

REVIEW

The feasibility of implementing autism intervention methods in formal education settings welcoming refugee and asylum-seeking children: A systematic review of the literature

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Abstract

Given the significant amount of time that refugee and asylum-seeking children (RASC) spend in schools, these institutions play an important role in their lives and represent an ideal environment in which to help them to adapt to their host society. The present study aimed to draw attention to the possibility of transferring intervention methods designed for children with ASD to formal education settings welcoming newly arrived RASC to support their adaptation to their new school environment. For this purpose, a systematic review was undertaken to assess the feasibility of implementing three specific ASD intervention methods (i.e., TEACCH, PECS, and PMI) in schools welcoming RASC. While the review did not reveal previous attempts to implement and evaluate ASD intervention methods with newcomer RASC, 21 records were uncovered providing preliminary evidence in support of this idea. Hypothesized strengths and limitations, as well as considerations about implementation, are discussed.

KEYWORDS

adaptation, autism, education, intervention programs, PECS, PMI, TEACCH, refugee children

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1 | INTRODUCTION

Children currently constitute over half of the world's 82.4 million displaced people (UN Refugee Agency, 2020). For children, forced migration can have long-lasting effects, often involving exposure to trauma (Cerna, 2019). Moreover, relocation can bring additional stressors as families negotiate their needs within foreign social structures, often with limited support (see Graham et al., 2016, for a review). Schools in host societies have the potential to offer significant opportunities for newcomer refugee and asylum-seeking children (hereinafter: RASC¹) such as connecting with their community, building relationships, and establishing a sense of normality as well as belonging in the new host society (Due & Riggs, 2016). Not only that, the significant role schools play for this population is increasingly being recognized as it is thought that the process of adaptation of RASC into a host society largely occurs in the educational institutions they attend (Horswood et al., 2019; Hyndman, 2011). Drawing from Berry's (1992) work on acculturation, adaptation within the context of forced migration may be understood as the sociocultural and psychological change that occurs when encountering a new culture which may be impacted by an individual's desire to adjust to or withdraw from the new culture. The adaptation of immigrant children and youth in general, and RASC in particular, in formal education settings has garnered much research attention internationally and is thought to affect school engagement, academic achievement, and psychological well-being (Berry et al., 2006; Garcia Coll & Marks, 2012). However, few school-based intervention programs are available to help RASC with this process and address their diverse needs (Cerna, 2019). Thus, this study conducted a systematic review of the literature to critically appraise the available evidence on the feasibility of the following idea: the potential of implementing programs, more precisely Autism Spectrum Disorder (ASD) intervention methods, in school environments welcoming newly arrived RASC to help them adapt to their new, formal education settings. It is of course entirely possible for RASC to be diagnosed with ASD and a systematic review of the literature by Abdullahi et al. (2018) even found that children of immigrant and refugee backgrounds from low- and middle-income countries had greater risks of a neurodevelopmental disorder, such as ASD, compared to their locally born peers. However, in the present review, RASC without ASD and children with ASD will be considered as two separate groups. In addition, ASD was the focus of this particular literature review over other psychiatric disorders for two reasons. The first reason pertains to the specific socialization (e.g., RASC's adaptation to a new school environment in a host society) and educational needs (e.g., children with ASD's needs for support in the areas of social communication and social interactions) of RASC and children with ASD which will be further discussed in the next sections. The second reason is the wide array of evidence-based ASD interventions both in the literature and implemented in institutions that addresses, in part, the needs for educational supports shared by RASC and children with ASD. The theoretical rationale underlying this study is guided by Berry's (1992) theory of adaptation to a new culture and Cerna's (2019) framework of refugee children's educational integration needs. Both frameworks will be presented next alongside background research on the adaptation of newcomer RASC in education settings followed by the rationale behind an integrated perspective on RASC and children with ASD underlying this study.

1.1 | Adaptation of newcomer RASC in formal education settings in a host society

Formal education encompasses all forms of education normally delivered by trained teachers in a systematic, intentional way within a school (Patrick, 2010). RASC who can enter

formal education upon arriving in a host society and who must then learn to navigate their new school environment may be faced with several challenges to adaptation (Reynolds & Bacon, 2018). First, newly enrolled RASC may bring with them not only curiosity and excitement about their new world, but also traumatic experiences such as PTSD (with reported prevalence rates from 10% to 25% in OECD countries) and, consequently, an increased risk for psychological disturbances (Fazel, 2018; Fazel et al., 2012). Second, newcomer RASC often carry diverse educational experiences which can put them at risk for school failure (Graham et al., 2016; Miller et al., 2017). Some may need to overcome limited education because of frequent interruptions which may be small (a few weeks of missed school) or large (many years without schooling) (Dryden-Peterson, 2016). Others may be unfamiliar with Western pedagogical approaches such as teacher-centered learning (Dryden-Peterson, 2016). Third, the process of RASC entering formal education in a host society can also be understood as a transition process. For native children, entering a new school environment is experienced as a transition which may cause tension and anxiety (Broström, 2002). RASC on the other hand must negotiate not only this transition but also multiple other transitions connecting the home culture with the culture of the new school environment, including transitions in family, friendships, community, language, culture, and identity (Graham et al., 2016). Dachyshyn and Kirova (2008) argue that RASC in particular experience transitions every day as they travel from home to school, navigating between two very different environments, languages, and cultures that may be experienced as parallels. As a result, they may struggle to balance their identity between the home and host culture which can hinder adaptation (Cerna, 2019). Because of these multiple transitions, schools may become a site of marginalization for RASC, affecting their identity formation, sense of belonging, and, in turn, educational outcomes (Pritchard et al., 2019). Finally, RASC must attempt to negotiate their entry into these social structures, carrying their cultural wealth, their unique cultural and linguistic background (Yosso, 2005). However, according to Berry (1992), post-migration acculturation, the dynamic process of learning to relate to others from different cultures and navigate within a new social and cultural context, can be affected by acculturation stress, the stress that individuals experience as they face a cultural conflict between their native and host society. It is argued that, for RASC, difficulties adjusting to a new language, values, social/behavioral norms, and possible experiences of bullying and discrimination can result in acculturation stress which can cause identity confusion, familial conflict as well as problems at school (Berry, 1992; d'Abreu et al., 2019). Taken together, these multiple barriers might explain why RASC entering formal education in a host society are more likely to receive poorer grades (Dryden-Peterson, 2016) and drop out at higher rates than their peers (Reynolds & Bacon, 2018; UNHCR, 2016). Yet, the adaptation of newcomer RASC to their school environment has been found to have positive effects not only on RASC's academic outcomes but also their social and emotional well-being (Cerna, 2019). RASC are often resilient, despite prior hardship, and providing stable school supports can enhance resilience but also academic and social achievement (Mace et al., 2014).

Therefore, RASC must receive the support they need to adapt to their new school environment. However, education systems in host societies are not always prepared to effectively support newcomer RASC (Due & Riggs, 2016). On the one hand, teachers and educators often report feelings of anxiety and frustration from being ill-prepared and ill-equipped to teach newcomer RASC whether it is educators working with newly arrived, English as a Second Language (ESL) students in Australia (Dobinson & Buchori, 2016) or teachers of Syrian refugee children in Turkey (Soylu et al., 2020). On the other hand, there is very limited research investigating the efficacy of existing school-based interventions aimed at helping RASC adapt to new, formal education settings and reach their full developmental potential (Due & Riggs, 2016). Most research up to now on school programs

for newcomer RASC have focused on either coping with trauma, for example, how educators can support RASC through role-play activities (Kalkman & Clark, 2017), or language programs specifically for newcomer RASC, such as “Willkommensklasse” (Welcome Class) in Germany or New Arrival Programs (NAP) in Australia (Cerna, 2019; Matthews, 2021). While it is important to address both traumatic experiences and language proficiency, it is also imperative to further recognize the diversity of RASC’s needs beyond this. In a working paper published by the OECD, Cerna (2019) proposes a holistic model for refugee educational integration which recognizes the complexity of their needs. According to this model, educational integration can be achieved only if all or at least most of their specific needs are met. These include the need (1) to learn the language of the host society; (2) to overcome interrupted schooling; (3) to adjust to the new education system; (4) to communicate with others; (5) to bond with others; (6) to develop a strong personal identity; (7) to feel safe; and (8) to cope with trauma.

To conclude, there is a need for school-based intervention programs to support RASC entering formal education to help them adapt to their new school settings which recognizes their need to adapt to the host society, as posited by Berry’s theory of adaptation to a new culture, but which also recognizes their diverse and complex needs, as defined by Cerna’s (2019) framework of refugee educational integration needs. We next look at how some of these needs bear comparison with the needs of children with ASD within the school setting and hence why ASD interventions could be implemented for use in school settings welcoming newly arrived RASC to promote adaptation.

1.2 | Shared educational needs of RASC without ASD entering formal education in a host society and children with ASD

ASD is a neurodevelopmental, lifespan disorder characterized by persistent deficits in social communication and social interaction, such as deficits in verbal and nonverbal communicative behaviors, and restricted, repetitive patterns of behavior, interests, or activities, such as inflexible adherence to routines (American Psychiatric Association, 2013). According to estimates from the Autism and Developmental Disabilities Monitoring Network, ASD affects 1 in 54 children in the USA (Baio et al., 2018). For this review, it is argued that newcomer RASC without ASD on the one hand and children with ASD on the other share three specific types of needs as they relate to participation in education, namely (1) a need for a clearly structured and predictable learning environment; (2) a need for communication support; and (3) a need for support understanding social-cultural norms.

1.2.1 | The need for a clearly structured and predictable learning environment

ASD is typically characterized by rigidity in behavior and/or thinking so that small changes in the routine of a person with ASD can be experienced as an unpleasant disruption (Mesibov, 2018). As a result, the classroom setting can be perceived as an unpredictable environment that can hinder participation. Thus, within any education setting, children with ASD need a clearly structured and predictable environment to allow them to participate in the curriculum (Mesibov, 2018). On the other hand, RASC are not generally characterized by the need for repetition and fixed routines. However, RASC entering formal education in a host society experience multiple transitions so that the classroom setting may also be perceived as chaotic which, in turn, may impede participation and adaptation to their new educational settings. Hence, it could be argued that they would also benefit

from a school setting with clear rules and a structured, predictable environment. Therefore, both newcomer RASC and children with ASD in formal education settings could be characterized by the similar need for a clearly structured and predictable learning environment.

1.2.2 | The need for communication support

ASD is typically characterized by communication difficulties, ranging from the ability to use spontaneous speech, but with deficits in social or pragmatic use of language, to a total lack of both verbal and nonverbal communication (American Psychiatric Association, 2013). As a result, children with ASD may have difficulty participating in and expressing their needs within the classroom setting (Beukelman & Mirenda, 2013; Mesibov, 2018). For this reason, they may require additional communication support within education settings. For RASC, language is pivotal in the integration of a society. But just as children with ASD, they may also be faced with communication challenges. These challenges may also affect participation as communication is important not just for school performance (OECD, 2015) but also to express their needs to teachers and peers, build relationships, and develop a sense of belonging (Cerna, 2019). Therefore, although the nature of the communication difficulties of both populations is very different, providing a means of communication support within the school setting will arguably promote developmental outcomes of children with ASD and newcomer RASC alike.

1.2.3 | The need for support understanding social-cultural norms

ASD is typically characterized by difficulties in reciprocal social interaction skills, including basic conversation, initiating, and maintaining eye contact, and reciprocal behavior such as turn-taking. These skills are important for participation in education but also for the development and maintenance of relationships (Radley et al., 2015). For this reason, they may require additional support to help develop their social interaction skills. On the other hand, RASC arrive in the new school setting often without the predominant sociocultural experience or resources and must learn to navigate a new culture with its unique values and norms, such as implicit social rules specific to the school, which could be different from native values and norms. According to Borsch et al. (2021), these implicit routines, rules, and expectations within the new school environment, which they may be unfamiliar with, can cause feelings of inferiority and self-doubt but also lead to being excluded by peers. In addition, the process of acculturation, usually a slow, subtle, and continuous process (Fazel et al., 2012), is often associated with psychological stress as it may be impacted by unfamiliar social and behavioral expectations but also conflicting cultural identities and experiences of discrimination (Liebkind & Jasinskaja-Lahti, 2000). Therefore, both newcomer RASC and children with ASD in formal education settings could be characterized by a similar need for support in understanding social-cultural norms within the school setting albeit for different underlying reasons.

Taken together, these are some of the educational needs both populations are hypothesized to share. They may also share other needs and challenges beyond mere education and learning, such as the need for teacher and peer support. However, the present study specifically focuses on similar educational needs between RASC and children with ASD and therefore limits this review to the already very wide variety of ASD intervention methods, more specifically to those which could be transferred to newly arrived RASC in school settings.

2 | AIMS AND METHODS

Based on the above comparisons, the question is whether ASD intervention methods can be transferred for the use with newcomer RASC to support adaptation to new, formal education settings in their host society. To investigate this question, a systematic review of the literature was carried out to analyze past research and uncover potential evidence, guided on the one hand by Berry's (1992) model of adaptation to a new culture and on the other hand by Cerna's (2019) framework of refugee educational integration needs. More specifically, it is hypothesized that such programs could offer RASC the opportunity to adapt to their school settings in a way that minimizes acculturation stress and recognizes their diverse and complex needs. Before presenting the search methodology, the next sections will present three ASD intervention methods potentially suitable for transfer to formal education settings welcoming newly-arrived RASC.

2.1 | ASD interventions

A wide range of evidence-based intervention methods has been developed to support children with ASD (Odom et al., 2010). These interventions aim to help children with ASD to function independently by addressing specific difficulties in areas such as the need for repetition and fixed routines, communication, and social interactions (Odom et al., 2010). For this review, three specific ASD intervention methods were selected, namely (1) a classroom curriculum plan, *Treatment and Education of Autistic and Related Communication Handicapped Children* (TEACCH) (Mesibov et al., 2005); (2) an augmented communication tool, *Picture Exchange Communication System* (PECS) (Bondy & Frost, 1998); and (3) a social skills intervention, *Peer Mediated Interventions* (PMI) (Odom & Strain, 1984). These three specific ASD intervention methods were chosen over others based on several criteria. First, they had to be evidence-based methods that are both internationally recognized and widely used. This is important as there exist a plethora of intervention methods targeting individuals with ASD including highly sought-after evidence-based methods, pharmaceutical interventions, animal-based treatments, dietary programs, and ever-new gadgets. Second, as the focus of this review is on educational needs, the focus of the interventions under investigation had to be on education, more precisely providing scaffolding to holistically support learning in school, rather than for instance only emotional development. Third, the interventions had to be implementable in education settings to be able to reach RASC which is why only interventions that had previously been implemented and evaluated in schools were selected. TEACCH, PECS, and PMI were specifically selected because they are recognized within the field of autism intervention methods and because they were deemed eligible per the above criteria. Finally, the interventions had to be implementable in group settings rather than one-on-one for cost-efficiency and also so as not to isolate RASC. That is why certain well-known ASD intervention methods such as Applied Behavior Analysis (ABA), which has been found to significantly support children with ASD but is typically implemented in a one-on-one format (Foxy, 2008), were intentionally excluded. Next, each intervention method will be described in more detail and how they could potentially support newcomer RASC adapt to formal education settings.

2.1.1 | TEACCH

TEACCH can best be described as a manualized teaching curriculum that attempts to respond to the specific needs of children with ASD with the goal of teaching autonomy

(Virues-Ortega et al., 2013). In a typical TEACCH intervention program, individualized, structured teaching procedures are used to facilitate the acquisition of specific learning goals. Of particular interest are the three TEACCH factors that are essential in this connection: (a) organization of the physical environment in a way that is consistent with the needs of the child (e.g., minimizing possible distractions); (b) arrangement of activities in a predictable fashion (e.g., use of visual schedules of daily routines); and (c) organization of the materials and tasks to promote independence from adult directions/prompts (e.g., use visual materials if the student is more able to benefit from them). More specifically, the structured teaching component requires the individual's environment and activities to be organized in ways that would optimize learning and avoid frustration. This is made possible, for instance, through the use of visual schedules and room planners with physically designated areas for specific activities (e.g., a reading area, an arts and crafts area) to "translate the expectations and opportunities of the environment into concepts that people with ASD can understand, master, and enjoy" (Mesibov et al., 2005, p. 34). As a result, the environment feels predictable and easier to navigate and control which is meant to alleviate stress originating from feelings of uncertainty. TEACCH has been implemented throughout the world and it is reported that students with ASD who use this approach can work longer, more efficiently, and more calmly, therefore improving accessibility to the curriculum (Mesibov, 2018). In practice, as it was originally designed as a classroom curriculum, TEACCH could present a simple, versatile but also materially cost-effective (as it does not warrant expensive equipment) school-based intervention method appropriate for newcomer RASC. Activities may be difficult for RASC to relate to if they are based on concepts that are unfamiliar to them. TEACCH could support the participation and adaptation of RASC to the new school environment by helping them to quickly become familiar with them in a way that they can easily understand. Such a classroom system could provide RASC with a supportive, pedagogical environment allowing them to feel orientated, to be able to predict the school day, and to quickly gain both autonomy and native academic fluency. It could also help them to internalize rules and behavioral expectations that they might be unfamiliar with, such as waiting in line or asking to go to the toilet.

2.1.2 | PECS

PECS is a popular, manualized intervention method for teaching functional communication skills, especially with children with ASD who are non-verbal (Bondy & Frost, 1998; Wendt et al., 2019). It is an augmented communication method involving the systematic instruction of self-initiated communication skills designed to systematically build on each learned behavior to achieve more communicative independence. As proficiency is gained, the user advances from one phase to another. In the first phases, they learn to initiate a request by selecting picture cards and exchanging them with a communicative partner for preferred items as it is widely reported that individuals with ASD prefer visual stimuli over auditory stimuli. In the final phases, they learn to respond to "What do you want?" and to comment. By the end of the training program, they are expected to be able to use PECS to make more detailed requests using descriptors (e.g., "I want a yellow gummy bear") and make spontaneous comments (e.g., "I see a blue sky") (Wendt et al., 2019). Research shows PECS is effective in promoting functional communication skills, specifically requesting, along with increases in social-communicative behaviors and speech (Boesch et al., 2013). The body of research supporting the effectiveness of PECS as an evidence-based practice is substantial and continues to expand, with research reports of implementation around the world (Sanz-Cervera et al., 2018). In addition, PECS is easy to implement in school settings (Chua & Poon, 2018). PECS could be considered a cost-effective communication

method potentially consistent with the need for communication support of young RASC entering preschool and primary school levels of formal education in a host society. PECS could potentially help RASC to overcome the stress of the initial language barrier by facilitating basic communication until they can develop language proficiency, a lack of which can hinder their ability to communicate, participate, and learn (OECD, 2015). PECS could be implemented in educational settings with newcomer RASC both as a communication and a language learning tool. On the one hand, it could represent an effective, in-class communication aid that can be used within a classroom setting with peers, almost providing a temporary, “common language” between child and teacher allowing RASC to participate in the curriculum, foster relationships, and also provide an additional means to ask for help if needed. On the other hand, when the teacher gets a card depicting a desired object from a child, they might hold the card and say the name of the object giving the child the opportunity to learn the name of that object in the local language. In practice, implementation of PECS in an educational setting would require both teachers and RASC to be trained to use PECS, and RASC having their own picture card booklet. RASC should ideally work through the different phases of PECS depending on their age, individual language needs, and individual learning pace. For instance, some children may not want to or even need to use PECS at all perhaps because of their ability to pick up the language on their own solely through immersion. Others, however, may greet it as a valuable communication tool and even experience relief knowing they can communicate their needs and emotions until they are sufficiently proficient in the local language. From a material perspective, PECS is a cost-efficient intervention method as it does not rely on expensive technologies such as tablets. It also represents culturally responsive communication as it is possible to produce individualized picture cards of objects that are culturally meaningful to RASC. Of interest would also be an additional review of the literature on augmented communication systems, such as PECS, and second language acquisition theories in RASC, such as whether the acquisition is solely dependent on immersion (e.g., Krashen, 1982), but is beyond the scope of this review.

2.1.3 | PMI

Social skills interventions are commonly used for children with ASD. These interventions typically involve regular group training sessions of several students with similar skill levels guided by a trained program provider (Olsson et al., 2017). The aim is to improve the child’s ability to understand social rules and relationships, initiate social overtures, develop conversation skills, identify and interpret verbal and nonverbal social signals, manage conflicts, and develop social communication strategies. This is achieved using measures such as didactic instruction, modeling, and role-play to develop social skills, employing different formats such as peer-mediated, parent-mediated, or video-modeling (Olsson et al., 2017). One specific social skills intervention is PMI (Odom & Strain, 1984), a peer-to-peer group training method in which typically developing peers are included to help teach and practice social skills to children with ASD (Chang & Locke, 2016). These peers help to create a situation in which instruction occurs in the context of a positive social relationship using strategies such as mentoring and modeling (Leaf, 2017). As a result, an important additional benefit of PMI is the increased opportunity to interact with peers (Kaya et al., 2015). PMI is considered one of the most empirically supported and recommended evidence-based practices to date for children with ASD (Chang & Locke, 2016; Watkins et al., 2015). Therefore, it could be argued that a culturally responsive social skills intervention such as PMI implemented for use in schools with RASC who have enough knowledge of the local language could (1) provide RASC with the

knowledge of the social-cultural norms of their new school environment and skills with which to minimize social-cultural misunderstandings, such as how to appropriately greet peers or express boundaries during play; (2) help RASC to form relationships with their peers and counteract feelings of loneliness and isolation; (3) increase participation in extra-curricular activities; and (4) perhaps even reduce instances of bullying. This is important as positive peer relationships have been associated with greater self-esteem and social adjustment among RASC (Lustig et al., 2004), whereas difficulty forming relationships has been found to result in significant loneliness and emotional stress (Graham et al., 2016). Further, PMI could also encourage dialog between RASC, their peers, and their teachers about social-cultural norms, hereby recognizing RASC's cultural wealth and potentially preventing discriminatory behavior. This is important as it was found by Correa-Velez et al. (2017) that refugee children who experienced discrimination in schools in Australia were more likely to drop out of school later on. Several other social skills interventions, such as video modeling, which provides a video model of social skills, or parent-mediated interventions, in which parents are trained to help their children accomplish specific social skill goals, could be considered for RASC entering formal education. However, these interventions may be less appropriate as none of these provide face-to-face interaction with peers as with PMI (see Leaf, 2017, for a comparison). In practice, PMI should be relatively easy to implement within educational settings perhaps as an extra-curricular activity. Additional measures should be taken to adapt PMI to this specific population. For instance, intervention providers themselves should be prepared to have an open mind to the cultural wealth that RASC may bring with them to the table.

2.1.4 | Commonalities between all three ASD intervention methods

There are further subtle overlaps between all three methods. For instance, "visual aids" are used both as a means of communication for PECS and to provide a structured and predictable environment in TEACCH. Likewise, "learning of rules" is a theme common to both TEACCH (classroom rules must be clear and ideally visualized) and PMI (social rules are discussed as part of the training).

2.2 | The search process

A systematic search was carried out in November 2020. Several key terms were utilized to ensure that a variety of articles and perspectives were explored. In total, eight different keyword searches on RASC and ASD intervention methods were run in English, German, and French within the databases PsycINFO, MedLine, Embase, Education Resources Information Center (ERIC), ProQuest Social Sciences, and PubMed. The keyword searches were carried out in two phases. First, it was investigated whether any of the three autism intervention programs ("TEACCH," "PECS," and "PMI") were specifically used with RASC in school settings. Second, cross-referencing using extra search terms, namely keywords referring to strategies and practices specific to the three autism intervention programs, was carried out to expand the search. The aim was to identify instances in the literature in which specific elements, similar to those used for the three ASD interventions, were used in school settings welcoming RASC such as "predictable routine" for TEACCH, "visual aids" for PECS or "social skills" for PMI. The exact string of search terms used can be found in Table SM1 in the Supplementary Material. This search yielded 3,726 records, of which 1,344 duplicates were removed using EndNote, resulting in a total of 2,382 records. These records were then uploaded to RAYYAN QCRI, a free, systematic review web tool for

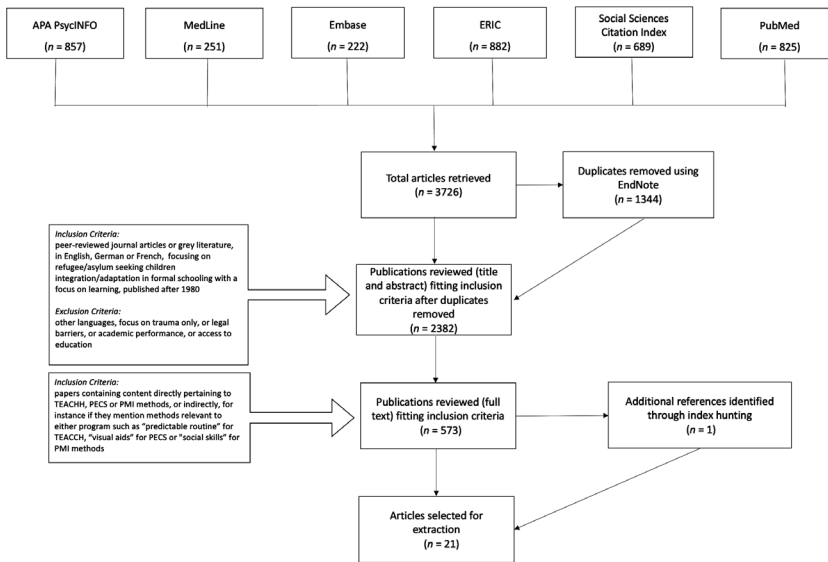


FIGURE 1 Flow chart of the search and review process

screening and selection of studies according to inclusion and exclusion criteria by multiple reviewers (<https://www.rayyan.ai/>). All titles and abstracts were then screened and references selected for full-text review if they were articles in academic journals or grey literature such as government documents written in English, French, or German and if their titles and abstracts indicated that they involved school-aged RASC in educational settings. There were no strict timelines for the publication of articles. Based upon the title and abstract screening, the first author included 573 studies that met inclusion criteria for full-text review. Next, the first author carried out a full-text review of all 573 studies. A trained research assistant independently reviewed a subsample (15%) of the 573 references to assess coding reliability. When both reviewers' ratings of this subsample were compared, an inter-rater agreement of 95.33% was found which was deemed satisfactory and all disagreements were discussed and resolved. Studies were selected during the full-text review for extraction if they were found to include content directly about TEACCH, PECS, or PMI. The first phase of the keyword search revealed that none of the studies directly mentioned any of the three autism intervention programs ("TEACCH," "PECS," and "PMI") being used specifically with RASC in school settings. The second phase of the keyword search, in which studies were reviewed if they mentioned methods relevant to either program, resulted in 20 studies for inclusion in the review. Index hunting was also utilized to identify additional relevant studies based on reference lists of articles that have already been selected. This process identified one additional study, resulting in a total of 21 references selected for inclusion in the review. A flow chart of the search process for this study is presented in Figure 1.

3 | RESULTS

The 21 references selected for extraction are a mix of program implementation studies, ethnographic observation studies, case studies, and qualitative interview studies of RASC of all age groups located in the USA (6), Australia (4), Canada (2), Germany (2), the Netherlands (1), the Philippines (1), and Turkey (1) published between 1991 and 2020. These

studies investigated either RASC adapting to new, formal education settings in a host society or the implementation of specific programs to foster integration, either from the perspective of school staff, such as teachers or school counselors, or from the perspective of RASC themselves. In addition, two government documents on refugee integration in schools, one from Canada and one from Northern Ireland, and two books on the same topic from the UK, were found to contain information deemed relevant to the study question. A summary of all 21 references selected for extraction can be found in Table SM2 in the Supplementary Material. None of the included studies explicitly investigated using well-designed, controlled trials the possibility of implementing TEACCH, PECS, and PMI for use with newcomer RASC entering formal education in a host society to help them adapt to their new school environment. However, the literature search did reveal preliminary evidence in support of this idea, as outlined below.

3.1 | TEACCH

While the review did not reveal any studies which directly attempted to or suggested implementing TEACCH in an educational setting with RASC, the importance of establishing a predictable routine guided by visual aids and clearly defined rules and expectations was mentioned in five publications. In a study on the implementation of multicultural education programs for Indonesian refugee children aged 6 to 11 years old in the Philippines, Thursby (1992) reported how these children needed additional support to follow their classroom routines and to cope with the many transitions throughout the school day, recommending the use of materials such as “pictorial instructions” or using “pictorial format” to provide directions. Furthermore, in a case study of school principals of four different schools working with refugees in Australia, one participant, a primary school principal, reported adopting an “inclusive approach” to teaching and learning using “visual resources” to help “orient” children, such as using PowerPoints or pictures of a clock showing when school starts and when it is time to go home (Taylor & Sidhu, 2012). Similarly in Germany, in a study by Busch et al. (2018) of 28 early childhood educators working with refugee children aged under seven years, the educators recommended using “predictable and reliable structures”, such as repeating timetables. They argue that such measures would allow children more time to familiarize themselves with the new childcare setting, such as daily routines. In addition, in a case study of a young refugee student entering mainstream primary school in Australia by Picton and Banfield (2020), the authors also recommended that “rules and structures at mainstream school be made transparent” (p. 9) for young refugees to avoid situations such as accidentally breaking the rules which can impede adaptation. Finally, in a case study exploring the implementation of the Literacy, English, and Academic Development (LEAD) program to help refugee students aged 14–18 years old to settle in a Canadian high school, the authors mention how, as part of the program, “the predictable routine of the day is posted as a series of labeled pictures visible at eye level” and that “the LEAD staff ensure that the routine is up to date and refer to the pictures throughout the day to help students know what to expect” (Miles & Bailey-McKenna, 2016, p. 117). They further found that the LEAD program had a positive effect on the academic success of the students although it was not clear if this was due to the structured environment.

The review further revealed an interesting point: implementing a clear and predictable routine in school is particularly important for the emotional well-being of RASC who have suffered traumatic experiences, as was mentioned in four additional publications. Cole (2005) argues in a paper on mental health support for immigrant and refugee children in schools that, for all children who have experienced traumatic events, efforts should be

made to provide a supportive school environment by implementing and maintaining a predictable routine, making a daily schedule visually available, and warning of changes to this schedule ahead of time. In addition, Blaustein and Kinniburgh (2010) suggest an Attachment, Regulation, and Competency (ARC) framework, a set of structured strategies to assist children and adolescents recovering from trauma. One of its components is the establishment of a predictable and structured routine as they argue that children fleeing insecure environments, such as those escaping wars, require such an environment to restore a sense of safety and stability. Furthermore, in a narrative study of a teacher's experiences working with adolescent refugees aged 16–17 years in a detention center in Australia (Birch et al., 2014), participants emphasized the importance of having a “clear and explicit structure around a curriculum with demonstrable and predictable tasks” (p. 7) for each lesson, day, and week. They suggest using strategies such as having clearly outlined goals for each session, visualizing the curriculum using a road map, providing each student with a clear timetable, allowing the students time to understand the curriculum, and giving simple but clear instructions. The authors further argue that these ideas are in line with theories about the emotional needs of children who have experienced trauma. Finally, in a case study by Hos (2016) of a teacher working with Limited or Interrupted Formal Education (SLIFE) students aged 13–18 years in the USA, this teacher reported establishing “predictable routines that helped students to adapt to the classroom” (p. 492). The teacher explained that, because of students' interrupted education on one hand and past trauma on the other, consistent and predictable routines create a safe and supportive environment for the students in the classroom.

Taken together, the results of the included literature provide preliminary evidence that TEACCH could potentially meet the needs of newcomer RASC of all ages for a clearly structured and predictable learning environment within the school, in particular for those who have experienced trauma.

3.2 | PECS

The review revealed five publications mentioning the importance of using visual aids with RASC in educational contexts, in particular for language learning and communication. Rutter (2006) mentions, for instance, using “visual cues” for working with refugee children (no age range provided) in schools in the UK, whereas Scott (2008) mentions using “visual labels” for teaching English as an additional language to children aged 7–11 years old in the UK. Kernaghan and Webb (2015) further note using “labels,” “visual signs” around the classroom, and “picture cards” with newcomer children with English as an additional language in primary schools in Northern Ireland. Also, the Ontario Ministry of Education (2008) mentions using pictures and various visual tools for both learning and communication purposes, including the use of a “picture dictionary,” in their report on strategies for teachers to support immigrant children aged 3–12 years. Finally, one publication explicitly mentioned implementing PECS as a communication support system for preschool refugee children. In a qualitative interview study by Hurley et al. (2011) investigating 25 early childhood educators in the USA, they found that teachers working with preschool-aged refugee children reported some “initial success” (p. 165) with alternative methods of communication, such as using symbols from PECS. Unfortunately, a detailed description of the implementation process is not provided.

In sum, the present review provides reasons to believe that PECS could potentially meet the needs of newcomer, preschool, and primary school-aged RASC for communication support but also language learning within their new, formal education settings.

3.3 | PMI

Just as for TEACCH, the review did not reveal any studies which directly attempted to or suggested implementing PMI in an educational setting with RASC. However, the review did reveal two publications that briefly mention the potential usefulness of implementing social skills interventions, such as field trips, specifically to enhance “social skills” in newcomer immigrant students aged 12–18 years (Friedlander, 1991) and refugee students aged 11–14 years (Rumsey et al., 2017) in schools in the USA. In addition, one publication by Çiçekoğlu et al. (2019) examining peer relations among preschool refugee children aged 5–6 years in Turkey also recommends implementing “social skills programs” (p. 323) to reduce aggressive behaviors which were observed more often among this population compared to their native peers. Moreover, three publications analyzed the implementation of tandem or group programs to promote integration, such as through the fostering of social skills in migrant and refugee children in educational settings. Copley et al. (2011) describe a school-based occupational therapy program for adolescent refugees in a high school in Australia (no specific age range provided). One component of the program involves the development of social competencies through group-based activities, such as cooking or moviemaking, aimed at facilitating and promoting engagement and participation in school. These group activities aimed to “provide opportunities to address social competence goals for each student within the group context” (p. 313) as such activities require working together as a team towards a specific goal. Feedback on the implementation of the program from school staff was positive, suggesting that the group activities effectively developed social competencies leading to increased participation in school. The intervention further had a positive effect on the school staff such as by making them more aware of students’ issues. Similarly, de la Hera Conde-Pumpido et al. (2018) studied tandem groups of refugee and native children aged 7–12 years playing together on a virtual reality ice-skating game to foster peer relations and social skills. Interviews with the children revealed that the single play-session intervention promoted intercultural interaction and integration of ethnic minority groups within the school. More recently, Hannover et al. (2020) implemented a school-based intervention program to support the social integration of newcomer immigrant children aged 9–10 years old in primary schools in Germany. Based on the creation of tandems with native peers, the aim of this intervention was to create “repeated positive contact situations” (p. 713). While the intervention did not promote integration, children participating in the tandems did report more positive self-beliefs.

Overall, these findings suggest that social skills interventions such as PMI could be a viable option to help RASC in pre-school, to develop adaptive behaviors, but also in primary school and beyond, to learn and understand implicit social rules of their new, formal education settings.

3.4 | Intervention method overlaps

Finally, because of subtle overlaps between the three intervention methods noted above, it was not possible to subcategorize the publication by Hurley et al. (2013) under one of the specific intervention methods. In this study, 25 preschool service providers were interviewed about the implementation of a “Pyramid Model” (Fox et al., 2010) for supporting positive behavioral and social development in preschool-aged refugee children in the USA. More specifically, participants were asked about the specific strategies and practices they implemented per the Pyramid model to meet the needs of refugee families. Participants reported using communication strategies involving feeling pictures and other visual cues, similar to PECS. They also reported using peer models to provide “social skill instruction,”

similar to PMI, in order, for instance, for children to learn how to deal with peer conflicts. Finally, they also highlighted the children's needs for predictable routines using "picture schedules" or "visual schedules" every day, similar to TEACCH, so that they are "able to move through the day with easy transitions and comfortably" (p. 83). The teachers suggested that the use of pictures and schedules that have "become an accepted practice for supporting preschool children with ASD" (p. 85) would also be "promising for the support of young refugee children who have limited English knowledge" (p. 86). The study authors conclude that additional research is needed to investigate the effectiveness of peer models, visual schedules, feeling pictures along with other intervention methods on newcomer refugee children in preschools building on the existing research on the effectiveness of such strategies on children with disabilities such as ASD.

4 | DISCUSSION

The present review attempted to investigate the idea of whether it would be feasible to transfer ASD intervention methods to formal education settings welcoming newly arrived RASC to support adaptation guided on one hand by Berry's (1992) model of adaptation to a new culture and on the other hand by Cerna's (2019) framework of refugee educational integration needs. Unexpectedly, the systematic review of the literature did not reveal any previous, explicit attempts to implement TEACCH, PECS, or PMI using well-designed, controlled trials. However, the review did reveal preliminary evidence from 21 references in support of the idea that ASD interventions implemented in formal education settings could help newcomer RASC adapt to their new school environment. Namely, both researchers and practitioners (e.g., school staff) expressed within these 21 records the importance of structured schedules and predictable routines, especially for RASC who have experienced trauma, of visual aids for communication and language learning, and of interventions involving peers to develop social skills and promote integration in school. In addition, the results further revealed potential age-group suggestions for each intervention method. Taken together, while not providing concrete evidence, this review demonstrates that implementing ASD programs such as TEACCH, PECS, and PMI in schools welcoming RASC might not be so farfetched. Given this preliminary evidence, the next sections will discuss hypothesized advantages and limitations of ASD intervention methods with newcomer RASC as well as important considerations concerning implementation.

4.1 | Hypothesized advantages and limitations of transferring ASD intervention methods to school settings with newcomer RASC

The transfer of existing knowledge, research, and resources from evidence-based ASD intervention methods to classroom contexts welcoming newly arrived RASC could have several advantages. First of all, the idea under investigation prioritizes RASC's needs that might not immediately be obvious. It aims to provide RASC with optimal learning opportunities to foster adaptation within their new, formal education setting so that they may engage in the learning processes and achieve their full developmental potential. Second, all three reviewed ASD intervention methods are evidence-based, manualized intervention methods that are widely used across different countries and have previously been implemented in schools. They could, therefore, be implemented in various settings around the world among different displaced populations, whether Syrian children at Temporary Education Centers (TEC) in Turkey (Gümüş et al., 2020), Somali refugee children in Australia (Dodds et al., 2010), or newcomer Latino youths in the USA (Szlyk et al., 2020).

Implementation of ASD intervention methods in such settings would present a practical and cost-effective alternative for the countless schools around the world that already implement these methods within their schools for children with ASD rather than designing and implementing brand new programs for newcomer RASC from scratch. Furthermore, implementing ASD methods with newcomer RASC would further expand the reach of the target populations for each ASD intervention method beyond children with ASD alone. Third, ASD intervention methods address the educational needs experienced by RASC entering formal education in a host society but are also flexible enough to be able to consider their individual needs and abilities. For newcomer RASC in educational settings then, for example, some could use PECS while others in the same classroom do not because they are more comfortable learning solely through immersion. Fourth, implementation of these intervention methods could help newcomer RASC, and possibly also their parents, to feel welcome and taken care of in the new school environment. This is important as a welcoming environment can create a sense of security and belonging that enables children to form new relationships and make new friends (Hek, 2005). A sense of belonging is causally linked to increased student outcomes and healthy social-emotional development at school for all children (Demant & Van Houtte, 2012). In turn, positive school experiences have been shown to confer a protective effect on well-being in RASC (Fazel et al., 2012). In addition, it could also be expected that parents may be likely to accept such methods and perhaps even feel reassured about sending their children to school knowing that their specific educational needs are being considered which could, in turn, prevent school absenteeism due to parents' lack of trust. It is important to also consider the role of the family in the adaptation process as adaptation to the new school environment cannot be achieved without also focusing on the parents and family who may have different educational expectations to those of the host society (Graham et al., 2016). Fifth, implementation of these intervention methods could support teachers by providing a curriculum specifically for newcomer RASC which could help alleviate feelings of frustration and beliefs of being ill-prepared to adequately help newcomer RASC previously discussed in this paper. Finally, because of the materially cost-efficient nature of these intervention methods for children with ASD, as they require simple materials rather than expensive technologies, implementation could further be possible in locations other than schools such as community centers to reach RASC who, for legal or bureaucratic reasons, are not yet able to enter formal education in the host society. This way, they can be prepared for the new school environment once they can enroll.

Despite the potential of ASD intervention methods for formal education of RASC revealed in this review, several limitations must be considered. First of all, implementing ASD intervention methods does not address the larger problem of enrollment barriers as globally, access to primary and secondary education is limited for refugee children with only 61% of refugee children attending primary education against 91% for native children, while for adolescents, 23% are enrolled in secondary school compared to 84% (UNHCR, 2017). Nor does this idea address post-enrollment issues such as the lack of standardized tests appropriate for RASC to assess their abilities which can lead to inaccurate grade placement (Graham et al., 2016) or infrequent attendance and absenteeism. According to Busch et al. (2018), reasons for infrequent attendance include mental distress, cultural differences in childcare practices, such as educational expectations, and fear of separation. In addition, because of its focus on educational needs rather than emotional needs, a major pitfall is that the idea under investigation fails to address the important issue of trauma which carries with it risks of mental health problems later on in life (Fazel & Stein, 2002). Further adaptation of these intervention methods would be required such as by training intervention providers to address RASC's experiences of trauma and to be able to

recognize the signs of PTSD. Second, these methods run the risk of over-simplification of the needs of RASC who are a heterogeneous group characterized by a variety of individual experiences and needs (Cerna, 2019). Thus, additional individual factors need to be considered such as country of origin, religion, and socio-economic, cultural, and educational background before migration as well as age at the time of flight, migration, and resettlement (Kaprielian-Churchill, 1996). For instance, research with migrant children has found that age is a major determinant of education needs, opportunities, trajectories, and outcomes (UNESCO, 2018). Whether a child enters school in the host society at the beginning, middle, or end of compulsory education greatly affects outcomes such as school completion (Cerna, 2019). Third, for this approach to be effective, experienced ASD intervention providers are required to guide implementation. However, they are unlikely to be available for all schools everywhere welcoming newcomer RASC as a lack of trained ASD intervention providers is already a significant issue for ASD children alone (Martin et al., 2021). Finally, the present review was limited to evidence-based interventions aimed specifically at individuals diagnosed with ASD. Interventions aimed at populations diagnosed with other disorders were beyond the scope of this review. However, future research could benefit from building upon the present research by investigating the implementation of interventions beyond those for the treatment of ASD. To conclude, while ASD intervention methods could potentially hold many promises to the adaptation of RASC entering formal education in a host society, a critical appraisal suggests that caution and further reflection are warranted.

4.2 | Questions for future consideration

Several additional questions about implementation need to be considered. First, are teachers or specifically trained intervention providers (or both) best suited to deliver these intervention methods as efficiently and inexpensively as possible to RASC in formal education settings? A study by Stahmer et al. (2015) found that teachers in special education public schools were able to learn to implement evidence-based ASD strategies; however, they required extensive training, coaching, and time to reach and maintain moderate procedural implementation fidelity. Alternatively, trained external providers could be bought in to deliver the intervention methods themselves after having been trained to work with RASC. Teachers might even benefit from external support as this might alleviate the stress of working with newcomer RASC. Or teachers and external providers could collaborate towards implementation, perhaps even with a third party such as a school psychologist, school counselor, or other in-school mental health staff, potentially encouraging various school stakeholders to work together. Whether training teachers to work with ASD intervention methods or training ASD intervention providers to work with newcomer RASC, in both cases, such practice would increase their range of skills, their scope of activity areas, and potentially also their employability. A comparison of the requirements of professional development of both options (e.g., financial costs, duration of training) should be taken into consideration for a suitable solution to be agreed on.

Second, would it be possible to implement these intervention methods in a mixed classroom with both RASC and native children? The question of integrated or segregated classrooms for newcomer RASC is hotly debated with recent research claiming that integrated classrooms should be prioritized (OECD, 2015). More specifically, a quick transition into mainstream classes together with sustained second language support is thought to be more effective than segregated classes over an extended period as this can hinder educational outcomes (Crul et al., 2016). Consequently, it is hypothesized that an inclusive

classroom would likely be more appropriate than segregated schooling for the implementation of ASD intervention methods in educational settings welcoming newcomer RASC.

Finally, in the case that implementation should be attempted, how should it be evaluated? As there is only limited research on interventions specifically with RASC entering formal education in a host society (Cerna, 2019), it is difficult to establish with confidence which specific outcomes should be measured and how. Several suggestions may be considered. Parents and teachers could provide feedback on the effectiveness of TEACCH on general well-being (e.g., feelings of confidence), of PECS on language abilities, and PMI on RASC's social skills, acculturative stress, and feelings of confidence and loneliness. Consequently, it will be important to consider questions concerning program delivery, format, dosage, and evaluation as a necessary next step before planning implementation. Pilot studies could provide information and guidance needed to answer the above questions.

5 | CONCLUSION

A systematic review of the literature investigating the feasibility of implementing ASD intervention methods, namely TEACCH, PECS, and PMI, in schools to help newcomer RASC adapt to their new educational settings preliminary revealed evidence in support of this idea, which therefore warrants further research. As a next step, pilot studies linking this preliminary evidence with empirical research would provide answers which could, in turn, guide policy-relevant research. Such research would be able to determine whether RASC and children diagnosed with ASD do share conceptually similar needs, as they relate to participation in education. It would also provide insight as to whether TEACCH, PECS, and PMI, which have been found to benefit children with ASD, would also benefit RASC entering formal education in a host society in a way that minimizes acculturation stress, as posited by Berry's (1992) model of adaptation to a new culture, and recognizes their diverse and complex needs, as defined by Cerna's (2019) framework of refugee educational integration needs. Such research would also help to determine whether teachers and educators but also RASC themselves and their parents would accept these intervention methods. Should the implementation of ASD intervention methods in educational settings welcoming RASC be attempted, potential long-term effects of successful implementation could include improved integration of RASC in schools and beyond, effectively contributing to the achievement of a more socially cohesive society in the face of increasing movement of people across borders often referred to as a crisis (Cerna, 2019). This endeavor would not only work to advance the well-being of these children, but also to serve the goals of promoting education to build a more just, inclusive, and equal society, consistent with the fourth Sustainable Development Goal of ensuring quality education for all (United Nations Development Programme, 2015).

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AUTHOR STATEMENT

In accordance with the New Directions for Child and Adolescent Development policy and my ethical obligation as a researcher, I am reporting that neither I, nor any of the co-authors, have any financial, institutional or other competing interests that may affect the research reported in the enclosed paper.

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NOTE

¹ In this paper, the term “refugees” refers to individuals who have been uprooted from their homes because of war, violence, or a well-founded fear of persecution for reasons of race, religion, nationality, political opinion, or membership in a particular social group (UNHCR, 2017). The term “asylum seekers” on the other hand refers to individuals who are displaced and who have not yet been officially recognized as refugees (UNHCR, 2017).

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