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Evaluating the Effectiveness of the Picture Exchange Communication System (PECS) for Enhancing Communication Skills in Children with Autism: Perspective of Speech Therapists in Lahore, Pakistan

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Abstract

This study examined the effectiveness of the Picture Exchange Communication System (PECS) in enhancing communication skills among children with Autism Spectrum Disorder (ASD) from the perspectives of speech therapists in Lahore, Pakistan. A mixed-methods descriptive research design was employed, involving 53 speech therapists working in clinical, school, and home-based settings. Quantitative data were collected through a structured questionnaire and analyzed using descriptive statistics to assess perceived effectiveness, communication outcomes, and the relationship between duration of PECS use and communication improvement. Qualitative data from open-ended responses were analyzed thematically to explore factors influencing PECS implementation and effectiveness. Findings revealed that PECS was perceived as highly effective in improving expressive and receptive language, promoting social interaction, and reducing challenging behaviors, with greater improvements associated with longer and consistent use across settings. Qualitative insights highlighted the importance of professional training, parental involvement, and consistency in implementation. Ethical principles were strictly observed, including informed consent, confidentiality, and voluntary participation. The study underscores the value of PECS as an effective communication intervention while emphasizing the need for systemic support to maximize its impact in Pakistan

Keywords: Picture Exchange Communication System; Autism Spectrum Disorder; Augmentative and Alternative Communication; Speech Therapists; Mixed-Methods Research

Introduction

Autism Spectrum Disorder (ASD) is a developmental condition that significantly affects communication, behavior, and social interaction (American Psychiatric Association, 2013). Children with autism often experience challenges in verbal and non-verbal communication, making early and effective intervention crucial in promoting their language and social skills (Charman, 2013). One of the most widely utilized interventions for improving communication in children with autism is the Picture Exchange Communication System (PECS), a form of

Augmentative and Alternative Communication (AAC) that uses pictures to enable communication (Bondy & Frost, 1994). PECS has gained global recognition for its ability to facilitate functional communication in non-verbal children with ASD, especially in environments where speech therapy and verbal communication are not fully effective (Tincani et al., 2006). Despite the success of PECS in various global settings, there is limited research on its implementation and effectiveness from the perspective of speech therapists in Pakistan. In Pakistan, the availability of specialized autism services and interventions, including PECS, remains limited, and cultural attitudes toward autism further complicate the application of these therapies (Rashid et al., 2017). Understanding the effectiveness of PECS in the Pakistani context, particularly from the viewpoint of speech therapists, is crucial to addressing communication challenges in children with autism and improving therapeutic practices. This study aims to evaluate the effectiveness of PECS in enhancing communication skills in children with autism, focusing on the insights of speech therapists practicing in Pakistan. By exploring the experiences and perspectives of therapists, this research seeks to highlight both the successes and challenges associated with implementing PECS in Pakistani clinical settings. The findings from this study will provide valuable information to support the adoption of effective communication interventions and inform policy decisions regarding autism therapy in Pakistan. Furthermore, it will contribute to the limited body of research on autism therapies in South Asia, where culturally appropriate interventions are of paramount importance (Fung et al., 2017). Despite the widespread use of the Picture Exchange Communication System (PECS) in autism intervention globally, there is a significant research gap regarding its effectiveness and implementation in Pakistan. While PECS has been well-documented in Western countries, studies exploring its application in Pakistani contexts, particularly from the perspective of speech therapists, are limited. The cultural, societal, and infrastructural differences between Pakistan and Western countries may influence the effectiveness and adoption of PECS, yet few studies have investigated these contextual factors. Moreover, the lack of comprehensive research focusing on the specific challenges faced by speech therapists in Pakistan, including training, resources, and parental involvement, underscores the need for localized studies. This research aims to fill this gap by examining the perspectives of speech therapists in Pakistan on the effectiveness of PECS, providing valuable insights for enhancing communication interventions for children with autism in the region.

Objectives

1- Evaluate the effectiveness of PECS in enhancing communication skills in children with autism in Pakistan.
2- Assess the types of communication improvements observed after using PECS.
3- Identify challenges faced by speech therapists in implementing PECS in Pakistan.
4- Examine the relationship between PECS use duration and communication improvement.
Compare the effectiveness of PECS in different settings (clinical, home, school).

Literature Review

The Picture Exchange Communication System (PECS) is an Augmentative and Alternative Communication (AAC) system designed to aid children with Autism Spectrum Disorder (ASD) in expressing themselves through pictures. Since its development by Bondy and Frost (1994), PECS has been widely implemented as a communication tool, particularly for non-verbal children. Its primary goal is to enable children to communicate their needs and wants by selecting and exchanging pictures, thus fostering the development of functional communication skills. PECS has been shown to enhance communication, social interaction, and reduce problem behaviors (Tincani et al., 2006), making it a valuable tool for children with autism.

Effectiveness of PECS in Enhancing Communication Skills

Numerous studies have demonstrated the effectiveness of PECS in improving communication skills in children with autism. A study by Charlop-Christy et al. (2002) showed that children who used PECS showed significant improvements in both expressive and receptive communication. This aligns with other research suggesting that PECS is particularly beneficial for children who are non-verbal or have limited speech abilities (Bondy & Frost, 1994). In the Pakistani context, although the application of PECS is relatively recent, its potential to improve communication skills has begun to attract attention. The effectiveness of PECS in Pakistan has been explored in studies by Rashid et al. (2017), which indicated that while PECS is an effective intervention for many children with autism, its success is largely dependent on cultural factors, such as parental involvement and training. In urban areas with better access to resources, PECS has been implemented with positive outcomes. However, rural areas face challenges due to the lack of trained professionals and educational materials. Therefore, PECS' effectiveness in enhancing communication skills is largely influenced by the availability of resources, parental support, and professional training.

Types of Communication Improvements Observed After Using PECS

PECS has been associated with various types of communication improvements. Research by Bondy and Frost (2001) indicates that children using PECS typically show improvement in both receptive and expressive language skills, as well as in social engagement. Children with autism often struggle with social communication, and PECS can help bridge this gap by providing a structured means for children to communicate their needs, thereby reducing frustration and increasing social interaction (Frost & Bondy, 2002). In a review of PECS implementation in different countries, Tincani et al. (2006) highlighted that children showed improvements not only in their ability to express needs but also in their social communication skills, including initiating interactions with peers and adults. In Pakistan, similar trends have been observed in small-scale studies, where speech therapists reported that children using PECS began to engage more with their peers and family members (Rashid et al., 2017). However, the scope and nature of these improvements vary across individuals, with some children showing more significant advancements than others.

Challenges Faced by Speech Therapists in Implementing PECS

The implementation of PECS, although widely recognized as effective, comes with several challenges. In Pakistan, these challenges are often magnified due to a lack of trained professionals, limited resources, and societal stigma surrounding autism (Rashid et al., 2017). One of the primary challenges reported by speech therapists in Pakistan is the insufficient training in PECS, which affects the consistency and quality of its implementation (Rashid et al., 2017). Additionally, many parents are not fully trained to support their children's use of PECS at home, which limits the system’s effectiveness. Parental involvement is critical for the successful implementation of PECS (Bondy & Frost, 1994), yet in many parts of Pakistan, parents lack the necessary education and support to consistently use the system at home. Furthermore, cultural perceptions of autism can hinder the acceptance and utilization of PECS. In Pakistan, autism is often misunderstood, and many parents may not immediately recognize the benefits of alternative communication systems (Fung et al., 2017). These barriers are compounded by a lack of accessibility to materials such as picture cards, which are essential for the PECS process (Rashid et al., 2017). Therefore, the successful implementation of PECS in Pakistan requires overcoming these challenges by providing professional training, increasing parental involvement, and improving access to resources.

Relationship between PECS Use Duration and Communication Improvement

The duration of PECS usage is often correlated with the level of improvement in communication skills. Several studies, including those by Charlop-Christy et al. (2002), have demonstrated that longer durations of PECS use lead to more substantial improvements in both receptive and expressive communication. This is consistent with the findings of Bondy and Frost (1994), who emphasized that sustained use of PECS enables children with autism to internalize the communication system, which leads to more functional and consistent communication skills. In the Pakistani context, speech therapists have reported that children who use PECS for extended periods (more than 6 months) tend to show more notable progress, particularly in initiating communication (Rashid et al., 2017). However, the rate of improvement varies across children, depending on factors such as the child's level of autism, the involvement of caregivers, and the consistency of PECS implementation. Therefore, while duration is an important factor, it is not the sole determinant of success.

Effectiveness of PECS in Different Settings (Clinical, Home, School)

The effectiveness of PECS is also influenced by the setting in which it is implemented. In clinical settings, where trained professionals and structured environments are available, PECS tends to be more effective (Tincani et al., 2006). Similarly, school environments that offer specialized services for children with autism also see greater success with PECS use. However, the effectiveness diminishes in home settings, especially when there is a lack of parental training and involvement (Bondy & Frost, 1994). In Pakistan, these setting-based differences have been observed, with clinical settings showing the highest success rates, followed by school settings, and home settings exhibiting the lowest effectiveness due to inconsistent application (Rashid et al., 2017). While PECS has demonstrated effectiveness across different settings, the consistency and quality of its application in home and school settings are critical factors in determining its overall success. Speech therapists often report that parents in clinical settings or specialized schools are more involved and motivated to learn the system, resulting in better outcomes for children.

Method and Material

This study adopted a mixed-methods research approach using a descriptive study design to evaluate the effectiveness of the Picture Exchange Communication System (PECS) in enhancing communication skills among children with autism in Lahore, Pakistan. The study population comprised speech therapists working with children with autism in clinical, school, and home-based settings in Lahore. Participants were selected through random sampling to ensure a diverse and representative sample, and a total of 53 speech therapists participated in the study. Data were collected using a structured questionnaire consisting of both closed-ended and open-ended questions. Quantitative data were analyzed using descriptive statistics to assess the perceived effectiveness of PECS and the relationship between the duration of its use and improvements in communication. Qualitative data obtained from open-ended responses were analyzed using thematic analysis to explore Integrated Factors Influencing PECS Implementation and Effectiveness. Ethical considerations were strictly observed, with informed consent obtained from all participants before data collection. Participants were assured of confidentiality and anonymity, and all data were used solely for academic research purposes.

Table 1: Demographic information of Respondents (N = 53)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	25–30	14	26.4
	31–40	21	39.6
	41–50	12	22.6
	51 and above	6	11.3
Gender	Male	17	32.1
	Female	36	67.9
Years of Experience	1–5 years	18	34.0
	6–10 years	16	30.2
	11–15 years	11	20.8
	16 years +	8	15.1
Primary Work Setting	Clinical	24	45.3
	School	17	32.1
	Home-based	8	15.1
	Other	4	7.5

The demographic profile of the respondents (N = 53) indicates that the majority of speech therapists were aged between 31–40 years (39.6%), followed by those aged 25–30 years (26.4%). Female participants constituted a higher proportion of the sample (67.9%) compared to males (32.1%). Regarding professional experience, most respondents had 1–5 years of experience (34.0%), while 30.2% reported 6–10 years of experience. In terms of primary work setting, nearly half of the participants were working in clinical settings (45.3%), followed by school-based settings (32.1%), with fewer respondents providing services in home-based or other settings.

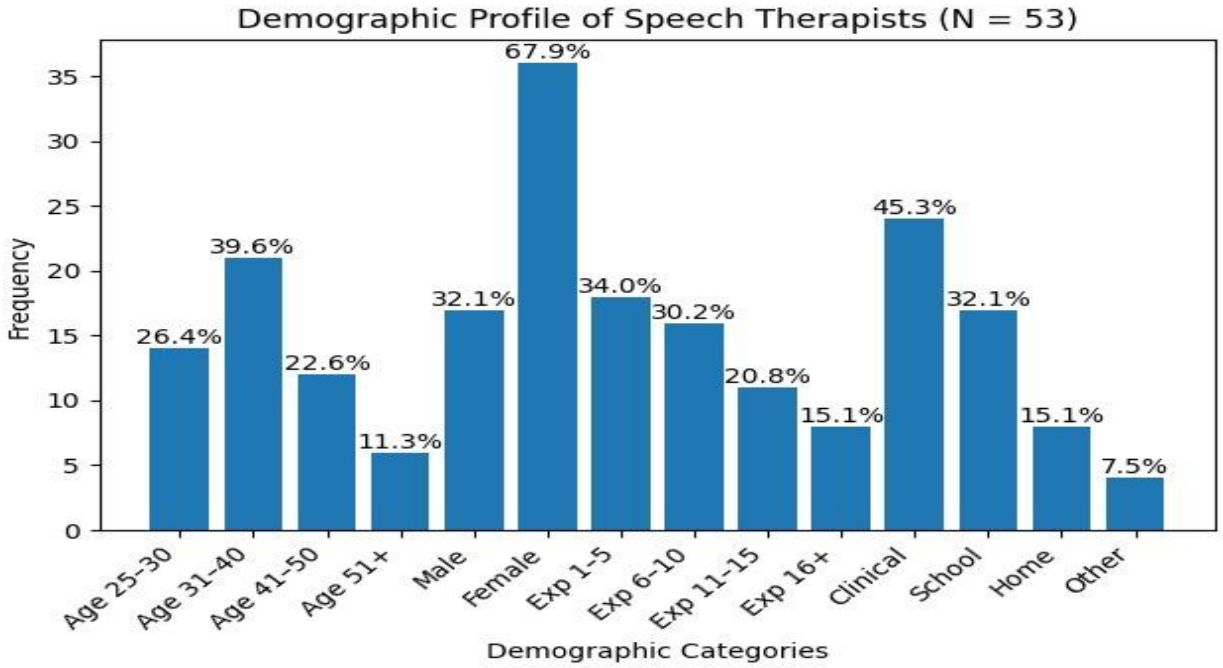

Table 2: Descriptive Statistics of Speech Therapists' Perceptions of PECS Effectiveness in Enhancing Communication Skills in Children with Autism (N = 53)

Item / Statement	Mean	Std. Dev.
Overall effectiveness of PECS in improving communication skills	4.23	0.71
PECS improves expressive language skills	4.36	0.65
PECS improves receptive language skills	4.05	0.79
PECS enhances social interaction abilities	3.92	0.84
PECS contributes to reduction of challenging behaviors	3.78	0.90
Communication improvements observed soon after PECS implementation	3.97	0.82
Expressive language shows the greatest improvement with PECS	4.29	0.70
Observable behavioral improvement after PECS use	4.12	0.77
Longer duration of PECS use leads to better communication outcomes	4.18	0.76

Item / Statement	Mean	Std. Dev.
Effectiveness of PECS across different implementation settings	4.08	0.81
PECS is equally effective across clinical, school, and home settings	3.89	0.88

The results presented in Table 2 indicate that speech therapists generally held positive perceptions regarding the effectiveness of the Picture Exchange Communication System (PECS) in enhancing communication skills among children with autism. The overall effectiveness of PECS received a high mean score (M = 4.23, SD = 0.71), suggesting strong agreement among respondents about its usefulness. PECS was perceived as particularly effective in improving expressive language skills (M = 4.36, SD = 0.65), followed by receptive language skills (M = 4.05, SD = 0.79). Therapists also reported favorable perceptions of PECS in enhancing social interaction (M = 3.92, SD = 0.84) and reducing challenging behaviors (M = 3.78, SD = 0.90). Additionally, respondents agreed that communication improvements were observed relatively soon after implementation (M = 3.97, SD = 0.82) and that longer duration of PECS use led to better communication outcomes (M = 4.18, SD = 0.76). Overall, the findings suggest that PECS is viewed as an effective communication intervention across different settings, although slightly lower agreement was observed regarding its equal effectiveness in clinical, school, and home environments (M = 3.89, SD = 0.88).

Results and Discussion

Concerning speech therapists' perceptions of the effectiveness of the Picture Exchange Communication System (PECS) in enhancing communication skills among children with autism in Lahore, the findings of the study revealed a generally strong and positive appraisal of PECS as a communication intervention. Most participants expressed agreement that PECS plays a critical role in enabling children with autism to communicate their basic needs and preferences, particularly for those with limited or absent verbal abilities. Speech therapists acknowledged that PECS facilitates functional communication and provides children with an alternative means of expression, which in turn supports their engagement with caregivers, peers, and educators. Participants reported that PECS encourages communication initiation and reduces communication-related frustration. As one participant stated, "PECS allows children to communicate independently and reduces their reliance on non-functional behaviours."

Another therapist similarly remarked, "For many non-verbal children, PECS becomes the first effective way to express their needs, which significantly improves their communication."

These findings align with previous research indicating that augmentative and alternative communication systems enhance functional communication and promote intentional interaction in children with autism (Ganz et al., 2012).

In addition to improvements in communication, speech therapists reported noticeable positive changes in social interaction and behavioural regulation following PECS implementation. Participants observed that children became more engaged in social exchanges and demonstrated reduced levels of frustration-related behaviours such as tantrums, aggression, and withdrawal. Therapists emphasized that improved communication through PECS contributed to better emotional regulation and behavioural outcomes. One participant explained, "When children are able to express themselves using PECS, their behavior improves because their needs are

understood." Another participant reinforced this view, stating, "There is a clear link between improved communication and reduced challenging behaviours once PECS is introduced."
This finding supports existing evidence suggesting that communication interventions can significantly reduce problem behaviours by addressing unmet communicative needs in children with autism (Carr & Durand, 1985; Schlosser & Wendt, 2008).

Despite the overall positive perceptions of PECS, participants identified several challenges that hinder its effective implementation. A prominent concern raised by speech therapists was the lack of formal training and professional development opportunities related to PECS. Many participants reported that they relied on informal learning or limited workshops, which affected their confidence and consistency in using the system. One therapist noted, "There is a lack of structured training for PECS, and most therapists learn through practice rather than formal instruction."
Another participant echoed this concern, stating, "Without proper training, it becomes difficult to implement PECS systematically and effectively."

These findings are consistent with earlier research highlighting that inadequate professional training can compromise the fidelity and effectiveness of communication interventions (Kent-Walsh & McNaughton, 2005). Parental involvement and consistency across settings also emerged as critical factors influencing the effectiveness of PECS. Speech therapists frequently reported that children showed better progress when PECS was used consistently across clinical, school, and home environments. Conversely, limited parental understanding and inconsistent use of PECS at home were identified as major barriers to sustained improvement. One participant explained, "Progress is much faster when parents actively use PECS at home, but many parents are not fully aware of its importance."

Another participant similarly stated, "When PECS is only used during therapy sessions and not reinforced at home or school, the child's progress is limited."
These findings highlight the importance of collaborative implementation and are supported by research emphasizing caregiver involvement as a key determinant of successful AAC outcomes (Romski et al., 2010).

Regarding the assessment of PECS effectiveness over time, speech therapists described using continuous observation and goal-based evaluation to monitor progress. Participants reported assessing improvements in communication initiation, frequency of picture exchanges, and reductions in behavioral difficulties as indicators of success. One therapist noted, "We regularly monitor how often the child initiates communication and whether prompts are reduced over time."
Another participant added, "Setting short-term goals helps us evaluate whether PECS is effective and whether adjustments are needed."

This approach reflects best practices in AAC intervention, where ongoing assessment and individualized goal-setting are considered essential for measuring intervention effectiveness (Beukelman & Light, 2020). In terms of implementation settings, participants generally agreed that PECS was most effective when applied in structured environments with trained professionals, such as clinical and school settings. However, therapists emphasized that the effectiveness of PECS across all settings depended largely on consistency, environmental structure, and stakeholder involvement. One participant remarked, "PECS works best in settings where everyone is trained and committed to using it consistently."

This finding is consistent with previous studies indicating that contextual support and environmental consistency significantly influence the success of communication interventions (Brady et al., 2016).
Speech therapists offered several recommendations to enhance the use and effectiveness of PECS in Pakistan. Participants emphasized the need for standardized training programs, increased awareness among parents and educators, development of culturally appropriate PECS materials, and stronger institutional and policy-level support. One participant suggested, "There should be formal training and certification programs for PECS to improve its proper use."

Another therapist highlighted the need for broader awareness, stating, "Parents and schools need more awareness so that PECS can be implemented effectively beyond therapy sessions."

The findings demonstrate that speech therapists in Lahore perceive PECS as a highly effective intervention for enhancing communication skills in children with autism. However, its successful implementation is influenced by challenges related to training, parental involvement, and consistency across settings. The results reveal a clear gap between the recognized benefits of PECS and the systemic support required for its optimal application. Addressing this gap through targeted professional training, collaborative practices, and institutional support is essential for maximizing the impact of PECS, a conclusion that aligns with international evidence on effective AAC implementation (Beukelman & Light, 2020; Ganz et al., 2012).

Summary

This study examined the effectiveness of the Picture Exchange Communication System (PECS) in enhancing communication skills among children with autism from the perspective of speech therapists in Lahore, Pakistan. Using a quantitative descriptive design supported by qualitative insights, data were collected from 53 speech therapists working in clinical, school, and home-based settings. The findings indicated that PECS is widely perceived as an effective communication intervention, particularly in improving expressive and receptive language skills, enhancing social interaction, and reducing challenging behaviors. Speech therapists reported that communication improvements were often observed within a relatively short period and were more pronounced with longer durations of PECS use. Qualitative findings further highlighted that PECS supports functional communication and emotional regulation but its effectiveness is influenced by factors such as professional training, parental involvement, and consistency across settings. The study concludes that while PECS is a valuable intervention for children with autism in Pakistan, strengthening training opportunities, increasing awareness, and enhancing institutional support are essential to maximize its impact.

Recommendations

1- Structured and standardized training programs on the Picture Exchange Communication System (PECS) should be introduced for speech therapists, special educators, and related professionals to ensure consistent and effective implementation.
2- Parental awareness and involvement should be enhanced through regular counseling and practical training sessions so that PECS can be used consistently at home alongside clinical and school settings.
3- Collaboration among speech therapists, teachers, and caregivers should be strengthened to promote a multidisciplinary approach and ensure uniform application of PECS across different environments.

4- Culturally appropriate and cost-effective PECS materials should be developed in local languages to improve accessibility, particularly in low-resource and community-based settings.
5- Policymakers and educational authorities should incorporate PECS and other augmentatives and alternative communication strategies into national special education frameworks, supported by clear guidelines, resources, and institutional backing

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