

ORIGINAL ARTICLE

Speech Development and Communicative Demands in Autistic Children Using the Picture Exchange Communication System (PECS)

FAIZA ARSHAD¹, SIDRA ANSAR², RABIA KHALID³, MAHRUKH RASHID⁴, FAHAD MASOOD⁵, KANZA SANA UMER⁶

¹Lecturer University of Lahore, Workplace Social Security Hospital Multan road

²Senior Lecturer/ Demonstrator Fatima Memorial College of Medicine & Dentistry

³Visiting Faculty University of Home Economics

⁴Speech and Language Pathologist, NUR International University, Lahore

⁵Senior Lecturer, Department of Rehabilitation Sciences, Faculty of Allied Health Sciences University of Lahore

⁶Clinical Psychologist, Kingdom of Saudi Arabia

Corresponding author: Faiza Arshad, Email: faizaarshad143@gmail.com, Cell: 03338488612

ABSTRACT

Background: PECS, or Picture Exchange Communication System, addressed in writing. The answers for such schemes to influence word retrieval in autism spectrum disorders in children (ASD).

Objective: The objective of the current study finding out the effects of Development of the picture exchange communication system in autistic children's speech and communicative requesting was the main goal of the current study.

Materials & Methods: The study design was Quasi experimental. The research was carried out at Riphah International University Lahore campus. Data was collected from Lahore. The study time was six months after the approval of synopsis. Data was collected from the Autistic children and purposive sampling technique was used in this research. The sample size calculated was ten. The picture-exchange technique for communication (PECS) was used for data collection. Data was examined using SPSS software and Endnotes were used for references.

Results: Results from the Childhood Autism Rating Scale (CARS) assessment scoring form indicated that there is a significant relationship between the Effects of Communicative PECS speech and request development in autistic children, overall analysis of the pre and post scores of CARS assessment. In which mean of pre score is 36.15 and mean of post score is 29.5. The standard deviation of pre score is 8.47 and the post score standard deviation is 5.39. The mean difference showed the improvement between CARS pre and post assessment.

Used was the paired sample t test for finding the mean difference between the pre and post scores. The results indicate that every participant showed improvement in different skills such as verbal and nonverbal communication, visual response. Some participants got higher in verbal communication

Practical implication: This will give us a better understanding of how speech develops in children with autism and how children's vocabulary develops and awareness develops in children.

Conclusion: The pre-post assessment of The Childhood Autism Rating scale (CARS) with intervention of PECS concluded that there is significant influence of intervention using a photo exchange communication technology for autistic kids.

Keywords: Autism, Chemical Imbalance, PECS, CARS, Autism Rating Scale, Autism spectrum condition

INTRODUCTION

ASD, often known as autism spectrum disorder, is a complex developmental condition marked by persistent difficulties with social communication, narrow interests, and repetitive behaviour. Although autism is a lifelong illness, each autistic person's level of functioning impairment varies as a result of these difficulties¹. Autism is conceptualized as a social state of extreme; neurological wounds connected with a huge decent variety of restorative circumstance. The prospect that the cerebrum brokenness may lie underneath a particular absence of a hypothesis of brain is talked about. Mental imbalance is viewed as maybe existing on a scope of disarranges seeking both Kenner chemical imbalance and Asperger Syndrome. Epidemiological, organic, mental and follow-up results are quickly audited². Parents, carers, or paediatricians may notice the first indications of this disease before a child turns one year old. However, symptoms typically begin to manifest more consistently by the time a child is 2 or 3 years old. When a child first joins school, the functional impairment associated with autism may occasionally be mild and not visible until the child interacts with peers³. The six phases of the picture exchange communication system are as follows: PECS Phase I: Communication Skills, The child with artificial unevenness concentrates to exchange specific images for objects or activities that they actually require. Distance and Persistence PECS Phase II To be sure, even now by single pictures, the child with mental irregularity concentrate to revamp this novel bent by using it in various spots, with different people and across over partitions. They are also taught to be extra enduring communicators. PECS PHASE III: Picture Discrimination, The kids with concoction unevenness makes sense of how to peruse in any event two pictures to interest for their favoured things. These are organised in a correspondence book and stored on a ring stretched with Velcro strips so that they can easily be removed for

correspondence. PHASE IV OF THE PECS: Sentence Structure, Children with autism are taught to construct simple phrases using a releasable sentence band that features a "I need" picture that is followed by a picture of the object being needed. PECS PHASE V: Responding to Inquiries, The autistic youngsters focus on using PECS to respond to the question, "What do you need? PHASE SIX OF PECS: COMMENTING, The youngsters with autism are instructed to respond to questions like, "What do you see?" at the exhibit by commenting. What do you hear? What's more, what's going on here? They figure out how to form up sentences to begin with I see, I listen, I feel, It is an, and so on⁴. The research was conducted on determine the impact on open mentioning development of the picture exchange communication system and speaking in kids with autistic traits. The analyst use PECS to limit challenges with relational abilities influenced by children with autism. The outcomes demonstrate that PECS expanded authority the quantity of articulations of the words multifaceted nature of sentence structure⁵. The study was conducted on expanding relational abilities for a rudimentary matured Understudy with chemical imbalance utilizing the photos trade correspondence framework. PECS's impact on social association is likewise inspected. The outcome demonstrates that PECS expands the immediacy of language in mentioning and remarking. It likewise makes great consequences for verbalizations and visual symbols in various setting in which PECS was executed. Analyst additionally analysed changes in social collaboration in school settings⁶. An examination was directed to discover the usage of PECS method m based multimedia augmented reality based as a learning alternative in training the autism children. The researcher use experimental research design with 12 autistic children to find out their pre and post assessment. The results indicate that ability level of their communication is more than in average of 76% after using PECS rather than before average level is 47 %⁷. The study

was conducted to assess the viability of a social intercession that coordinated peer interceded approaches and the pictures trade communication framework (PECS). Analyst utilized the arrangement of A-B plans on the 4 children with extreme introvertedness and negligible verbal abilities. So also other gather which were comprised on seven children without incapacities were prepared to utilize PECS and empower social aptitudes. The outcomes about appears that children who utilize PECS have improve their communication aptitudes additionally appear great enhancement in social interaction with their peers ⁸. Significant of the study and research gap Limited literature is available on the topic both nationally and internationally. This topic needs exploration to improve the academic standard of the children with special needs.

Objective: The objective of the research is to determine the Effect of Children with autism who use communicative requesting and speech to strengthen their picture exchange communication framework.

MATERIAL AND METHOD

The study design was Qusai experimental design. Data was collected from Autism centers, tertiary care hospitals and special education settings. The study was carried out at Riphah International University; Lahore The target population of the study was the children with autism spectrum disorder. Children who have autism spectrum disorder. Children with age 3 to 8 years were included. Both male and female children were included. Children with any other co morbidity problem or disorder. Convenient sampling technique was used. Sample was based on 10 children. The rational of sample size was based on parent article. The Childhood Autism Rating Scale was used for the assessment. The reliability of this scale is ≥ 33 and Validity of this scale is .0.42. For interventional purpose Picture Exchange Communication System (PECS) was used. Data was collected from the Global Institute for Autism and Special Needs. The pre and post assessment done by using childhood autism rating scale. The Picture Exchange Communication System was used for intervention with three months' time duration. The data was statistically analyzed by application of descriptive statistics through SPSS21. In order to analyze data correlation analysis was applied to find difference between pre and post assessment by using PECS intervention. Endnote was used for references.

RESULTS

Table 1: Frequency of Gender

	Frequency	Percentage
Male	8	80.0
Female	2	20.0
Total	10	100.0

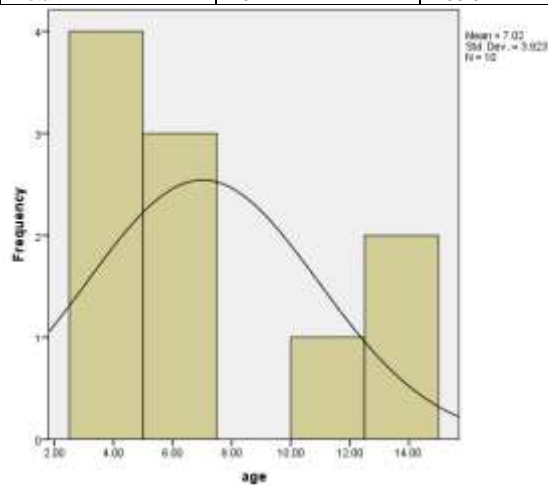


Figure 1: Histogram of the Age

The above results showed the gender differences. The table demonstrates that 80.0% male and 20.0% females are taken an interest in this examination.

The histogram demonstrates the mean length and standard deviation of the age in the investigation. The mean scores are 7.02 and standard deviation utterances 3.923 from the total number 10.

In the table 5.3 the cross tabulation of pre score of assessment of the childhood autism rating sale and gender was mentioned.

Table 2: Pre .score of CARS* Assessment Cross tabulation

		Gender		Total
		Male	Female	
Pre.score	22.50	1	0	1
	25.50	1	0	1
	29.50	1	0	1
	33.50	1	0	1
	35.50	1	0	1
	36.50	1	0	1
	43.00	0	1	1
	43.50	0	1	1
	45.50	1	0	1
	46.50	1	0	1
Total		8	2	10

Table 3: Post .score of CARS* Assessment Cross tabulation

		Gender		Total
		male	female	
Post.score	20.50	1	0	1
	24.50	1	0	1
	25.50	1	0	1
	26.50	1	0	1
	27.50	1	0	1
	30.50	1	0	1
	33.50	1	0	1
	34.50	0	1	1
	35.50	1	0	1
	36.50	0	1	1
Total		8	2	10

The table showed the crosstab of the post score of assessment of the childhood autism rating sale and gender was mentioned.

Table 4: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pre.score	36.1500	10	8.47890	2.68126
	post.score	29.5000	10	5.39547	1.70620

The table shows the overall analysis of the pre and post scores of CARS assessment. In which mean of pre score is 36.15 and mean of post score is 29.5. The standard deviation of pre score is 8.47 and the post score standard deviation is 5.39. The mean difference showed the improvement between CARS pre and post assessment.

Table 5: Paired Samples correlations

		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference
		Lower			
		Upper			
Pair 1	pre.score - post.score	6.65000	4.10995	1.29968	3.70992

Table 6: Paired Sample Test

		Paired Differences		T	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference				
		Upper				
		Lower				
Pair 1	pre.score - post.score	9.59008		5.117	9	.001

Below the table contrast of the pre and post appraisal of the CARS. The results indicate that the three month Picture Exchange communication System (PECS) intervention put influence on the verbal and nonverbal category of the CARS.

The table demonstrated that there is a factually critical contrast in all out score between the mean of huge connection of the Effects of The picture exchange communication system in children with autism is improved through communicative requesting and speech. 9.59 demonstrate that this distinction is because of picture Exchange Communication System procedure. Since Paired Samples Statistics uncovered that the Mean score of post score following multi month treatment intercession with PECS was more prominent than the mean of pre score. So it is concluded that PECS improved subscales of CARS score of verbal communication and non-verbal communication.

Table 7: Baseline assessment verses post assessment score of CARS

Pt. no	Pre score of CARS	Post score of CARS	Difference b/w pre and post scores
1.	45.5	35.5	10
2.	35.5	25.5	10
3.	46.5	36.5	10
4.	43.0	36.5	6.5
5.	33.5	27.5	6
6.	22.5	20.5	2
7.	25.5	24.5	1
8.	46.5	36.5	10
9.	29.5	24.5	5
10.	36.5	33.5	3

The table showed the total baseline representation of the pre and post assessment score of 15 subscales of Childhood Autism Rating Scale (CARS).

DISCUSSION

The examination expects to research the Effects of Children with autism can develop their picture exchange communication system through speech and communicative requests. An examination of the information showed that as aftereffects of PECS, all the ten members in the momentum research gained ground in the dominance of the PECS system and exhibited increments in normal clear word verbally expressed per preliminary; furthermore understudy demonstrated speculation of aptitudes with the assortment of grown-ups. Generally speaking the members aced the PECS program quickly. The table 4.5 to 4.9 demonstrated the pre and post scores of the PECS mediation.

An inquiry was conducted while simultaneously taking note of conventional psychometric data, organised useful evaluation of flexible direct, and data on social-open elements coded in an unstructured setting to examine the effects of PECS on social-open aptitudes in teenagers with mental imbalance. 18 preschoolers (mean age = 38.78 months) received two intervention approaches, including PECS and Traditional Language Therapy (CLT). For a period of six months, PECS (Phases I–IV) and CLT were delivered in numerous, 30-minute sessions each week. Results were being tracked for Autism^{9,10,11}.

The impact of augmentative and alternative communication therapies on speech output in children with mental imbalance were the subject of a study by Relf, Scescholar¹¹. There were nine single-subject exploratory structure (27 individuals) and 2 gathering examinations (98 individuals) were fused. Results showed that AAC intervention don't block discourse generation. Truth is told; most assessments natty gritty a development in talk age. Regardless, top to bottom examinations revealed that the augmentations were somewhat modest.it was presumed that AAC mediations don't seem to impede talk age and may bring about extended talk creation, the modest expands viewed require down to earth desires among clinicians and various accomplices. Future research should be more theory driven and intend to perceive perceptive members characteristics, for instance, prior talk pantomime and article examination tendency^{12,13}.

In 2019 the research was held on the many youngsters with mental imbalance inaccessible escalated guidance in the utilization of intensifying or elective correspondence frameworks^{12,13}, for example, picture-exchange messaging system (PECS). The examination explored the utilization of PECS with three young men with autism to decide the effect of PECS preparing on utilization of images for mentioning, utilization of clear symbols, and dysfunctional practices. A numerous standard test plan with an amazed begin was executed. Results showed that the majority of the members immediately figured out how to make solicitations utilizing pictures and that two utilized coherent discourse adhering to PECS guidance; maladaptive practices were variable all through pattern and intercession stages. Despite the fact that the majority of the members advancement in at any rate one ward variable, there endure questions with respect to is most appropriate for PECS and comparable mediations^{14, 15,16}.

Traverse interpersonal relationships through the life stories of Individuals with chemical imbalance Suppositions of troubles with social communication, or absence of enthusiasm for social cooperation^{17 18}, are vital to numerous definitions and ordinary understandings of chemical imbalance. In any case, numerous people with chemical imbalance portray a solid longing for social communication. This article utilizes self-portraying accounts composed by people who distinguished as mentally unbalanced as a wellspring of subjective research information and explicitly investigates the manners in which these writings address issues of social connections. Utilizing account request, the creators investigated how people with chemical imbalance depicted their very own ideas of and encounters with social association. This article talks about the expansive topics of (a) the longing to have associations and (b) route through the universe of individuals. Last, ramifications for the training of people with mental imbalance are considered^{19,20}.

CONCLUSION

The pre-post assessment of The Childhood Autism Rating scale (CARS) with intervention of PECS concluded that there is significant influence of picture exchange communication system intervention on children with autism.

REFERENCES

1. Zuo M, Hu Y, Luo H, Ouyang H, Zhang Y. K-12 students' online learning motivation in China: An integrated model based on community of inquiry and technology acceptance theory. *Education and Information Technologies*. 2022 May;27(4):4599-620.
2. Piao J, Huang Y, Han C, Li Y, Xu Y, Liu Y, He X. Alarming changes in the global burden of mental disorders in children and adolescents from 1990 to 2019: a systematic analysis for the Global Burden of Disease study. *European Child & Adolescent Psychiatry*. 2022 Nov;31(11):1827-45.
3. Li B, Roden DM, Capra JA. The 3D mutational constraint on amino acid sites in the human proteome. *Nature Communications*. 2022 Jun 7;13(1):3273.
4. The Picture Exchange Communication System (PECS): National Autim Resources; [cited 2019 25 .01 2019]. Available from: 5. <https://www.nationalautismresources.com/the-picture-exchange-communication-system-pecs/>
5. Reni PS, Kalyani KS, Nagarajan A, Senthilnathan K. Management of Children with Autism Spectrum Disorder using Picture Exchange Communication System-A Pilot Study. *Indian Journal of Behavioural Sciences*. 2022 Oct 31;25(02):93-9.
6. Long-term effects of PECS on social–communicative skills of children with autism spectrum disorders: a follow-up study. *International journal of language & communication disorders*. 2014;49(4):478-85.
7. Lorah ER, Holyfield C, Griffen B, Caldwell N. A systematic review of evidence-based instruction for individuals with autism using mobile augmentative and alternative communication technology. *Review Journal of Autism and Developmental Disorders*. 2022 Jul 20:1-5.
8. Reni PS, Kalyani KS, Nagarajan A, Senthilnathan K. Management of Children with Autism Spectrum Disorder using Picture Exchange Communication System-A Pilot Study. *Indian Journal of Behavioural Sciences*. 2022 Oct 31;25(02):93-9.
9. Causton-Theoharis J, Ashby C, Cosier M. Islands of loneliness: Exploring social interaction through the autobiographies of individuals

- with autism. *Intellectual and Developmental Disabilities*. 2009;47(2):84-96.
10. Mariani LH, Eddy S, AlAkwa FM, McCown PJ, Harder JL, Nair V, Eichinger F, Martini S, Ademola AD, Boima V, Reich HN. Precision nephrology identified tumor necrosis factor activation variability in minimal change disease and focal segmental glomerulosclerosis. *Kidney International*. 2022 Nov 25.
 11. Niu H, Atallah E, Alvarez-Alvarez I, Medina-Caliz I, Aithal GP, Arkan C, Andrade RJ, Lucena MI. Therapeutic Management of Idiosyncratic Drug-Induced Liver Injury and Acetaminophen Hepatotoxicity in the Paediatric Population: A Systematic Review. *Drug Safety*. 2022 Nov;45(11):1329-48.
 12. Drüsedau LL, Götz A, Kleine Büning L, Conzelmann A, Renner TJ, Barth GM. Tübinger Training for Autism Spectrum Disorders (TÜTASS): a structured group intervention on self-perception and social skills of children with autism spectrum disorder (ASD). *European Archives of Psychiatry and Clinical Neuroscience*. 2023 Jan 11:1-5.
 13. Stosic MD, Fultz AA, Brown JA, Bernieri FJ. What is your empathy scale not measuring? The convergent, discriminant, and predictive validity of five empathy scales. *The Journal of Social Psychology*. 2022 Jan 2;162(1):7-25.
 14. Ambuga P. Adaptation strategies of Small-scale farmers to climate change and food security: the case of Kiambaa constituency, Kiambu County (Doctoral dissertation, University of Nairobi).
 15. Lim HA, Ellis EM, Sonnenschein D. Effect of sing and speak 4 kids: An online music-based speech and language learning game for children in early intervention. *Child Language Teaching and Therapy*. 2022 Jun;38(2):180-96.
 16. Lim HA, Ellis EM, Sonnenschein D. Effect of sing and speak 4 kids: An online music-based speech and language learning game for children in early intervention. *Child Language Teaching and Therapy*. 2022 Jun;38(2):180-96.
 17. Winner MG. Why teach social thinking?: Questioning our assumptions about what it means to learn social skills. *Think Social Publishing*; 2022 Sep 13.
 18. Suddaby R, Viale T, Gendron Y. Reflexivity: The role of embedded social position and entrepreneurial social skill in processes of field level change. *Research in Organizational Behavior*. 2016 Jan 1;36:225-45.
 19. Gruber J, Prinstein MJ, Clark LA, Rottenberg J, Abramowitz JS, Albano AM, Aldao A, Borelli JL, Chung T, Davila J, Forbes EE. Mental health and clinical psychological science in the time of COVID-19: Challenges, opportunities, and a call to action. *American Psychologist*. 2021 Apr;76(3):409.
 20. Gruber J, Prinstein MJ, Clark LA, Rottenberg J, Abramowitz JS, Albano AM, Aldao A, Borelli JL, Chung T, Davila J, Forbes EE. Mental health and clinical psychological science in the time of COVID-19: Challenges, opportunities, and a call to action. *American Psychologist*. 2021 Apr;76(3):409.