autism spectrum disorder with learning disability in schools of children with special needs.

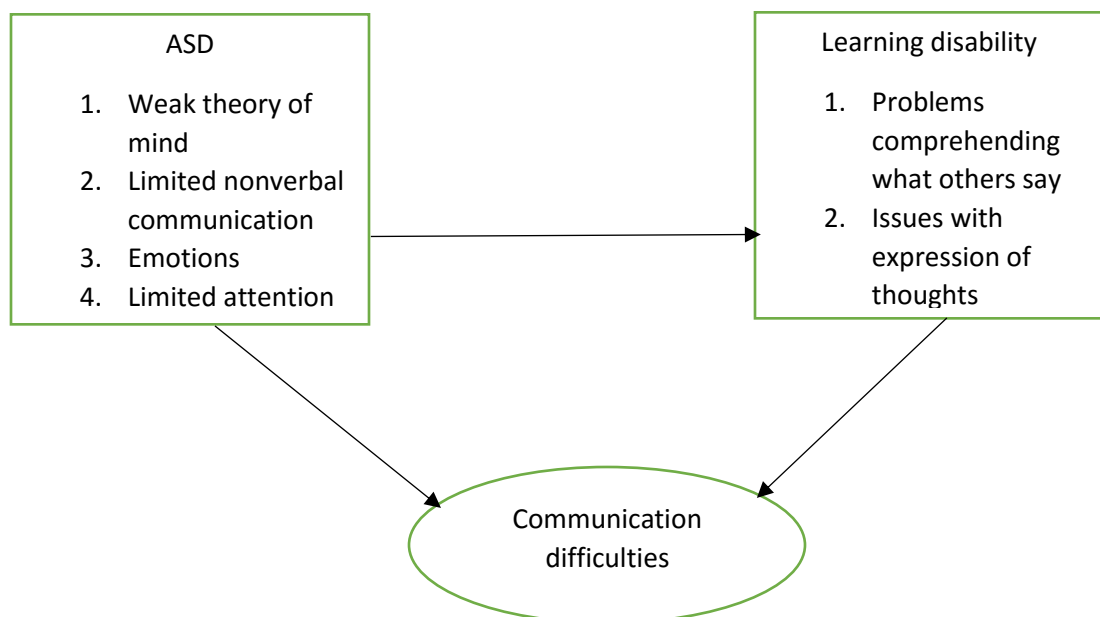
1.4.2 Specific objectives

1. To find out the effects of autism spectrum disorder and learning disability on communication of children.
2. To find out the prevalence of communication disorders.

1.5 Research questions

1. What is the effect of autism spectrum disorder and learning disability on the communication of children?
2. What is the prevalence of communication disorders?

1.6 Conceptual frame work



CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Effects of autism spectrum disorder and learning disability on communication of children.

Matson et al 2013 [16] carried out a study on the moderating effects of challenging behaviors and communication deficits on social skills in children diagnosed with an autism spectrum disorder. It was carried out by Louisiana State University in the United States on 109 children aged 3-16 years. The moderation via multiple regression, verbal communication and challenging behaviors and how they interacted with social skills.

Participants were recruited from clinics, support groups, and schools from Louisiana, Texas, Connecticut, New York, Georgia, and Mississippi.

Results indicated that both communication and challenging behaviors significantly predicted total social skills. Also, the interaction between communication skills and challenging behaviors was also significant, indicating that challenging behaviors moderate the relationship between verbal communication and total social skills among children with ASD. Children who exhibited higher rates of challenging behaviors and had better communication skills were predicted to have the worst social skills. Participants exhibiting high rates of challenging behaviors with poor communication skills had better social skills than those with high rates of challenging behaviors and better communication skills. For children who exhibited low rates of challenging behaviors, the impact of verbal communication skills appears to be minimal.

Colleen Pickett et al 2013 carried out a study to describe potential communicative acts in a sample of 17 children with autism spectrum disorders who produced few to no intelligible words (mean age $\frac{1}{4}$ 32.82 months).

Parents reported on children's potential communicative acts for 10 different communicative functions. A potential communicative act was defined as any behavior produced by an individual that may be interpreted by others to serve a communicative purpose.

Results showed significant associations were found between higher number of gesture types and increased scores on language comprehension, language expression, and non-verbal thinking measures. Relative to other types of potential communicative acts, parents reported that children used higher proportions of body movement.

In the conclusive remark, the number of body movement types was not related to child ability, while number of gesture types was related to receptive and expressive language {Braddock, 2015 #10}

Kimberly R Lin et al 2022 [17] carried out a study about the imageability being associated with expressive vocabulary of children with ASD. The study explored the extent to which imageability and word frequency were associated with early nouns and verb acquisition in the children of ASD.

It involved 156 children (78 typical development, 78 ASD) were used and total expressive vocabulary was measured as by the MacArthur Bates communicative development inventory including 123 words.

A two-step hierarchical linear regression was used to examine the relationship between word input frequency, imageability and total expressive vocabulary when controlling for word input frequency.

Results showed that imageability was significantly associated with noun vocabulary size alone and thus imageability explaining a greater portion of variance in total nouns produced than in total verbs produced. In the conclusive remark, imageability was identified as a significant lexicosemantic feature for describing expressive vocabulary size in children with ASD.

The children with ASD who have small vocabularies primarily produce words that are highly imageable.

Jackciane Eduarda Araujo Pereira et al 2022 [18] carried out a study to investigate the communication skills of a group of children with ASD, the relationship with an age group and speech therapy intervention.

The study used 11 children aged 2-7 years that attended speech-language pathology clinic were used. ACOTEA protocol was used to assess communication, after two sessions with games and toys to establish communicative situations, therapist answered 36 statements related from the anamnesis on age, gender and whether the child had already undergone speech therapy with extended and alternative communication.

Result showed deficits in expressive skills, shared attention and playing alone

Mauricio A. Lopez-Espejo et al 2021 [19] carried out a study about the motor disturbances in children with ASD. A cross sectional observational study of 96 children of median age 4 ranging from 3-9 years were used, 32.3% girls, 18.8% preterm children were evaluated at a clinic hospital neurodevelopmental unit for three years. The relationship between motor signs (stereotypies, delayed gait and hypo/hypertonia) and spoken language at 4 years of age.

Results showed 63.5% of children presented a motor disorder, 33.3% had hand or body motor stereotypes at the time of evaluation. 28.1% had delayed gait. The children had a higher frequency of absence of spoken language at four years of age than patients without delayed gait.

40.6% of children presented alteration of muscle tone during first two years of life and a generalized hypotonia increased the chances of presenting delayed gait that had an effect on spoken language.

In the conclusive remark, children with ASD usually develop motor disorders, infant hypotonia may predict the occurrence of other motor disorders and delayed gait which are associated with spoken language absence in preschool.

Nicolas Linares-Orama et al 2022 [20] carried out a study on distinctive language profiles of autism in Hispanic children focusing on obtaining knowledge about speech language and functional pragmatic language skills that are useful at differentiating various severity levels in ASD.

A detailed analysis of functional speech language approaches and social regards when speaking with a Spanish speaking clinician. 133 participants aged 1-8 years were each evaluated by a

clinical psychologist, speech-language pathologist and an occupational therapist and also each family member of the patient was interviewed. Evaluation had a duration of 3 hours with stimulation of the child through toys using CARS.

Results showed that children with low functioning autism showed a higher severity in person imitation, conjoined object use, nonverbal communication, oriented behaviour, curiosity and social development than those with high functioning autism. Those with high functioning autism were inferior in person consideration, auditory behaviour, change adaption, imagination, social collaboration and social interaction.

Thomas et al 2021 [21] carried out a study aimed at examining the variable language profiles in children with ASD who shown to have impairments in the structure, meaning, and social use of language. These challenges were captured by a measure that was created to assess the spontaneous use of language in a naturalistic environment

The study involved 87 children with ASD (20 females) between the ages of 1.5– 11.5 years.

Objectivity of the study was to describe the patterns of impairments in spontaneous expressive language in clinically ascertained children with ASD using the OSEL. Children with ASD consistently showed significantly more impairments in all areas of spontaneous and adaptive expressive language. Cross-sectional comparisons also showed that the expressive language skills of the children with ASD increased significantly from toddler years to elementary-age.

Results from the Observation Spontaneous Expressive Language (OSEL), children with ASD showed pervasive and varying levels of impairments in the spontaneous and social use of language, which persisted over the course of preschool and elementary school years.

2.2The prevalence of communication disorders

A study in the United States was conducted by Pinborough et al 2007 [22] to determine a population of children with communication disorders that had co-occurrence of autism and intellectual disability. A surveillance was made on 8-year-old children in the most populous counties of Utah in which a multi-source record review was conducted at all major health and educational facilities on 26315 children. A total of 1667 children met the criteria of

communication disorders. The prevalence of communication was estimated to be 63.4 per 1000 8 year-olds with the ratio of boys to girls being 1.8:1.

Konadath et al [23] carried out a study in 2020 in Andaman and Nicobar Islands, a diverse and populated union territory in the Indian sub-continent which had no existing data regarding the prevalence of communication disorder. The information was considered essential for creating awareness among the population about communication impairments, providing rehabilitation, improving policies and facilities for the affected individual. The study was completed in two phases.

In the first phase, a door-to-door survey was carried out by students and staffs of All India Institute of Speech and Hearing, Mysuru, in the islands. All individuals with communication disorders were identified and referred for a two-day camp that followed.

The second phase involved diagnosis and rehabilitation of these referred individuals in a camp site set in a well accessible point in the capital city of Port Blair. 4.12% of the population that was surveyed got referred for the camp. Amongst the referred individuals who participated in the camp, the prevalence of ear-related problems was estimated to be 47.76%, and that of speech and language disorders came up to 52.24%. It was also noticed that males were more affected by communication disorder than females. The prevalence values are quite high and immediate action is required in terms of facilities and infrastructure in these areas for improving the quality of life of individuals with communication disorders.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This provided a clear description of methods that was used during the study to obtain information including the study design, site, population, data collection procedures analysis methods.

3.2 Study design

The study was a descriptive cross-sectional study that determined the prevalence of communication disorders and effects of autism spectrum disorder and learning disability on communication in children.

3.3 Study site and setting

The study was conducted at Hearts Home Uganda, Salama Buziga.

3.4 Study population

The study targeted children from the aged 3 to 14 years who had ASD and attended the school.

3.5 Sample size calculation.

Yamane Taro formula of 1967 was used to estimate the sample size to be studied and was as follows

$$n = N / (1 + Ne^2)$$

Where n signified sample to be studied

N=the whole population under study (30)

e= the margin error (5%)

$$n = 30 / (1 + (30) (0.05)^2)$$

$$n = 27.9$$

Therefore, the sample size that was studied involved 28 participants.

3.6 Study variables

The study included both girls and boys on the spectrum

3.7 Selection criteria

All children on the center who are on the spectrum

3.7.1 Inclusion criteria

1. All children with autism spectrum disorder having learning disability.
2. Care takers who consented to obtain information from them
3. All children aged 3 to 14 years diagnosed with ASD

3.7.2 Exclusion criteria

1. All children outside the age bracket with or without the ASD and learning disability at the centers
2. All children whose caretakers had not consented to obtain information from them and also participate in the study
3. Sick children

3.8 Data collection methods

Data was collected with a self-administered structured questionnaire. It involved collecting data by asking the care takers of the desired groups of participants about their communication difficulties in regards to the questions set by the researchers in a prearranged sequence. Different play toys were used during the process of gathering the information required from the children.

3.9 Data quality control

Data was collected by the principal investigator. The questionnaires were pretested among 4 clients at the center to check for comprehensiveness and understandability of the questions and changes were made accordingly. The adjustments were made basing on the results of the pretest by rephrasing questions to what could be understood. Thus, not to miss out on important information while in the field and to minimize the possible outcome of errors. Data entry was

carried out by the principal investigator to ensure accuracy and proper interpretation of findings from the study.

3.10 Data analysis

The data was collected from the participants through the use of questionnaires and informal assessments. Questions were read several times for easy analysis and understanding, then typed out using Microsoft word programs and Microsoft excel, then analyzed using SPSS software.

Similar data that was obtained during the study was categorized accordingly for further comparison with the differing data.

The data was analyzed by a statistician using analyzing programs.

3.11 Ethical considerations

Permission was sought from Ethical Research Body at Makerere University.

The research ensured that information obtained was kept confidential and strictly for academic purposes.

And prior to collection of data, written consent from the care takers was obtained.

3.12 Dissemination of results

Copies of the results would be disseminated to the different centers where research was conducted, ENT department SLT unit of Makerere University College of health sciences, Makerere university college of health sciences library (albert cook)

3.13 Limitation of the study

The study was conducted on the children with learning disability and ASD thus it was hard for them to comprehend and process what was being tasked them to do so as to obtain the necessary information as per the study.

Due to the emotional and attention issues seen in children with ASD and learning disability, it affected the process of getting information because of being non-responsive.

CHAPTER 4: RESULTS

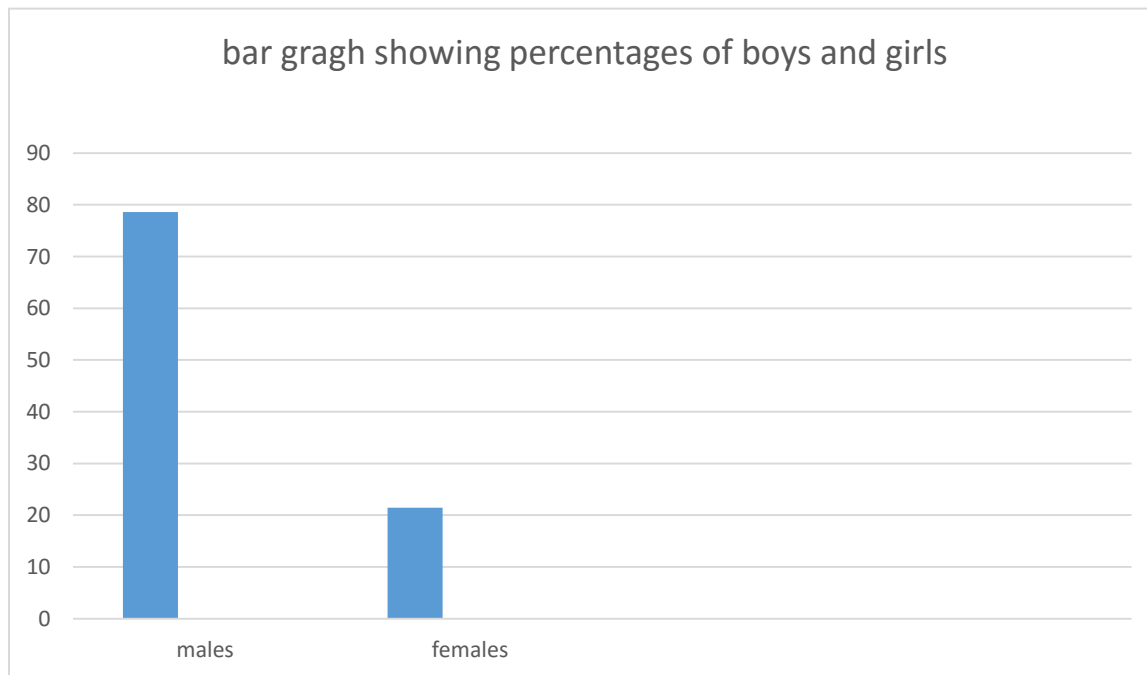
4.1 The prevalence of communication disorders in occurrence with ASD

Respondents were asked of their bio data ages and sex as indicated below in table.

Table 1: Proportions of the gender of the participants

Characteristic (sex)	Numbers	percentages
Males	22	78.57%
Females	6	21.43%

The number of respondents was higher in males than in females as indicated on the graph below



4.2 Effects of autism spectrum disorder on communication of children with learning disability.

The respondents were categorized into three main groups that is (3-6) with a percentage of 46.43%, (7-10) 28.57% and (11-14) 25%. The biggest percentage of the respondents were males 78.57% and females 21.43%

Table 2: Showing age groups, frequency and percentages.

Age group	frequency	percentages
3-6	13	46.43
7-10	8	28.57
11-14	7	25

Table 3: Showing results from children aged 3-6 years

Challenges	Response	frequencies	percentages
Understanding when others speak	Yes	6	46.2
	No	7	53.8
Naming common object in the school environment	Yes	8	61.5
	No	5	38.5
Producing intelligible speech	Yes	11	84.6
	No	2	15.4
With Attention when being engaged	Yes	11	84.6
	No	2	15.4
Using words appropriately	Yes	10	76.9
	No	3	23.1
Using phrases and sentences	Yes	13	100
	No	0	0
Making Eye contact	Yes	10	76.9
	No	3	23.1
Understanding commands	Yes	13	100
	No	0	0
Poor at performing given tasks	Yes	7	53.8
	No	6	46.2
Sameness	Yes	7	50
	No	7	50
Attachment to objects/person	Yes	11	84.6
	No	2	15.4
Self-injurious activities when give a task they find difficult to perform	Yes	8	61.5
	No	5	38.5
Inappropriate expression	Yes	9	69.2
	No	4	30.8
Pointing at objects or persons as answers	Yes	10	76.9
	No	3	23.1

Table 4: Showing results from children aged 7-10 years

Challenges	Response	Frequencies	percentages
Reading age appropriate sentences	Yes (has problems)	8	100
	No (has no problem)	0	0

Writing names of simple school items	Yes	8	100
	No	0	0
Completing simple arithmetic	Yes	8	100
	No	0	0
Understanding when others speak	Yes	4	50
	No	4	50
Naming common object in the school environment	Yes	5	62.5
	No	3	37.5
Producing intelligible speech	Yes	6	75
	No	2	25
Attention when being engaged	Yes	5	62.5
	No	3	37.5
Using words appropriately	Yes	3	37.5
	No	5	62.5
Using phrases and sentences	Yes	8	100
	No	0	0
Making Eye contact	Yes	5	62.5
	No	3	37.5
Understanding commands	Yes	8	100
	No	0	0
Poor at performing given tasks	Yes	8	100
	No	0	0
Sameness	Yes	8	100
	No	0	0
Attachment to objects/person	Yes	3	37.5
	No	5	62.7
Self-injurious activities when give a task they find difficult to perform	Yes	7	87.5
	No	1	12.5
Inappropriate expression	Yes	6	75
	No	2	25
Pointing at objects or persons as answers	Yes	7	87.5
	No	1	12.5

Table 5: Showing results of children aged 11-14 years.

Challenges	Response	frequencies	percentages
Reading age appropriate sentences	Yes (has problems)	7	100
	No(has no problems)	0	0
Writing names of simple school items	Yes	7	100
	No	0	0
Completing simple arithmetic	Yes	7	100
	No	0	0
Understanding when others speak	Yes	5	71.4

	No	2	28.6
Naming common object in the school environment	Yes	4	57.1
	No	3	42.9
Producing intelligible speech	Yes	5	71.7
	No	2	28.6
With Attention when being engaged	Yes	6	85.7
	No	1	14.3
Using words appropriately	Yes	5	71.4
	No	2	28.6
Using phrases and sentences	Yes	7	100
	No	0	0
Making eye contact	Yes	5	71.4
	No	2	28.6
Understanding commands	Yes	5	71.4
	No	2	28.6
Poor at performing given tasks	Yes	5	71.6
	No	2	28.4
Sameness	Yes	4	57.1
	No	3	42.9
Attachment to objects/person	Yes	3	42.9
	No	4	57.1
Self-injurious activities when give a task they find difficult to perform	Yes	5	71.4
	No	2	28.6
Inappropriate expression	Yes	7	100
	No	0	0
Pointing at objects or persons as answers	Yes	5	71.4
	No	2	28.6

CHAPTER 5: DISCUSSION

5.1 Introduction

In the study we aimed at finding out the effects of autism spectrum disorder on the communication and learning of children aged between three to fourteen years attending school at Hearts Home Uganda Buziga Salama

5.2 Effects of autism spectrum disorder and learning disability on the communication of children

Through use of questionnaires that were presented, the findings showed that all the children with ASD had 100% deficits and challenges in reading, writing and mathematics.

Still through the use of questionnaires, 78.57% were not able to produce intelligible speech that could easily be understood by the other people and immediate family relatives. This was because these children exhibited verbal communication difficulties and the words that were used were image able as results of Kimberly Lin et al 2022 also indicated.

The children used inappropriate facial expressions with a total percentage of 78.57% of whole population with the age group of 11-14 years showing most of the challenges.

Results further showed that 64.28% of the children did not use words to express themselves and those who used word most of which were not clear and could not easily be understood.

All the population under study did not use phrases and sentences for expression.

The children showed self-injurious behaviors (hand biting, slapping themselves, banging heads on the wall) in cases of trying to make an attempt to communicate and they fail with a proportion of 71.42%. This could be due to increases anxiety.

5.3 Prevalence of communication disorders

The frequency of boys was 78.57% more than that of girls 21.43%. This is because of the increased genetic disposition in males than in females. The ratio therefore is 3.7:1 boys: girls.

5.4 Study limitations

In this study, caretakers were mainly used to provide information since most of the children could not express themselves well so as information can be obtained.

Due to the small number of participants, some of the information may have been left out in terms of comparison with the biggest population.

5.5 Conclusion

The results showed that children with autism spectrum disorder and learning disability exhibited a lot of challenges in communication as seen with 100% deficits in reading, writing and mathematics and higher percentages of deficits in producing intelligible speech that cannot be understood by other people.

5.6 Recommendations

Relevant authorities may create more awareness about autism spectrum disorder, the children's' communication and learning before it's too late as they continue to age since most of the challenges faced were with older age who are not in inclusion schools as results have shown that children aged 11-14 years showed more challenges followed by those aged between 7-10 years and 3-6 years.

Community sensitization should be improved as to widen knowledge about these challenges and aid in formulation of possible appropriate interventions for management of communication difficulties.

Future research may be conducted to generate more information regarding how learning disability and autism spectrum disorder bring about communication challenges.

References

1. Gillberg, C. and H. Soderstrom, *Learning disability*. The Lancet, 2003. **362**(9386): p. 811-821.
2. Foster, A., H. Titheradge, and J. Morton, *Genetics of learning disability*. Paediatrics and Child Health, 2015. **25**(10): p. 450-457.
3. Abosi, O., *Educating children with learning disabilities in Africa*. Learning Disabilities Research & Practice, 2007. **22**(3): p. 196-201.
4. Nemati, S., R. Badri Gargari, and S. Erfani, *Academic Well-Being and Self-Compassion in Students with and without Specific Learning Disability*. Journal of Learning Disabilities, 2021. **11**(1): p. 54-69.
5. Rutter, M. and E. Schopler, *Autism and pervasive developmental disorders: Concepts and diagnostic issues*. Journal of autism and developmental disorders, 1987. **17**(2): p. 159-186.
6. Noens, I.L. and I.A. van Berckelaer-Onnes, *Captured by details: sense-making, language and communication in autism*. Journal of communication disorders, 2005. **38**(2): p. 123-141.
7. Invento, C.Q. and C.A.L. Jaca, *Adaptive Storytelling as a Teaching Strategy with Specific Learning Disability*.
8. Frith, U. and F. Happé, *Theory of mind and self- consciousness: What is it like to be autistic?* Mind & language, 1999. **14**(1): p. 82-89.
9. Bonney, E., et al., *Sex differences in age of diagnosis of autism spectrum disorder: Preliminary evidence from Uganda*. Autism Research, 2022. **15**(1): p. 183-191.
10. Cooper, A.M. and R. Michels, *Diagnostic and statistical manual of mental disorders, revised (DSM-III-R)*. American journal of Psychiatry, 1988. **145**(10): p. 1300-1301.
11. Noens, I. and I. van Berckelaer-Onnes, *Making sense in a fragmentary world: Communication in people with autism and learning disability*. Autism, 2004. **8**(2): p. 197-218.
12. Howlin, P. and A. Moore, *Diagnosis in autism: A survey of over 1200 patients in the UK*. autism, 1997. **1**(2): p. 135-162.
13. Gillberg, C. and M. Coleman, *The biology of the autistic syndromes*. 2000: Cambridge University Press.

14. Wing, L. and J. Gould, *Severe impairments of social interaction and associated abnormalities in children: Epidemiology and classification*. Journal of autism and developmental disorders, 1979. **9**(1): p. 11-29.
15. Fitzpatrick, R., B.E. McGuire, and H.K. Lydon, *Improving pain-related communication in children with autism spectrum disorder and intellectual disability*. Paediatric and Neonatal Pain, 2022. **4**(1): p. 22-32.
16. Matson, J.L., J.A. Hess, and S. Mahan, *Moderating effects of challenging behaviors and communication deficits on social skills in children diagnosed with an autism spectrum disorder*. Research in Autism Spectrum Disorders, 2013. **7**(1): p. 23-28.
17. Lin, K.R., et al., *Word imageability is associated with expressive vocabulary in children with autism spectrum disorder*. Autism & Developmental Language Impairments, 2022. **7**: p. 23969415221085827.
18. Pereira, J.E.A., et al., *Communicative skills of children with autism*.
19. López-Espejo, M.A., et al., *Motor disturbances in children with autism spectrum disorder*. Andes Pediátrica: Revista Chilena de Pediatría, 2022. **93**(1): p. 37-42.
20. Linares-Orama, N. and G. Solis, *Distinctive Language Profiles of Autism in Hispanic Children*. Sciences, 2022. **11**(4): p. 132-135.
21. Thomas, H.R., et al., *Spontaneous expressive language profiles in a clinically ascertained sample of children with autism spectrum disorder*. Autism Research, 2021. **14**(4): p. 720-732.
22. Pinborough-Zimmerman, J., et al., *Communication disorders: Prevalence and comorbid intellectual disability, autism, and emotional/behavioral disorders*. 2007.
23. Konadath, S., et al., *Prevalence of communication disorders in Port Blair-Andaman and Nicobar Islands*. Clinical Epidemiology and Global Health, 2020. **8**(1): p. 233-238.

APPENDICES

APPENDIX I: CONSENT FORM

TITLE: COMMUNICATION DIFFICULTIES IN CHILDREN HAVING AUTISM SPECTRUM DISORDER WITH LEARNING DISABILITY

Principal investigator

KIMERA ENOCK

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Makerere University

College of Health Sciences

School of Medicine

Purpose of the study:

This study aims at describing communication difficulties in children aged three to fourteen years having autism spectrum disorders with learning disability.

Who will participate in the study?

All children age 3 to 14 diagnosed with autism spectrum disorder and learning disability

Risks/Discomforts:

This study will cause no major risk, harm, or discomfort to you or any member of your family and shall not affect the services offered to you or your loved one. Your name shall not be reflected anywhere on the questionnaire.

Benefits:

There is no direct benefit to you from the study. However, the information generated from the study will help in developing and creating more awareness about the conditions.

Compensation for participation in the study:

There is no compensation for participating in this study. Your participation in this study is completely volunteering activity.

Reimbursement:

There is no reimbursement for participation in the study. All expenses needed to reach the participant will be covered by the investigator himself.

Questions: In case of any questions about the study, you can contact the principal investigator,

Approval of the research study:

The study has been approved by Makerere University School of Health Sciences Research and Ethics Committee, an accredited Ugandan based research and ethics committee.

Dissemination of study findings

The findings from this study will be provided to the ENT department of Makerere University and the SLT unit

Confidentiality:

The information collected will be kept anonymous and confidential in accordance with the international and local ethical standards governing research involving humans as research participants. Participants' identity will be concealed and their names will not appear on any forms with the information. Any filled data collection form will be kept under strict lock and key, and information on computers will be kept confidential with password protection.

Statement of consent

All that is going to be done has been described to me by KIMERA ENOCK. I understand my decision to participate in the above study will generate more knowledge that will be used in future research. With all the above information, I understand my identity will be kept confidential and signing of the form indicate that I have been informed about the study in which I am voluntarily agreeing to participate.

.....

.....

Participant's signature

date

APPENDIX 2: QUESTIONNAIRE

Communication difficulties of children with learning disability and ASD.

DEMOGRAPHIC DETAILS.

DATE OF INTERVIEW:

NAME:

AGE:

SEX:

LANGUAGE:

SECTION A

RATING SCALE	
ALWAYS (3)	The child consistently displays the problem in the skill always
SOMETIMES (2)	The child displays the problem of the skill at a particular occasion but not all the time
NEVER (1)	The child does not exhibit problems of the skill at all

Respond with a number as per the table corresponding to the answer that you feel is suitable for a given response.

INTERVIEW QUESTIONS	SCORE
1.Does your child have problem with Reading	
2.Does your child have problem with Writing	
3.Does your child have problem with Mathematics	
4. Does the child understand when others speak?	
5. Can the child name things surrounding him/her like a house, plate fork among others?	
6. Does the child produce intelligible speech?	
7. Does the child attend to activities for more than 1 minutes?	
8. When asked, does the child respond with Words?	
9. When asked, does the child respond with Phrases?	
10. When asked, does the child respond with Sentences?	
11. Does the child maintain eye contact with peers or other people during interaction and play activities?	

12. Does the child understand complex commands involving more than one instruction? For example, “bring that big yellow cup and pick water”	
13. How does your child perform tasks given to him or her?	

SECTION B

Social communication checklist for children with autism spectrum disorder.

Question	yes	no
1. Does the child ever use same things over and over almost the same way for example says the same words over and over or using specific objects of the same color (sameness).		
2. Does the child have particular friends he/she usually attached to?		
3. Does the child have any object other than a favorite toy or comfort cloth that he/she carries around		
4. Has the child ever injured him/her self deliberately such as biting and banging head		
5. Has the child ever had repeated movements of his or her whole body such as spinning and repeatedly bouncing up and down		
6. Does the child have facial expressions that usually seem inappropriate to a particular situation as far as you can tell		
7. Has the child ever used your hand like a tool for pointing or reaching		
8. Has the child ever seemed to be more interested in the parts of toys or any object for example spinning the wheel of the car rather than in using the object as it was intended?		
9. Has she/he ever seemed to be unusually interested in the sight of things or people?		
10. Has she/he ever seemed to be unusually interested in the feel of things or people?		
11. Has she/he ever seemed to be unusually interested in the sound of things or people?		
12. Has she/he ever seemed to be unusually interested in the taste of things or people?		
13. Has she/he ever seemed to be unusually interested in the smell of things or people?		
14. Has the child ever had mannerisms of her/his hands or fingers such as flapping or moving his/her fingers in front of her/his eyes?		

APPENDIX 3: BUDGET

ACTIVITY	UNIT COST	NO OF UNITS	TOTAL AMOUNT
Printing questionnaires	1,000	30	30,000
Transport to and from Mulago hospital	4,000	15	60,000
Lunch and tea during data collection	7,000	15	105,000
Airtime and internet	3,000	15	45,000
Printing and binding dissertation	25,000	1	25,000
Pens	500	20	10,000
Masks	10,000	2 boxes	20,000
Sanitizer	25,000	2 boxes	50,000
Miscellaneous			55,000
Total			400,000

APPENDIX 4: TIME FRAME

S/No.	activity	year							
		months	March 2022	April 2022	May 2022	June 2022	July 2022	August 2022	September 2022
1	Proposal writing								
2	Data collection								
3	Data entry and analysis								
4	Report writing								
5	Submission of dissertation								

APPENDIX 5: COVID-19 RISK MANAGEMENMT PLAN

Activities that pose risk	People at risk	Measures to be taken	Responsible person	Remarks
Transport to hospital	Investigator	Wear mask Ensure social distancing	Investigator	I shall adhere to all the SOPs
Data collection	Investigator and participants	Observation of M.O.H guidelines and SOPs Hand washing and sanitization Wearing of a face mask social distancing of 2M if possible	Investigator and participants	I will ensure adherence to M. O. H guidelines and SOPs
Data analysis	Investigator	Observation of M.O.H guidelines and SOPs	Investigator	I shall ensure adherence to M. O. H guidelines and SOPs