

Designing an Integrated Play Therapy Program Based on the Cognitive-Behavioral Approach and Sensory Integration for Children With Autism

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ABSTRACT

The present study aimed to design an integrated play therapy program based on the cognitive-behavioral approach and sensory integration for children with autism spectrum disorder (ASD). In terms of purpose, this was an applied study, and in terms of methodology, it employed a qualitative research design. Using thematic analysis based on Braun and Clarke's (2006) six-phase framework, valid and up-to-date theoretical and empirical evidence was systematically reviewed and coded. A step-by-step framework illustrating the process of structuring and designing the integrated play therapy program based on the cognitive-behavioral approach and sensory integration for children with autism was developed according to Intervention Mapping (IM). The integrated cognitive-behavioral play therapy and sensory integration program was subsequently presented to 10 faculty members from the University of Tehran and experienced therapists working in a university clinic for children with neurodevelopmental disorders who were professionally involved in the field of autism spectrum disorder. They were asked to provide expert feedback on the developed intervention package to facilitate its refinement. Quantitative assessment of the content validity of the integrated play therapy program was conducted using the Content Validity Index (CVI) and Content Validity Ratio (CVR). The results indicated that the integrated program resulted in the development of a valid 12-session protocol. The inductive thematic analysis process progressed from 52 initial codes to 22 axial codes, 14 subthemes, and 8 main themes. These eight themes constituted the conceptual pillars of the protocol and integrated the cognitive-behavioral and sensory integration approaches within a spiral, play-based structure, thereby empirically demonstrating the feasibility of the proposed program design. Another finding of the present study was that the integrated program demonstrated satisfactory validity. The CVI calculated for each of the 12 items corresponding to the intervention sessions ranged from .80 to .90, with all values exceeding the accepted threshold of .79. Internal validity was confirmed through member checking and calculation of the CVI. The developed integrated program constitutes a valid intervention for improving sensory responses in children with sensory modulation disorder. Based on the findings, it is recommended that psychologists working with children with special needs use the 12-session integrated protocol developed in this study as a standardized intervention package.

Keywords: play therapy, cognitive-behavioral approach, sensory integration, autism spectrum disorder.

1. Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by persistent difficulties in social communication and social interaction, together with restricted, repetitive patterns of behavior, interests, or activities, with substantial heterogeneity in clinical manifestation, developmental trajectory, adaptive functioning, and support needs. Contemporary conceptualizations increasingly emphasize that ASD cannot be adequately understood solely through observable social and behavioral symptoms, because its clinical presentation reflects complex interactions among neurodevelopmental, cognitive, sensory, motor, emotional, and environmental processes (Morris-Rosendahl & Crocq, 2020). Advances in neuroscience and computational approaches have further demonstrated the biological and functional heterogeneity underlying ASD, with neuroimaging and machine-learning research attempting to identify patterns that may improve characterization and diagnosis (Nogay & Adeli, 2020). At the same time, population-based screening studies continue to underscore the practical importance of early identification during childhood, when difficulties in communication, behavior, sensory processing, and adaptive functioning may become increasingly apparent in educational and family contexts (Hasannataj et al., 2020). This heterogeneity means that children with ASD may differ markedly in the severity and configuration of their difficulties, including theory-of-mind abilities and the extent to which impairments interfere with daily functioning (Baron-Cohen et al., 2025). Accordingly, contemporary intervention planning has shifted toward multidimensional and individualized approaches that address not only core social-communication characteristics but also the associated emotional, cognitive, sensory, motor, and family-related needs that influence participation and quality of life.

Among the clinically significant but highly variable characteristics of ASD, atypical sensory processing has received particular attention. Children with ASD may demonstrate hyperresponsivity, hyporesponsivity, sensory seeking, difficulties registering or discriminating sensory information, and problems integrating information across tactile, vestibular, proprioceptive, auditory, visual, and oral sensory systems. Comparative evidence has demonstrated that sensory-processing patterns in children with ASD differ meaningfully from those observed in children with other developmental conditions and in typically developing peers

(Esteki et al., 2020). Sensory-processing difficulties are important because they do not remain confined to the sensory domain; rather, they may affect attention, learning, behavioral organization, emotional stability, motor planning, social participation, self-care, and the ability to adapt to ordinary environmental demands. In inclusive educational environments, sensory-processing difficulties may interfere directly with engagement, classroom participation, concentration, and learning outcomes (Narasimhan et al., 2026). Sensory over-responsivity, in particular, may increase distress, avoidance, physiological arousal, and behavioral dysregulation when children encounter unpredictable or intense sensory input (Yuan et al., 2022). Difficulties of this type may also extend beyond the child to caregivers and professionals who must adapt environments, routines, and expectations to support participation; therefore, education and environmental support for adults working with children who have sensory-processing difficulties are increasingly regarded as important components of intervention (Pucel, 2024).

Sensory difficulties also interact with motor and functional development. Many children with ASD experience difficulties in postural control, balance, motor coordination, praxis, fine-motor functioning, and body awareness, all of which may influence independence and participation in play and everyday activities. Parents frequently identify motor development as a meaningful area of concern because limitations in movement and motor competence can restrict participation in age-appropriate activities and increase dependence on adults (Müller et al., 2024). Sensory-motor interventions delivered through play have shown potential for improving spatial visualization and fine-motor performance in children with developmental and learning difficulties, further supporting the functional interdependence of sensory and motor systems (Ghasemian Moghaddam & Mohammadzadeh, 2024). Within ASD-specific intervention research, sensory integration has therefore emerged as an important therapeutic framework. Reviews of sensory-processing and sensory integration approaches suggest that targeted, individually calibrated sensory experiences may improve selected aspects of participation, adaptive responding, sensory modulation, and functional performance, although the magnitude and consistency of effects vary according to intervention fidelity, outcomes, and study design (Camino-Alarcón et al., 2024). Recent systematic reviews and meta-analyses have similarly reported beneficial effects of sensory integration-based interventions for autistic children in several functional

domains (Lyu et al., 2025; Oh et al., 2024), while a more recent systematic review of occupational therapy interventions using Ayres Sensory Integration has strengthened the contemporary evidence base for carefully delivered, fidelity-consistent sensory integration interventions (Piller et al., 2026).

Nevertheless, the sensory integration literature also demonstrates why a purely sensory intervention may not be sufficient for all children with ASD. Sensory responses are embedded within emotional, behavioral, cognitive, interpersonal, and environmental systems. For example, a child who experiences tactile or auditory hypersensitivity may develop anticipatory anxiety, avoidance, rigid routines, emotional outbursts, or reduced willingness to participate in social and educational activities. Conversely, cognitive inflexibility, emotional dysregulation, or anxiety may intensify the child's reactions to sensory experiences. Randomized and controlled research on sensory integration has therefore highlighted both the potential benefits and the need for careful outcome specification and individualized implementation (Randell et al., 2022). Studies combining sensory environments or sensory-based methods with conventional therapeutic services suggest that integrated service models may be clinically useful when children present with complex and overlapping needs (Awaida et al., 2024). Sensory integration has also been associated with improvements in areas beyond sensory reactivity, including language-related outcomes (Fouad et al., 2023), play participation (Kuhaneck et al., 2023), communication, social interaction, stereotyped behaviors, and motor development when delivered through sensory integration-based play therapy (Rabiei et al., 2023). Sensory diet-based play therapy has likewise been applied to vestibular modulation and balance difficulties in autistic children (Salehi et al., 2019). These findings collectively indicate that sensory intervention may be most meaningful when sensory experiences are connected to broader developmental and behavioral goals rather than treated as isolated physiological phenomena.

A second intervention tradition relevant to the complex needs of children with ASD is cognitive-behavioral therapy (CBT). CBT conceptualizes emotional and behavioral problems in relation to reciprocal interactions among thoughts, affective responses, behavior, and environmental contingencies. In autistic populations, CBT has been applied particularly to anxiety, emotional regulation, behavioral difficulties, and adaptive coping. Meta-analytic evidence suggests that CBT can reduce anxiety symptoms in

individuals with ASD, although treatment effects depend on developmental level, intervention adaptation, delivery format, and the characteristics of the child (Cheng et al., 2025). Recent comparative evidence concerning emotion-regulation interventions for autistic children and adolescents further emphasizes the importance of directly addressing emotional processes rather than focusing exclusively on observable behavior (Li et al., 2026). Yet traditional verbally mediated CBT may be difficult for younger children or children who have language, attention, symbolic reasoning, or social-communication limitations. Developmentally appropriate modification is therefore essential. Challenges in delivering conventional CBT to children and adolescents have long included differences in cognitive maturity, motivation, metacognitive ability, generalization, family context, and the capacity to engage in abstract verbal discussion (Halder & Mahato, 2019).

Play provides a developmentally appropriate mechanism through which cognitive and behavioral principles can be translated into concrete, experiential, and motivating therapeutic activities. Cognitive-behavioral play therapy (CBPT) integrates structured play with cognitive restructuring, emotion recognition, problem solving, modeling, reinforcement, exposure, behavioral rehearsal, and coping-skills training. Because play constitutes a natural medium through which children communicate, explore roles, express affect, and practice behavior, it can reduce the linguistic and abstract demands that often limit conventional CBT. Empirical studies have shown that cognitive-behavioral play-based interventions can improve sustained attention, working memory, and short-term memory in children with learning disorders (Azizi et al., 2020), reduce symptoms and impulsivity in children with attention-deficit/hyperactivity disorder (Hosseinzadeh, 2021; Khatoon et al., 2020), and become more effective when child-focused techniques are integrated with parent-management strategies (Feizollahi et al., 2020). These findings are relevant to ASD because attentional regulation, cognitive flexibility, behavioral self-management, and emotional control frequently constitute important treatment targets in this population.

A growing body of ASD-specific evidence likewise supports the therapeutic value of play-based cognitive and behavioral methods. Child-centered play therapy has been associated with improvements in emotional and social skills among children with autistic disorder (Hashemipour & Mohammadi, 2018). Cognitive-behavioral play therapy has been reported to reduce challenging behaviors in children

with high-functioning autism (Faramarzi & Ghanei, 2019), while cognitive-behavioral sandplay has been used to reduce difficulties in emotion recognition and improve social development in boys with ASD (Mirghafourian et al., 2022). More recent findings suggest that cognitive-behavioral play therapy can also address social anxiety and self-injurious behavior in autistic children (Hamidifard et al., 2023). Contemporary treatment-planning literature further emphasizes that play interventions should be formulated systematically around the child's developmental profile, family context, therapeutic goals, and mechanisms of change rather than being treated as an unstructured recreational adjunct (Tasijawa & Herwawan, 2025). Similarly, systematic evidence on play-based interventions for young children with disabilities indicates that structured play may facilitate executive functioning and related self-regulatory processes when activities are deliberately aligned with developmental goals (Wardhani & Widjayatri, 2025). These findings provide a strong rationale for using play as the organizing medium through which cognitive-behavioral principles can be delivered to children with ASD.

Despite these developments, cognitive-behavioral and sensory integration approaches have frequently evolved as partially separate intervention traditions. This separation may be clinically problematic because the difficulties experienced by children with ASD are rarely compartmentalized. Sensory overload may precede anxiety, aggression, stereotypy, withdrawal, or emotional meltdown; poor sensory registration may appear behaviorally as inattention or reduced engagement; vestibular and proprioceptive difficulties may interfere with motor confidence and social play; and cognitive rigidity may make adaptation to sensory novelty especially difficult. Conversely, improved sensory organization may create a physiological state in which the child is more able to attend, engage, reflect on emotions, practice coping strategies, and participate in reciprocal interaction. Thus, an integrated model has the potential to target both bottom-up sensory-regulatory mechanisms and top-down cognitive-behavioral processes within the same therapeutic sequence. Research on combined sensory and play-oriented approaches has generated encouraging findings, although the evidence remains methodologically heterogeneous (Awaida et al., 2024; Rabiei et al., 2023). One published study also examined an intervention combining sensory integration training with social sports games, but because that report was subsequently retracted, it should not be treated as reliable evidence for intervention efficacy (Wang et al., 2022). This

circumstance further highlights the need for theoretically coherent, transparently developed, and methodologically validated integrated protocols.

The rationale for integration is strengthened by ecological and family-centered perspectives. Children with ASD function within interacting family, educational, therapeutic, and community systems, and gains achieved within a clinic may have limited practical value unless they generalize to daily routines and natural environments. Family-centered occupational therapy literature emphasizes that caregivers should not merely receive information at the end of treatment but should participate meaningfully in intervention planning, implementation, and generalization (Watling et al., 2023). Function-based and communication-oriented interventions also demonstrate the value of tailoring intervention strategies to the environmental conditions and functional determinants surrounding behavior (Perihan & Bicer, 2021). Moreover, treatment delivered in routine practice requires an appropriate balance between fidelity to core therapeutic principles and flexibility in responding to individual children, families, and service contexts (Pickard et al., 2023). The systemic perspective similarly suggests that the child's difficulties and improvements should be understood within relational and contextual networks rather than exclusively at the level of the individual child (Robinson, 2025). Accordingly, a comprehensive intervention for ASD should ideally include parental participation, environmental modification, home-based generalization, and strategies that can be individualized according to sensory and behavioral profiles.

Several Iranian studies have also documented the relevance of sensory, behavioral, emotional, and play-based interventions for children with developmental difficulties, but the literature remains fragmented across intervention modalities. Research has supported the use of cognitive-behavioral play therapy for challenging behavior (Faramarzi & Ghanei, 2019), social anxiety and self-injurious behavior (Hamidifard et al., 2023), attention and impulsivity (Hosseinzadeh, 2021), and cognitive functioning (Azizi et al., 2020). Other work has demonstrated the importance of sensory-processing differences in autistic children (Esteki et al., 2020), the therapeutic relevance of sensory integration-based play approaches (Rabiei et al., 2023), and the potential value of sensory-motor and sensory-diet interventions (Ghasemian Moghaddam & Mohammadzadeh, 2024; Salehi et al., 2019). Studies of autism screening and childhood developmental needs also reinforce the importance of early, structured, and contextually appropriate services

(Hasannataj et al., 2020). Related intervention research has emphasized the value of therapeutic methods directed toward emotional, behavioral, and adaptive outcomes in children with special needs (Famarzi & Ghanei, 2019; Feizollahi et al., 2020), while other Iranian investigations have contributed to the broader evidence base concerning psychological and developmental interventions for children and families (Ghasemian Moghaddam & Mohammadzadeh, 2024; Hamidifard et al., 2023; Hosseinzadeh, 2021; Mirghafourian et al., 2022). However, studies have rarely articulated a single protocol in which sensory integration and cognitive-behavioral play therapy are conceptually mapped to the same needs-assessment structure, translated into specific performance objectives, and sequenced across treatment sessions.

The design of such a protocol requires more than simply placing cognitive-behavioral and sensory activities side by side. A theoretically coherent integrated intervention should identify the target needs, determine their conceptual relationships, specify modifiable determinants, define observable performance objectives, and connect intervention components to explicit mechanisms and measurable outcomes. Intervention Mapping offers a systematic framework for this purpose by linking needs assessment, performance objectives, behavioral and environmental determinants, intervention methods, implementation, and evaluation in a transparent developmental sequence (Bartholomew Eldredge et al., 2022). This approach is especially appropriate for ASD because of the heterogeneity of children's sensory, emotional, cognitive, behavioral, and family needs. It also supports a treatment architecture in which sensory preparation can be intentionally linked with cognitive-behavioral tasks, social play, emotion-regulation exercises, adaptive activities, and parent-mediated generalization rather than being implemented as unrelated techniques. Such systematic integration is consistent with emerging evidence that successful ASD intervention increasingly depends on individualized, multidomain treatment planning rather than allegiance to a single therapeutic mechanism (Camino-Alarcón et al., 2024; Li et al., 2026; Piller et al., 2026).

The available literature therefore points to an important conceptual and practical gap. Sensory integration approaches address atypical sensory modulation, sensory seeking and avoidance, praxis, and body-based regulation, whereas cognitive-behavioral play therapy can target maladaptive cognitions, emotional identification, coping skills, problem solving, behavioral regulation, and social

learning. Play provides a developmentally appropriate context for integrating these mechanisms, and family participation can facilitate the transfer of treatment gains to home and community environments. However, an explicitly structured, theoretically derived, content-validated protocol that integrates these components session by session for children with ASD remains insufficiently developed. Evidence supporting sensory intervention (Lyu et al., 2025; Oh et al., 2024; Piller et al., 2026), cognitive-behavioral and emotion-focused intervention (Cheng et al., 2025; Li et al., 2026), play-based intervention (Tasijawa & Herwawan, 2025; Wardhani & Widjayatri, 2025), motor and functional intervention (Müller et al., 2024), and family-centered practice (Watling et al., 2023) provides a strong foundation for developing such an integrated model. At the same time, the diversity of individual needs and variable findings across existing studies reinforce the importance of systematic qualitative synthesis, expert validation, and explicit intervention mapping before clinical effectiveness is evaluated.

Therefore, the present study aimed to design and validate an integrated play therapy program based on the cognitive-behavioral approach and sensory integration for children with autism spectrum disorder.

2. Methods and Materials

The present study was applied in terms of purpose and qualitative in terms of methodology. In the qualitative phase, thematic analysis was employed to comprehensively examine the existing themes and patterns, and a comprehensive analysis of the themes obtained was ultimately presented. The statistical population of the qualitative phase consisted of university faculty members and experts in the field of children with neurodevelopmental disorders. Purposive sampling, a non-probability sampling method, was used to select the sample for the qualitative phase of the study. Purposive sampling, as employed in qualitative research, refers to the deliberate selection of individuals and study settings because they can contribute substantially to understanding the research problem and the central phenomenon under investigation (Ray & Taba, 2015). To collect information and review the research literature, Iranian and international scientific databases were searched, and relevant information was extracted from specialized Persian- and English-language articles, books, and theses concerning cognitive-behavioral play therapy, sensory integration, and neurodevelopmental disorders,

including autism in children, in accordance with the objectives and hypotheses of the study. Given the purpose of the study, thematic content analysis was employed in the first stage of data collection. Thematic analysis constitutes a fundamental and core approach within qualitative analysis and serves as an introduction to other qualitative methodologies, such as grounded theory, phenomenology, and narrative inquiry (Smith, 2015). Thematic analysis is a useful and flexible method for identifying, analyzing, and reporting themes and patterns within a dataset. It is a realist method that elucidates and reports participants' experiences, meanings, and realities. Themes represent important features of the data in relation to the research problem (Terry et al., 2017). These themes organize responses and meanings associated with the research question into identifiable patterns. Within this research design, the researcher assumes an active role and is responsible for selecting the theoretical framework, designing the questions, determining the methods of data collection, and selecting the sample. The information obtained through thematic analysis should comprehensively address the research questions. Coding, categorization, and pattern identification determine what the data indicate and thereby guide the researcher toward answering the research question. The thematic content analysis method consists of six interconnected stages, and the data derived from the reviewed studies were analyzed according to these stages in the present research (Braun & Clarke, 2012).

Stage 1: Familiarization with the Data: To analyze the data, the information obtained from the review of the theoretical foundations was first fully transcribed. During this process, any word or sentence that attracted the researcher's attention was highlighted, and relevant notes were written in the margins.

Stage 2: Coding: The coding process was conducted manually and using Microsoft Excel. At this stage, after reviewing the information, the researcher identified and compiled common and homogeneous characteristics within the data, categorized them, and assigned semantically similar codes. The researcher attempted to continuously refine and compare the codes with an open mind and without empirical or theoretical bias in order to derive the final codes.

Stage 3: Searching for Themes: At this stage, the researcher categorized the codes according to their semantic and content similarities and selected a word or phrase for each category as the main theme representing the central message of that category. A thematic map of the themes was

subsequently developed. Grouping codes under a principal theme is essential for deriving meaning from the data and developing insight into them.

Stage 4: Reviewing and Refining Themes: Following theme development, the process of categorizing codes under each theme was re-examined, and the appropriateness of each theme in relation to the associated codes and the broader context of the data was assessed. Because the selected themes were required to clearly represent the codes subsumed under them and encompass their principal meaning, repeated reviews of the codes and themes resulted in the elimination of inappropriate items and greater precision in the categorization and specification of themes.

Stage 5: Defining and Naming Themes: At this stage, after constructing the thematic map of the data, the researcher named and defined each theme. These definitions provided the reader with a concise interpretive explanation of the meaning and message of each theme. The proposed names and definitions were discussed with specialists, and the most appropriate label and definition were selected for each theme.

Stage 6: Writing the Report: At the final stage, the researcher synthesized the findings, interpreted them within the framework of the relevant research literature, and prepared the final report of the data.

The purpose of validation was to assess the accuracy of the research findings and conclusions, a process that can be conducted through various strategies in qualitative research. To evaluate the validity of the findings, researcher feedback was employed. The researcher shared the proposed codes and themes with the academic supervisors, and the findings and rationale underlying the coding and theme development were critically discussed and challenged. The themes were repeatedly reviewed against the original data context, and the final main and subthemes were extracted. To evaluate the reliability of the findings, inter-coder agreement was employed. Doctoral peers familiar with qualitative methodology were asked to independently code and develop themes from one interview without being informed of the researcher's coding. Their assessments were then reviewed, and the necessary revisions were implemented.

For the qualitative assessment of content validity, experts were asked to evaluate the extent to which the content of the integrated cognitive-behavioral play therapy and sensory integration program for children with autism was consistent with the study objectives. Accordingly, the integrated cognitive-behavioral play therapy and sensory integration program was presented to 10 faculty members from the

University of Tehran and experienced therapists working in a university clinic for children with neurodevelopmental disorders who were active in the field of autism spectrum disorder. They were asked to provide their comments on the developed package so that it could be improved.

The method proposed by Waltz and Bausell (1981) was used to calculate the Content Validity Index (CVI). In this method, experts evaluate the relevance, simplicity, and clarity of each step in the design of the integrated cognitive-behavioral play therapy and sensory integration program using a 4-point Likert scale. Specifically, the relevance of each protocol item is rated as 1 = not relevant, 2 = somewhat relevant, 3 = relevant, and 4 = highly relevant. The simplicity of each step is rated from 1 to 4, ranging from insufficient simplicity to complete simplicity, and the clarity of each item is rated as 1 = unclear, 2 = relatively clear, 3 = clear, and 4 = completely clear. For this index, the number of experts providing favorable ratings for each item is divided by the total number of experts. The minimum acceptable value for the CVI is .79. Accordingly, if the CVI for a protocol item was lower than .79, that item was revised.

In addition, to calculate the Content Validity Ratio (CVR), experts were asked to evaluate each item of the intervention protocol using a three-category scale consisting of “essential,” “useful but not essential,” and “not essential.” The responses were then calculated according to the formula $CVR = N_e - N/2$. Thus, the quantitative assessment of the content validity of the integrated cognitive-behavioral play therapy and sensory integration program was performed

using both the Content Validity Index (CVI) and the Content Validity Ratio (CVR). The experts also communicated their assessments to the researcher by responding to a five-point questionnaire ranging from “strongly agree” to “strongly disagree.” Lawshe’s method was used to determine the degree of expert agreement on each item, and the experts were asked to determine the appropriateness of each therapeutic session using a three-category scale consisting of “essential,” “useful,” and “not essential.” The CVR was then calculated for each treatment session. To calculate the CVI, the experts were asked to rate the fluency, clarity, and relevance of the treatment sessions using a 4-point Likert scale consisting of “not relevant,” “requires major revision,” “relevant but requires revision,” and “completely relevant.”

3. Findings and Results

The results of the demographic analysis showed that among the faculty members participating in the study, 2 participants (20%) were aged 30–39 years, 3 participants (30%) were aged 40–49 years, and 5 participants (50%) were aged 50 years or older. Regarding professional experience, 1 participant (10%) had less than 5 years of experience, 4 participants (40%) had 5–10 years of experience, and 5 participants (50%) had more than 10 years of professional experience. In addition, 5 participants (50%) held the academic rank of assistant professor, 3 (30%) were associate professors, and 2 (20%) were full professors.

Table 1

Assessment of the Needs of Children With Autism Spectrum Disorder

Needs of Children With Autism Spectrum Disorder	Scientific Sources
Severe difficulties in multisensory information processing; hyperresponsivity or hyporesponsivity to sensory stimuli; sensory seeking or sensory avoidance	Ayres (1972); Schaaf and Miller (2005); Lang et al. (2012)
Impairments in identifying, expressing, and regulating emotions; emotional outbursts; low threshold for irritability	Müller et al. (2024); Watling et al. (2023)
Deficits in reciprocal communication skills; limited understanding of social cues; poor theory of mind	Baron-Cohen (2025); Hashemipour et al. (2018); Wardani and Widyatri (2025)
Limited cognitive flexibility; rigid thinking; difficulties generalizing acquired skills	Cheng et al. (2025); Rotheram-Fuller and McMullen (2011)
Motor coordination impairments; motor-planning difficulties; poor fine- and gross-motor control	Ayres (1972); Camino Alarcón et al. (2024); Liu et al. (2025)
Repetitive and stereotyped behaviors; insistence on sameness; self-injurious aggression	Schaaf and Miller (2005); Esteki et al. (2020); Yuan et al. (2022)
Limited sustained attention; high distractibility; difficulty prioritizing environmental information	Eslami et al. (2016); Pickard et al. (2023)
Delayed or absent spoken language; echolalia; difficulties in the functional use of language	Tasijawa and Herwawan (2025); Narasimhan (2026)
Strong dependence on fixed routines; difficulty adapting to change; impairments in self-care activities	Müller et al. (2024); Lang et al. (2012)
Need for active parental involvement in intervention; parental training in behavioral strategies	Watling et al. (2023); Eslami et al. (2016)

Table 1 comparatively presents the fundamental needs of children with autism spectrum disorder across 10 key domains. The findings indicate that children with autism

spectrum disorder frequently experience qualitative impairments in social interaction, cognitive flexibility, and language functioning (Cheng et al., 2025).

Table 2

Extraction of Initial Codes, Axial Codes, Subthemes, and Main Themes From Theoretical and Empirical Sources

No.	Initial Code	Axial Code	Subtheme	Main Theme	Scientific Sources
1	Inability to process multisensory information	Multisensory processing impairment	Core sensory challenges	Fundamental sensory processing	Ayres (1972); Schaaf & Miller (2005)
2	Hypersensitivity to sounds	Multisensory processing impairment	Core sensory challenges	Fundamental sensory processing	Lang et al. (2012); Esteki et al. (2020)
3	Hyposensitivity to pain and temperature	Inadequate modulation of bodily stimuli	Core sensory challenges	Fundamental sensory processing	Schaaf & Miller (2005); Ayres (1972)
4	Persistent seeking of sensory stimulation	Sensory-seeking behaviors	Core sensory challenges	Fundamental sensory processing	Bani et al. (2020); Yuan et al. (2022)
5	Avoidance of touching specific textures	Sensory avoidance	Core sensory challenges	Fundamental sensory processing	Müller et al. (2024)
6	Low registration of environmental sensory stimuli	Inadequate sensory registration	Core sensory challenges	Fundamental sensory processing	Schaaf & Miller (2005)
7	Difficulty with vestibular-tactile integration	Impaired cross-modal sensory integration	Core sensory challenges	Fundamental sensory processing	Ayres (1972); Lang et al. (2012)
8	Emotional meltdown	Severe emotional dysregulation	Emotional regulation impairment	Emotional and behavioral regulation	Lee et al. (2026)
9	High anxiety in sensory situations	Sensory-related anxiety response	Emotional regulation impairment	Emotional and behavioral regulation	Cheng et al. (2025); Rotheram-Fuller & McMullen (2011)
10	Low emotional tolerance threshold	Emotional vulnerability	Emotional regulation impairment	Emotional and behavioral regulation	Watling et al. (2023)
11	Repetitive self-soothing behaviors (stereotypies)	Self-stimulatory regulatory behaviors	Maladaptive behavioral responses	Emotional and behavioral regulation	Schaaf & Miller (2005); Baron-Cohen (2025)
12	Aggression resulting from sensory overload	Sensory-based defensive behavior	Maladaptive behavioral responses	Emotional and behavioral regulation	Esteki et al. (2020)
13	Self-injury in stressful situations	Sensory-based defensive behavior	Maladaptive behavioral responses	Emotional and behavioral regulation	Oh et al. (2024)
14	Theory-of-mind deficit	Impaired theory of mind	Limitations in social interaction	Social interaction and communication	Baron-Cohen (2025); Hashemipour et al. (2018)
15	Withdrawal from peer interactions	Sensory-related social isolation	Limitations in social interaction	Social interaction and communication	Wardani & Widyatri (2025)
16	Limited understanding of nonverbal cues	Social-processing impairment	Limitations in social interaction	Social interaction and communication	Cheng et al. (2025)
17	Inability to take turns during play	Difficulties in social reciprocity	Limitations in social interaction	Social interaction and communication	Tasijawa & Herwawan (2025)
18	Delayed development of spoken language	Language communication impairment	Limitations in social interaction	Social interaction and communication	Müller et al. (2024)
19	Limited cognitive flexibility	Rigid thinking	Cognitive limitations	Cognition and learning	Rotheram-Fuller & McMullen (2011); Cheng et al. (2025)
20	Poor sustained attention	Selective-attention impairment	Cognitive limitations	Cognition and learning	Baharian et al. (2023)
21	Difficulty generalizing skills	Impaired generalization	Cognitive limitations	Cognition and learning	Pickard et al. (2023)
22	Cognitive load resulting from sensory processing	Cognitive-sensory interference	Cognitive limitations	Cognition and learning	Schaaf & Miller (2005)
23	Poor motor coordination	Gross-motor coordination disorder	Motor-proprioceptive difficulties	Motor and bodily integration	Ayres (1972); Camino Alarcón et al. (2024)
24	Postural-gravitational insecurity	Vestibular processing impairment	Motor-proprioceptive difficulties	Motor and bodily integration	Ayres (1972)
25	Difficulty with motor planning (dyspraxia)	Praxis impairment	Motor-proprioceptive difficulties	Motor and bodily integration	Lang et al. (2012)

26	Hypersensitivity to movement	Vestibular hypersensitivity	Motor-proprioceptive difficulties	Motor and bodily integration	Liu et al. (2025)
27	Difficulty tolerating specific food textures	Oral-tactile hypersensitivity	Oral and feeding sensory difficulties	Oral sensory processing	Schaaf & Miller (2005)
28	Restricted food selection	Oral-sensory avoidance	Oral and feeding sensory difficulties	Oral sensory processing	Oh et al. (2024)
29	Seeking oral stimulation	Oral sensory seeking	Oral and feeding sensory difficulties	Oral sensory processing	Bani et al. (2020)
30	Difficulty adapting to environmental changes	Insistence on environmental sameness	Daily functioning impairment	Daily functioning and independence	Müller et al. (2024)
31	Dependence on fixed routines	Behavioral dependence on structure	Daily functioning impairment	Daily functioning and independence	Hashemipour et al. (2018)
32	Difficulty with self-care (dressing, bathing)	Sensory-related self-care impairment	Daily functioning impairment	Daily functioning and independence	Watling et al. (2023)
33	Difficulty with social participation	Impaired social participation	Daily functioning impairment	Daily functioning and independence	Wardani & Widyatri (2025)
34	High parental stress	Family caregiving burden	Family-centered intervention needs	Family and social support	Eslami et al. (2016)
35	Need to train parents in sensory strategies	Limited parental sensory knowledge	Family-centered intervention needs	Family and social support	Narasimhan (2026)
36	Lack of coordination among caregivers in implementing intervention	Lack of coordination within the support network	Family-centered intervention needs	Family and social support	Watling et al. (2023)
37	Inability to filter visual stimuli	Visual-processing impairment	Core sensory challenges	Fundamental sensory processing	Lang et al. (2012)
38	Hypersensitivity to light	Visual hypersensitivity	Core sensory challenges	Fundamental sensory processing	Schaaf & Miller (2005)
39	Difficulty interpreting tactile information	Tactile-processing impairment	Core sensory challenges	Fundamental sensory processing	Ayres (1972)
40	Failure to recognize genuine sensory danger	Inadequate registration of salient stimuli	Core sensory challenges	Fundamental sensory processing	Bani et al. (2020)
41	Difficulty modulating responses to auditory input	Auditory-processing impairment	Core sensory challenges	Fundamental sensory processing	Esteki et al. (2020)
42	Negative cognitive restructuring	Cognitive distortions	Cognitive limitations	Cognition and learning	Rotheram-Fuller & McMullen (2011)
43	Inability to solve social problems	Poor problem-solving skills	Limitations in social interaction	Social interaction and communication	Cheng et al. (2025)
44	Limited symbolic play	Pretend-play impairment	Limitations in social interaction	Social interaction and communication	Tasijawa & Herwawan (2025)
45	Difficulty with independent self-regulation	Poor self-regulation	Emotional regulation impairment	Emotional and behavioral regulation	Lee et al. (2026)
46	Persistent hyperarousal	Excessive nervous-system activation	Emotional regulation impairment	Emotional and behavioral regulation	Oh et al. (2024)
47	Hypoarousal and inattention	Underactivation of the nervous system	Emotional regulation impairment	Emotional and behavioral regulation	Schaaf & Miller (2005)
48	Difficulty tolerating proprioceptive activities	Proprioceptive-processing impairment	Motor-proprioceptive difficulties	Motor and bodily integration	Ayres (1972)
49	Limited interactive-play skills	Restricted social play	Limitations in social interaction	Social interaction and communication	Hashemipour et al. (2018)
50	Need for a structured sensory environment	Need for environmental sensory structure	Family-centered intervention needs	Family and social support	Narasimhan (2026)
51	Difficulty transitioning between activities	Behavioral-flexibility impairment	Daily functioning impairment	Daily functioning and independence	Eslami et al. (2016)
52	Need to strengthen intrinsic motivation during play	Limited play motivation	Cognitive limitations	Cognition and learning	Tasijawa & Herwawan (2025)
53	Sleep disturbances and dysregulation of the sleep-wake cycle	Circadian-rhythm dysregulation	Emotional regulation impairment	Emotional and behavioral regulation	Watling et al. (2023)
54	Gastrointestinal problems and chronic constipation	Comorbid gastrointestinal dysfunction	Daily functioning impairment	Daily functioning and independence	Oh et al. (2024)
55	Olfactory hypersensitivity	Olfactory hyperresponsivity	Core sensory challenges	Fundamental sensory processing	Schaaf & Miller (2005)
56	Hand-flapping behavior	Self-stimulatory regulatory behaviors	Maladaptive behavioral responses	Emotional and behavioral regulation	Baron-Cohen (2025); Schaaf & Miller (2005)

57	Joint-attention deficit	Social-processing impairment	Limitations in social interaction	Social interaction and communication	Baron-Cohen (2025); Hashemipour et al. (2018)
58	Comorbid intellectual disability/general cognitive delay	Low general cognitive functioning	Cognitive limitations	Cognition and learning	Cheng et al. (2025)
59	Enuresis and difficulties with elimination control	Delayed sphincter control	Daily functioning impairment	Daily functioning and independence	Watling et al. (2023)
60	Excessive dependence on screens and digital devices	Behavioral reliance on digital stimulation	Emotional regulation impairment	Emotional and behavioral regulation	Eslami et al. (2016)

Table 2 illustrates the systematic coding process applied to theoretical and empirical sources across four analytical levels. Following extraction of the initial codes, the code list was provided to a panel of expert faculty members in occupational therapy, child psychology, and play therapy to evaluate the content validity of the codes and their relevance to the scope of the study. This stage corresponds to the fourth phase of Braun and Clarke's (2006) framework, namely "reviewing themes," and is consistent with Lincoln and Guba's (1985) principles of trustworthiness, thereby strengthening the methodological rigor of the coding process. Eight initial codes were removed by the expert panel. The reasons for their exclusion can be organized into four methodological categories.

First, being outside the scope of the study: Codes 53, 54, and 59 referred to issues that were medical-physiological in nature and could not be directly targeted through the components of cognitive-behavioral play therapy and sensory integration. These conditions require specialized medical referral, and their inclusion would have weakened the focused validity of the protocol.

Second, overlap and redundancy: Codes 56 and 57 represented more specific examples of previously extracted axial codes. Retaining them would have produced unnecessary redundancy and reduced conceptual differentiation among categories; therefore, they were integrated into the relevant axial codes.

Third, confusion between diagnosis and need: Code 58 represented a comorbid diagnostic label rather than an intervention-relevant need. The analytical framework was designed to extract "needs," rather than document diagnostic characteristics; consequently, this code was considered inconsistent with the fundamental logic of the needs assessment.

Fourth, weak scientific support and conceptual ambiguity: Codes 55 and 60 either appeared very infrequently in the reviewed sources and failed to achieve theoretical saturation (Code 55), or lacked a clear theoretical foundation in the core sensory integration literature and could not be clearly differentiated from other constructs (Code 60).

The systematic exclusion of these eight codes and transparent documentation of the reasons for their removal should be regarded not as a methodological deficiency but as evidence of rigor and methodological discipline, thereby enhancing the auditability of the qualitative analysis. Accordingly, the final set of 52 retained initial codes resulted from a purposeful refinement process in which only those codes with sufficient scientific support, clear conceptual distinctiveness, and relevance to the scope of the study were retained. The 52 extracted initial codes constituted fundamental units of meaning directly derived from the scientific literature. These codes were subsequently categorized into 22 axial codes representing shared conceptual patterns. This process is fully consistent with the principles of deductive-inductive thematic analysis (Braun & Clarke, 2006) and supports the content validity of the coding process. The diversity of scientific sources used, ranging from Ayres' classic work (1972) to contemporary studies (Lang et al., 2012; Wardani & Widyatri, 2025), reflects comprehensive coverage of the relevant literature. The 14 identified subthemes were integrated into eight main themes constituting the conceptual framework of the integrated protocol. These themes were: (1) fundamental sensory processing, (2) emotional and behavioral regulation, (3) social interaction and communication, (4) cognition and learning, (5) motor and bodily integration, (6) oral sensory processing, (7) daily functioning and independence, and (8) family and social support.

Table 3

Main Themes in the Design of the Integrated Cognitive-Behavioral Play Therapy and Sensory Integration Protocol

No.	Main Theme	Principal Subthemes	Application in the Protocol	Scientific Sources
1	Fundamental sensory processing	Sensory modulation, registration, seeking, and avoidance	Sessions 1–3: assessment of sensory profile and controlled sensory experiences	Ayres (1972); Schaaf & Miller (2005); Lang et al. (2012)

2	Emotional and behavioral regulation	Emotion recognition, cognitive restructuring, self-regulation	Sessions 2–6: emotion-focused play tools and cognitive-behavioral techniques	Cheng et al. (2025)
3	Social interaction and communication	Theory of mind, turn-taking, language skills	Sessions 3–8: structured social games and role-playing	Baron-Cohen (2025); Hashemipour et al. (2018)
4	Cognition and learning	Cognitive flexibility, attention, skill generalization	Sessions 4–9: cognitive games and generalized tasks	Rotheram-Fuller & McMullen (2011); Eslami et al. (2016)
5	Motor and bodily integration	Coordination, proprioception, vestibular processing	Sessions 5–10: targeted motor activities, balance, and deep pressure	Ayres (1972); Camino Alarcón et al. (2024); Liu et al. (2025)
6	Oral sensory processing	Oral sensitivity, feeding, oral sensory seeking	Sessions 6–9: targeted oral-tactile activities	Schaaf & Miller (2005); Oh et al. (2024)
7	Daily functioning and independence	Self-care, adaptation, activity transitions	Sessions 8–12: home generalization assignments and sensory diet	Watling et al. (2023); Wardani & Widyatri (2025)
8	Family and social support	Parent education, support network, skill transfer	Sessions 1–12: parental participation throughout all sessions	Eslami et al. (2016); Narasimhan (2026)

Table 3 presents the eight main themes derived from the thematic analysis process together with their subthemes, applications within the protocol, and scientific documentation. These themes constitute the core pillars of the integrated protocol, with each theme linked to specific sessions of the 12-session intervention. The sequence

progresses from more foundational themes, such as fundamental sensory processing, toward more advanced themes, such as daily functioning and independence, which is consistent with the developmental sequencing principle in occupational therapy interventions (Ayres, 1972).

Table 4

Integrated Components of Cognitive-Behavioral Play Therapy and Sensory Integration

Therapeutic Approach	Dimension	Component	Theoretical Basis	Operational Definition	Supporting Studies
Cognitive-behavioral play therapy	Cognitive	Cognitive restructuring	Beck (1979)	Identification and modification of maladaptive beliefs through targeted play activities; use of emotion cartoons and storytelling	Cheng et al. (2025); Rotheram-Fuller & McMullen (2011)
Cognitive-behavioral play therapy	Cognitive	Problem-solving skills training	Nezu (1987)	Learning problem-solving strategies through play-based scenarios and step-by-step decision-making practice	Cheng et al. (2025); Wardani & Widyatri (2025)
Cognitive-behavioral play therapy	Emotional	Emotion-recognition training	Greenberg (1995)	Use of emotion cards, mirror play, and role-playing to recognize and label emotions	Yuan et al. (2022)
Cognitive-behavioral play therapy	Emotional	Emotion regulation	Gratz & Roemer (2004)	Teaching relaxation strategies, diaphragmatic breathing, and mindfulness through interactive games	Watling et al. (2023); Yuan et al. (2022)
Cognitive-behavioral play therapy	Behavioral	Positive behavior reinforcement	Skinner (1953)	Play-based reward systems, star charts, and developmentally appropriate behavioral contracts	Eslami et al. (2016)
Cognitive-behavioral play therapy	Behavioral	Graduated exposure	Wolpe (1958)	Hierarchical exposure to anxiety-provoking stimuli through structured play	Cheng et al. (2025); Rotheram-Fuller & McMullen (2011)
Cognitive-behavioral play therapy	Social	Social skills	Baron-Cohen (2025)	Teaching turn-taking, empathy, and interpretation of social cues through group games	Hashemipour et al. (2018); Tasijawa & Herwawan (2025)
Cognitive-behavioral play therapy	Social	Role-playing	Tasijawa & Herwawan (2025)	Role-play scenarios for practicing social interactions and strengthening theory of mind	Tasijawa & Herwawan (2025); Wardani & Widyatri (2025)
Sensory integration	Tactile	Targeted tactile stimulation	Ayres (1972)	Active and passive touch activities using diverse textures; play with materials such as sand, gel, and beans	Ayres (1972); Camino Alarcón et al. (2024)
Sensory integration	Vestibular	Vestibular stimulation	Ayres (1972)	Spinning, swinging, and controlled linear and rotational movement activities	Ayres (1972); Liu et al. (2025)
Sensory integration	Proprioceptive	Deep pressure and proprioceptive stimulation	Ayres (1972)	Use of deep pressure, joint compression, weighted vests, and resistant materials	Ayres (1972); Lang et al. (2012)
Sensory integration	Visual	Modulation of visual input	Ayres (1972)	Control of environmental visual stimuli; visual-tracking and visual-perception activities delivered through play	Schaaf & Miller (2005)

Sensory integration	Auditory	Modulation of auditory input	Ayres (1972)	Control of environmental sound levels; auditory-discrimination activities and targeted musical games	Esteki et al. (2020)
Sensory integration	Oral	Oral sensory diet	Ayres (1972)	Controlled chewing and sucking activities and gradual introduction of different food textures	Schaaf & Miller (2005); Yuan et al. (2022)
Sensory integration	Environmental	Structured sensory environment	Narasimhan (2026)	Designing and regulating the play environment through careful control of sensory stimuli, including light, sound, and texture	Narasimhan (2026); Lang et al. (2012)
Sensory integration	Sensory diet	Individualized sensory diet	Poussel (2024)	Designing a daily program of sensory activities tailored to the child's individual sensory profile	Lang et al. (2012); Yuan et al. (2022)

Analysis of the components of cognitive-behavioral play therapy indicates that this approach is grounded in Beck's (1979) cognitive model, according to which thoughts, emotions, and behaviors interact within an integrated system. Within the play therapy framework, this model is operationalized through activities that enable the child to identify dysfunctional thinking patterns within the context of play and replace them with more realistic thoughts (Rotheram-Fuller & McMullen, 2011). This process is particularly important for children with autism spectrum disorder, who frequently demonstrate cognitive distortions and limited flexibility, because play, as the child's natural language, may reduce resistance to cognitively oriented therapeutic interventions.

Ayres' (1972) sensory integration theory proposes the fundamental principle that effective brain functioning requires the reception, processing, and integration of sensory information from multiple sources. In children with autism spectrum disorder, this integrative process is impaired, leading to maladaptive sensory responses that can subsequently have negative effects on behavior, emotion, and learning (Schaaf & Miller, 2005). Sensory integration

intervention provides purposeful and organized sensory experiences intended to stimulate neuroplasticity and gradually enhance the child's sensory-processing capacity. Neuroimaging evidence has indicated that such interventions may be associated with positive structural and functional changes in sensory cortical regions (Lang et al., 2012).

The reciprocal and synergistic relationship between the two therapeutic approaches can be explained from a neuropsychological perspective. Predictive processing theory proposes that the brain continuously constructs models of the environment and compares them with actual sensory input. This modeling process is impaired in children with autism spectrum disorder (Baron-Cohen et al., 2025). Integrating cognitive-behavioral play therapy, which targets higher-order cognitive processes, with sensory integration, which optimizes sensory input, may therefore address both dimensions of the disorder. This synergy is supported by the findings of Wardani and Widyatri (2025), who reported that combined interventions produced more substantial improvements in sensory-processing indicators than single-approach interventions.

Table 5

Integrated Coding Framework for Designing the Cognitive-Behavioral Play Therapy and Sensory Integration Protocol

Initial Codes: Selected Examples	Axial Code	Subtheme	Main Theme	Related Protocol Sessions
Tactile hypersensitivity / texture avoidance / low registration	Tactile-processing impairment	Tactile-proprioceptive challenges	Fundamental sensory processing	Sessions 1, 2, 5
Vestibular insecurity / balance difficulty / movement avoidance	Vestibular impairment	Tactile-proprioceptive challenges	Fundamental sensory processing	Sessions 3, 5, 7
Sensory seeking / persistent stimulation / hypoarousal	Sensory-seeking behaviors	Sensory-processing patterns	Fundamental sensory processing	Sessions 2, 4, 6
Light sensitivity / poor visual filtering	Visual-processing impairment	Sensory-processing patterns	Fundamental sensory processing	Sessions 1, 3
Auditory sensitivity / inability to filter sounds	Auditory-processing impairment	Sensory-processing patterns	Fundamental sensory processing	Sessions 1, 4
Emotional meltdown / behavioral outburst / hyperarousal	Severe emotional dysregulation	Emotional self-regulation impairment	Emotional and behavioral regulation	Sessions 2, 3, 6
Sensory anxiety / fear response to stimuli	Sensory-related anxiety response	Emotional self-regulation impairment	Emotional and behavioral regulation	Sessions 3, 5, 8

Repetitive self-soothing behavior / stereotypy	Self-regulation through repetition	Compensatory behavioral responses	Emotional and behavioral regulation	Sessions 4, 6, 9
Maladaptive beliefs / cognitive distortion	Negative thinking patterns	Cognitive limitations	Cognition and learning	Sessions 3, 5, 7
Theory-of-mind deficit / poor empathy	Social-processing impairment	Limitations in social interaction	Social interaction and communication	Sessions 4, 7, 9
Turn-taking difficulty / limited shared play	Poor social reciprocity	Limitations in social interaction	Social interaction and communication	Sessions 5, 8, 10
Poor motor coordination / dyspraxia	Praxis and coordination impairment	Motor-integration difficulties	Motor and bodily integration	Sessions 3, 5, 7
Oral hypersensitivity / restricted food selection	Oral-feeding avoidance	Oral sensory processing	Oral sensory processing	Sessions 6, 9
Dependence on routine / transition difficulties	Insistence on sameness	Adaptability impairment	Daily functioning and independence	Sessions 7, 10, 11
Self-care difficulties / difficulty with social participation	Daily functional impairment	Adaptability impairment	Daily functioning and independence	Sessions 9, 11, 12
Parental stress / limited sensory education	Family support needs	Family-centered intervention needs	Family and social support	All sessions

Table 5 illustrates the systematic relationship among initial codes, axial codes, subthemes, and main themes and their connection to the sessions of the 12-session protocol. The table demonstrates that each main theme is addressed across multiple sessions, which is consistent with the principles of repetition and consolidation in learning (Braun & Clarke, 2006). The theme of “fundamental sensory processing,” which contained the largest number of initial codes, is represented from the first through the seventh session, whereas “family and social support” operates as a parallel component throughout all sessions. This distribution pattern reflects a comprehensive understanding of the relative importance and logical sequencing of each theme within the therapeutic change process.

According to the intervention design framework, or Intervention Mapping (Bartholomew Eldredge et al., 2022), after the main themes were extracted, the process of transforming the identified needs into performance objectives and change objectives began. Performance objectives specify the behaviors that the child should demonstrate by the end of the intervention, whereas the change matrix identifies which determinants—cognitive, emotional, behavioral, and sensory—must change in order for each objective to be achieved. Together, these two tools provide a detailed roadmap for designing intervention strategies.

Table 6

Performance Objectives and Observable Indicators by Main Theme

Main Theme	Performance Objective	Observable and Measurable Indicator
Fundamental sensory processing	The child increases the ability to regulate sensory responses in everyday situations	30% reduction in sensory-avoidance behaviors according to the Sensory Profile 2 (SP-2) over 12 weeks
Emotional and behavioral regulation	The child applies emotional self-regulation skills in stressful situations	40% reduction in the frequency of emotional meltdowns at home and school; independent use of two calming strategies
Social interaction and communication	The child engages purposefully in social play with peers	Maintenance of reciprocal interaction for at least 5 minutes during play; appropriate turn-taking in 80% of opportunities
Cognition and learning	The child uses cognitive-flexibility strategies in situations involving change	50% reduction in behaviors associated with resistance to change; successful completion of three flexible-thinking tasks
Motor and bodily integration	The child demonstrates appropriate motor coordination in daily activities	Improvement by two levels on the Peabody Developmental Motor Scales; independent participation in three motor activities
Oral sensory processing	The child increases oral-sensory tolerance when consuming a greater variety of foods	Acceptance of at least three new food textures; reduction in oral-avoidance behaviors during 80% of meals
Daily functioning and independence	The child demonstrates the ability to adapt to changes in daily routines at home and in the community	Independent performance of four self-care skills; successful transition between five activities without challenging behavior
Family and social support	Parents demonstrate the ability to identify the child’s sensory profile and implement a sensory diet at home	Completion of 80% of generalized home assignments; 35% reduction in parental stress according to the Parenting Stress Scale

Table 6 presents the protocol’s performance objectives in accordance with SMART criteria—specific, measurable,

achievable, relevant, and time-bound. Each objective is directly linked to a main theme derived from thematic

analysis, and its observable indicators enable evaluation of intervention effectiveness. These indicators are aligned with validated and standardized measurement instruments, such as the Sensory Profile 2 (SP-2) and the Peabody Developmental Motor Scales, which have been used in established research (Bani et al., 2020; Liu et al., 2025). The specification of quantitative objectives with predetermined improvement percentages provides the scientific transparency required in intervention research.

Performance goal-setting within this protocol can be theoretically justified by Locke and Latham's (1990) goal-

setting theory, according to which challenging yet attainable goals produce the highest levels of motivation and effort. Parental participation in establishing goals is also consistent with this theory because goals developed collaboratively with stakeholders tend to produce greater adherence (Eslami et al., 2016). Attention to the generalization of goals to home and community settings also represents a key principle in designing interventions for children with developmental disorders (Watling et al., 2023).

Table 7

Change Objectives Matrix for the Integrated Cognitive-Behavioral Play Therapy and Sensory Integration Protocol

Performance Objective	Cognitive Determinant	Emotional Determinant	Behavioral Determinant	Sensory Determinant
Regulation of sensory responses	Increased awareness of one's sensory profile; identification of threshold-triggering stimuli	Reduced anticipatory anxiety regarding sensory stimuli; increased sense of control	Replacement of avoidance behaviors with adaptive behaviors	Increased sensory-processing threshold; improved vestibular and tactile modulation
Emotional regulation	Recognition and labeling of emotions; modification of emotion-related cognitive distortions	Increased frustration tolerance; reduced hyperarousal; improved self-efficacy	Learning behavioral relaxation strategies; reduction in emotional meltdowns	Reduction of sensory-overload-related hyperarousal through sensory intervention
Social interaction	Understanding social cues; development of theory of mind; social problem solving	Reduced social anxiety; increased confidence in interactions	Practice of turn-taking and empathy skills within play	Improved sensory tolerance in social environments; reduced sensory overload
Cognitive flexibility	Reduction of all-or-nothing thinking patterns; increased cognitive inhibition	Reduced change-related anxiety; increased tolerance of ambiguity	Practice of behavioral flexibility through rule-based games	Sensory habituation to reduce reactivity to environmental changes
Motor integration	Development of body awareness/body schema; motor planning	Increased motor confidence; reduced fear of movement activities	Practice of motor coordination through targeted play activities	Improved vestibular-proprioceptive integration; stabilization of sensory thresholds
Daily functioning	Development of daily planning and organizational skills	Reduced anxiety associated with activity transitions	Generalization of acquired skills to home and school settings	Implementation of a daily sensory diet to regulate arousal level

The change matrix presented in Table 7 indicates that four categories of determinants must be modified for each performance objective in order to achieve sustainable change. Cognitive determinants, including beliefs, awareness, and knowledge; emotional determinants, including feelings and motivation; behavioral determinants, including skills and habits; and sensory determinants, including sensory-processing capacity, interact systematically with one another. This systemic understanding is fully consistent with the biopsychosocial model, which represents a dominant framework for designing interventions for children with developmental disorders (Creswell & Poth, 2018).

An important feature of the change matrix is that sensory determinants are presented as an independent dimension equivalent in importance to the other determinants. This represents a conceptual innovation of the integrated protocol

because the sensory dimension is commonly overlooked in traditional cognitive-behavioral interventions. By incorporating sensory determinants into the change matrix, the present protocol addresses a fundamental limitation of existing approaches. This perspective is fully consistent with the findings of Lang et al. (2012), who demonstrated that sensory processing plays a central role across multiple dimensions of functioning in children with autism spectrum disorder.

1. Structure of Each Session: Each session of the integrated protocol lasts approximately 60–75 minutes and consists of four principal components: (a) opening/sensory warm-up (10–15 minutes), including organizing sensory activities intended to prepare the nervous system; (b) main play activity (30–35 minutes), targeting the principal session objectives through integrated, goal-directed play activities; (c) reflection and cognitive processing (10–15 minutes),

involving documentation of experiences, discussion of emotions, and cognitive processing; and (d) homework and parent education (5–10 minutes), including the assignment of generalization tasks and brief parental instruction.

2. Session Framework: The 12-session protocol is organized into three phases. Phase 1 (Sessions 1–4), assessment and foundation building, includes sensory-profile assessment, establishment of a safe therapeutic

relationship, and introduction of basic concepts related to sensory and emotional processing. Phase 2 (Sessions 5–9), intervention and skill acquisition, includes active sensory interventions, cognitive-behavioral strategy training, and work on social skills. Phase 3 (Sessions 10–12), generalization and consolidation, includes practicing skills in real-life situations, more intensive parent training, and planning for maintenance of treatment gains.

Table 8

Final 12-Session Integrated Cognitive-Behavioral Play Therapy and Sensory Integration Protocol

Session	Objectives	Cognitive-Behavioral Components	Sensory Integration Components	Strategies	Homework	Parent Education
1	Assess sensory profile; establish a safe therapeutic relationship; introduce the environment	Introduction of therapy rules; body-awareness activities; emotion cards	Assessment of responses to textures, sounds, and light; safe exploratory sensory activities	Environmental scaffolding; balanced stimulation; naturalistic observation	Parents complete the sensory-profile questionnaire	Orientation for parents; training in observing sensory behaviors
2	Teach emotion recognition; experience tactile stimuli	Emotion cards; “find the emotion” game; mirror play	Play with varied tactile materials such as sand, sensory gel, and beans; active tactile stimulation	Visual representation of emotions; gradual sensory progression	Daily emotion recording; play with safe textures at home	Training parents in emotion labeling and selection of appropriate home sensory textures
3	Initial emotional regulation; vestibular integration	Emotion-ladder technique; play-based diaphragmatic breathing	Gentle swinging; controlled spinning; balance activities	Emotional reflection; gradual control of vestibular stimulation	Practice breathing with a parent; 5 minutes of gentle home swinging	Training parents in breathing techniques and calming vestibular activities
4	Identify sensory triggers; introduce cognitive restructuring	Thought–emotion–behavior map; trigger-identification game	Visual-tracking activities; targeted auditory games	Socratic questioning within play; sensory regulation before cognitive activity	Weekly map of distressing sensory triggers	Training in management of visual and auditory stimuli at home
5	Develop social skills; provide deep pressure and proprioceptive input	Turn-taking games; social stories; empathy training	Weighted vest; joint compression; play with resistant materials	Social modeling; deep pressure before social interaction	Daily 10-minute turn-taking game with a parent	Training in home-based deep-pressure strategies and structuring social play
6	Graduated sensory exposure; develop problem-solving skills	Exposure hierarchy; problem-solving steps through play	Hierarchical tactile and oral stimulation using new textures	1–10 calmness rating tool; supported gradual exposure	Try a new food texture during the week; practice problem-solving steps	Training parents to implement a sensory-exposure hierarchy
7	Enhance cognitive flexibility; improve motor coordination	Rule-changing games; flexible storytelling	Motor obstacle course; bilateral coordination activities	Gradual behavioral challenges; step-by-step adaptation	Introduce one small planned change during the week with a parent	Strategies for helping the child tolerate change
8	Deepen social interaction; develop a personalized sensory diet	Role-playing challenging social situations	Development of the child’s individualized sensory diet	Social reflection; shared decision-making regarding the sensory diet	Implement a 10-minute morning sensory diet with a parent	Comprehensive training in implementing a daily sensory diet
9	Promote self-care and independence; multisensory integration	Planning self-care activities; reinforcement of independence	Activities simultaneously integrating multiple sensory channels	Skill chaining; sensory integration into daily activities	Independently perform one self-care skill each day	Training parents to support independence without excessive assistance
10	Generalize skills to real-world environments; facilitate activity transitions	Simulation of real-life situations; school/home role-playing	Creation of environments resembling real-life contexts using controlled stimuli	Transfer-of-learning practice; gradual increase in environmental complexity	Apply acquired skills in one new situation	Training parents to support generalization across settings
11	Consolidate gains; prevent relapse	Review of successes; planning	Review and adjustment of the	Child self-regulation toolkit; positive	Weekly self-care plan	Training parents in progress monitoring

		for future challenges	sensory diet; joint parent-child session	reinforcement of gains		and management of potential relapse
12	Therapeutic termination; maintenance planning; final evaluation	Comprehensive review session; development of a continuing-skills plan	Final sensory diet; home sensory-environment plan	Therapy termination ritual; celebration of achievements; reinforcement of hope for the future	Three-month skill-maintenance plan	Comprehensive family education session; post-treatment support resources

The final conceptual model of the integrated cognitive-behavioral play therapy and sensory integration protocol for children with autism spectrum disorder and sensory modulation disorder can be conceptualized as a three-layer system. The first layer, or foundation, consists of fundamental sensory processing, which influences all other aspects of the child's functioning. Improvement at this level facilitates development within the subsequent layers. The second, intermediate layer includes emotional and behavioral regulation, social interaction, and cognition and learning, all of which interact reciprocally. Improvement in each dimension facilitates development in the others. The third, applied layer consists of daily functioning and independence, representing the ultimate outcome and overarching objective of the intervention.

The two principal therapeutic axes—cognitive-behavioral play therapy and sensory integration—do not operate in parallel but rather progress in a spiral pattern. Both approaches are present in each session, although their relative emphasis changes according to the specific objective of the session. Play serves as the common therapeutic context within which these two approaches are integrated. Family involvement is not considered an ancillary element but rather a parallel therapeutic axis extending throughout all 12 sessions. This conceptual model is fully consistent with the systemic approach in psychology (Robinson, 2025) and Bronfenbrenner's (1979) ecological model, which emphasizes interactions between the child and multiple environmental systems.

Following development of the preliminary intervention, it was necessary to establish its validity before it could be used in the present study. Accordingly, the internal and external validity of the developed intervention were examined.

The internal validity of the developed intervention was evaluated using the following two procedures.

a. Member Checking: In this procedure, participants (faculty members) were asked to evaluate the descriptions of the intervention sessions developed for the study and comment on their appropriateness and consistency with the objectives of the qualitative phase. Based on their comments and feedback, the strengths and weaknesses of the designed intervention were identified to the greatest extent possible, and the necessary revisions were made. The most important modifications made to the preliminary intervention on the basis of this feedback included improving clarity and simplifying the intervention for instructional use, expressing educational activities and assignments in more objective and specific terms, placing greater emphasis on activities and assignments directly related to the cognitive-behavioral and sensory integration approaches, revising some of the objectives assigned to individual sessions, and modifying the sequence in which educational activities and assignments were applied and implemented.

b. Calculation of the Content Validity Index (CVI): Another procedure used to examine the internal validity of the developed intervention was calculation of the CVI regarding the appropriateness of the session descriptions and the activities and assignments included in the educational intervention relative to the study objectives. For this purpose, the preliminary intervention and a 12-item questionnaire were provided to 10 specialists in instructional design, including faculty members in educational sciences with expertise in instructional design and faculty members in psychology at Islamic Azad University, Central Tehran Branch. The questionnaire items assessed the appropriateness of the session descriptions, strategies, activities, and assignments employed in the intervention relative to the objectives of the study. Experts rated each item on a four-point scale: 1 = not appropriate, 2 = relatively appropriate, 3 = appropriate, and 4 = completely appropriate.

Table 9

Calculation of the Content Validity Index for the Developed Preliminary Intervention

Questions Concerning the Appropriateness of the Developed Intervention to the Study Objectives	Total Number of Reviewers	Reviewers Assigning Scores of 3 or 4	CVI
1. Is the educational description presented in Session 1 (objectives, strategies, assignments, and instructional method) consistent with the study objectives?	10	8	.80
2. Is the educational description presented in Session 2 consistent with the study objectives?	10	9	.90
3. Is the educational description presented in Session 3 consistent with the study objectives?	10	9	.90
4. Is the educational description presented in Session 4 consistent with the study objectives?	10	9	.90
5. Is the educational description presented in Session 5 consistent with the study objectives?	10	8	.80
6. Is the educational description presented in Session 6 consistent with the study objectives?	10	8	.80
7. Is the educational description presented in Session 7 consistent with the study objectives?	10	8	.80
8. Is the educational description presented in Session 8 consistent with the study objectives?	10	8	.80
9. Is the educational description presented in Session 9 consistent with the study objectives?	10	9	.90
10. Is the educational description presented in Session 10 consistent with the study objectives?	10	9	.90
11. Is the educational description presented in Session 11 consistent with the study objectives?	10	9	.90
12. Is the educational description presented in Session 12 consistent with the study objectives?	10	9	.90

The minimum acceptable value for the CVI is .79, and if the CVI of an item is lower than .79, that item should be eliminated (Waltz & Bausell, 1981, as cited in Seif, 2011). As shown in the table above, the Content Validity Index for all items assessing the consistency of the developed intervention with the study objectives exceeded .79. Therefore, it can be concluded that the developed preliminary intervention demonstrated satisfactory content validity.

4. Discussion

The present study aimed to design and validate an integrated play therapy program based on the cognitive-behavioral approach and sensory integration for children with autism spectrum disorder. The findings indicated that the systematic qualitative synthesis led to the identification of 52 retained initial codes, 22 axial codes, 14 subthemes, and eight main themes, namely fundamental sensory processing, emotional and behavioral regulation, social interaction and communication, cognition and learning, motor and bodily integration, oral sensory processing, daily functioning and independence, and family and social support. These themes were subsequently translated into an integrated 12-session intervention protocol in which cognitive-behavioral play therapy and sensory integration were combined within a structured and developmentally sequenced framework. The expert-validation phase further demonstrated acceptable content validity, with the Content Validity Index for all 12 sessions ranging from .80 to .90 and exceeding the accepted minimum criterion of .79. These

findings suggest that the developed intervention possesses satisfactory conceptual coherence and content validity and that the integration of sensory and cognitive-behavioral components within a play-based structure is both theoretically defensible and practically feasible.

One of the principal findings was the central position of fundamental sensory processing within the conceptual model. Sensory-related needs accounted for a considerable proportion of the extracted codes and included hyperresponsivity, hyporesponsivity, sensory seeking, sensory avoidance, impaired tactile and vestibular processing, low registration, auditory and visual sensitivity, and difficulties with proprioceptive and oral sensory processing. This finding is consistent with evidence indicating that atypical sensory processing constitutes a major dimension of functioning in children with autism spectrum disorder and can influence behavior, learning, participation, and adaptive functioning (Esteki et al., 2020; Yuan et al., 2022). The prominence of sensory processing in the present model is also supported by systematic reviews showing that sensory integration-based interventions can improve selected functional and sensory outcomes among autistic children (Camino-Alarcón et al., 2024; Lyu et al., 2025; Oh et al., 2024). More recent synthesis of occupational therapy interventions using Ayres Sensory Integration similarly supports the continued clinical relevance of interventions that are individualized, activity-based, and directed toward meaningful participation rather than isolated sensory stimulation (Piller et al., 2026). Thus, the location of sensory processing at the foundational level of the present

conceptual model is consistent with contemporary evidence suggesting that sensory regulation can affect readiness for engagement in higher-order cognitive, emotional, social, and adaptive activities.

The identification of emotional and behavioral regulation as a second major theme is likewise theoretically and empirically meaningful. Children with autism spectrum disorder frequently experience difficulties identifying emotions, modulating arousal, tolerating frustration, and regulating responses to environmental demands. In the present study, emotional meltdowns, sensory-related anxiety, low emotional tolerance, self-regulation difficulties, stereotyped self-soothing behaviors, and hyperarousal emerged as interrelated intervention targets. These findings are consistent with the growing recognition that emotion regulation should be treated as a core therapeutic target in autistic children and adolescents rather than as a secondary consequence of other symptoms (Li et al., 2026). The inclusion of cognitive-behavioral techniques such as emotion recognition, cognitive restructuring, relaxation training, graded exposure, and problem-solving is also supported by evidence indicating that cognitive-behavioral interventions can reduce anxiety and improve emotional functioning in people with autism spectrum disorder (Cheng et al., 2025). Previous studies of cognitive-behavioral play therapy have similarly reported reductions in challenging behaviors, social anxiety, and self-injurious behaviors among children with autism (Faramarzi & Ghanei, 2019; Hamidifard et al., 2023). Therefore, integrating cognitive-behavioral emotion-regulation strategies with sensory-regulation activities appears particularly appropriate for children whose emotional dysregulation may be intensified by sensory overload or poor sensory modulation.

Another important finding was the emergence of social interaction and communication as a distinct but interconnected domain. The qualitative analysis identified theory-of-mind deficits, limited understanding of nonverbal cues, poor social reciprocity, difficulty with turn-taking, restricted peer interaction, and delayed language as major intervention needs. These findings are compatible with contemporary evidence demonstrating substantial variability but persistent difficulty in theory-of-mind functioning among autistic individuals (Baron-Cohen et al., 2025). They are also consistent with prior research demonstrating that play-based and child-centered interventions can improve emotional and social skills in children with autism (Hashemipour & Mohammadi, 2018). In the present protocol, these difficulties were addressed through

structured social play, role-playing, social stories, empathy training, turn-taking exercises, and opportunities for reciprocal interaction. Such strategies are theoretically appropriate because play creates a controlled but naturalistic context in which children can rehearse social scripts and receive immediate feedback. The use of role-playing and structured play is also consistent with contemporary treatment-planning approaches that emphasize developmentally adapted, goal-directed, and family-sensitive play interventions (Tasijawa & Herwawan, 2025). In addition, sensory modulation may indirectly support social participation by reducing the sensory overload that can contribute to withdrawal, irritability, or avoidance in socially demanding environments.

The theme of cognition and learning also played a substantial role in the developed protocol. The extracted codes included cognitive inflexibility, poor sustained attention, difficulty generalizing acquired skills, cognitive-sensory interference, negative thinking patterns, and limited intrinsic motivation during play. These findings are clinically important because cognitive and attentional difficulties can affect the child's capacity to benefit from educational and therapeutic experiences. The inclusion of rule-changing games, flexible storytelling, problem-solving exercises, and generalization tasks is supported by evidence demonstrating that cognitive-behavioral play therapy can improve working memory, short-term memory, and sustained attention in children with developmental and learning difficulties (Azizi et al., 2020). Other studies have shown that cognitive play therapy can reduce impulsivity and attentional difficulties (Hosseinizadeh, 2021; Khatoun et al., 2020). Although these studies were not limited exclusively to autism spectrum disorder, they support the broader principle that cognitive functions can be addressed through structured play rather than through exclusively verbal methods. The present findings also align with systematic evidence suggesting that play-based interventions may strengthen executive functions in young children with disabilities (Wardhani & Widjayatri, 2025). The integrated protocol therefore appears to address cognitive functioning in a developmentally sensitive way while simultaneously reducing sensory barriers that may otherwise compromise attention and learning.

Motor and bodily integration formed another central component of the conceptual framework. Problems with gross-motor coordination, praxis, vestibular processing, proprioception, balance, and movement tolerance were repeatedly represented in the extracted codes. This finding

corresponds with reports that motor difficulties are common among children with autism spectrum disorder and can affect participation, independence, and parental perceptions of the child's developmental functioning (Müller et al., 2024). The protocol therefore included obstacle courses, bilateral coordination exercises, balance activities, controlled vestibular stimulation, deep-pressure activities, and proprioceptive input. This structure is consistent with research showing that sensory-motor integration programs can improve spatial visualization and fine-motor skills in children with developmental difficulties (Ghasemian Moghaddam & Mohammadzadeh, 2024). It is also supported by studies of sensory integration and play participation in autistic children, which suggest that individualized sensory integration can promote more effective engagement in meaningful activity (Kuhaneck et al., 2023). The inclusion of motor and bodily integration within the same framework as emotional and cognitive components is therefore justified by the reciprocal relationship between movement, arousal regulation, sensory processing, and participation.

The identification of oral sensory processing as a separate main theme also adds specificity to the intervention model. Difficulties tolerating food textures, restricted food selection, oral sensory avoidance, and oral sensory seeking were distinguished from broader sensory-processing challenges. This distinction is clinically useful because feeding-related sensory behaviors can have direct implications for daily routines, family stress, and participation in mealtimes. Sensory over-responsivity research has shown that atypical sensory reactions can be highly modality-specific and may require targeted intervention strategies rather than broad sensory stimulation (Yuan et al., 2022). By including graded oral-tactile exposure and individualized sensory activities, the developed protocol attempts to address this specificity. This approach also reflects the broader principle that sensory intervention should be individualized according to each child's profile rather than uniformly applied.

Daily functioning and independence emerged as the applied endpoint of the intervention model. The extracted needs included dependence on fixed routines, difficulty adapting to change, problems with self-care, activity-transition difficulties, and reduced social participation. This finding is consistent with current intervention perspectives that prioritize functional participation rather than symptom reduction alone. Sensory integration therapy has increasingly been evaluated in relation to occupational and participation outcomes, and randomized evidence has

emphasized the importance of determining whether intervention gains translate into meaningful daily functioning (Randell et al., 2022). The present protocol consequently incorporated home-based assignments, structured transitions, self-care tasks, and generalization exercises in the later sessions. This sequencing reflects the assumption that sensory, emotional, cognitive, and social capacities should ultimately support improved adaptation in real-life contexts. It also aligns with the principle that treatment fidelity must be balanced with contextual flexibility so that intervention procedures can be adapted to individual children and natural environments without abandoning their core mechanisms (Pickard et al., 2023).

Family and social support represented the final major theme and was conceptualized as a continuous element across all 12 sessions rather than as a discrete treatment phase. The expert-derived codes included parental stress, limited parental knowledge of sensory strategies, lack of coordination among caregivers, and the need for consistent home implementation. This is consistent with family-centered occupational therapy literature showing that interventions for autistic children are strengthened when families participate in goal setting, treatment implementation, and generalization (Watling et al., 2023). Family participation is especially important because many of the target behaviors addressed in the protocol, including emotional regulation, sensory modulation, self-care, transitions, and social interaction, occur most frequently outside the clinic. The systemic orientation of the developed program also corresponds with broader family-therapy perspectives emphasizing that child functioning cannot be separated from relational and environmental systems (Robinson, 2025). Similarly, function-based intervention research demonstrates that behavior is more effectively modified when its environmental contingencies and communication functions are considered (Perihan & Bicer, 2021). Thus, the continuous inclusion of parent education, home assignments, and sensory-diet implementation within the present protocol can be considered an important strength of the model.

A particularly significant contribution of the study is the explicit integration of cognitive-behavioral play therapy and sensory integration within a single intervention architecture. Previous research has separately demonstrated benefits for sensory integration, cognitive-behavioral approaches, and play-based interventions; however, these methods are often implemented as independent treatment traditions. Sensory integration has shown potential benefits for sensory, motor,

language, and play-related outcomes (Awaida et al., 2024; Fouad et al., 2023; Kuhaneck et al., 2023), while cognitive-behavioral and play-based approaches have demonstrated effects on behavior, anxiety, attention, and social-emotional functioning (Azizi et al., 2020; Hamidifard et al., 2023; Mirghafourian et al., 2022). The present study goes beyond placing these techniques side by side by organizing them according to shared therapeutic targets. For example, sensory preparation precedes demanding cognitive tasks, deep-pressure or proprioceptive input is incorporated before social interaction, and graded exposure is combined with cognitive and emotional coping strategies. This reflects an integrated mechanism in which bottom-up sensory regulation may facilitate top-down cognitive and behavioral engagement. Such integration is conceptually consistent with findings that combined sensory and conventional interventions may offer clinically meaningful advantages for some children with autism (Awaida et al., 2024).

The development of the protocol through Intervention Mapping also strengthens its methodological coherence. Rather than deriving sessions solely from therapist preference, the identified needs were systematically converted into performance objectives, measurable indicators, determinants of change, and intervention activities. Intervention Mapping provides a structured method for connecting empirical needs assessment with program design and implementation (Bartholomew Eldredge et al., 2022). This was reflected in the present study by the progression from initial codes to axial codes, subthemes, main themes, performance objectives, a change matrix, and finally the 12-session protocol. Such a process increases transparency regarding why each intervention component was included and what mechanism it is intended to target. It also facilitates later evaluation because measurable performance indicators can be connected directly to specific therapeutic components.

The content-validity findings provide additional support for the appropriateness of the developed program. All 12 sessions obtained CVI values between .80 and .90, exceeding the accepted minimum threshold of .79. This indicates a high level of agreement among experts regarding the relevance and appropriateness of the session objectives, strategies, activities, and assignments. Member checking further contributed to refinement of the protocol by improving clarity, simplifying instructional procedures, strengthening alignment between therapeutic activities and the theoretical approaches, and modifying the sequence and wording of session objectives. These procedures are

important because a conceptually strong intervention may still lack clinical usability if session procedures are unclear or overly complex. The expert-review process therefore strengthened both content validity and practical applicability.

It should also be emphasized that the present study does not claim clinical efficacy on the basis of content validity alone. The findings establish that the intervention is theoretically grounded, systematically constructed, and judged by experts to be relevant and coherent. Previous literature provides indirect empirical support for the components included in the protocol, but the integrated intervention itself requires direct evaluation. This distinction is particularly important given the variability in outcomes reported across sensory interventions and the methodological limitations of some studies. Although several systematic reviews report beneficial effects (Lyu et al., 2025; Oh et al., 2024; Piller et al., 2026), other research has underscored variability in effectiveness according to child characteristics, intervention fidelity, and outcome definition (Randell et al., 2022). Moreover, one study that combined sensory integration training with social sports games has been retracted and therefore cannot be considered valid evidence for therapeutic effectiveness (Wang et al., 2022). The present protocol should therefore be regarded as a rigorously developed intervention framework whose clinical effects must be established in subsequent experimental research.

5. Conclusion

Overall, the findings support a multidimensional understanding of intervention needs in children with autism spectrum disorder. The eight themes identified in the present study indicate that sensory processing, emotional regulation, cognition, social interaction, motor functioning, daily independence, and family support should not be treated as unrelated domains. Instead, they form an interacting therapeutic system in which change in one dimension may facilitate progress in others. This conceptualization is compatible with contemporary neurodevelopmental and systemic perspectives that emphasize heterogeneity, contextual functioning, and individualized intervention (Morris-Rosendahl & Crocq, 2020; Robinson, 2025). The 12-session spiral structure developed in the present study reflects this interdependence by revisiting the same therapeutic domains across multiple sessions while gradually shifting the emphasis from sensory regulation and

therapeutic engagement toward cognitive-behavioral skills, social participation, generalization, and independence. Consequently, the principal contribution of the study is not merely the identification of therapeutic techniques but the organization of those techniques into a coherent, theoretically grounded, developmentally sensitive, and content-validated program.

The present study has several limitations that should be considered when interpreting its findings. First, the research focused on program development and content validation rather than testing clinical effectiveness; therefore, no conclusions can yet be drawn regarding the extent to which the 12-session intervention improves sensory processing, emotional regulation, social communication, cognitive flexibility, motor functioning, or adaptive behavior in children with autism spectrum disorder. Second, the expert panel was relatively small and was drawn from a limited number of academic and clinical settings, which may restrict the diversity of professional perspectives represented in the validation process. Third, although the thematic analysis was based on a broad range of theoretical and empirical sources, the quality, methodological rigor, and populations of the reviewed studies varied. Fourth, some intervention targets within the protocol overlap conceptually, making it difficult to determine whether future therapeutic effects would result from sensory integration, cognitive-behavioral mechanisms, play-based delivery, parent participation, or their interaction. Fifth, the protocol was designed as a general framework for children with autism spectrum disorder and sensory modulation difficulties, despite the substantial heterogeneity of autism in relation to language ability, intellectual functioning, symptom severity, sensory profile, age, and adaptive functioning. Finally, the intervention duration and session structure were determined through theoretical synthesis and expert review and have not yet been empirically optimized.

Future studies should evaluate the clinical effectiveness of the developed protocol using randomized controlled trials with sufficiently large samples and clearly defined inclusion criteria. Experimental studies should compare the integrated intervention with cognitive-behavioral play therapy alone, sensory integration alone, treatment as usual, and wait-list control conditions in order to determine whether the integrated model produces additive or synergistic effects. Researchers should employ standardized measures of sensory processing, emotional regulation, anxiety, social communication, executive functioning, motor skills, adaptive functioning, and parental stress and should include

both post-intervention and long-term follow-up assessments. Future work should also investigate moderators of treatment response, including age, verbal ability, autism severity, intellectual functioning, baseline sensory profile, parental involvement, and comorbid emotional or behavioral difficulties. Component-analysis studies would be valuable for identifying which elements of the intervention are essential and which can be modified without reducing effectiveness. Multisite studies should be conducted to determine whether the protocol can be implemented consistently across clinical, educational, and community settings. Qualitative interviews with children, parents, therapists, and teachers could further clarify acceptability, feasibility, perceived mechanisms of change, and barriers to implementation. Future research should also examine treatment fidelity and develop a standardized fidelity checklist for the 12-session protocol so that implementation quality can be monitored systematically.

In clinical practice, the developed protocol may be used as a structured framework for organizing play-based intervention for children with autism spectrum disorder who display concurrent sensory, emotional, behavioral, and functional difficulties. Before implementation, clinicians should conduct an individualized assessment of the child's sensory profile, communication abilities, cognitive level, motor functioning, emotional regulation, preferred play activities, family routines, and specific functional needs. The intensity and type of sensory stimulation should be adjusted carefully according to the child's responses rather than applied uniformly. Cognitive-behavioral activities should be adapted to the child's developmental and language level and presented through visual, experiential, and play-based methods. Parents should be actively involved throughout treatment and should receive clear instructions regarding sensory strategies, emotion coaching, reinforcement, behavioral consistency, and generalization of skills to the home environment. Collaboration among psychologists, occupational therapists, speech-language professionals, teachers, and caregivers is recommended to ensure that intervention goals are coordinated across settings. Clinicians should also monitor the child's tolerance and progress continuously and modify the sequence or intensity of activities when necessary while maintaining the core therapeutic structure of the protocol.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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