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Evaluating socioemotional skill interventions for preschool children with autism spectrum disorder: a systematic review

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ABSTRACT

This study aims to systematically review and synthesize recent empirical evidence on socioemotional skill interventions for preschool children with autism spectrum disorder (ASD) from an educational evaluation perspective. Guided by the preferred reporting items for systematic reviews and meta-analyses (PRISMA) framework, a systematic search of Scopus and Web of Science (WoS) identified 15 peer-reviewed studies published between 2019 and 2025. The included studies were thematically analyzed and appraised using the mixed methods appraisal tool (MMAT). The findings revealed three dominant intervention themes: i) relationship-based and developmental interventions; ii) structured and skill-focused interventions; and iii) creative, expressive, and technology-supported approaches, demonstrating overall positive effects on socioemotional outcomes. However, the strength of evidence remains moderate due to methodological heterogeneity, small sample sizes, and limited longitudinal designs. These findings highlight the importance of developmentally appropriate and flexible intervention designs in inclusive early childhood education. The review offers practical implications for educators, curriculum developers, and policymakers. Specifically, it emphasizes the need for evidence-based socioemotional programs to strengthen inclusive preschool practices for children with ASD.

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1. INTRODUCTION

Autism spectrum disorder (ASD) is not a mental illness; rather, it is a neurodevelopmental condition associated with atypical brain development [1]. ASD is a lifelong and heterogeneous condition characterized by persistent difficulties in social communication and interaction, accompanied by restricted interests, repetitive behavior, and a strong preference for sameness and routine [2]–[5]. In recent decades, the prevalence of ASD has increased substantially among children worldwide. For instance, data from the centers for disease control and prevention (CDC) indicate a marked rise in ASD prevalence in the United States, increasing from earlier low estimates to approximately 1 in 54 children, suggesting that millions of children are living with ASD [6]. Similarly, national data in Malaysia show an increase in ASD prevalence among children aged 5 and 6, rising from 1 in 175 in 2021 to 1 in 168 in 2022 [7], reflecting a consistent upward trend. At the global level, the World Health Organization (WHO) estimates that approximately 1 in 100 children worldwide have ASD [8], with higher prevalence consistently observed in boys than in girls [9], [10].

This growing prevalence has placed increasing pressure on families, educators, and early childhood education systems to provide effective and appropriate support [11]–[13].

The term "spectrum" in ASD reflects the wide range of characteristics, abilities, and levels of severity that can vary significantly among individuals affected by the disorder [8], [14]–[16]. Among the developmental domains affected in children with ASD, socioemotional skills are particularly critical [7], [17], as these skills underpin emotional regulation, adaptive behavior, and meaningful interpersonal interactions [18]. Impairments in this domain often hinder children's ability to engage with peers, express their feelings appropriately, and navigate daily social environments [19]–[21]. These challenges are particularly evident in early educational settings, where social interaction and emotional responsiveness form the foundation of learning experiences [22].

From a developmental perspective, emotional development begins in infancy through the expression of basic emotions and responses to facial cues, gradually evolving into more complex socioemotional competencies such as empathy, self-regulation, and relationship-building [23], [24]. This trajectory is crucial, as strong socioemotional competence in early childhood is consistently associated with long-term academic achievement, psychological well-being, and successful social adaptation later in life [25], [26]. Consequently, delays or impairments in socioemotional development during the preschool years may have enduring educational and psychosocial consequences [27], particularly for children with ASD.

Internationally, the importance of socioemotional development in early childhood education is widely recognized. The National Association for the Education of Young Children (NAEYC), an accrediting body for kindergartens in the United States, highlights the critical role of children's socioemotional development within learning curriculum and the assessment of children's development [28]. Several key organizations, such as the collaborative for academic, social, and emotional learning (CASEL), the center on the social and emotional foundation for early learning (CSEFEL), and the technical assistance center on social and emotional interventions (TACSEI) have been established to provide comprehensive resources on socioemotional learning in young children.

In the Malaysian context, the National Preschool Standard Curriculum was introduced to cultivate a balanced and holistic generation by encompassing six core pillars: communication, spirituality, attitudes and values, humanity, personal skills, physical and aesthetic development, as well as science and technology. Notably, the curriculum places particular emphasis on personal and self-management skills, which form the foundation of socioemotional development by encouraging children to recognize, manage, and express their emotions while fostering empathy and awareness of others' feelings. This policy emphasis highlights the growing need for evidence-based socioemotional interventions that align with inclusive preschool curriculum frameworks and support holistic child development in Malaysian early childhood education settings.

Research consistently highlights the value of early intervention, noting that targeted support during the preschool years can lead to significant improvements in children's communication, self-awareness, and interpersonal abilities [29], [30]. This is largely attributed to the rapid development of socioemotional skills that typically occurs during the preschool period [22]. Moreover, evidence-based interventions have been shown to yield favorable outcomes and enhanced functional capabilities [28], [31], [32]. However, the heterogeneous nature of ASD and the varying levels of support required across the spectrum [33] highlight the need for interventions that are carefully designed, contextually grounded, and responsive to individual differences. Given the educational nature of socioemotional interventions, systematic evaluation of their effectiveness, implementation contexts, and methodological rigor is essential to inform evidence-based early childhood education practices. Effective socioemotional interventions for preschool children with ASD often involve integrated approaches that combine behavioral, social, and educational strategies within supportive learning environments. To ensure both effectiveness and sustainability, such interventions must be adaptable to diverse educational contexts and aligned with the developmental needs of young children.

Despite the growing body of research on autism and socioemotional learning, systematic reviews that specifically examine socioemotional skill interventions for preschool children with ASD from an educational evaluation perspective remain scarce. Existing reviews tend to prioritize school-aged populations, single intervention modalities, or broad developmental outcomes, with relatively little attention given to the preschool period as a critical window for socioemotional intervention [34]. Furthermore, many prior reviews adopt descriptive approaches and lack systematic appraisal of methodological quality and intervention effectiveness across educational contexts. To date, there remains a paucity of methodologically rigorous and developmentally focused reviews that systematically synthesize socioemotional skill interventions for preschool children with ASD within inclusive early childhood and educational contexts. Addressing these gaps, the present systematic review applies the preferred reporting items for systematic reviews and meta-analyses (PRISMA) framework to synthesize recent empirical evidence on socioemotional skill interventions for preschool children with ASD. In addition to mapping publication trends and intervention types, this review integrates a structured methodological quality appraisal using the mixed

methods appraisal tool (MMAT), thereby offering evaluative insights into the strength and credibility of the existing evidence base. By systematically examining diverse socioemotional intervention approaches, including relationship-based, structured, and creative or technology-supported strategies, this review contributes a developmentally sensitive and methodologically informed synthesis to support evidence-based decision-making among early childhood educators, researchers, and policymakers.

Building upon these research gaps, this study provides a developmentally focused synthesis by systematically reviewing socioemotional skill interventions for preschool children with ASD within inclusive early childhood education contexts. Unlike previous systematic reviews that predominantly emphasized school-aged populations, single intervention approaches, or broad developmental outcomes, this review integrates relationship-based, structured, and creative or technology-supported interventions into a unified thematic framework. Positioning the synthesis within inclusive preschool education and policy-relevant contexts, the study contributes a context-sensitive evidence base to inform socioemotional intervention design, educational practice, and early childhood policy.

2. METHOD

This systematic review followed the PRISMA guidelines [35], [36], which provide a structured framework for conducting transparent and reproducible systematic reviews [37]–[39]. The review process consisted of four main phases: identification, screening, eligibility, and inclusion, as seen in Figure 1. Initially, 1,669 records were retrieved through database searching. After applying predefined screening criteria and removing duplicates, 256 full-text articles were assessed for eligibility. Ultimately, 15 studies met the inclusion criteria and were included in the final qualitative synthesis. PRISMA is particularly suitable for systematic literature reviews (SLR) in the social sciences, as it supports the formulation of clear research questions, explicit inclusion criteria, and systematic literature examination [40]. A SLR is a research methodology that synthesizes findings from primary studies to address clearly defined research questions in a transparent and replicable manner [41]. The process commenced with the formulation of a clearly defined research question, which serves as the methodological foundation guiding the scope, search strategy, study selection, and synthesis of evidence [42]. Based on these principles, the present review was guided by the following research questions (RQs):

- What are publication trends and methodological characteristics of recent evidence-based intervention studies addressing socioemotional skills development in preschool children with ASD? (RQ1)
- What types of evidence-based socioemotional skill interventions have been reported to be effective for preschool children with ASD? (RQ2)
- What developmental outcomes have been reported in relation to the effectiveness of socioemotional skill interventions for preschool children with ASD? (RQ3)

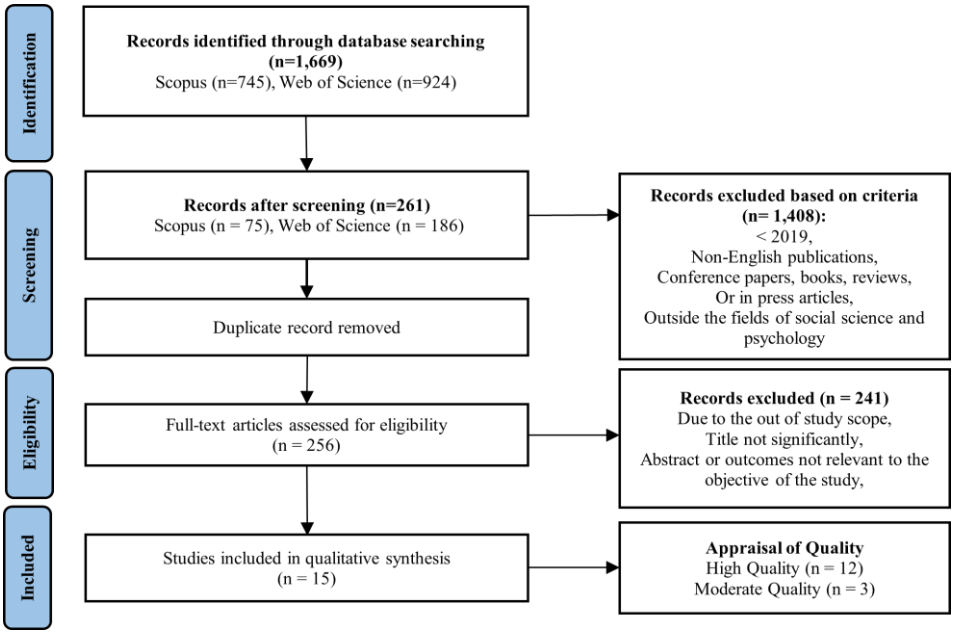

Figure 1. PRISMA flow diagram of the study selection process [35], [36]

2.1. Identification

This review employed the four primary stages of the systematic review process to identify and select relevant publications. Initially, a comprehensive set of keywords and synonymous terms was developed based on the research questions and refined through prior literature and conceptual references to ensure a rigorous and exhaustive search strategy [43]. In December 2025, comprehensive search strings were developed and applied across two major databases: Scopus and Web of Science (WoS). These databases were selected for their complementary strengths in terms of impact, academic prestige, and disciplinary coverage [44]. WoS contains over 74.8 million academic records, while Scopus indexes more than 23,452 active peer-reviewed journals, making both databases highly suitable for systematic reviews and bibliometric analyses [45].

The initial database search yielded a total of 1,669 records, comprising 745 records from Scopus and 924 records from WoS. Based on the research question, four primary keywords were identified: “socioemotional skills”, “autism spectrum disorder”, “preschool children”, and “interventions”. To enhance the comprehensiveness of the literature search, these keywords were expanded to include related terms and synonyms, ensuring that all relevant articles were captured. An advanced search strategy incorporating field codes, Boolean operators, and proximity operators was used to refine and narrow the search scope. The Boolean operators OR and AND were strategically applied to refine and expand the database search, ensuring comprehensive retrieval of relevant studies [46]. The OR operator accommodated alternative spellings and synonymous terms, while the AND operator combined different concepts to retrieve more targeted results, including studies with greater specificity. Additionally, to strengthen the identification of relevant terms, an online thesaurus was consulted and expert opinions from the field of education were sought. The final search strings used in each database are presented in Table 1.

Table 1. The search strings and keywords used for the systematic review process

Database	Search string
Scopus	TITLE-ABS-KEY=((socioemotional OR “socioemotional skills” OR "socio-emotional skills" OR “social skills” OR “emotional development” OR "social and emotional" OR “social-emotional” OR “social-emotional skills” OR “social emotional learning”) AND (preschool* OR "preschool children" OR “early childhood” OR "young children") AND ("autism spectrum disorder" OR autism OR autistic OR ASD) AND (intervention* OR strateg* OR therap* OR program* OR train*)) Date of access: December 2025
WoS	TS=((socioemotional OR “socioemotional skills” OR "socio-emotional skills" OR “social skills” OR “emotional development” OR "social and emotional" OR “social-emotional” OR “social-emotional skills” OR “social emotional learning”) AND (preschool* OR "preschool children" OR “early childhood” OR "young children") AND ("autism spectrum disorder" OR autism OR autistic OR ASD) AND (intervention* OR strateg* OR therap* OR program* OR train*)) Date of access: December 2025

2.2. Screening

The screening phase aimed to exclude studies that did not meet predefined inclusion and exclusion criteria to identify articles relevant to the research questions [47]. A total of 1,408 records were excluded at this stage based on the inclusion and exclusion criteria outlined in Table 2. At this phase, content-related criteria focused on selecting studies specifically examining the development of socioemotional skills in preschool children with ASD. The main inclusion criterion was peer-reviewed empirical studies published between 2019 to 2025. This seven-year range is supported by methodological recommendations suggesting that newer fields of study may require a longer publication window to capture relevant developments [48], [49]. Subsequently, 256 full-text articles were assessed for eligibility, after five full-text articles were eliminated due to duplication.

Table 2. Inclusion and exclusion criteria involved in the screening process

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2019-2025	<2019
Literature type	Journal (Article)	Besides Journal (Article)
Publication stage	Final	In Press
Subject area	Social sciences, psychology	Besides social sciences and psychology

2.3. Eligibility

The third phase, known as the eligibility assessment, involved manual screening of the articles. While the earlier identification and screening stages were supported by automated tools, this phase required detailed human evaluation. As noted by Liberati *et al.* [50], automated screening carries the risk of including studies that may not align with the specific context of the research. Therefore, each article's full-text was manually reviewed to ensure its relevance to the development of socioemotional skills in preschool children with ASD. During this phase, a total of 256 articles were compiled for assessment. Titles, abstracts, methodology, and findings sections were scrutinized to determine whether the studies met the established inclusion criteria and addressed the research objectives. As a result, 241 articles were excluded for reasons such as being outside the field of the study scope, lacking methodological alignment, or having inaccessible full text. Ultimately, 15 articles demonstrating strong relevance and methodological rigor were retained for in-depth review and synthesis in the final review phase.

2.4. Data abstraction and analysis

An integrative analysis approach was employed to synthesize findings from qualitative, quantitative, and mixed-method studies, given the methodological heterogeneity of the included research. The thematic development process involved an in-depth review of the 15 selected articles, focusing on empirical findings relevant to the research questions. Recurring patterns in socioemotional skill interventions were identified, compared across studies, and organized into coherent themes and subthemes.

A quality appraisal was conducted using the MMAT version 2018 [51]. Each study was evaluated based on its research design against five core criteria: clarity of research questions, appropriateness of research design, adequacy of data collection methods, rigor of data analysis, and coherence between data and interpretations. The appraisal was performed independently by two reviewers, with discrepancies resolved through discussion to achieve consensus. As summarized in Table 3, the methodological quality of the included studies was generally satisfactory, with all studies meeting at least three MMAT criteria. Specifically, five studies met all five criteria, seven met four criteria, and three met three criteria. No studies were excluded based on methodological quality, as the appraisal was intended to inform the interpretation of findings rather than serve as an exclusion criterion. To ensure transparency, replicability, and responsible reporting, this systematic review adhered to the PRISMA 2020 guidelines. As the study synthesized data from previously published studies and did not involve human participants or primary data collection, formal ethical approval was not required.

Table 3. Results of the quality assessment

No.	Author	Research design	Score (n/5)	Quality
1	Almarzooqi *et al.* [52]	Qualitative research	5/5	High
2	Wantini *et al.* [53]	Qualitative research	4/5	High
3	Cao *et al.* [54]	Qualitative research	4/5	High
4	Gong *et al.* [55]	Randomized controlled trial	5/5	High
5	Zhou *et al.* [56]	Randomized controlled trial	5/5	High
6	Yang and Zhang [57]	Randomized controlled trial	4/5	High
7	Mirzakhani *et al.* [58]	Randomized controlled trial	4/5	High
8	Zhang *et al.* [59]	Randomized controlled trial	5/5	High
9	Kazemi and Abolghasemi [60]	Randomized controlled trial	3/5	Moderate
10	Galanis and Gena [61]	Non-randomized controlled trial	4/5	High
11	Du *et al.* [62]	Non-randomized controlled trial	3/5	Moderate
12	Tripathi *et al.* [63]	Quantitative research	4/5	High
13	López-Bouzas *et al.* [64]	Quantitative research	5/5	High
14	Blanc *et al.* [65]	Quantitative research	3/5	Moderate
15	Alkinj *et al.* [66]	Mixed methods research	4/5	High

Note: n=number of criteria fulfilled

3. RESULTS AND DISCUSSION

This section presents the synthesized findings in relation to the three research questions. An overview of the 15 included studies is presented in Tables 4–6, which categorize the interventions into three overarching themes: i) Theme 1: relationship-based and developmental interventions (n=7); ii) Theme 2: structured and skill-focused interventions (n=4); and iii) Theme 3: creative and technology-supported interventions (n=4). Collectively, these themes highlight diverse yet complementary intervention pathways for enhancing socioemotional competencies in preschool children with ASD in inclusive early childhood settings.

Table 4. Relationship-based and developmental interventions and primary socioemotional outcomes

No.	Author	Year	Country	Intervention type	Primary socioemotional outcomes
1	Almarzooqi *et al.* [52]	2025	UAE	Companion pet ownership	Empathy; emotional response
2	Gong *et al.* [55]	2025	China	Parent training (Heart-Mind-Behavior)	Emotional regulation; social interaction
3	Tripathi *et al.* [63]	2022	USA	PEERS® (parent-mediated)	Social communication; peer engagement
4	Wantini *et al.* [53]	2019	Indonesia	Socioemotional therapy (inclusive early childhood education)	Emotional awareness; social participation
5	Blanc *et al.* [65]	2021	France	Exchange and development therapy (EDT)	Social interaction; emotional engagement
6	Mirzakhani *et al.* [58]	2022	Iran	Son-rise and floor-time programs	Social reciprocity; social interaction
7	Kazemi and Abolghasemi [60]	2019	Iran	Play-based empathy training	Empathy; social skills

Table 5. Structured and skill-focused interventions and primary socioemotional outcomes

No.	Author	Year	Country	Intervention type	Primary socioemotional outcomes
1	Galanis and Gena [61]	2025	Greece	Self-management intervention	Social interaction; self-regulation
2	Du *et al.* [62]	2024	China	Applied behavior analysis (ABA)-based training	Socioemotional skills; motivation
3	Zhang *et al.* [59]	2022	China	Peer-mediated intervention	Social skills; peer participation
4	Alkinj *et al.* [66]	2022	Portugal	Modelling and social stories	Social competence; adaptive behavior

Table 6. Creative and technology-supported interventions and primary socioemotional outcomes

No.	Author	Year	Country	Intervention type	Primary socioemotional outcomes
1	Zhou *et al.* [56]	2025	China	Music therapy	Social skills; emotional expression
2	Yang and Zhang [57]	2025	China	Music-based intervention	Social engagement; emotional expression
3	López-Bouzas *et al.* [64]	2024	Spain	Gamified learning environment	Socioemotional skills; motivation
4	Cao *et al.* [54]	2022	Belgium	NAO robot–assisted intervention	Joint attention; social engagement

3.1. General background of the selected studies

The review comprises 15 empirical studies investigating socioemotional skill interventions for preschool children with ASD. The included studies demonstrate a broad international distribution across Asia, Europe, the Middle East, North America, and Oceania. Asia accounted for the largest proportion of studies (China, Indonesia, and Iran), indicating a strong regional interest in early socioemotional interventions for ASD. European contributions were identified from Greece, Spain, Portugal, France, and Belgium, alongside one study from the United States and a qualitative study from the United Arab Emirates. In terms of research design, the sample comprised six randomized controlled trials (40%), two non-randomized controlled trials (13%), three qualitative studies (20%), three quantitative studies (20%), and one mixed-methods study (7%), reflecting methodological diversity in intervention research. Publication trends indicate increasing scholarly attention to socioemotional interventions for preschool children with ASD, particularly between 2022 and 2025. However, methodological heterogeneity in research design, sample size, and intervention settings suggests that the evidence base remains emergent and limits direct cross-study comparability.

3.2. Discussion

This review synthesized empirical evidence from diverse intervention approaches to evaluate the effectiveness of socioemotional skill interventions for preschool children with ASD. Across the three themes, the findings indicate that socioemotional development is most effectively supported through integrated and multi-modal intervention approaches in inclusive early childhood settings. Rather than converging on a single dominant model, effective interventions varied in mechanisms, delivery modes, and contextual embedding, reflecting the heterogeneous socioemotional needs of preschool children with ASD. Collectively, the evidence highlights the importance of flexibly integrating relationship-based, structured, and creative or technology-supported strategies within developmentally inclusive preschool environments.

3.2.1. Relationship-based and developmental interventions

Seven studies were categorized under relationship-based and developmental interventions, characterized by emotionally attuned interactions, reciprocal communication, and learning embedded within naturalistic social contexts. Overall, these interventions primarily enhanced emotional engagement, social

reciprocity, and early social communication through caregiver involvement and relational interaction. Across the reviewed studies, caregivers, peers, and relational partners consistently emerged as key agents in facilitating socioemotional development among preschool children with ASD. Qualitative evidence from Almarzooqi *et al.* [52] highlighted companion pet ownership as a naturalistic relational medium that supported emotional responsiveness, empathy, and everyday social functioning. Similarly, Wantini *et al.* [53] demonstrated that socioemotional therapy implemented within inclusive early childhood settings enhanced emotional awareness and social participation through play-based and relational activities. These findings reinforce the importance of embedding socioemotional learning within naturalistic daily interactions.

Several studies within this theme employed developmental and parent-mediated frameworks. Tripathi *et al.* [63] reported sustained improvements in social communication and peer engagement following participation in the PEERS® for preschoolers' program, underscoring the importance of structured parental involvement in early intervention. In parallel, Gong *et al.* [55] demonstrated that heart–mind–behavior parent training significantly improved children's emotional regulation and social interaction, highlighting the effectiveness of empowering parents as active intervention agents.

Developmental play-based approaches were further supported by Mirzakhani *et al.* [58], who found that both son-rise and floor-time programs produced significant gains in social interaction alongside reductions in stereotyped behaviors. Likewise, Blanc *et al.* [65] reported positive socioemotional outcomes following EDT, particularly for children with more severe autism profiles, emphasizing early relational engagement as a catalyst for socioemotional growth. Complementing these findings, Kazemi and Abolghasemi [60] demonstrated that play-based empathy training enhanced social skills by fostering emotional understanding and perspective-taking. However, several relationship-based studies relied on small-scale or qualitative designs, which limit causal inference and cross-context comparability.

Taken together, relationship-based and developmental interventions appear particularly effective in nurturing foundational socioemotional competencies through naturalistic, relational, and play-based contexts. Their emphasis on emotional engagement, social reciprocity, and meaningful interaction supports early socioemotional development among preschool children with ASD in inclusive preschool settings. However, the predominance of small-scale and qualitative designs within this theme limits causal generalization, indicating the need for more rigorous and longitudinal studies to strengthen the evidence base.

3.2.2. Structured and skill-focused interventions

Four studies were grouped under structured and skill-focused interventions, characterized by systematic instruction, behavioral strategies, and explicit socioemotional skill instruction. The reviewed studies consistently reported short-term improvements in social initiation, peer participation, and self-regulation among preschool children with ASD. For instance, Galanis and Gena [61] demonstrated that self-management strategies implemented during school recess effectively increased social interactions among preschool children with ASD, indicating successful transfer of behavioral self-regulation to semi-natural school settings. Similarly, Du *et al.* [62] reported that an ABA-based training program significantly enhanced socioemotional skills when delivered through structured instructional formats.

Peer-mediated and modelling-based strategies also emerged as key mechanisms within this theme. Zhang *et al.* [59] demonstrated significant improvements in social skills through peer-mediated intervention, highlighting the role of structured peer interaction as an effective learning mechanism. In addition, Alkinj *et al.* [66] showed that an educational program incorporating modelling and social stories improved social competence by providing explicit social cues and behavioral scripts.

Despite their effectiveness, several studies noted limitations related to generalization and long-term maintenance of acquired skills. This suggests that structured interventions may be most effective when integrated with relational or naturalistic approaches to support skill transfer across diverse social and classroom contexts. Therefore, combining structured instructional methods with developmentally appropriate and context-sensitive strategies may enhance both skill generalization and long-term socioemotional development in preschool children with ASD.

3.2.3. Creative and technology-supported interventions

The final theme comprised four studies that employed creative, expressive, or technology-enhanced modalities to promote socioemotional development in preschool children with ASD. Overall, creative and technology-supported interventions enhanced social engagement, emotional expression, and joint attention by leveraging sensory-rich and technology-mediated modalities. Music-based interventions featured prominently within this theme. Zhou *et al.* [56] reported significant improvements in social skills following music therapy in a randomized controlled trial, while Yang and Zhang [57] similarly demonstrated that music-based interventions facilitated social engagement and emotional expression. These findings suggest that music may function as an effective medium for emotional communication and social connection in early childhood autism interventions.

Technology-supported approaches, including augmented gamified environments [64] and robot-assisted interventions [54], further demonstrated positive effects on joint attention, motivation, and socioemotional skills by increasing engagement and sustained participation. These modalities appear especially beneficial for children who experience difficulties responding to conventional instructional methods. However, most studies within this theme were exploratory and characterized by small sample sizes and short intervention durations, limiting conclusions regarding long-term effectiveness and scalability. Overall, creative and technology-supported interventions demonstrate strong potential as complementary approaches to enhance engagement, accessibility, and socioemotional participation in preschool children with ASD, despite the exploratory nature and small sample sizes of existing studies.

3.2.4. Educational implications, practical applications and methodological considerations

From an educational evaluation perspective, the findings provide actionable implications for early childhood educators, curriculum developers, and policymakers working in inclusive preschool settings. Overall, socioemotional development in preschool children with ASD is enhanced when relational, structured, and creative approaches are flexibly integrated rather than implemented in isolation. Accordingly, intervention planning should prioritize developmentally appropriate and context-sensitive strategies that can be adapted to diverse socioemotional profiles in inclusive early childhood education environments.

For classroom practice, educators may incorporate relationship-based strategies such as guided play, parent collaboration, and emotionally responsive interactions alongside structured socioemotional instruction, including modelling, social stories, and peer-mediated activities. Such integration aligns with developmentally appropriate practices in early childhood education and supports diverse socioemotional profiles among children with ASD. For curriculum developers, the findings highlight the importance of embedding explicit socioemotional learning components within inclusive preschool curricula, particularly through developmentally appropriate, play-based, and context-sensitive modules. Structured socioemotional activities should be designed to allow gradual skill generalization across classroom routines, peer interactions, and naturalistic learning environments. This is especially relevant for inclusive educational frameworks that emphasize holistic child development and socioemotional competence as core learning outcomes. From a policy perspective, the synthesis underscores the need for evidence-based socioemotional intervention programs that are adaptable to diverse educational contexts, including inclusive preschool and special education integration settings. Policymakers should prioritize teacher training, intervention fidelity monitoring, and the provision of structured socioemotional learning resources to support sustainable implementation in early childhood education systems.

Methodologically, while most studies reported positive socioemotional outcomes, the strength of evidence remains moderate due to variations in research design, small sample sizes, short intervention durations, and inconsistent outcome measures. The limited use of standardized socioemotional assessment tools constrains cross-study comparability and reduces the robustness of cumulative evidence. Relationship-based interventions demonstrated strong ecological validity but often relied on qualitative or small-scale designs, limiting causal inference. In contrast, structured interventions showed clearer short-term behavioral gains but faced challenges related to generalization and long-term maintenance. Creative and technology-supported interventions enhanced engagement and motivation, yet many were exploratory and lacked large-scale validation.

Collectively, these findings indicate that future socioemotional intervention research should prioritize longitudinal designs, larger and more diverse samples, standardized socioemotional assessment instruments, and transparent reporting of implementation fidelity. Cross-cultural comparative studies are also essential to enhance the global applicability and contextual relevance of socioemotional interventions for preschool children with ASD in inclusive educational settings. These directions would further strengthen the methodological rigor and enhance the practical applicability of socioemotional interventions in inclusive early childhood education contexts.

4. CONCLUSION

This systematic review synthesized recent empirical evidence on socioemotional skill interventions for preschool children with ASD, highlighting intervention trends, methodological characteristics, and primary developmental outcomes. The findings indicate that relationship-based, structured, and creative or technology-supported interventions collectively contribute to improvements in social interaction, emotional regulation, and emotional understanding in inclusive early childhood settings. Importantly, the evidence suggests that socioemotional development in preschool children with ASD is most effectively supported through the flexible integration of these intervention approaches rather than reliance on a single intervention model. From educational and policy perspectives, the review underscores the importance of embedding

evidence-based socioemotional interventions within inclusive preschool curricula, classroom routines, and teacher professional practices. These findings further support the development of structured socioemotional learning modules, systematic teacher training, and scalable intervention frameworks aligned with inclusive education agendas. This review provides a novel and developmentally focused synthesis by integrating relationship-based, structured, and creative or technology-supported socioemotional interventions specifically for preschool children with ASD within inclusive early childhood education contexts. Nevertheless, this review is subject to several limitations, including the restriction to two databases (Scopus and WoS), the relatively small number of included studies, methodological heterogeneity, and the limited use of standardized socioemotional outcome measures, which may affect the generalizability and comparability of the findings. Therefore, future research should prioritize longitudinal designs and stronger methodological rigor to enhance the sustainability and contextual relevance of interventions in inclusive early childhood education settings.

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C : **C**onceptualization
M : **M**ethodology
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R : **R**esources
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O : Writing - **O**riginal Draft
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Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

ETHICAL APPROVAL

Ethical approval is not applicable for this article.

DATA AVAILABILITY

This paper is based on previously published studies and does not involve the generation or analysis of primary data; thus, data availability is not applicable.

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