International Journal of Autism

E-ISSN: 2710-3927
P-ISSN: 2710-3919
Impact Factor (RJIF): 6.59
IJA 2026; 6(1): 07-13

www.rehabilitationjournals.com/autism-journal
Received: 09-11-2025
Accepted: 14-12-2025

Abha Horo
Clinical Tutor, Department of Child Health Nursing, College of Nursing, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

Dr. P Ponnarasi
Professor cum HOD, Department of Medical-Surgical Nursing, Narayan Nursing College, Gopal Narayan Singh University, Jamuhar, Sasaram, Bihar, India

Correspondence
Abha Horo
Clinical Tutor, Department of Child Health Nursing, College of Nursing, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

From red flags to resilience: A comprehensive overview of Autism spectrum disorder

Abha Horo and P Ponnarasi

DOI: https://www.doi.org/10.22271/27103919.2026.v6.i1a.67

Abstract
Background: Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental condition characterised by impairments in social communication, restricted and repetitive patterns of behaviour, and atypical sensory processing. The increasing global prevalence has emphasised the importance of early identification, an accurate understanding of etiological factors, and the implementation of evidence-based interventions to optimise developmental outcomes.
Aim: This article aims to present a comprehensive overview of Autism Spectrum Disorder, focusing on definitions, prevalence and incidence, risk and etiological factors, developmental milestones, early warning signs, clinical features, and common misconceptions, while highlighting effective intervention and parent-focused management strategies.
Methods: A narrative review was conducted using authoritative diagnostic frameworks (DSM-5 and ICD-11), epidemiological data, peer-reviewed literature, and standard pediatric and nursing texts. Evidence related to early identification, symptom presentation, and multidisciplinary intervention approaches was synthesised, with a particular emphasis on behavioural, educational, therapeutic, and family-centred practices.
Conclusion: Early detection of autism through recognition of developmental red flags, combined with timely, individualised, and multidisciplinary interventions, is critical for improving communication, adaptive functioning, and quality of life in children with ASD. Parental involvement, structured educational planning, and evidence-based therapies play a central role in promoting resilience and long-term outcomes. Addressing misconceptions and strengthening inclusive support systems are essential for empowering autistic individuals and their families.

Keywords: Autism spectrum disorder, early identification, developmental red flags, Etiology, intervention strategies, parent involvement, multidisciplinary care

Introduction
Autism, or autism spectrum disorder (ASD), is a neurodevelopmental condition characterised by differences in social communication, behaviour, and sensory processing. It is called a "spectrum" because it affects individuals differently, with varying strengths and challenges. Common traits include difficulty with social interactions, repetitive behaviours, intense focus on specific interests, and sensitivity to sensory stimuli. While the exact cause is unknown, autism is believed to result from genetic and environmental factors. Early diagnosis and support can help individuals thrive in their unique ways.

Definition
American Psychiatric Association (2013) [1]: Autism Spectrum Disorder (ASD) is defined as a "neurodevelopmental disorder characterised by persistent deficits in social communication and social interaction across multiple contexts, along with restricted, repetitive patterns of behaviour, interests, or activities" (*DSM-5*).

World Health Organization (2018): Autism is described as "a group of conditions characterised by some degree of difficulty with social interaction and communication. Other characteristics are atypical patterns of activity and behaviour, such as difficulty with transition from one activity to another, a focus on details, and unusual reactions to sensations" (*ICD-11*).

Prevalence
According to the Global Burden of Disease Study 2021, about 61.8 million people worldwide were estimated to be on the autism spectrum.

- The World Health Organization (WHO, 2023) estimates that about 1 in 100 children worldwide has autism.
- By sex: approximately 1,064.7 per 100,000 males and 508.1 per 100,000 females.
- Recent data indicate that approximately 1 in 36 children in India are diagnosed with ASD.
- The male-to-female ratio for autism diagnosis in India is approximately 3:1, indicating that boys are more commonly affected than girls.

Incidence (Global)
A study published in BMC Public Health estimated 1.14 million new ASD cases globally in 2021.

In India
The reported incidence of Autism Spectrum Disorder (ASD) is limited due to the absence of a national registry; however, community-based epidemiological studies suggest an estimated rate of about 15 per 10,000 children (≈0.15%)

Risk factors
Risk factors of autism spectrum disorder are related to genetic, environmental, neurobiological, pregnancy and birth-related and other factors.

1. Genetic Factors
- Family history of autism
- Genetic mutations (e.g., SHANK3, CHD8, MECP2 mutations)
- Syndromic conditions (e.g., Fragile X syndrome, Rett syndrome, Tuberous sclerosis)

2. Environmental Factors
- Advanced parental age (both maternal and paternal)
- Prenatal exposure to toxins (e.g., air pollution, heavy metals, pesticides)
- Maternal infections during pregnancy (e.g., rubella, cytomegalovirus)
- Prenatal exposure to valproic acid or thalidomide

3. Neurobiological Factors
- Abnormal brain development and connectivity
- Imbalances in neurotransmitters (e.g., serotonin, dopamine, GABA)
- Immune system dysfunction

4. Pregnancy and Birth-Related Factors
- Low birth weight or preterm birth
- Birth complications (e.g., oxygen deprivation at birth)
- Maternal diabetes or obesity

5. Other Factors
- Male gender (Autism is more common in boys, with a 4:1 male-to-female ratio)

Etiological factors
- Genetic factors
- Biological factors
- Environmental factors
- Perinatal
- Postnatal
- Social environmental factors

1. Genetic Factors
- Autism has a strong genetic basis, with heritability estimates above 70-80%.
- First-degree relatives of individuals with ASD have a significantly higher risk.
- Mutations in several genes such as SHANK3, MECP2, CHD8, NLGN3/4, SCN2A are associated with disrupted neural development.
- Chromosomal disorders like Fragile X syndrome, Rett syndrome, and tuberous sclerosis are linked with higher ASD prevalence.
- De novo mutations (spontaneous genetic changes not inherited from parents) also contribute to ASD, especially in cases without family history.

2. Biological Factors
- **Neurological abnormalities:** Early brain overgrowth, atypical neural connectivity, and differences in brain areas like the amygdala, cerebellum, and prefrontal cortex.
- **Neurochemical imbalances:** Altered levels of neurotransmitters such as serotonin, dopamine, GABA, and glutamate.
- **Immune system dysfunction:** Maternal immune activation, elevated inflammatory markers, and autoantibodies affecting fetal brain development.
- **Hormonal factors:** Increased prenatal testosterone exposure has been associated with ASD traits in some studies.

3. Environmental Factors
A. Perinatal Factors
- Prematurity (birth before 37 weeks) and low birth weight
- Birth asphyxia (reduced oxygen during delivery)
- Neonatal jaundice (hyperbilirubinemia)
- Complications during birth, such as prolonged labour or emergency C-section (inconsistent evidence)
- Maternal medical conditions such as pre-eclampsia or gestational diabetes

B. Postnatal Factors
- Severe infections in early life, such as meningitis or encephalitis
- Exposure to environmental toxins (heavy metals like lead or mercury)
- Early childhood head injury (rare contribution)
- Nutritional deficiencies (e.g., lack of early folate support though mainly prenatal)

4. Social Environmental Factors
- Maternal stress, anxiety, and depression during pregnancy may influence fetal neurodevelopment.
- Lack of early social stimulation does NOT cause autism but may worsen pre-existing symptoms.
- Family stress, poor caregiver-child interaction, and adverse childhood experiences do not cause ASD but can influence behavioural outcomes.
- Socioeconomic factors indirectly contribute by affecting access to healthcare, nutrition, and early intervention services.

Common myths about Autism Spectrum Disorder (ASD)

Myths	Facts
Autism is caused by vaccines	Extensive scientific research shows **no link** between vaccines and autism.
Autism is caused by bad parenting.	ASD is a neurodevelopmental condition, not related to parenting style.
All autistic individuals have intellectual disability.	Many have average or above-average intelligence; abilities vary widely.
People with autism don't feel emotions.	They feel emotions, but may express or interpret them differently.
Autism only affects children.	Autism is lifelong; children grow into autistic adults.
Only boys have autism.	Girls also have ASD but are often underdiagnosed due to subtle symptoms.
Autistic individuals prefer to be alone.	Many want social relationships but face communication and sensory challenges.
Autism can be outgrown.	ASD cannot be cured, but early intervention improves skills and functioning.
All autistic people have savant skills.	Savant abilities occur in only a small minority of individuals with ASD.
Autism has a single cause.	ASD results from multiple genetic, biological, and environmental factors.

Developmental milestones and red flags
Developmental Milestones (0-3 years)
(Normal expected milestones for comparison)

A. Social Milestones
- **2 months**: Smiles responsively (social smile)
- **6 months**: Responds to name, enjoys social interaction
- **9 months**: Shows joint attention (looks at objects with caregiver)
- **12 months**: Waves bye-bye, imitates actions
- **18 months**: Shows affection, engages in pretend play
- **24 months**: Plays alongside other children (parallel play)
- **3 years**: Shares toys, engages in simple social games

B. Communication Milestones
- **6 months**: Babbles ("ba-ba", "da-da")
- **9 months**: Understands simple words
- **12 months**: Says first word
- **18 months**: Speaks 10-20 words
- **24 months**: 2-word phrases ("want milk")
- **3 years**: Speaks in simple sentences; understands instructions

C. Motor Milestones
- **6 months**: Rolls over
- **9 months**: Sits without support
- **12 months**: Walks with support
- **18 months**: Walks independently
- **24 months**: Runs, kicks a ball
- **3 years**: Climbs stairs, rides a tricycle

Red Flags of Autism (Warning Signs)
By 6 months
- No big smiles or joyful expressions
- Limited eye contact

By 9 months
- No sharing of sounds, smiles, or facial expressions
- No back-and-forth interaction

By 12 months
- No babbling
- No gestures (pointing, waving, reaching)
- No response to name

By 16 months
No meaningful single words

By 18 months
No pretend or imaginative play

By 24 months
No 2-word meaningful phrases (not echolalia)

At any age
- Regression (loss of speech, social skills)
- Unusual sensory responses (oversensitivity or lack of response)
- Lack of interest in peers
- Repetitive behaviours (hand flapping, lining up objects)

Clinical Symptoms of Autism Spectrum Disorder
1. Social Difficulties
- Poor or reduced eye contact
- Limited interest in interacting with peers
- Difficulty understanding others' feelings or social cues
- Does not share enjoyment, interests, or achievements with others
- Prefers to play alone rather than engage in group play
- Limited or absent showing, pointing, or bringing objects to share
- Difficulty forming and maintaining age-appropriate relationships

2. Communication Difficulties
- Delayed speech or absence of spoken language
- Limited use of gestures (e.g., pointing, waving)
- Difficulty initiating or sustaining conversations
- Echolalia (repeating words or phrases)
- Unusual tone, rhythm, or pitch of voice
- Literal interpretation of language; difficulty understanding jokes or sarcasm
- Poor understanding of nonverbal communication (facial expressions, body language)

3. Unusual Behaviours
- Repetitive movements: hand flapping, rocking, spinning, finger flicking
- Lining up toys or objects in a fixed pattern
- Strong need for routines; distress with small changes
- Intense and restricted interests (e.g., wheels, numbers, maps)
- Rigid thinking and difficulty adjusting to transitions
- Fascination with specific parts of objects (e.g., wheels, buttons)

4. Exploration of Environment
- Hyper- or hypo-reactivity to sensory input (sounds, lights, textures, touch)
- Smelling, touching, or tasting objects in unusual ways
- Watching spinning objects or lights for long periods
- May ignore dangerous situations due to sensory under-responsiveness
- Unusual visual exploration, such as side glancing or looking at objects very closely

5. Associated Symptoms
- Sleep problems (difficulty falling or staying asleep)
- Feeding issues: food selectivity, texture aversions
- Motor difficulties: clumsiness, delayed motor milestones, toe walking
- Emotional issues: tantrums, anxiety, irritability due to communication challenges
- Cognitive profile variability: may have intellectual disability or savant abilities
- Self-injurious behaviours (in severe cases) such as head banging or biting
- Gastrointestinal problems (common but not diagnostic)

Exploration of therapies and training approaches

Autistic children benefit most from early, intensive, structured, and multidisciplinary interventions. Effective management involves a combination of behavioural therapies, communication support, skill training, appropriate educational strategies, and strong parental involvement.

Therapies and Training Approaches used for Autistic Children
- Behaviour therapy
- Psychotherapy
- Cognitive behaviour therapy
- Behaviour modification
- Speech therapy
- Occupational therapy
- Sensory integration
- Pharmacotherapy
- Parent Training for Autism: Essential Skills and Strategies

1. Behaviour Therapy
- Based on the principles of Applied Behaviour Analysis (ABA).
- Uses reinforcement to increase desirable behaviours and reduce maladaptive behaviours.
- Techniques include Discrete Trial Training (DTT), Pivotal Response Training (PRT), and task analysis.
- Helps in improving communication, daily living skills, academic behaviours, and social interaction.

2. Psychotherapy
- Used primarily for older children and adolescents.
- Focuses on emotional expression, coping with anxiety, self-esteem issues, and behaviour-related stress.
- Play therapy or child-centred therapy may be used for younger children to enhance emotional connection and reduce stress.
- Helps children express feelings they cannot verbalise due to communication difficulties.

3. Cognitive Behaviour Therapy (CBT)
- Modified CBT is used for autistic children who can understand basic concepts of thoughts and emotions.
- Helps manage anxiety, rigid thinking, phobias, anger, and obsessive behaviours.
- Uses visual aids, structured worksheets, and social stories.
- Teaches emotional regulation, flexibility in thinking, and problem-solving.

4. Behaviour Modification
- Systematic use of reinforcement (reward systems), prompting, shaping, and fading to change behaviour.
- Token economy systems are commonly used.
- Helps reduce tantrums, aggression, self-injury, and repetitive behaviours.
- Encourages adaptive behaviours such as sitting tolerance, waiting, sharing, following instructions.

5. Speech Therapy
- Focuses on improving expressive and receptive language skills.
- Works on articulation, vocabulary building, conversational skills, and comprehension.
- Uses Alternative and Augmentative Communication (AAC) like PECS (Picture Exchange Communication System), sign language, or communication boards.
- Helps develop functional communication, reduces frustration, and improves social interaction.

6. Occupational Therapy (OT)
- Enhances fine motor skills, handwriting, dressing, grooming, feeding, coordination, and daily living activities.
- Addresses motor planning, hand-eye coordination, and functional independence.
- Provides strategies for improving attention, sensory processing, and classroom skills.

7. Sensory Integration Therapy (SI)
- Used for children with sensory processing difficulties.
- Helps children who are hypersensitive (over-sensitive) or hyposensitive (under-sensitive) to sensory input such as touch, sound, light, balance, or textures.
- Involves activities like swinging, brushing, deep pressure, weighted blankets, and balance exercises.
- Aims to help children appropriately process sensory information and reduce behavioural dysregulation.

8. Pharmacotherapy
- No medicine cures autism, but medications help manage associated symptoms
- Medicines are used only as supportive management and always combined with behavioural therapies.

9. Parent Training for Autism: Essential Skills and Strategies

Building a Positive Relationship

Creating a nurturing and supportive relationship with a child is fundamental to effective intervention. Positive relationships are built on trust, respect, and understanding. Parents should focus on:

Active Listening
Pay close attention to verbal and non-verbal cues from the child. Validate their feelings and experiences.

- **Engagement:** Spend quality time with the child, engaging in activities they enjoy. This fosters connection and builds trust.
- **Consistency:** Consistent responses and routines provide a sense of security and predictability for the child.

Establishing Routines and Structure
Children with autism often thrive in structured environments. Routines provide a predictable framework that helps the child feel secure and understand what to expect. To establish effective routines:

- **Create Visual Schedules**
  Outline daily activities using pictures, symbols, or written schedules. This helps the child anticipate and prepare for transitions.
- **Set Clear Expectations**
  Clearly define expectations for behaviour and tasks. Use simple language and visual supports to reinforce these expectations.
- **Maintain Consistency**
  Consistent routines and rules across different settings (home, school, etc.) help the child generalize skills and behaviours.

Developing Communication Skills
Effective communication is vital for children with autism. Parents can support communication development through:

- **Encouraging Language Use**
  Model and encourage verbal communication by providing ample opportunities for the child to practice speaking. Use simple language.
- **Using Visual Supports**
  Incorporate visual aids, such as picture cards or communication boards, to support understanding and expression.
- **Reinforcing Communication Efforts**
  Reinforce any attempts at communication, whether verbal or non-verbal. Positive reinforcement encourages continued efforts.

Implementing Behavioural Strategies
Behavioural strategies can help address challenging behaviours and promote positive behaviours. Parents should focus on:

- **Understanding Triggers**
  Identify potential triggers for challenging behaviours, such as changes in routine or environmental factors. Addressing these triggers can help prevent issues.
- **Positive Reinforcement**
  Use rewards and praise to reinforce desired behaviours. This encourages the child to repeat these behaviours.
- **Behavioural Interventions**
  Implement specific interventions, such as Applied Behaviour Analysis (ABA), to target and modify specific behaviours. Work with a trained professional to tailor interventions to the child's needs.

Teaching Social Skills: Social skills are crucial for interacting with peers and participating in various activities. It is conducted in small groups using modelling, rehearsal, feedback, role-play, and visual cues. Parents can support social skills development by:

- **Modelling Social Interactions**
  Demonstrate appropriate social behaviours, teach eye contact, sharing, turn-taking, greetings, conversation rules, understanding feelings, and perspective-taking. A Child learns by observing and imitating.
- **Role-Playing**
  Engage in role-playing activities to practice social scenarios. Provide feedback and guidance to help the child navigate social interactions.
- **Life skills training:** dressing, toileting, eating independently.
- **Encouraging Peer Interactions**
  Facilitate opportunities for the child to interact with peers in structured and unstructured settings. Encourage participation in group activities and playdates.

Supporting Emotional Regulation:
Emotional regulation helps Children manage their feelings and respond to situations in a balanced way. Parents can support emotional regulation by:

- **Teaching Coping Strategies**
  Introduce coping strategies, such as deep breathing or using calming tools, to help the child manage stress and frustration.
- **Recognizing Emotions**
  Help the child identify and label their emotions. Use visual aids or emotion charts to support this process.
- **Providing a Calm Environment**
  Create a calming space where the child can retreat when feeling overwhelmed. This space should be quiet and comforting.

Encouraging Independence
Fostering independence helps children develop self-confidence and life skills. Parents can promote independence by:

- **Breaking Tasks into Steps**
  Divide tasks into smaller, manageable steps. Teach each step individually and guide as needed.
- **Encouraging Self-Care Skills**
  Support the child in developing self-care skills, such as dressing, grooming, and hygiene. Provide opportunities to practice and gradually increase responsibilities.
- **Promoting Decision-Making**
  Encourage the child to make choices and decisions. This builds confidence and fosters a sense of autonomy.

Collaborating with Professionals
Working with professionals can provide additional support and guidance. Parents should consider:

- **Seeking Professional Advice**
  Consult with specialists, such as speech therapists, occupational therapists, or behavioural therapists, to address specific areas of need.
- **Participating in Therapy Sessions**
  Attend therapy sessions and actively participate in the treatment process. Follow recommendations and implement strategies at home.
- **Staying Informed**
  Stay informed about best practices and emerging

research in autism support. Attend workshops, seminars, and training sessions to enhance your knowledge and skills.

Building a Support Network

Having a support network is essential for parents navigating the challenges of autism. Parents can build a support network by:

- **Connecting with Other Families**
  Join support groups or online communities to connect with other families facing similar experiences. Sharing insights and experiences can provide valuable support.
- **Accessing Community Resources**
  Explore community resources, such as local organisations and services that offer support and information for families.
- **Seeking Professional Support**
  Consider working with a counsellor or therapist to address any personal challenges or stressors related to parenting a child with autism.

Advocating for Your Child

Advocacy is a critical component of supporting a child's needs and ensuring they receive appropriate services and accommodations. Parents should:

- **Understand Your Rights**
  Familiarise yourself with your child's rights and entitlements, such as special education services or accommodations in public settings**.**
- **Communicate with Educators**
  Collaborate with teachers and school staff to ensure the child's educational needs are met. Participate in Individualised Education Program (IEP) meetings and advocate for necessary support.
- **Raise Awareness**
  Advocate for awareness and understanding of autism in the community. Participate in events or campaigns to promote inclusion and acceptance.

Recommended Activities for Autistic Children

A. Sensory-Friendly Activities

- Deep pressure activities
- Swinging, trampoline jumping
- Water play
- Weighted blankets or vests

B. Structured Play Activities

- Puzzle solving
- Sorting games
- Matching activities

C. Physical Activities

- Swimming
- Yoga for kids
- Cycling

D. Communication Activities

- Role play
- Picture-based games
- Story-based conversation practice

Contraindicated Activities: These activities may worsen anxiety, sensory overload, or behaviour in ASD.

- Unstructured or chaotic group activities
- Loud environments (fireworks, loud music, crowded events)
- Rough physical play or aggressive competitive sports
- Activities with bright flashing lights (may trigger sensory issues)
- Overstimulating screen time or fast-paced video games
- Forced eye contact or social interaction
- Pressure-based punishment or negative reinforcement
- Complicated multi-step directions without visual support

Educational Strategies for Autistic Children

A. Structured Teaching

- Fixed routines and predictable schedules
- Clear visual timetables
- Step-by-step instructions displayed visually

B. Individualised Education Plan (IEP)

- Tailored academic goals
- Special educator support
- Adapted learning materials

C. Visual Supports

- Visual schedules, charts, task strips
- Social stories to explain new situations
- Classroom labels and pictorial cues

D. Multi-sensory Teaching

- Using visual, auditory, and kinesthetic methods
- Hands-on learning materials

E. Small Group Teaching

- Reduces distractions
- Allows personalised attention

F. Positive Reinforcement

- Reward systems for desirable behaviours
- Token economy programs

Conclusion

Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental condition with diverse presentations, influenced by a combination of genetic, biological, and environmental factors. Although it cannot be cured, early identification and comprehensive, individualised interventions significantly improve communication, behaviour, learning, and overall quality of life. With appropriate support from families, educators, therapists, and communities, individuals with ASD can develop their strengths, achieve meaningful independence, and lead fulfilling lives. The focus must remain on early intervention, acceptance, and inclusive practices that empower every autistic individual to reach their full potential.

References

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington (VA): American Psychiatric Publishing; 2013.
2. World Health Organization. Autism spectrum disorders [Internet]. Geneva: World Health Organization; 2023 [cited 2025 Jan 10]. Available from:

https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders
3. Global Burden of Disease Study 2021 Autism Spectrum Collaborators. The global epidemiology and health burden of the autism spectrum: findings from the Global Burden of Disease Study 2021. Lancet Psychiatry. 2025;12(2):111-121. doi:10.1016/S2215-0366(24)00363-8
4. Centers for Disease Control and Prevention. Treatment and intervention for autism spectrum disorder [Internet]. Atlanta (GA): CDC; 2024 May 16 [cited 2025 Jan 5]. Available from: https://www.cdc.gov/autism/treatment/index.html
5. Chakrabarti B. Autism in India: time for a national programme. Indian Journal of Medical Research. 2023;157(4):227-229. doi:10.4103/ijmr.ijmr_506_23
6. Blume Health. Autism spectrum disorder in India [Internet]. Blume Health; 2023 [cited 2025 Jan 10]. Available from: https://blume.health/conditions/autism-spectrum-disorder-in-india
7. Raviola GJ, Trieu ML, DeMaso DR, Walter HJ. Autism spectrum disorder. In: Kliegman RM, Stanton BF, St Geme JW, Schor NF, editors. Nelson textbook of pediatrics. Vol 1. New Delhi: Reed Elsevier India Pvt Ltd; 2016. p. 176-183.
8. Bryant R. Impact of cognitive or sensory impairment on the child and family. In: Hockenberry MJ, Wilson D, Rodgers CC, editors. Wong's essentials of pediatric nursing. New Delhi: Elsevier India Pvt Ltd; 2015. p. 498-500.
9. Gupte S. The short textbook of pediatrics. 12th ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2016. p. 99-101.
10. Magon P, Ashraf MU. Textbook of child health nursing. Punjab: Lotus Publishers; 2022. p. 546-550.
11. Bai D, Yip BHK, Windham GC, *et al*. Association of genetic and environmental factors with autism in a 5-country cohort. JAMA Psychiatry. 2019;76(10):1035-1043. doi:10.1001/jamapsychiatry.2019.141
12. Bolton PF, Golding J, Emond A, Steer CD. Autism spectrum disorder and autistic traits in the Avon Longitudinal Study of Parents and Children: prenatal and perinatal risk factors. Journal of the American Academy of Child and Adolescent Psychiatry. 2012;51(3):249-258. doi:10.1016/j.jaac.2011.12.009
13. Estes ML, McAllister AK. Immune mediators in the brain and peripheral tissues in autism spectrum disorder. Nature Reviews Neuroscience. 2015;16(8):469-486. doi:10.1038/nrn3978
14. Fombonne E. Epidemiology of pervasive developmental disorders. Pediatric Research. 2020;65(6):591-598. doi:10.1203/PDR.0b013e31819e7203
15. Cleveland Clinic. Autism therapies [Internet]. Cleveland Clinic; 2025 [cited 2025 Jan 5]. Available from:https://my.clevelandclinic.org/health/articles/autism-therapies
16. National Institute of Child Health and Human Development. What are the treatments for autism? [Internet]. Bethesda (MD): NICHD; [cited 2025 Jan 5]. Available from: https://www.nichd.nih.gov/health/topics/factsheets/autism
17. WebMD. Autism spectrum disorder (ASD) treatment [Internet]. WebMD; 2025 [cited 2025 Jan 5]. Available from:https://www.webmd.com/brain/autism/understanding-autism-treatment
18. Autism Society. Intervention and therapies [Internet]. Autism Society; 2025 [cited 2025 Jan 5]. Available from: https://autismsociety.org/resources/intervention-and-therapies/