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Using the Picture Exchange Communication System with Children with ASD: Educational Professionals' Experience and Perspectives

Mohammed Buobaid*
King Faisal University
Eastern Province, Al-Ahsa

Abstract. Educational professionals (EPs) are expected to be knowledgeable about the use of the Picture Exchange Communication System (PECS). This study aims to explain the perspectives and experiences of EPs regarding their familiarity with and understanding of PECS, as well as the barriers to successful PECS usage. This study uses a qualitative descriptive approach to investigate PECS usage in Saudi governmental educational institutions serving children with autism spectrum disorders (ASD). In-person semi-structured interviews were conducted with 11 EPs. The inductive thematic analysis of the interview extracts reveals that EPs have limited knowledge of PECS, a lack of understanding of its implementation procedures, and insufficient training. Barriers to the successful implementation of PECS were also revealed, including a shortage of assistant teachers, low parental awareness, and limited parental collaboration. EPs expressed negativity regarding the availability of PECS tools and highlighted a need for resources. The findings suggest that there are areas for improvement in terms of PECS practices in schools and identify several barriers—organization-related, school-related, family-related, and child-related—that should be taken into consideration when implementing PECS with children with ASD. Based on the qualitative results, this study provides suggestions for further research as well as implications for practice. Barriers to the use and implementation of PECS are identified. The results will be helpful for schools regarding the provision of the necessary tools and training for PECS application as well as for policy makers who need to consider employing assistant teachers to assist EPs with the development and implementation of PECS.

Keywords: Picture Exchange Communication System; children; ASD; educational professionals

*Corresponding author: Mohammed Buobaid; *mbuobaid@kfu.edu.sa*

1. Introduction

ASD is a complex neurodevelopmental disorder characterized by persistent deficits in social communication and interaction, as well as repetitive patterns of behaviors and activities (Haney et al., 2018). A recent global increase in ASD prevalence among children has led to an increased interest in providing appropriate services for those who have been diagnosed (Hasan, 2020). According to estimations, one-third of children diagnosed with ASD have limited or no oral communication, which necessitates the provision of alternative sources to develop their language and communicative skills (Klin & Jones, 2018). A variety of augmentative and alternative communication modes (AAC) have been established to assist children with ASD in acquiring functional communication skills (De Bortoli et al., 2014), some of which include voice output communication aids (Sankardas & Rajanahally, 2017), PECS (Simeoli et al., 2024), and manual signing (Frolli et al., 2022).

Originally developed by Bondy and Frost (1994), PECS is a picture-based, structured training system that is based on the principles of applied behavior analysis. Many professionals use this system extensively with children exhibiting complex communication needs or language deficiencies with the aim of enhancing their social interaction and functional communication skills (Martocchio & Rosales, 2016). Through this easily implemented method, children intuitively learn to use the PECS board to form sentences by selecting and exchanging picture cards with an adult partner to request desired objects or activities (Koudys et al., 2022). The PECS system involves exchanging a picture of the desired item with a communication partner, who instantly reinforces the behavior by presenting the desired object. Thus, the process gradually trains the child to naturally request their preferred object (Chua & Poom, 2018).

Rooted in such principles of behaviorism as differential reinforcement and stimulation techniques, PECS emphasizes the interaction between individuals and their environment (stimuli). Moreover, it demonstrates that repetition of a particular behavior depends on the reward or reinforcement obtained (Bondy & Frost, 2012). PECS involves six sequential teaching phases (Zohoorian et al., 2021), the first of which involves training students to initiate and request a desired item, before progressing toward teaching more advanced communicative skills (Koudys et al., 2022). An overview of each PECS phase is outlined in Table 1 below.

Table 1: Phases of PECS

Phase	What is taught	Description
1	Requesting through picture exchange	Students are taught how to exchange a single picture for a corresponding real object or activity.
2	Persistence in initiating communication	Students are taught the generalization of the new learned skill across distance and communication partners. The number of pictures is increased, but students still utilize a single picture at a time.

3	Discrimination of pictures	Students are taught to choose from multiple pictures in the PECS book.
4	Sentence structure	Students are taught to construct sentences by combining two PECS pictures, e.g. "I want books."
5	Answering a direct question	Students are encouraged to respond to the question, "What do you want?"
6	Commenting	Students are taught to initiate speech by answering simple questions, such as "What do you hear?", by choosing the card representing the item and combining it with "I hear." Gradually, this phase develops to a more advanced dialogue.

2. Theoretical Review

Numerous reviews have previously suggested that PECS aids children with ASD in acquiring and improving spoken language and communicative skills (Bishop et al., 2019; White et al., 2021; Forbes et al., 2024; Paris et al., 2024). Furthermore, several studies have confirmed the effectiveness of PECS for children with ASD in areas such as speech imitation and language development (Aftab et al., 2023; Greenberg, 2014; Alotaibi, 2023), increased initiation of communication and social interactions (Alsayedhassan et al., 2016; White et al., 2024), enhanced joint attention and cooperative play (Lerna et al., 2014), and reduced problematic behavior (Hu & Lee, 2019).

Given the positive outcomes for children with ASD who have been trained to use the PECS technique (e.g. Arana et al., 2024; Zohoorian et al., 2021; Santos et al., 2021), educational professionals (EPs) have frequently employed the PECS strategy to boost the social and functional communication skills of children with ASD (Chua & Poon, 2018). However, limited research has yet explored EPs' familiarity with, and understanding of, PECS use with children with ASD. In the only study on this topic, by Alsayedhassan et al. (2021), 120 participants in the United States were surveyed, with the aim of exploring the perspectives and experiences of teachers and therapists with regard to their understanding and knowledge of PECS, the benefits and importance of its use, and barriers to using PECS with children with ASD. The findings of this study revealed that the participants were aware of the importance of PECS and its ease of use and reported many gains from using PECS with children with ASD, including improved functional communicative and daily life skills. However, participants noted that there were barriers to using PECS, including limited training opportunities, extensive training time, and limited choices of vocabulary within the communication book.

As a form of AAC, PECS necessitates training the communicator (i.e. learner) and the adult communicative partner (Light & McNaughton, 2015). Indeed, the success of PECS depends on the quality of training offered to implementers (Koudys et al., 2022), with proper training positively affecting the outcomes of the PECS intervention (McCoy & McNaughton, 2019). Snapshot training (e.g. one-day

sessions) is deemed ineffective in training professionals who work with children with ASD and other developmental disabilities (Koudys et al., 2022).

Koudys et al. (2022) used a pre-post group experimental design with 22 children and young people with ASD in Canada to investigate the nature of using PECS with children with ASD through the use of multiple sources of data gathering. The findings of their study showed that the participants utilized the PECS intervention in multiple environments and required many reinforcing objects. Additionally, parents reported that the use of PECS for their children had been generalized to the home environment. The findings of this study showed that teachers' ability to adequately implement the PECS criteria and the quality of its implementation significantly improved after receiving PECS training. Therefore, the findings indicate that there is a need to improve training for teachers, as brief training sessions, such as one-day workshops, are ineffective for implementers working with children with ASD or developmental disorders in community settings.

Joginder Singh et al. (2022) interviewed 11 speech and language pathologists in Malasia to gain their perspectives on their experiences and the benefits of a two-week AAC training program they had undertaken. Reportedly, the participants of this study had acquired a rounded picture of the role of speech and language pathologists in AAC and had increased in confidence regarding the implementation of AAC. Thus, the findings of this study suggest an urgent need for communicative partners to undergo training related to AAC on a regular basis.

In the UK, May et al. (2024) surveyed 283 implementers of PECS working with children with ASD to explore their knowledge and attitudes toward PECS, adherence to PECS, training and support needs pertaining to PECS, and barriers to the use of PECS. According to the findings, the participants' knowledge and understanding of PECS varied, and the conclusion was that formal training leads to better knowledge and more accurate implementation of PECS. In addition, the participating educators reported a number of barriers, including the unavailability of resources, the time needed to apply PECS, and educators' limited knowledge and understanding of PECS.

Aldabas (2022) surveyed 869 special education teachers in Saudi Arabia to explore their views on the optimal training for AAC. Most participants reported a need for a high level of training on AAC, and a smaller proportion indicated that the training they had received was limited to a few lectures or a single visit to a specialized center. These findings highlight an urgent need to improve training for teachers by providing more practical, consistent training in their local areas. In a similar study, Chua and Gorgon (2019) conducted a cross-sectional study of 152 Filipino speech and language pathologists to determine their perceived level of competence before and after undertaking an AAC training program. Before the AAC program, more than 50% of participants reported a lack of competence and knowledge about AAC. Almost 80% felt that this deficit was a barrier to using the system with their clients and wanted additional training opportunities to increase their competence and confidence in using ACC.

The perceptions of communication partners in AAC interventions represent a vital source of information. For example, their opinions of a particular AAC intervention can help promote easier implementation and can foster students' communication and interactions (McLay et al., 2017). Despite the widespread implementation of the PECS intervention and numerous literature reviews and studies on its effectiveness (Lerna et al., 2014; Chua & Poon, 2018; Forbes et al., 2024), few studies have yet explored the perspectives of professionals on using PECS with children with ASD (Alsayedhassan et al. 2021). Instead, professional opinion has generally been sought with regard to AAC rather than PECS (Aldabas, 2022; Chua & Gorgon, 2019). To date, only one study has been found to address this gap (Alsayedhassan et al., 2021), demonstrating an urgent need for further research in this particular area of interest. Similarly, a recent systematic literature review identified 49 studies on the topic of facilitators and barriers to the implementation of PECS and found that no qualitative research had been published investigating implementers' views and perspectives on this topic (Paris et al., 2024).

Therefore, the current research aims to explore teachers' familiarity and understanding of PECS by assessing their related skills and training, learning resources and implementation protocols, and barriers to implementing PECS with children with ASD. Therefore, this study aims to investigate the following variables:

(1) The level of knowledge and understanding of PECS, as perceived by EPs.
(2) The skills and training possessed by EPs and those needed for effective PECS intervention.
(3) The guidelines and protocols followed by practitioners in the implementation of PECS intervention with children with ASD.
(4) Barriers to implementation: the barriers encountered in the use and implementation of PECS intervention with children with ASD.

3. Method

This part of the paper describes the method used in this research, including research design, participants and data collection, and data analysis procedures.

Research Design

In order to comprehensively explore and explain EPs' familiarity with, and understanding of, the use of PECS with children with ASD, this study followed a qualitative descriptive approach. The researcher employed an interview method to gather the required data. According to Galvin (2015), interviews are effective for collecting rich and detailed data through the exploration of participants' views and experiences.

Participants and Data Collection

This study used a purposive sampling approach, commonly used in qualitative research (Patton, 2014), whereby schools, subjects, or activities are intentionally selected to provide answers to particular research questions (Lichtman, 2023). Participants for this study were drawn from among EPs at various ASD governmental institutions and schools in a metropolitan governorate of the eastern province of Saudi Arabia. School leaders chose the participants from each pool.

The following inclusion criteria were applied in recruiting eligible participants for this study: EPs should (a) currently work with children with ASD; (b) possess prior knowledge and experience of using PECS; and (c) be employed in the governmental sector. A total of 11 eligible EPs agreed to participate in this study. The interviewees (n=11) were males who had worked in governmental institutions with students aged 5-15 with ASD and intellectual disabilities. All participants had worked with students at the elementary school level. Four interviewees had a bachelor's degree, two held a master's degree, and five had a higher diploma. The demographic information of the interviewees is presented in Table 2.

Table 2: Demographic information of the interviewees

Participant code	Age	Role	Experience	Education level
FA	31	AT	9 years	Higher diploma
KJ	25	AT	5 years	Higher diploma
MS	37	AT	12 years	Bachelor
AD	39	AT	13 years	Bachelor
MS2	37	AT	12 years	Bachelor
AL	31	AT	9 years	Higher diploma
AH	29	AT	5 years	Higher diploma
HG	38	EP	15 years	Master
AB	37	AT	15 years	Master
KH	35	AT	9 years	Higher diploma
HB	37	RS + AT	12 years	Bachelor

Note. AT= autism teacher; EP= education psychologist; RS= residential supervisor.

In June and July 2023, the author conducted in-person semi-structured interviews with 11 EPs. All of the interviews took place at the interviewees' workplaces. The researcher collected data for this qualitative study from professionals who

worked at various ASD institutions, including a residential supervisor, an educational psychologist, and autism teachers. The author conducted the study in Al-Ahsa, a metropolitan governorate in the eastern province of Saudi Arabia. The interviews covered four main components, exploring (1) EP's knowledge and understanding of PECS; (2) EP's skills and training; (3) the learning resources and implementation protocols; and (4) the barriers to using PECS. (For the interview schedule, see Appendix 1.) Prior to the study, the participants received an information sheet and a consent form, ensuring that they are well informed about the study.

Each interview lasted between 20 and 35 minutes and was audio-taped, with the participants' consent, for subsequent data analysis. Interviewees were sent transcripts via WhatsApp for validation (Torrance, 2012) and the translation and analysis of the transcripts did not begin until the participants' approval was obtained.

Data Analysis

For this study, the researcher employed interviews as a qualitative tool. Using an audio-recording device, each interview was recorded and then transcribed in Arabic using a word processing document. Subsequently, the researcher translated the Arabic transcripts into English to facilitate the processes of coding, analysis, and reporting in the presentation language. As the researcher is bilingual in the two languages and knowledgeable about the participants' situations, the interview transcripts could be translated with the necessary contextual understanding. However, in order to further ensure the accuracy of the translations, the researcher employed an Arabic-English bilingual speaker to compare the Arabic and English transcripts, with no major issues between the two versions being found.

In preparation for the coding process, every interview was designated with two letters based on the interviewee's initials (e.g. FA, MS, KJ). To ensure confidentiality, the tape recordings and the files of extracts were password-protected on the researcher's university office computer. Dunwoodie et al. (2023) pointed out the necessity for collecting comprehensive data on interview participants to facilitate the study's transferability to different contexts or samples. With this in mind, the author created a detailed demographic information table, presented above in Table 1.

To ensure total immersion in each interview, the researcher began the analysis process (i.e. transcription) immediately after completing each interview. This procedure also helped the researcher to identify any prominent issues that should be discussed in later interviews. In order to deeply and comprehensively analyze the qualitative interview data obtained from the EPs, the researcher used Braun et al.'s (2023) multi-staged thematic approach. Clarke and Braun (2023) advised that it is good practice for qualitative researchers utilizing a thematic approach to familiarize themselves with the data by reading the transcriptions several times.

Following this advice, the author of the present study read the entire translated data three times to identify relevant patterns and codes.

Using manual coding, the researcher was able to confidently identify key data from the interviews and avoid missing any information. The author used a word processing document to highlight the texts in different colors, facilitating the search for relevant codes in the extracts. Furthermore, the researcher used the "track changes" feature in Word to copy relevant codes and annotations. A comparison was then made between the identified codes and the coded data to ensure that they reflected each other. Coherent and clustered patterns of extracts were colored identically to begin thematizing. This systematic and rigorous process led to the generation of four potential themes. To assure the anonymity of the interviewees, the researcher withheld their names and any identifying information pertaining to their institutions.

4. Results

This section presents the findings organized around four interrelated themes that were derived from the EPs' reported experiences and perspectives on using PECS with children with ASD. Following Lichtman's (2023) advice to utilize direct quotations from interviewees to enhance the trustworthiness of the interview findings, the author of this study incorporated exact quotations from the EPs into the thematic analysis of the data. Braun et al.'s (2023) multi-staged approach was applied to the thematic analysis to generate four overarching themes. The classification and presentation of these themes and their sub-themes were based on differences and similarities and are presented in the figure below.

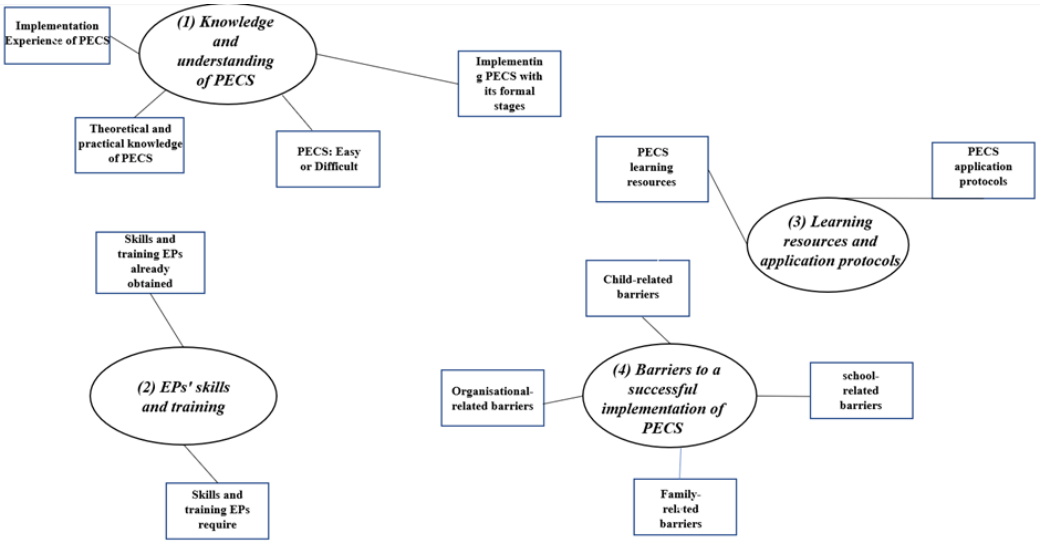

Figure 1: Mapping of the four identified themes

Theme One: Knowledge and Understanding of PECS

This theme illustrates EPs' perceptions regarding their knowledge and understanding of the PECS program in terms of their implementation experience,

theoretical and practical knowledge, perception of difficulty, and implementation stages.

Implementation Experience of PECS

Most interviewees admitted to feelings of incompetence in using PECS for teaching social communication and interaction skills, expressing dissatisfaction with their limited knowledge. For instance, FA expressed his dissatisfaction: *"To be honest, I knew [about] PECS for nine years, but I did not use it with my students, as I did not have the proper training and confidence in its application due to possessing a limited knowledge of this program."*

Theoretical and Practical Knowledge of PECS

EPs expressed general dissatisfaction with their level of theoretical and practical knowledge of PECS. KJ indicated, "We have little expertise and theoretical knowledge relating to PECS… our implementation is very limited and in a narrow scope. We only applied the first stage of PECS and do not have the confidence to implement the remaining stages."

However, HG expressed confidence regarding his current PECS experience, stating, "I claim that I have the confidence and the required theoretical and practical knowledge about PECS…of course, I have a little doubt about what I am doing, but I am gradually improving myself in a positive direction."

PECS: Easy or Difficult?

Most EPs agreed that it was easy to understand, implement, and use the PECS intervention with children with ASD. MS confirmed, "This program is very fun and easy to understand and implement, but it needs to be frequently practiced in order to master it as well as requiring time and the precise selection of students' preferences."

Implementing PECS with its Formal Stages

Most EPs revealed that they did not usually follow current protocols but implemented PECS in a simplified way. AD mentioned, "We used to hang a large board on the wall that contained many pictures, and if a student wanted something, he would take the desired picture and bring it to me, so I would know what he wants." AL added, "I have been using PECS for six years, but in a simplified way that does not adhere to the current protocols that include six stages. I usually place pictures on a side table in the classroom, and then the student chooses the reinforcement he likes or the activity he wants to do."

Feedback from EPs regarding their experience, theoretical and practical knowledge, and formal implementation of PECS suggests the need for additional education and training workshops as a prerequisite for the successful use and implementation of PECS.

Theme Two: EPs' Skills and Training

This theme highlights the skills and training previously obtained by EPs, as well as the specific skills and training still required to confidently implement PECS with students with ASD.

Skills and Training Previously Obtained by EPs

While EPs valued the use of PECS with ASD students, most faced difficulties in implementing it due to a lack of specialized training. For instance, AD noted, *"We attended a day of PECS training at school, but unfortunately, the maximum benefit from this course was not obtained, as it was short and needed more practical components."*

Skills and Training Required by EPs

EPs frequently emphasized the importance of practical training coupled with theoretical training. MS2 asserted, *"We need more hands-on training on the basics of PECS…and a detailed mechanism of its application instead of gaining theoretical knowledge that is not helpful alone."*

In summary, a lack of both theoretical knowledge and practical training related to PECS appeared to be an issue for EPs, with most expressing frustration and asserting their need for more training.

Theme Three: Learning Resources and Application Protocols

This theme contains EPs' feedback on the PECS learning resources and protocols used when implementing PECS with students with ASD.

PECS Learning Resources

The participants cited various resources for learning about PECS, with YouTube being the primary source for most (n=9). Conversely, only two EPs mentioned searching the internet for information. HG stated, *"I read a lot of books and scientific articles…I also watched a lot of YouTube videos to learn and delve more deeply into PECS; we learn so much about PECS' practical elements from YouTube clips."* MS added, *"We learned a lot about PECS' use and implementation from discussions with experts who have excellent mastery of this intervention."* The PECS learning resources mentioned by EPs are presented in Table 3 below.

Table 3: PECS learning resources used by EPs

N	PECS learning resources	Participant code
1	YouTube	KJ, MS, AD, MS2, AL, AB, KH, HB, HG
2	Discussions with experts in PECS	FA, MS, MS2, AH
3	Reading books and articles	MS2, HG, HB
4	Internet searches	Al, HG

PECS Application Protocols

All EPs confirmed that they applied the protocols outlined by Bondy and Frost. HB reported, *"I try my best to apply the protocols that Bondy and Frost discussed in their book and other parts of the protocols taken from Bondy's pyramid approach, such as the Four-Step Error Correction technique, when implementing PECS...But I feel unconfident using these protocols due to the inadequate training I obtained related to PECS."*

Theme Four: Barriers to the Successful Implementation of PECS

This theme addresses the barriers reportedly facing EPs when implementing PECS with children with ASD. This theme involves four sub-themes:

Sub-Theme One: Organizational-Related Barriers

Assistant Teachers. One barrier mentioned in the interviews is the lack of assistant teachers in ASD institutions. For example, FA emphasized the need for assistants, saying, *"The correct and precise application of PECS protocols requires the presence of communication partners. This is extremely necessary in the process of physical stimulation…implementing the six stages is very difficult or may be impossible in their absence."*

Supervision by the Education Department and School. Among the organizational barriers mentioned by EPs is the limited supervision provided by their schools and the education department. AB reported, *"In the absence of a supervision role for the school and education administration over the teacher, we find that the teacher sometimes may not have the enthusiasm or motivation to utilize PECS, and therefore he may not consider the implementation of this program among the tasks that he has to do."*

Sub-Theme Two: Family-Related Barriers

Families' Awareness and Collaboration. Many of the participants expressed dissatisfaction with families' low awareness of the importance of PECS and their limited collaboration with schools. This was regarded as being a barrier to the successful implementation of PECS. AL said, *"The greatest obstacle we face as teachers in implementing PECS is that many families strongly refuse to use it with their children or collaborate in its implementation as they believe that PECS may impede their children's natural language development."*

Sub-Theme Three: Child-Related Barriers

Child Health. According to the EPs, another barrier to the optimal implementation of the PECS program is nonadherence to medication schedules. MS explained, *"Not giving medications as prescribed by the doctor, especially for hyperactive students, may lead to the child not sitting and never calming down. Thus, the teacher may encounter great difficulty in implementing PECS with this child and, as a result, children may not function well in the implementation stage."*

Severity of Disability. The level of disability was viewed by many EPs as being a barrier to implementing some stages of PECS. AH clarified, *"When using this program with children who are severely affected by a disorder or children with complex needs, we need to consider the difficulties we might face during the implementation phase.*

The first four stages of PECS can be implemented with most children; however, with some severe cases it may only be possible to reach the third stage at best."

Sub-Theme Four: School-Related Barriers

Availability of Resources. EPs expressed mostly negative perceptions about the availability of required resources, with the interview data indicating a lack of resources as being a limiting factor in the successful implementation of PECS. Several EPs discussed the issue and appeared to blame schools for not providing the necessary resources. AF noted, "*One obstacle is the lack of resources necessary for PECS implementation. Whether they are toys, pictures, or other reinforcers…sometimes pictures are not available or printed; we need a complete file of pictures which are updated periodically so that the teacher can implement the program without delay."*

Coordination of Reinforcers Identification. The participants suggested that preference assessments for children with ASD are usually conducted by teachers alone, without coordination or collaboration with school administrators or other EPs. AD explained, "*Preference identification relies entirely on the teacher. Yet, student advisors are supposed to participate in this through the collection of information about students' preferences and reinforcers at the start of each term…then the teacher can use this information to build the PECS program smoothly."*

5. Discussion

Many individuals on the autism spectrum have communication problems and poor social interaction, including delayed or absent speech, verbal and nonverbal language, and repetitive speech (American Psychiatric Association, 2013). In an effort to boost the social interaction and functional communication of students through the use of pictures (Martocchio & Rosales, 2016; Chua & Poon, 2018), EPs commonly use PECS, a picture-based strategy originally developed by Bondy and Frost (1994). The present study was motivated by a desire to investigate EPs' self-perceptions of their own knowledge and understanding of PECS, their prior and desired skills and training, learning resources used, implementation protocols followed, and barriers to the use and implementation of PECS. Using semi-structured interviews, this study collected comprehensive data from 11 EPs to gain answers to the proposed research questions, thus providing detailed and nuanced insights into this topic.

EPs' Experiences and Knowledge

The experiences reported by EPs in this study were inconsistent with previous findings in the existing literature. While other studies have reported on participants expressing confidence and general positivity toward the use of PECS with children with ASD (Alsayedhassan et al., 2021), the current study's participants reported inexperience in PECS use and limited knowledge and understanding of the strategy. Such findings highlight the scarcity of available training opportunities for EPs relating to PECS.

Most EPs in this study expressed dissatisfaction with their level of theoretical and practical knowledge of PECS. Participants reported having implemented the program only minimally, attributing this to their limited expertise and practical knowledge of PECS. This finding aligns with previous studies, in which

participating professionals reported a low level of competence in AAC due to very limited opportunities to train in the techniques (Chua & Gorgon, 2019; May et al., 2024). EPs' lack of theoretical and practical knowledge of PECS can be primarily explained by the scarcity of pre- and in-service training opportunities. This would also explain why many EPs admitted to implementing PECS in a simplified manner, as they are unable to follow current protocols. However, this finding is unsurprising; most EPs reported dissatisfaction with the training opportunities provided to them at the national or local level.

EPs' Skills and Training

Although adequate training is crucial for the effective implementation of PECS, the EPs interviewed in this study reported a lack of specialized training that enabled them to confidently use this program according to Bondy and Frost's current protocols. This finding is consistent with the wider literature, in which special education teachers reported having received insufficient training related to AAC systems (Aldabas, 2022). Similarly, participants in another study claimed to have received inadequate training related to AAC, viewing themselves as less experienced and competent in these systems (Chua & Gorgon, 2019). EPs in the present study frequently reported attending a one-day workshop or a single training session, which they deemed ineffective. This aligns with prior research indicating that brief training sessions, such as one-day workshops, are ineffective for professionals working with children with ASD or developmental disorders (Koudys et al., 2022). Indeed, EPs' comments on the scarcity of training within their schools and nationwide may underpin the difficulties they routinely encounter in implementing the PECS program.

Several EPs in this study mentioned the necessity for practical training on PECS. Specifically, they reported needing courses and workshops provided by qualified specialists that incorporate practical elements rather than theoretical lectures that are not beneficial. Other research supports this finding, highlighting that, rather than theoretical training, participants need additional, continuous training opportunities that involve more practical elements (Aldabas, 2022; May et al., 2024). This widely acknowledged lack of training emphasizes the need for creating practical training opportunities to equip EPs with the required knowledge and experience for best practices in delivering PECS interventions. In summary, the lack of theoretical knowledge and practical training related to PECS appears to be a prevalent issue for EPs, who need more training in developing and implementing the PECS strategy.

Learning Resources and Application Protocols

A promising finding was that the EPs in this study had utilized various sources to learn about PECS. They reported YouTube as being a main source of information, a choice which could be explained by its ease of use and appropriateness for learning practical implementation procedures. However, the EPs also mentioned reading books and scientific articles, having discussions with experts, and searching the internet to learn more about PECS. This finding is aligned with Chua and Gorgon's (2019) study, in which participants reported

using a variety of sources to learn and raise awareness of AAC systems, including reading journal articles, having discussions with experienced colleagues, and attending online webinars and seminars.

Nearly all of the EPs reported applying the protocols proposed by Bondy and Frost as well as Bondy's pyramid approach. The consistent application of these protocols indicates their widespread acceptance as evidence-based practices (May et al., 2024).

In summary, the interviews highlighted a lack of information available to Saudi EPs regarding the development and implementation of PECS. Additionally, the researcher spoke with many additional EPs in his social network who work with children with ASD, who confirmed the limited use of PECS in practice, primarily due to a lack of training for EPs.

Barriers to the Use and Implementation of PECS

During their interviews, the EPs identified the various challenges they face in the course of their work, asserting that these barriers may hinder successful PECS implementation with children with ASD.

According to many of the EPs in this study, a lack of assistant teachers in ASD institutions is another barrier to the successful implementation of PECS. The participants stressed the importance of having communication partners for PECS, emphasizing that their absence makes the six stages difficult or even impossible to implement. Furthermore, the EPs' frustration with the lack of assistant teachers is supported by the findings of other researchers, who have previously identified that opportunities for implementing PECS in the classroom are limited for children with ASD and that there is consequently a need for supporting adults or assistant teachers to increase the number of communicative partners available, thereby increasing the opportunities to provide PECS across various settings (Paris et al., 2024).

Furthermore, another barrier highlighted by EPs is the limited supervision provided by schools and education departments. This lack of support can be regarded as an explanation for the lack of motivation and productivity of many government employees. The participants expressed a desire for formal authorities, both external and internal, to observe and supervise their PECS sessions to ensure the success of the program. This finding was consistent with the findings from the wider literature, which indicate that supervision of implementation and support was found to be related to PECS protocol adherence, fidelity of implementation, and generally a facilitating factor in the success of PECS with children with ASD (Paris et al., 2024).

Negativity among families, their low awareness of the importance of PECS, and their limited collaboration with EPs were reported as being barriers to the successful implementation of PECS. Frustration with parental resistance, as reported by EPs in this study, aligns with the findings of other studies, which

reported that EPs were experiencing barriers to family involvement in AAC systems, such as negative perceptions and attitudes and parental resistance to using AAC with their children (Achmadi et al., 2015). Additionally, other research has shown that some families believe that using AAC may prevent normal speech development in their child (Joginder Singh et al., 2022).

Additionally, many EPs viewed students' disability level as a barrier to the implementation of certain phases of PECS. Specifically, they reported that when working with children with severe needs, it was not possible to go beyond phase 4. Similar findings have been reported in the previous literature; in particular, a study by Chua and Gorgon (2019) noted that an appropriate level of cognitive competence was viewed as a prerequisite for the proper and successful implementation of AAC systems.

With regard to the availability of resources, the perceptions shared by EPs were generally negative. Several EPs reported that PECS sessions were often hampered by a lack of available resources and asserted that it is vital for schools to provide these essential materials so that EPs can implement PECS smoothly and without delay. Consistent with the findings of this research, Paris et al. (2024) suggested that a lack of the relevant books, tools, software, and symbols needed for PECS represents a common barrier to the implementation of PECS with children with ASD. Furthermore, all of the EPs in this study shared that the selection of preferences and reinforcers is usually conducted individually by the classroom teacher, without any coordination or collaboration with school administrators or other EPs. However, the EPs expressed a keen desire for their schools to coordinate the process of selecting the reinforcers prior to starting PECS, thus reducing teacher workload and streamlining the PECS implementation process.

The interviews suggest that Saudi EPs feel inexperienced with PECS and acknowledge a perceived lack of information and knowledge with regard to PECS development and implementation. Hence, additional training opportunities—particularly practical sessions—are crucial to enable EPs to manage and implement PECS. Furthermore, the EPs expressed a need for schools to collaborate with parents, to provide them with opportunities to increase their awareness of PECS and to boost their acceptance of the program and its efficacy for their children. Providing parents with regular training and information at the beginning of each academic year could enhance parental knowledge and understanding of PECS.

Additionally, the EPs addressed various barriers to the use and implementation of PECS, such as a lack of teaching assistants, insufficient supervision, limited parental awareness and collaboration, the unavailability of resources, and difficulties in selecting preferences and reinforcers. Therefore, policymakers might consider employing teaching assistants to assist in the development and implementation of PECS. Schools might be advised to engage residential supervisors to collaborate with EPs in reinforcer identification. Another step that might be considered at the school level is to provide workshops and regular meetings for parents in order to provide training on PECS, raise awareness about

its importance, and request their collaboration with EPs. Lastly, school administrators might consider allocating a dedicated budget to ensure the provision of the materials and tools necessary for PECS.

6. Limitations and Future Directions

Although the present qualitative study offers valuable insights into using PECS with children with ASD from the perspectives of EPs, certain limitations should be addressed. First, the sample size is small (11 participants), resulting in a lack of confidence that the data reached theoretical saturation. A second limitation relates to the sample's diversity as the sample was predominantly comprised of teachers (n=9), while only one educational psychologist and one residential supervisor took part in this study. Using a more diverse sample may provide a more holistic picture pertaining to the experiences of EPs in using PECS with children on the autism spectrum. The third limitation relates to the recruitment method used to select participants for this study. Although the participating EPs were drawn from different institutions, selection bias could have influenced the selection process, as school leaders chose the participants. Finally, the translation of the interview transcripts also constitutes a limitation. Although the researcher took every measure to validate the translation process, the two languages used are diverse in grammar, sentence structure, and idiomatic expressions; thus, it cannot be guaranteed that the two transcript versions were completely identical.

The present study's findings suggest that some parents may reject using PECS with their children. Therefore, future research could explore parents' perceptions of using PECS with their children with ASD, providing insights into the reasons behind some parents' rejection. Additionally, as this study focused entirely on EPs working in the governmental sector, subsequent research could examine EPs working in both government and private sectors to compare their knowledge and understanding of PECS, the quality and quantity of training provided, and barriers to the successful use and implementation of PECS. Such research could provide invaluable insights into the differences between the work of EPs in different types of schools and institutions.

Finally, this study used a qualitative research method with a relatively small sample size. There is a need for future researchers to determine the extent to which the findings of the current study are applicable to the wider population. Therefore, the present findings could be regarded as a starting point for other researchers in developing a quantitative questionnaire that will provide findings that may be more widely applicable to the general population of Saudi EPs.

7. Conclusions

In conclusion, this study aimed to explore and explain the perspectives and experiences of EPs in regard to their familiarity with PECS, their understanding of it, and the sources they use to learn about it, as well as the barriers to successful PECS usage. EPs play a pivotal role in the successful use and implementation of the PECS program with children with ASD. Generally, the findings of this study suggest that EPs were dissatisfied with their level of knowledge and

understanding of PECS. The findings demonstrate that EPs' inexperience, limited knowledge, and inadequate understanding of PECS collectively indicate a need for continued PECS-related training. In particular, this study highlights the need for continuous training opportunities, provided by qualified specialists, that incorporate practical elements rather than theoretical lectures that are not beneficial. Furthermore, the findings highlight several barriers (organization-related, school-related, family-related, and child-related) that should be taken into consideration for improving the use and implementation of PECS. Specifically, the findings identify that the barriers to the use and implementation of PECS include a lack of assistant teachers, insufficient supervision, limited parental awareness and collaboration, unavailability of PECS tools, and difficulties in selecting preferences and reinforcers. Additionally, the study also outlines the sources that are frequently employed by EPs to learn about PECS and provides detailed information regarding the implementation protocols. It also provides recommendations for various sources that can be used to learn about PECS, such as YouTube, discussions with experts in PECS, reading books and articles, and navigating the internet. Improvements should be made in terms of the ways in which PECS is implemented, EPs are trained, and barriers to PECS implementation are dealt with, in order to increase PECS implementation. There remains a need for future research to confirm the study findings and investigate further aspects concerning PECS implementation.

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Appendix 1
Interview schedule

Interview segments	Interview variable statements (IVS) and guiding questions
Segment 1: Demographic information	**Can you tell me some information about you?** -Experience in teaching Age - -Role -Education level -Type of school (private or governmental)
Segment 2: Interview variable statements and questions	**IVS 1:** The level of knowledge and understanding of PECS as perceived by EPs. How long have you been utilizing PECS intervention with children with ASD? Do you think that you have sufficient knowledge and understanding of PECS?

	Do you feel confident when using PECS intervention with children with ASD? **IVS 2:** The skills and training possessed by EPs and those needed for effective PECS intervention. What skills and training have you already received pertaining to PECS intervention? What skills and training do you need to obtain regarding PECS intervention? **IVS 3:** The guidelines and protocols followed by EPs in the implementation of PECS intervention with children with ASD. Where do you go to learn about the use and application of PECS interventions (e.g. internet, books, other practitioners, workshops, other)? What guidelines and protocols do you frequently follow when applying the PECS intervention? What type of guidelines and protocols are needed/ are important in the application of PECS? **IVS 4:** Barriers to implementation: The barriers encountered in the use and implementation of PECS intervention with children with ASD. What do you think are the factors that hinder the successful implementation of PECS intervention with children with ASD?
Segment 3: Concluding the interview	Thank the interviewees for their participation.