THE IMPORTANCE OF EARLY INTERVENTION FOCUSED ON PARENT TRAINING FOR PRESCHOOL-AGED CHILDREN WITH AUTISM: A SYSTEMATIC LITERATURE REVIEW

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Abstract

Increased number of children with autism spectrum disorder (ASD) has also heightened interest in finding and providing appropriate interventions. Early intervention is implemented at the moment when deviations are noticed, without waiting for an official diagnosis. Parents are crucial participants in interventions carried out with children; therefore, this research considers interventions focused on training parents to work with children with ASD up to the age of six.

For the purposes of this paper, we searched the following journals: Autism, Focus on Autism and Other Developmental Disabilities, and Research in Autism. The search was limited to editions from 2012 to 2022, and the following keywords were considered: parent training, early intervention, autism. References were searched manually. The initial search yielded a total of 992 articles. Twenty-four studies related to children up to six years old and involving parent training in early intervention were included in the analysis. Using a tool for assessing quantitative studies, the selected studies were evaluated, with each component assessed based on the information contained in the study as good, moderate, or weak. The overall rating for the paper can be strong, moderate, or weak. This paper highlights the importance of support to enhance parental competencies.

Keywords: autism, early intervention, parent training

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by difficulties in social communication and interaction, as well as restricted or repetitive interests and behaviors (American Psychiatric Association, 2013). According to Baio et al. (2018), one in 59 children has ASD, and it occurs four times more frequently in boys than in girls.

Parents typically notice the first signs of autism by the age of two (Zuckerman, 2015). The American Academy of Pediatrics recommends the use of the Modified Checklist for Autism in Toddlers (M-CHAT) at 18 and 24 months to timely identify early signs of deviation and initiate early intervention (EI) (Robins et al., 2014). However, early detection often lags, and the diagnosis is frequently made later, usually between the ages of four and five (Brett et al., 2016). Recently, various tests and video conferencing through mobile applications have been employed for early identification of developmental deviations (Dahiya et al., 2020). Early detection increases the time available for implementing EI, which plays a significant role in enhancing developmental skills for children with ASD (Tonge et al., 2014). EI is conducted if deviations are observed, even without an officially diagnosed condition.

The European Network on EI defines EI as all forms of parent-focused encouragement. EI involves the child as well as their parents, family, and the broader network (Ljubešić, 2003). It is a support system for family interaction patterns that best stimulate a child's development (Guralnick, 2011). Early intervention (EI) is a universally acknowledged system designed to offer support to children from birth to five years old. Current research indicates that EI is the most effective approach for diminishing, and possibly eradicating, the symptoms of developmental disabilities (Babić-Čolaković et al. 2016).

The concept of EI began in the United States in the 1970s. It involves processes of informing, counseling, and educating parents and their children if developmental deviations are noticed (Dunst & Espe-Sherwidnt, 2017). In parallel, in 1973, Otto Speck laid the foundation for establishing interdisciplinary early childhood centers in Bavaria (Peterander et al., 1993). In 2002, the Regional Early Childhood Intervention (ECI) agency provided "at-your-fingertips" support for families through teams whose members collaborated by exchanging opinions and work plans for each individual case (Sanders et al., 2002). In Norway, nurses support families up to the child's first year of life, and, if necessary, extended support is provided (van Wassenaer-Leemhuis et al., 2016). In Portugal, EI exists through

transdisciplinary teams that offer family support (Pereira & Serrano, 2014). EI was incorporated into the legal system of the Republic of Croatia in 2011 through the Social Welfare Act, which defines it as "professional stimulating assistance to children and professional and advisory assistance to their parents, including other family members and foster parents for children, in cases If necessary, extended support is provided (van Wassenaer-Leemhuis et al., 2016). In Portugal, EI exists through transdisciplinary teams that offer family support (Pereira & Serrano, 2014). EI was incorporated into the legal system of the Republic of Croatia in 2011 through the Social Welfare Act, which defines it as "professional stimulating assistance to children and professional and advisory assistance to their parents, including other family members and foster parents for children, in cases of identified developmental risk or difficulties of the child" (Social Welfare Act, 2012).

Initially, EI was directed towards children of lower socioeconomic status through programs such as "Head Start" to help them overcome disparities and catch up with their peers. Gradually, it evolved into support for children with developmental challenges (Ilić, 2021). With Bronfenbrenner's (Bronfenbrenner, 1979) ecological systems model of support for parents and other family members of a child with developmental challenges, there has been a paradigm shift in EI. The child is at the center of attention, and the support team in EI trains parents and the environment on how to create a responsive environment for the child.

Research in recent years increasingly focuses on the role of parents in the EI process (Beaudoin et al., 2019; Ho & Lin, 2020; Matthews et al., 2018; Waddington et al., 2020). One of the well-known researchers who investigated the influence of parents in the EI process is Gerald Mahoney (1985), who, in his initial study, indicated that the impact of parental responsiveness in daily interactions with the child on developmental outcomes was neglected (Mahoney et al., 1985). Authors Klein and Gilkerson (2000) emphasize the importance of the family, stating that it must be at the center of EI, and the program should be adapted to its functioning. Parents in EI, through evidence-based training, yield the best intervention results in the early years (Burrell & Borego, 2012). They should be active participants in the intervention process, rather than individuals waiting outside the clinic for the therapy to conclude.

Children with developmental disabilities need to be involved in support systems as early as possible, which is an integral part of the learning and skill acquisition process (Swartzmiller, 2014). In order for children with difficulties to succeed, it is necessary to empower and educate parents to work with them. Interventions focused on parents should actively involve family members in finding the resources and support needed for caring for children (Dunst et al.,

2008). When planning and designing programs for children with ASD, it is important to take into account parental priorities for interventions (Ghanadzade et al., 2018). Besides parents, special educators have also emphasized EI as the topic of permanent professional development (Memisevic & Biscevic, 2023).

Benefits of early intervention involving parents contribute to more positive outcomes in children (Bailey et al., 2012), improvement in interaction and communication (Vismara et al., 2016), parenting skills, and reduced parental stress (Dababnah et al., 2019).

Early intervention is becoming increasingly important worldwide as programs have been shown to be cost-effective, efficient, have long-term effects on development, and maximize a child's developmental potential. Research indicates that every dollar invested in early education supports savings between seven and 21 dollars later in life, which would otherwise need to be invested throughout life in more expensive services required to support individuals who were not involved in early intervention (Heckman & Masterov, 2007; Rolnick & Grunewald, 2003; Sayre et al., 2015).

Objective

The purpose of this systematic review was to consolidate a broad range of literature investigating the effectiveness of interventions aimed at empowering parents of children with ASD at an early age. The goal was to enhance parental competencies for better preparing children for life.

The purpose of this systematic review was to consolidate a broad range of literature examining the effectiveness of interventions aimed at empowering parents of children with ASD in early childhood, with the goal of enhancing parental competencies for better preparing children for life.

Method

The systematic review was conducted following the Preferred Reporting Item for Systematic Review and Meta-Analysis (PRISMA) guidelines.

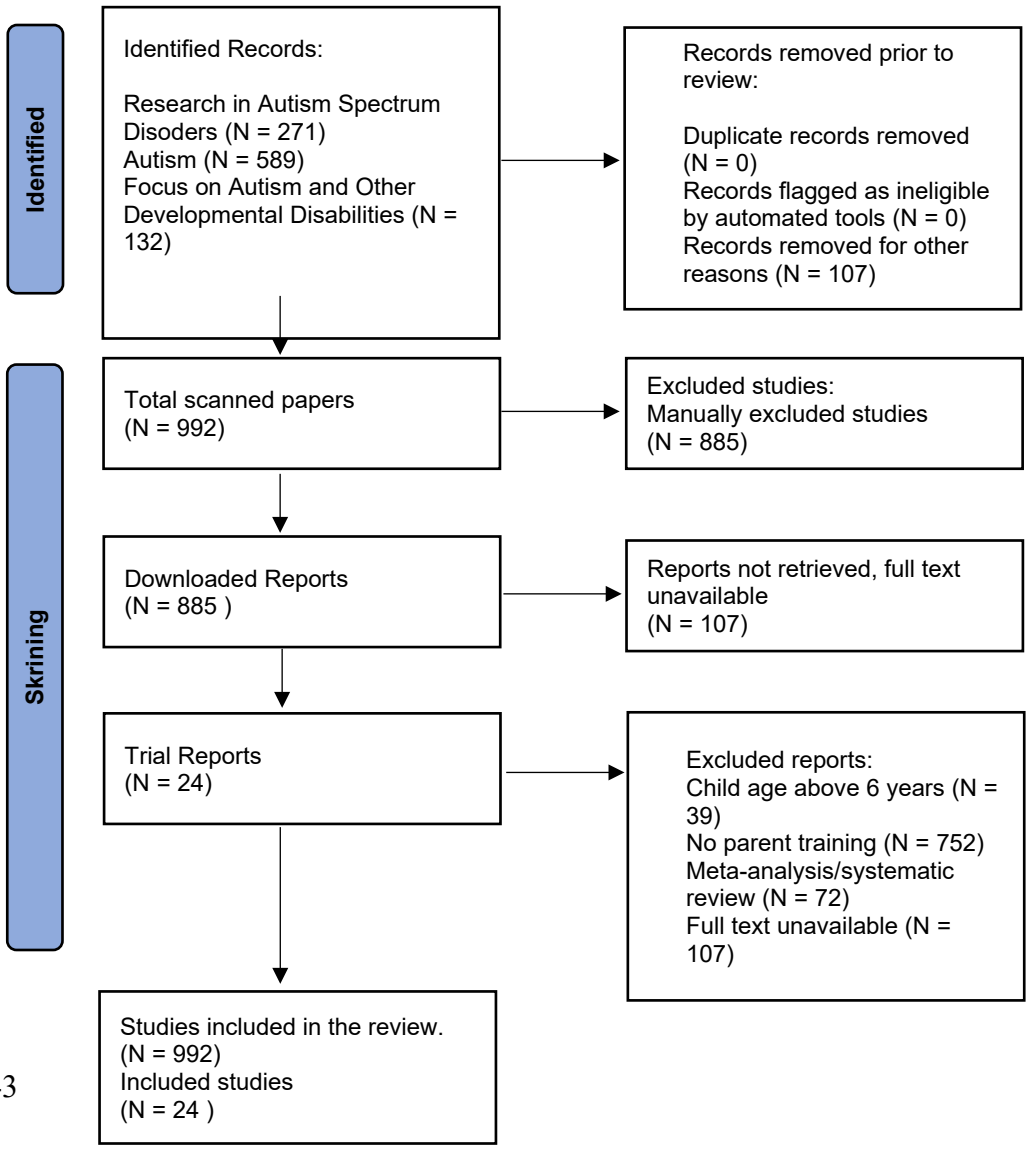
The search was performed in the journals Autism, Focus on Autism and Other Developmental Disabilities, and Research in Autism. The search was limited to journal issues

from 2012 to 2022, and it was conducted using criteria that included the following keywords: parents training, early intervention, autism. References were searched manually.

The search process included both quantitative and qualitative studies that met the following criteria:

- Studies related to children with autism spectrum disorder up to the age of six,
- Studies that involved a clearly defined intervention,
- Studies that included parent training to empower parents to work with children,
- Studies published in the last 10 years, from 2012 to 2022, and
- Studies in the English language.

Studies were excluded if the child's age exceeded six years, parents were not included in the early support system through parent training, the outcome of support was not directed toward the child and family, the works were systematic reviews/meta-analyses, or if they were not available in full.



Picture 1. PRISMA diagram showing the selection flow of studies included in the review

Selection of Studies

Studies were selected based on key terms. Papers that did not consider parent training, were not available in full, or were systematic reviews were removed, and then the selected works were read. Relevant studies were identified, their quality was assessed, and the data from the collected papers were entered into a table of review studies with elements of discussion.

Bias Assessment

The selected studies were assessed for quality using the Quality Assessment Tool for Quantitative Studies. The components of the tool include:

Selection Bias: Determines the representativeness of the target population. Ratings: good – representative of more than 80%, fair – 60–79% participation, poor - less than 60% participation or selection is not described.

Study Design: Assesses the likelihood of bias due to allocation processes in experimental studies, whether the study is randomized, the appropriateness of the method, controlled clinical trial, cohort analytic, case-control study, interrupted time series, surveys, or interviews. Ratings: good – randomized study, fair – cohort study, case-control study, poor – any method or method not specified.

Confounding Variables: Variables associated with the intervention or exposure and causally related to the outcome of interest. Ratings: good – articles that controlled for at least 80% of confounding factors, fair – studies that controlled for at least 60–79% of confounding factors, poor – controlled for at least 60% of confounding factors.

Blinding of Assessors/Participants to Protect Against Reporting Bias: Ratings: good – assessor is unaware of the intervention status, fair – outcome assessor is unaware of the intervention, poor – assessor is aware of the intervention status or blinding is not described.
Data Collection Method: Measurement tools must be reliable and valid.

- Assessment: Data Collection Method:

Good - Data collection tools are valid and reliable.

Fair - Data collection tools are valid, but reliability is not ensured.

Poor - Data collection tools are neither valid nor reliable.

- Follow-Up and Dropout:

Good - Follow-up rate is 80% or higher.

Fair - Follow-up rate is between 60-79%.

Poor - Follow-up rate is less than 60% or not described.

- Integrity of Intervention: Assesses how many participants received the complete intervention and whether contamination of the intervention occurred by random intervention.
- Analysis of Response to Questions: All participants in the study are analyzed according to the assigned intervention, regardless of whether they received it or not.

The selected studies in this review were assessed using the tool for evaluating quantitative studies. In the created table with seven columns, where the study name was entered, ratings were assigned to the tool components. Each component was rated based on the information contained in the study. The study ratings are: good, fair, and poor. Studies ultimately received an overall rating, which can be strong, moderate, or weak.

Results

The initial search yielded a total of 992 articles. Further analysis identified 885 articles that were fully accessible, while 107 articles only had abstracts. The next group of studies was excluded due to the absence of parent training (755), or they were excluded because they were systematic review studies or meta-analyses (72). Reviewed studies that involved parents undergoing training in early intervention but were related to children older than six years were also excluded (39).

After further analysis, 24 studies were selected that focused on children up to the age of six and included parent training in early intervention.

The studies included in the search were from the United States (N = 15), China (N = 3), Canada (N = 3), Albania (N = 1), India (N = 1), the Netherlands (N = 1), and Australia (N = 1).

Most of the studies were oriented towards mothers (N = 16), while eight studies included both parents (N = 8).

Applied Intervention Models

This review includes interventions conducted in centers such as The Incredible Years (Dababnah et al., 2019; Dababnah et al., 2016), Jump Start (Matthews et al., 2018), Functional Behavior Skills Training (FBST; Reitzel et al., 2013), Early Intensive Behavioral Intervention (EIBI; Rivard et al., 2014), Stars and Rain Education Institute for Autism – SREIA (Fang et al., 2022), RUBI program (Edwards et al., 2019), Project ImPACT based on Naturalistic Developmental Behavioral Interventions (NDBI; Sengupta et al., 2020), Ummeed Parent Program for Autism (UPPA; Sengupta et al., 2020), and Parent-Assisted Social Skills Training (SST; Park et al., 2022).

Interventions conducted in home settings include the Early Start Denver Model (Beaudin et al., 2018; Estes al., 2021; Waddington et al., 2019), Reciprocal Imitation Training (RTI; Gengoux et al., 2019; Hall et al., 2019; Penney & Schwartz, 2019), Project ImPACT based on NDBI (Law et al., 2018; Pickard et al., 2016), Parent Education and Counselling (PEAC) and Parent Education and Behavioral Management (PEBM; Tonge et al., 2014), Jump Start (Matthews et al., 2018), Joint Management (JA; Chiang et al., 2015), Video-feedback Intervention to promote Positive Parenting adapted to Autism (VIPP – AUTI; Poslawsky et al., 2014), and Developmental Individual-Difference Relationship-Based Model (DIR; Ho & Lin, 2020).

Interventions conducted via online conferences include Remote Parent Training (Dai et al., 2018), Paediatric Autism Communication Therapy (PACT; Leadbitter et al., 2020), and Project ImPACT based on NDBI (Stahmer et al., 2017).

Characteristics of Parent Training Programs

The parent training programs exhibited various characteristics, including parental consent, information collection from parents, online workshops, video recordings, consultations with trainers, individual sessions with therapists, group training, and certificates for completing the training (Estes et al., 2021). The application of video teachings, structured work programs, and free play periods were used for practicing activities and generalization (Estes et al., 2021). The focus was primarily on enhancing parental competencies to establish

better contact with the child and care for the parents' mental health. Completion of some programs was further incentivized with a $75 reward (Dababnah et al., 2016).

Parents were encouraged through direct participation and observation of video recordings to use different strategies to enhance their child's skills (Beaudin et al., 2018; Chiang et al., 2015; Hall et al., 2019). Effective reactions between parents and children (Chiang et al., 2015; Fang et al., 2022; Poslawsky et al., 2014), methods for improving communication and interaction (Gengoux et al., 2019), strategies for targeted behavior (Reitzel et al., 2013; Tonge et al., 2014), and techniques for generalizing acquired skills (Law et al., 2018) were also covered.

After explaining the programs, parents were given the opportunity to decide whether to participate in the intervention program. The programs were typically free, and some even provided meals and transportation for the children. Siblings of preschool age were also allowed to participate in some programs (Chiang et al., 2015).

Video recordings served as source materials, where various child behaviors and parent-child interactions were observed (Leadbitter et al., 2020). Parents performed activities with their children while trainers provided suggestions, examples, and models for more successful interaction (Penney & Schwartz, 2019). Parents could ask questions about their child's developmental possibilities during direct sessions (Estes et al., 2021) or contact a child center weekly to receive answers from therapists (Dai et al., 2018). A guide was used to evaluate participant satisfaction with the training model (Hall et al., 2019).

Some programs used a combination of didactic lessons and in vivo video observation for each individual case (Matthews et al., 2018; Penney & Schwartz, 2019; Pickard et al., 2016; Waddington et al., 2020).

In programs conducted in group settings (Edwards et al., 2019), caregivers practiced through role-playing, and therapists provided feedback on the quality of specific strategies. Caregivers attempted to establish better communication and interaction, adjusted the sensory environment, responded to sensory seeking, followed the child's lead, and devised enhancements to interaction and play (Fang et al., 2022). The same sets of materials were used for education in both centers and home settings (Gengoux et al., 2019; Hall et al., 2019).

Interventions conducted in centers involved one therapist working with one child and parent, after which the intervention was integrated into the environment through daily routines (Rivard et al., 2014). Parents received a weekly project plan and program to introduce into their daily routines. A manual was provided to parents where intervention strategies and homework assignments were recorded (Stahmer et al., 2017).

In addition to direct work with children, parents also participated by filling out surveys and demographic questionnaires (Dababnah et al., 2019).

Duration of Parent Training

Parent training durations varied with different numbers of sessions and hours of weekly treatment. Training durations ranged from 11 weeks (Fang et al., 2022) to 18 months (Sengupta et al., 2020), with the number of sessions ranging from 12 sessions (Beaudin et al., 2018) to 22 sessions (Law et al., 2018).

Each training program lasted a different number of hours and minutes per week, such as five hours per week (Estes et al., 2021), 60–90 minutes (Edwards et al., 2019; Park et al., 2022), 30–60 minutes (Dai et al., 2018; Chiang et al., 2016; Tonge et al., 2014), and 10–36 minutes (Law et al., 2018).

To assist parents in remote and rural areas, researchers devised online support through video conferences, phone calls, or sending video recordings of interactions with the child (Dai et al., 2018; Leadbitter et al., 2020; Stahmer et al., 2017). Child engagement activities were conducted in various situations, primarily through play and daily routines. Sent video recordings were analyzed, and parents received guidance on improving specific behaviors. Play activities were transferred to different routines and everyday situations. Empowered, educated parents can support the child's development and maximize it with expert guidance (Benzies et al., 2013).

Characteristics of Children Involved in Interventions

Children were enrolled in interventions based on recommendations from pediatricians or psychiatrists (Chiang et al., 2015), referrals from clinics (Dai et al., 2018), specialized institutions (Edwards et al., 2018; Gengoux et al., 2019; Law et al., 2018), and preschools they attended (Penney & Shwartz, 2019).

The age of the children included in the studies ranged from 12 months to six years. The children in the studies were either suspected of having ASD or already diagnosed with ASD

(Beaudin et al., 2018). They were predominantly male, with the representation of boys ranging from 100% (Waddington et al., 2020), 85% (Stahmer et al., 2017), 84.1% (Sengupta et al., 2020), 82% (Gengoux et al., 2019) to 80% (Park et al., 2022).

Depending on the intervention goals, children could also be involved in other interventions (Beaudin et al., 2018). Treatment was carried out in everyday situations such as home environments, playgrounds (Law et al., 2018), as well as in centers and clinics (Dababnah et al., 2019; Dababnah et al., 2016; Matthews et al., 2018; Reitzel et al., 2013; Rivard et al., 2014).

Characteristics of Educators

Educators in the programs had different educational backgrounds and were not exclusively associated with healthcare or education and social work (Fang et al., 2022). Therapists were certified and trained to implement specific intervention models. For example, in joint attention therapy, three experts participated, one of whom was a certified professional, while the other two were in the process of certification and had experience in implementing and providing support (Chiang et al., 2015). In the DiR program, researchers were pediatric occupational therapists with at least five years of experience in the DIR model, trained for ABA and EIBI programs under the supervision of a master's degree holder in psychoeducational studies (Rivard et al., 2014). They had to be familiar with elements and techniques of work, have experience working with children with ASD, understand the characteristics of parents of children with ASD, and adapt working methods to the cultural context, especially since some treatments were conducted in home settings (Estes et al., 2021).

Characteristics of Parents Involved in Training

Mothers predominantly participated in the training sessions, with percentages ranging from 73.7% to 96.8% (Pickard et al., 2016; Poslawsky et al., 2014; Dai et al., 2018; Beaudin et al., 2018). In four studies, both parents participated (Leadbitter et al., 2020; Matthews et al., 2018; Tonge et al., 2014; Sengupta et al., 2020). The age of parents ranged from 20 to 52 years, with the average age ranging from 21 years to 36.6 years (Dai et al., 2018; Poslawsky et al., 2014; Beaudin et al., 2018; Stahmer et al., 2017).

Mothers had varying levels of education, from elementary school to a college degree (see Table 1). Socio-demographic data indicated that the majority of families had low to moderate socio-economic status, with percentages as high as 92% in some studies (Dababnah

et al., 2016; Dababnah et al., 2019; Beaudin et al., 2018; Edwards et al., 2018; Sengupta et al., 2020). Some families demonstrated a middle to high economic status (Poslawsky et al., 2014). While most mothers attempted to complete the program, some families did not persist, often due to changes in socio-economic status (Beaudin et al., 2018).

Barriers to Parental Involvement in Interventions

Early interventions can be expensive, and organizing parents' attendance at a specific address in remote parts of the country can be challenging (Latifi et al., 2012). For employed parents, the timing of interventions can often pose a challenge (Dai et al., 2018). Sometimes, distinguishing between the roles of parents and therapists can be difficult, creating stress for some parents, particularly those of children with ASD (Bonis, 2016). Long waiting lists are also common, making it difficult for children to get into interventions promptly, thus diminishing parental interest (Zablotsky et al., 2015).

Outcomes of Applied Intervention Models:

The measurement of intervention outcomes was conducted using various methods, including independent evaluators (Beaudin et al., 2018), parental reports with personal insights through video recordings (Dababnah et al., 2019), checklists filled out by parents through interviews (Dababnah et al., 2016), demographic forms, evaluation forms, quizzes for parents created by researchers, and the Parenting Self-Efficacy Scale in Early Intervention (Dai et al., 2018).

The recorded outcomes of interventions include:

- Improvement in the dyadic relationship between parents and children, developmental skills, and behavior (Beaudin et al., 2018; Dababnah et al., 2016).
- Enhancement of joint engagement initiated by the child (Chiang et al., 2015).
- Improvement in parenting skills for managing challenging behaviors in children, reducing parental stress levels (Dababnah et al., 2019; Fang et al., 2022).
- Increase in parental self-efficacy, belief in their own knowledge and abilities compared to the waitlist control group (Dai et al., 2018; Estes et al., 2021; Matthews et al., 2018; Penney & Shwartz, 2019; Pickard et al., 2016).

- Improvement in children's behavior, which can be incorporated into everyday skills (Reitzel et al., 2013; Stahmer et al., 2017; Waddington et al., 2020) and confirmation that group interventions can be implemented in children with ASD (Edwards et al., 2018).
- Empowerment of parents and improvement in the social quality of life by alleviating core symptoms of ASD and child behavior, and improving social deficits and communication (Gengoux et al., 2019; Leadbitter et al., 2020).
- Increase in social communication such as social engagement, language, pretend play, and gesture use, and the empowerment of more parents to implement the intervention (Hall et al., 2019).
- Increase in functional emotional skills of children with ASD and parental skills (Ho & Lin, 2020).
- Enhanced effectiveness of using a mobile application for parental training to improve functional communication in children with ASD (Law et al., 2018).
- Improvements in the assessment of parental social responsiveness, social cognition, and social motivation, reduced restricted/repetitive behaviors and interests, and problematic behavior (Park et al., 2022).
- Improvement in interaction between parents and children, enhanced joint attention, reduced individual symptoms of ASD, and increased parental self-efficacy (Poslawsky et al., 2014).
- Improvement in IQ, adaptive behavior, and socio-affective competence (Rivard et al., 2014).

Table 1. Results of the review studies with elements of discussion

Red. Br.	Study	Country	Number of Children Age	Environment in which support is provided	Parent who participated in the treatment/ Parent education	Intervention, program, duration	Outcome	Quality of the study
1.	Beaudoin et al. (2019)	Kanada	N = 19 Age 16 - 30 months M = 26 months Intervention group (N = 9) Control group (N = 10) Male 15 (78.9%)	Home conditions	Mothers (N = 14; 73.7%).	*Early Start Denver Model* 12 sessions	- An increase in parents' use of strategies learned during a parent-mediated intervention - Improvement of motor skills, communication and social interaction children	2 Moderate
2.	Chiang et al. (2016)	Taiwan Kina	N = 34 Ages 2–4 years Intervention group (N = 18), Control group (N = 16), received general service in the community.	Home conditions	34 parents and fathers and mothers Intervention group Housewife mothers (N = 11) Other (N = 7) Father	*Joint anagment* JA session 20 sessions, 60 minutes per session, twice a week for the child and his parent.	- Children with ASD showed improvement in activities that initiated, - Reducing children's disengagement in the natural context	1,62 Moderate

					HSD (N = 4) Other (N = 14) Control group of housewife mothers (N = 12) Other (N = 4) Father HSD (N = 5) Other (N = 4)		- parent child interactions	
3.	Dababnah et al. (2019)	SAD	N = 36 Age 2–6 years Northwest of the country (N = 18) Southeast of the country (N = 18)	Center	Five pairs from the same family (four mother-father pairs and one mother-grandmother pair). North-West HSD 29.4 % BD 70.6 % Southeast HSD 23.1% BD 76.9%	*The Incredible Years* IY–ASD program 1 –15 weeks	- Improving parenting skills to address challenging behaviors in children -Decreasing the stress level of parents	1,62 Moderate
4.	Dababnah & Parish (2016)	SAD	N = 17 Age 3–6 years Male 12 (70.6%) Female gender 5 (19.4%)	Home conditions	Mother (N = 17) ES 3 (17.6%) HSD 2 (5%) AD 5 (29.4%) BD 7 (41.1%)	*The Incredible Years* 5 pm weekly training, - Weekly session 2.5 h	- Children's problematic behavior is reduced, - Children's social skills and self-regulation are improved,	1,37 Strong

							-Improving parents' coping with stress	
5.	Dai et al. (2018)	Tirana, Albania	N = 29 Age from 18 to 70 months M = 47 months 3 clinics	Home conditions	Mother 10 (90.9%) ES 31% BD 44% MD 25% Control ES 31% HSD 23% BD 23% MA 23%	*Remote Parent Training* six DVD modules with basic behavioral and naturalistic teaching models, each lasting 30–60 minutes	- Increasing the competence of parents whose children are involved in treatment, - Using video teaching in home conditions to work with parents of children with ASD.	1,25 Strong
6.	Edwards et al. (2019)	Južna AlabamaSAD	N = 11 Average age M = 57.82 (4.82) months. Participants from 3 special departments and 3 special clinics	Clinic/ Centar	Mother 10 (90.9%) ES 2 (18.2%) HSD 4 (36.4%) AD 2 (18.2%) BD 3 (27.3%)	*RUB*I program the RUBI parent training manual 1 year 60 and 90 min	- Parents feel more confident in managing their child's behavior - Reduction of problematic behavior and irritability in children	1,37 Strong
7.	Estes et al. (2021)	SAD	N = 87 Age from 13 - 30 months M = 22.9	Home conditions	Mother	*Early Start Denver Model* ESDM developmental and behavioral	Reduced stress level of parents - Increasing the level of parental efficiency	1 Strong

			(21 female and 66 male) EIBI 25 h (N = 23) EIBI 15 h (N = 22) ESDM 25 h (N = 21) ESDM 15 h (N = 21)			intervention 25 hours a week, 5 hours of intervention on weekdays EIBI approach intensive behavioral intervention, 15 hours per week, 3 hours of intervention on weekdays		
8.	Fang et al., 2022	Kina	Ages 3–6 years Male gender 11 (78.6%) Female 3 (21.4%3)	SREIA premises/ Center	N = 14 Age 26–50 years Mothers 13 (92.9%), Grandma 1 (7.1%) BD 2 (14.3%) AD 6 (42.9%) BD 4 (28.6%) Unknown 2 (14.3%)	- The SREIA program is based on applied behavior analysis, social learning theory, operant conditioning, developmental and cognitive behavior theory. - 5 days a week, for 11 consecutive weeks - behavior management techniques, visual support and daily structure and routine	Improving the mental health of parents, - Accepting the child's diagnosis - Better parent/child interaction and connection -less stress and more cooperative behavior among parents	1,62 Moderate
9.	Gengoux et al. (2019)	SAD	N = 22 Ages 2–6 years M = 44.6 months	Clinica	Most women HSD (15%), AD (38%)	Reciprocal Imitation Training (RTI) 12 weekly training sessions	Empowerment of parents and social quality of life,	1,5 Moderate

			Male 18 (82%) Female 4 (18%)		BD (46%)		- Improvement of social deficits and communication after development intervention	
10.	Hall et al. (2019)	SAD	Children under 3 years old	Home conditions	Parents	Reciprocal Imitation Training (RTI) -10 min video recording - 2h workshop - 4 - 6 repetitions	- Teaching the skills of imitating objects and gestures - Improving social communication such as social engagement, language, pretend play and use of gestures	1,75 Moderate
11.	Ho & Lin. (2020)	Tajvan, Kina	N = 24 Age 36–59 months M = 48.7	Home conditions	Mother HSD 9 (75%) AD 3 (25%) Father HSD 9 (75%) BD 3 (25%)	*Developmental individual-difference relationship*-based model DIR 14 weeks three-week courses and 11-week home programs The average intensity was 110.7 h (10.1 h per week)	Increasing the functional emotional skills of children with ASD and parenting skills	1,25 Strong

						study group and intervention group and 99.4 h (9 h per week)		
12.	Law et al. (2018)	SAD	N = 3 Age from 30 – 52 months Male gender 2 (66.6%) Female 1 (33.3%)	Home conditions	Majke	*Naturalistic developmental behavioral interventions*-NDBI. Map4speech mobile application Parent 1 = 22 feedback sessions (M = 20 min; range 10 – 36 min), Parent 2 = 18 feedback sessions (M = 16 min; range = 6 – 25 min), Parent 3 = 17 feedback sessions (M = 14 min; range = 7–22 min).	- Increasing the functional emotional skills of children with ASD and parenting skills	1,75 Moderate
13.	Leadbitter et al. (2020)	SAD	Age 2–5 years	Home conditions	18 parents from 12 families: 6 single parents (all women) i 6 male - female pairs	*Paediatric Autism Communication Therapy – PACT* Videos of parent-child communication, 12 months 8–18 sessions, 20–30 min daily session	Improvements in communication and interaction between parents and children - Improving the quality of family life, along with a continuous reduction in the severity of autism	1,62 Moderate

							symptoms in children	
14.	Matthews et al. (2018)	SAD	N = 36 Intervention group (N = 13) M = 40.83 Control group (N = 13) M = 40.72	Center	Parents	JumpStart -10 a.m. training - a four-week program - 2.5h meeting weekly	Support for parents in the intervention until they are organized comprehensive services	Moderate
15.	Park et al. (2022)	SAD	N = 5 Age from 4 - 6 years Asians 2 (40%), Whites 1 (20%), Latino/Hispanic 1 (20%) Others 1 (20%)	Kindergarten/ Center	Mother 4 (80%) Father 1 (20%)	Parent assisted social skills training SST program 13–16 group sessions, 60–90 min	- Improvements in parental social response, social cognition and social motivation, - Reduced limited/ repetitive behavior and interests	1,37 Moderate
16.	Penney & Shwartz (2019)	SAD	N = 3 Age 4–6 years	Home conditions	Mother (100%)	*Reciprocal Imitation Trening* – RTI Session 30–40 minutes 20 minutes a day, 5 days a week, Parents submit two 10-minute RIT practice	Improved parents' self-belief, and this is associated with an increase in spontaneous imitation in children.	1,5 Moderate

						videos with their child each week		
17.	Pickard et al. (2016)	SAD	N = 28 Age 19–73 months M = 43.26 months Male 77.8% Female gender 22.2%	Home conditions	28 perents Mother 96,8%	ImPACT *on-line*, - Interview, - video conference, - audio call	- I mproving the child's social communication skills and the parent's competence	1 Strong
18.	Poslawsky et al. (2014)	Holandija	Age 16–61 months M = 43.0 Dg by a board-certified child psychiatrist according to an extensive developmental history	Home conditions	78 primary educator mothers 90%	*Video-feedbback Intervention to promote Positive Parenting adapted to Autism* - VIPP – AUTI -Video Feedbeck intervention, - 5 home visits, - 3 months of follow-up - 1.5 h training duration	- Improving the interaction between parents and children - Improving joint attention - Increased self-efficacy of parents	1,25 Strong
19.	Reitzel et al. (2013)	Kanada	N = 15 Age 38–82 months M = 58.5	Center	Parents	*Functional Behavior Skills Training* - FBST 4 months, - 2h weekly session for children and parents	-Reduction of problematic behavior and development of functional behavioral skills	1,37 Moderate

							in children with ASD who have - disabilities in early learning skills	
20.	Rivard et al. (2014)	Kanada	N = 93 Age 33–57 months M = 46 months	Center	Parents	*Early Intensive Behavioral Intervention* – EIBI -12 months, -16–20 h per week	- Improving IQ, adaptive behavior and socio-affective competence	1,25 Strong
21.	Sengupta et al. (2020)	Indija	N = 57 Age M = 43.2	Center for child developme nt	Mother 100% ES 5 (8.77%) HSD 2 (3.56%) BD 4 (7.01%) MD 6 (10.52%) Doctoral 19 (33.03%)	U mmeed Parent Program for Autism (UPPA) - 18 months	- Interventions mediated by parents, - Implementation in environments with low resources and culturally diverse needs - Structured programs relieve stress	1,62 Moderate
22.	Stahmer et al. (2017)	SAD	N = 13 Ages 8–21 months M = 15 months, 85% male 15% female	Home conditions	Mother M=34.9 HSD=85% BD=15%	*Natrulalistic Developmental Behavioral Interventions* – NDBI - 12 sessions, - duration 4.7 months	-Changes in behavior - Improving the parents' belief in the strategies of their work	1,25 Strong

						a phone call after a month, M = 13 min (6–22) - information on the effect of a 2x monthly video call		
23.	Tonge et al. (2014)	Australija	N = 105 Age of 2.5–5 years PEBM (n=35), PEAC treatment (N = 33) and control group (N = 35; 17 children from the village and 18 children from the city) Dg is placed by specialist multidisciplinary autism assessment teams	Home conditions	All mothers and 90% of fathers	*Parent education and counselling* – PEAC, *Parent education and behavioural management* – PEBM - assessment before treatment and follow-up 6 months after the end of the interventions i - 11–12 months after the initial assessment for the control group, - 10 small group sessions of 90 minutes (4–5 families) alternated with ten individual family sessions of 60 minutes over a period of 12 months	- PEBM improvement of children's communication skills - PEAC improvements in children's socialization skills - PEBM was associated with improvement in the child's daily living skills compared to PEAC and the control group	1,25 Strong

24.	Waddingn ton et al. (2020)	SAD	N = 5 Age 23–59 months Male gender 100%	Home conditions	Mothers 5 (100%) Cambodian ES, New Zealand European HSD Maori HSD European BD Native American MD	Early Start model - 12 week program - 10 minute video	-All five mothers used more ESDM techniques in the parent training phase compared to the beginning - Improving the child's behavior	1,25 Strong

Ocjene *Quality Assessment tool for Quantitative Studies*: jaka (1,00–1,50); umjerena (1,51–2,50); slaba (2,51–3,00)

ES – Elementary School; HSD - High School Degree; AD - Associate Degree; BD- Bachelor's Degree-, MD – Master's Degre

Discussion

The purpose of this study is to review the existing literature from the last 10 years in scientific journals such as Autism, Focus on Autism and Other Developmental Disabilities, and Research in Autism, and assess the significance of providing training to parents of children with Autism Spectrum Disorder (ASD) up to six years of age. Parents spend the most time with their children and have the opportunity to expose them to various challenging situations, making their training crucial.

We reviewed 24 studies, predominantly conducted in the United States (N = 15), China (N = 3), Canada (N = 2), Albania (N = 1), India (N = 1), the Netherlands (N = 1), and Australia (N = 1). Parent training sessions were conducted in both centers and home settings, utilizing session recordings, video conferences, and telephone conversations. Fifteen interventions were conducted in home settings, while nine were conducted in centers.

The majority of the reviewed studies indicated improvements in parent competencies (Beaudoin et al., 2019; Dai et al., 2018; Edwards et al., 2019; Estes et al., 2021; Gengoux et al., 2019; Matthews et al., 2018; Park et al., 2022; Penney & Shwartz, 2019; Poslawsky et al., 2014; Stahmer et al., 2017), enhanced interaction and communication with children (Chiang et al., 2016; Leadbitter et al., 2020; Law et al., 2018; Hall et al., 2019; Pickard et al., 2016; Poslawsky et al., 2014; Tonge et al., 2014), behavioral improvements (Park et al., 2022; Dababnah et al., 2019; Dababnah & Parish, 2016; Edwards et al., 2019; Reitzel et al., 2013; Waddington et al., 2020), adaptive abilities (Rivard et al., 2014), the child's socio-emotional skills (Ho & Lin, 2020), as well as the preservation of mental health (Fang et al., 2022; Sengupta et al., 2020). Parental training can be categorized into three groups: support in centers, support in home settings, and support through video recordings.

Interventions conducted through online conferences, video calls, and telephone calls improved parenting skills, parental self-efficacy (Ingersoll et al., 2016), and significantly contributed to time and cost savings for parents during travel. Parents additionally emphasized the necessity of making such programs available when initial developmental deviations are observed and upon the diagnosis itself (Pickard et al., 2016). Researchers indicate that these programs can be successfully implemented in

environments with low resource capabilities and culturally diverse needs (Sengupta et al., 2020).

The effectiveness of video-based teaching programs is best demonstrated by parents with higher levels of education, while parents with lower levels of education typically require more personal support and guidance to complete the activities. Parents from urban areas in India showed that learned strategies lead to improvements in social communication skills (Sengupta et al., 2020).

Group and individual training have their advantages and disadvantages. Group training, such as RUBI for disruptive behaviors, is conducted in groups of three to six people. It has proven to be a good alternative for regulating problematic behavior through group work (Edwards et al., 2019). Although group training yields results for larger groups, it is essential to consider that a significant number of participants often drop out of training, especially parents with lower socioeconomic resources. Therefore, it is crucial to proactively eliminate factors contributing to the exclusion of parents from training or offer individual training, as public support services in Applied Behavior Analysis (ABA), such as Early Intensive Behavioral Intervention (EIBI), show significant benefits for families, improving the quality of life, reducing parental stress, and enhancing cognitive skills, adaptive behavior, and IQ (Rivard et al., 2014). Individual training allows for the compensation of lost hours, monitoring individual work and the child's progress, as well as their evaluation.

It is important to note that all studies in this review were primarily conducted in smaller groups with a limited number of participants (Reitzel et al., 2013).

Implications for Practice and Future Research

In practice, it is essential to incorporate as many training sessions for parents and families as possible, preparing them to reduce stressful situations encountered daily, especially during everyday routines, feeding, sleeping, and toilet training. Professionals providing support should also be under supervision to ensure the quality of assistance. To facilitate parents' work, utilize available resources, including online counseling. Future research should consider involving more fathers and other family members in training sessions.

Limitations

There is a relatively small number of studies involving parent training, especially from the year 2022, where, in most articles, only abstracts are available. Among the available studies, there is considerable diversity in the programs used, leading to variations in the length and duration of education. Interventions are based on a small number of participants. An additional limitation is the uneven representation of fathers and mothers in training, as well as the predominance of male participants among children.

Conclusion

Upon reviewing the existing literature, it can be concluded that parent-mediated interventions have significant effects on both the child and the parent. Empowered parents, through various training sessions, enhance parenting skills, maximizing the child's potential by continuing activities in different situations and routines, similar to those carried out by therapists during treatment.

This systematic review has identified the benefits for children through parent training, reflected in improved social and communication skills (Pickard et al., 2016), reduction of problematic behavior and self-regulation (Dababnah & Parish, 2016), and enhancement of IQ, adaptive behavior, and socioaffective competence (Rivard et al., 2014).

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