

Pragmatic Language Profiles Across Autism Spectrum Disorder, Attention-Deficit / Hyperactivity Disorder, and Co-occurring Autism and ADHD (AuDHD): A Systematic Review

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Abstract: Pragmatic language is important for effective communication and social interaction. Difficulties in the social use of language can affect relationships, participation and daily functioning. The present systematic review examined and compared pragmatic language profiles among individuals with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD) and co-occurring Autism and ADHD (AuDHD). The review followed PRISMA 2020 guidelines and nine studies met the inclusion criteria for qualitative synthesis. The findings showed common difficulties in conversational skills, turn-taking, topic maintenance, interpretation of social cues and social interaction across groups. Individuals with co-occurring ASD and ADHD demonstrated more complex communication characteristics due to overlapping features of both conditions. The findings highlight the importance of understanding pragmatic language characteristics for assessment and intervention planning. Further research with larger samples and standardized methods is needed.

Keywords: Autism Spectrum Disorder, Attention-Deficit/Hyperactivity Disorder, AuDHD, pragmatic language, systematic review

1. Introduction

Autism Spectrum Disorder (ASD) and Attention-Deficit/Hyperactivity Disorder (ADHD) are common neurodevelopmental disorders found in children and adolescents. These conditions can affect communication, attention, behavior, learning, and social interaction. As a result, children with ASD or ADHD may experience challenges in school, everyday activities, and relationships with others (American Psychiatric Association, 2022). In the past, these disorders were viewed as separate conditions; however, research has shown that ASD and ADHD can occur together in the same individual (Leitner, 2014). ASD mainly affects social communication and behavior. Individuals with ASD may find it difficult to understand social situations, continue conversations, interpret facial expressions, or respond appropriately during interactions. Some may also display repetitive behaviors or develop strong interests in certain activities (American Psychiatric Association, 2022). The nature and severity of these difficulties can differ across individuals.

ADHD is characterized by symptoms such as inattention, impulsivity, and hyperactivity. Children with ADHD often have difficulty staying focused, completing tasks, following instructions, or controlling their behavior. In addition to these symptoms, studies have shown that many children with ADHD also experience challenges in communication and social interaction, especially during conversations and peer interactions (Staikova, Gomes, Tartter, McCabe, & Halperin, 2013).

Research in recent years has shown that ASD and ADHD frequently occur together. This co-occurrence is commonly

referred to as AuDHD. Individuals with both conditions may show characteristics of ASD as well as ADHD, which can create additional challenges in communication and social functioning (Leitner, 2014). Difficulties in social understanding associated with autism and problems with attention and self-regulation seen in ADHD may work together and influence communication in daily life (Oerlemans, Hartman, Franke, Buitelaar, & Rommelse, 2014).

Pragmatic language is another area that can be affected in both conditions. Pragmatic language refers to the social use of language in communication. It includes skills such as taking turns during conversations, maintaining topics, understanding jokes and nonliteral language, identifying social cues, and changing communication according to different situations (Adams, 2002). These skills play an important role in communication at home, school, and social settings.

Difficulties in pragmatic language can affect both social and emotional development. Children with these difficulties may struggle to make friends, participate in classroom discussions, understand the feelings of others, or maintain conversations. Individuals with ASD often experience challenges in social understanding and reciprocal interaction. In comparison, children with ADHD may interrupt others, suddenly change topics, or have difficulty organizing their speech because of impulsive behavior and reduced attention (Geurts & Embrechts, 2008). People with both conditions may face more communication challenges than those with only one disorder. Therefore, understanding pragmatic language patterns in AuDHD is important for improving assessment, early identification, and intervention planning.

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Although research on ASD and ADHD has increased over time, only a limited number of studies have specifically examined pragmatic language in individuals with both conditions. Many studies have focused on ASD and ADHD separately, making it difficult to understand communication characteristics in individuals with co-occurring conditions. Therefore, a systematic review is needed to review and summarize the available evidence to better understand pragmatic language profiles in individuals with AuDHD.

Several studies have discussed the role of pragmatic language in neurodevelopmental disorders. Dolata, Suarez, Calamé, and Fombonne (2022) reported that pragmatic language characteristics may help differentiate children with ASD and ADHD and may also predict symptom severity. Similarly, Carruthers (2022) found that children with ADHD show difficulties in social discourse, narrative organization, and understanding nonliteral language, although these difficulties were less severe than those seen in autism. Research has also suggested that pragmatic language difficulties are closely related to behavioral symptoms and social functioning (Crutcher, 2023).

Within the Indian context, studies have also highlighted the importance of pragmatic communication skills in children with autism. Dudwadkar, Venkatachalam, Chheda, Shinde, Kale, and Priyadarshi (2022) reported difficulties in turn-taking and joint attention among children with ASD. In addition, Rasheeka (2024) emphasized the need for improved pragmatic assessment practices among speech-language pathologists in India.

2. Need for Study

Pragmatic language is an important part of communication that helps individuals use language effectively in social situations. It includes skills such as initiating and maintaining conversations, understanding social cues, taking turns during interaction and adjusting communication according to different situations. These skills are necessary for successful communication in school, at home and in everyday life. Individuals with Autism Spectrum Disorder (ASD) and Attention-Deficit/Hyperactivity Disorder (ADHD) commonly experience communication difficulties that may affect their social interactions and overall functioning. When both conditions occur together, individuals may experience more complex challenges because characteristics of both disorders can influence communication abilities. Although awareness regarding co-occurring ASD and ADHD has increased in recent years, research specifically focusing on pragmatic language profiles in individuals with AuDHD remains limited. Most available studies have examined autism and ADHD separately rather than studying both conditions together. In addition, findings reported in previous research vary across different age groups, study designs and assessment approaches. This complicates the understanding of the nature and characteristics of pragmatic language difficulties in individuals with co-occurring conditions.

Therefore, there is a need to systematically review the available literature to summarize existing findings, identify common pragmatic language characteristics, examine the methods used in previous studies and identify gaps in the

current literature. A better understanding of these communication patterns may contribute to improved assessment and intervention planning for individuals with co-occurring Autism Spectrum Disorder and Attention-Deficit/Hyperactivity Disorder.

3. Methodology

Aim: The present systematic review examined and compared pragmatic language profiles and communication characteristics among individuals with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD) and co-occurring Autism and ADHD (AuDHD) to identify similarities, differences, and common communication patterns across studies.

Participants: Children, adolescents and individuals diagnosed with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD) and co-occurring Autism Spectrum Disorder and Attention-Deficit/Hyperactivity Disorder (AuDHD). Studies including typically developing comparison groups were considered where available.

Review Design

This study was conducted as a systematic review in accordance with PRISMA 2020 guidelines to ensure a structured process for identifying, screening, selecting and reporting relevant studies.

Search strategy:

A comprehensive search was conducted in PubMed, PsycINFO, ScienceDirect, CINAHL, Cochrane Library, ProQuest, ResearchGate and Google Scholar. Search terms related to Autism Spectrum Disorder, ADHD, AuDHD, pragmatic language, social communication, conversation, turn-taking, topic maintenance and social cues were combined using AND and OR. The search covered studies published from 2008 to 2026. Studies were screened according to PRISMA 2020 guidelines and eligible articles were selected after duplicate removal, title and abstract screening and full-text review.

PICO framework

Table 1: PICO Framework for the Present Systematic Review

PICO Component	Description
Population	Children, adolescents, and individuals diagnosed with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD), or co-occurring Autism Spectrum Disorder and Attention-Deficit/Hyperactivity Disorder (AuDHD).
Interest	Pragmatic language and social communication characteristics, including conversational skills, turn-taking, topic maintenance, social interaction, narrative abilities, and interpretation of social cues.
Comparison	Comparison among individuals with ASD, ADHD, AuDHD, and typically developing individuals, where available.
Outcome	Pragmatic language profiles, communication patterns, and common pragmatic difficulties across groups.

The PICO framework was used to develop the research question and guide the literature search process for the present systematic review. It helped identify the target population, area of interest, comparison groups, and expected outcomes related to pragmatic language profiles in individuals with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD), and co-occurring Autism Spectrum Disorder and Attention-Deficit/Hyperactivity Disorder (AuDHD).

Research Question

What are the pragmatic language profiles and communication characteristics reported in individuals with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD), and co-occurring Autism Spectrum Disorder and Attention-Deficit/Hyperactivity Disorder (AuDHD)?

Inclusion criteria:

Studies were included if they involved participants with a formal diagnosis of ASD and/or ADHD based on DSM-5 or ICD-11 criteria, supported by standard diagnostic tools such as ADOS-2 for autism or Conners-3/K-SADS for ADHD. Participants had to fall within the relevant age range, have sufficient expressive language to complete pragmatic assessments, and have normal or corrected-to-normal hearing and vision. An IQ cutoff was also applied to reduce the influence of general intellectual disability.

Exclusion criteria:

Studies were excluded if participants had epilepsy, cerebral palsy, traumatic brain injury, developmental language disorder, severe speech sound disorders, or an IQ below the specified threshold. Studies involving non-native speakers were also excluded in some cases to avoid confusion between pragmatic difficulty and language-learning effects.

Tool used

A comprehensive literature search was conducted using

electronic databases to identify studies related to pragmatic language profiles in individuals with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD), and co-occurring ASD and ADHD (AuDHD). The databases searched included PubMed, PsycINFO, ProQuest and Google Scholar. Additional relevant studies were identified by screening the reference lists of selected articles.

Selection Process

The selection of studies was carried out following the PRISMA 2020 guidelines. All records retrieved from the databases were screened in stages. First, duplicate records were removed. Next, titles and abstracts were screened for relevance based on the eligibility criteria. Full-text articles of potentially relevant studies were then assessed in detail. Studies that met the inclusion criteria were included in the final review.

Data Extraction and Synthesis

Relevant information from selected studies was extracted and organized systematically. Extracted information included author details, publication year, country, study design, participant characteristics, assessment tools, and major findings related to pragmatic language abilities. Findings from the included studies were synthesized narratively and compared across studies to identify similarities, differences, and common communication patterns.

4. Result and Discussion

The study selection process was conducted according to the PRISMA 2020 guidelines. Studies identified from different electronic databases were screened based on the predefined inclusion and exclusion criteria. Duplicate studies were removed, followed by title screening, abstract screening, and full-text assessment. The complete study selection process is presented in

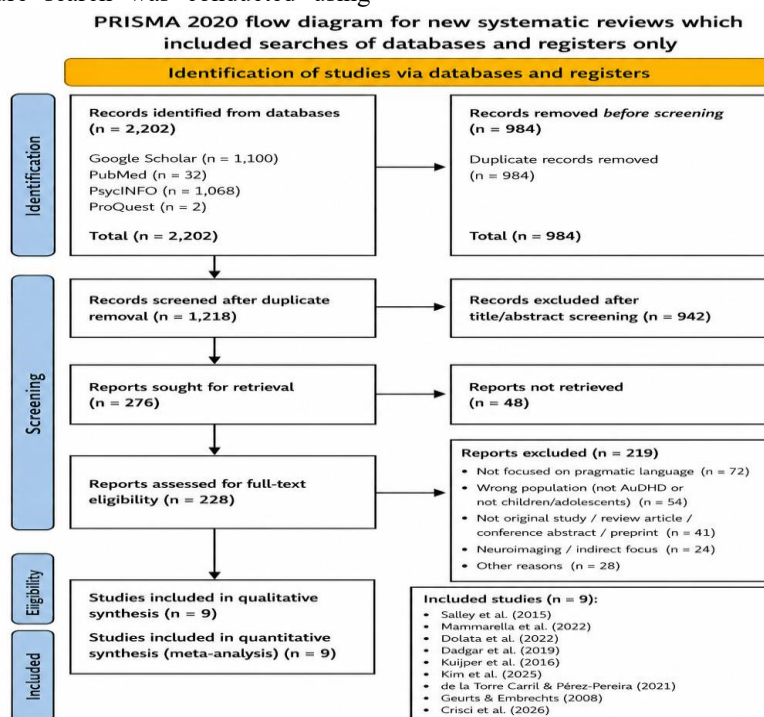


Figure 1

Characteristics of Included Studies

A total of nine studies met the inclusion criteria and were included in the review analysis. These studies explored pragmatic language characteristics in individuals with ASD,

ADHD and co-occurring ASD and ADHD using different research designs and assessment methods. A summary of the characteristics of the included studies is presented in Table 2.

Author/Year/Country	Journal	Paper Title	Aim of Study	Study Design	Technique Used	Duration/Training Period	Assessment Tool	Findings
Salley et al. (2015), USA	Journal of Autism and Developmental Disorders	Pragmatic Language in Children with Autism Spectrum Disorder and ADHD	To compare conversational and nonverbal communication characteristics in ASD and ADHD.	Quantitative, Cross-sectional	Comparative statistical analysis	Single assessment interval	ADOS	Children with ASD showed greater difficulties in social reciprocity and nonverbal communication. Children with ADHD mainly demonstrated conversational interruptions and topic shifts associated with impulsivity.
Mammarella et al. (2022), Italy	Research in Developmental Disabilities	Pragmatic Profiles and Working Memory in Children with Neurodevelopmental Disorders	To examine the contribution of executive functions to pragmatic language differences.	Comparative, Cross-sectional	Regression and profile analysis	Diagnostic cross-section	Parent and teacher questionnaires	Children with ASD showed broader pragmatic communication difficulties, while children with ADHD showed difficulties related to executive functioning and applying social rules during interaction.
Dolata et al. (2022), USA	Clinical Linguistics & Phonetics	Differentiating Pragmatic Language Profiles	To identify markers distinguishing communication profiles.	Descriptive, Cross-sectional	Regression and discriminant analysis	Clinical assessment	ADOS-2, WISC	ASD was associated with atypical prosody and repetitive language patterns, whereas ADHD was associated with excessive speech and conversational rule violations.
Dadgar et al. (2019), Iran	Iranian Journal of Psychiatry	Comparative Study of Pragmatic Language Abilities in ASD and ADHD	To compare pragmatic language abilities in ASD and ADHD.	Quantitative, Cross-sectional	MANOVA	Baseline assessment	CCC	Children with ASD demonstrated greater communication difficulties across pragmatic domains, whereas children with ADHD showed milder difficulties mainly in conversation and context interpretation.
Kuijper et al. (2016), Netherlands	Journal of Abnormal Child Psychology	Narrative Production in Children with ASD and ADHD	To examine narrative and pragmatic abilities.	Experimental, Comparative	Narrative discourse analysis	Narrative assessment	Narrative Assessment Protocol, ADOS, CCC-2	Both groups demonstrated pragmatic challenges; ASD showed greater difficulties with coherence and perspective-taking, whereas ADHD showed disorganized narratives with irrelevant details.
Kim et al. (2025), South Korea	Communication Sciences & Disorders	Associations of Pragmatic Language with Internalizing and Externalizing Behavior	To examine relationships between pragmatic language and behavior.	Comparative, Multivariate	MANCOVA and regression	Point-in-time assessment	CPLC, K-CBCL	Lower pragmatic language abilities were associated with greater internalizing and externalizing behavioral difficulties.
de la Torre Carril & Pérez-Pereira (2021), Spain	Revista de Logopedia, Foniatria y Audiología	Pragmatic Abilities in Children with ASD, ADHD, Down Syndrome and Typical Development	To evaluate diagnostic differences in pragmatic abilities.	Comparative, Empirical	Profile comparison analysis	Validation assessment	CCC-2	Children with ASD demonstrated broader communication difficulties, while those with ADHD showed more specific difficulties in conversation initiation and turn-taking.
Geurts & Embrechts (2008), Belgium	Journal of Autism and Developmental Disorders	Language Profiles in ASD, SLI, and ADHD	To compare structural and pragmatic language	Comparative, Quantitative	Profile analysis	Baseline assessment	CCC	Pragmatic difficulties in ADHD appeared related to executive functioning, whereas children with

			profiles.					ASD demonstrated broader social-pragmatic difficulties.
Crisci et al. (2026), Italy	Research in Developmental Disabilities	Blurred Lines: Investigating Functional Profiles in Autism and ADHD	To examine overlapping functional profiles across diagnoses.	Comparative	Latent Profile Analysis	Cross-sectional	Parent rating scales	Findings suggested overlap between ASD and ADHD characteristics, with some participants demonstrating combined social communication and behavioral difficulties.

Pragmatic Language Characteristics

The included studies showed that individuals with ASD, ADHD, and co-occurring ASD and ADHD experience difficulties in different areas of pragmatic language. Common difficulties included initiating conversations, maintaining topics, understanding social cues, taking turns and using language appropriately during social interactions. The severity and pattern of these difficulties varied across groups.

Communication Differences in AuDHD

The findings suggested that individuals with co-occurring ASD and ADHD may show more complex communication difficulties because characteristics of both conditions can affect social interaction. However, studies specifically focusing on AuDHD remain limited.

Overlap Between ASD and ADHD Communication Profiles

Some communication characteristics were found to overlap between ASD and ADHD. Individuals with ASD commonly showed difficulties in social understanding and reciprocal interaction, whereas individuals with ADHD showed communication challenges related to impulsivity and attention difficulties.

Assessment Approaches Used Across Studies

Differences in assessment methods may have influenced the findings across the reviewed studies because these tools evaluate communication in different environments. For example, the Autism Diagnostic Observation Schedule (ADOS) captures direct, clinician-observed behaviors within a structured, quiet clinic room. In contrast, the Children’s Communication Checklist (CCC/CCC-2) relies on caregiver or teacher ratings of everyday, natural social communication.

5. Discussion

The present systematic review examined pragmatic language characteristics across individuals with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD) and co-occurring (AuDHD). Analysis of the included studies indicated that pragmatic communication difficulties are present across these conditions, although the pattern and severity of impairment differed between groups. Common areas of difficulty included turn-taking, topic maintenance, conversational reciprocity, interpretation of social cues and the appropriate use of language during interaction. Similar findings have been reported in previous literature, suggesting that social communication difficulties may affect functional communication in both clinical and everyday settings.

Differences in communication profiles were observed between ASD and ADHD. Individuals with ASD more frequently demonstrated challenges associated with reciprocal interaction, understanding social context and perspective-taking. In contrast, communication difficulties in ADHD appeared more strongly related to impulsivity, reduced attention and difficulties in behavioral regulation during conversations. These findings suggest that pragmatic language challenges may arise through different underlying mechanisms despite some overlap in observable communication behaviors.

The review also highlighted the complexity of communication patterns in individuals with co-occurring ASD and ADHD. Characteristics associated with both conditions may interact and influence social communication abilities simultaneously. Difficulties related to social understanding commonly observed in autism, together with attention and executive functioning difficulties often reported in ADHD, may contribute to broader pragmatic challenges. Consequently, individuals with co-occurring conditions may present with more variable communication profiles compared to individuals diagnosed with either condition alone.

Another important finding of the review was the variation in assessment approaches used across studies. Most studies relied on standardized assessment tools such as the Autism Diagnostic Observation Schedule (ADOS), the Children’s Communication Checklist (CCC/CCC-2) and parent or teacher questionnaires. Variations in assessment methods and participant characteristics may have contributed to differences reported across studies. Clinical measures such as the Autism Diagnostic Observation Schedule (ADOS) provide structured observations of communication behaviors; however, they may not fully capture certain pragmatic difficulties in individuals with ADHD because the controlled testing environment may reduce the influence of external distractions. In contrast, caregiver-reported measures such as the Children’s Communication Checklist–2 (CCC-2) may identify communication difficulties that occur during everyday interactions, including conversational interruptions and abrupt topic changes. Parent and teacher reports can provide useful information regarding communication in natural settings, although these measures may also be influenced by individual perceptions and differences in observation.

The findings of the present review emphasize the importance of detailed speech-language assessment in individuals presenting with social communication difficulties. Early identification of pragmatic language characteristics may support more individualized intervention planning and contribute to improved social participation and

communication outcomes. Further research using larger sample sizes and standardized assessment procedures may help develop a clearer understanding of pragmatic language profiles in individuals with co-occurring ASD and ADHD.

6. Summary and Conclusion

The present review focused on studies related to pragmatic language profiles in individuals with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD) and co-occurring (AuDHD). The findings showed that individuals across these groups experience difficulties in pragmatic language skills, such as maintaining conversations, understanding social cues, participating in social interactions and using language appropriately in different situations.

The review also identified similarities and differences in communication characteristics between ASD and ADHD. Individuals with AuDHD may show more complex communication difficulties because characteristics of both conditions can influence language and social interaction. Overall, understanding pragmatic language characteristics is important for improving assessment and planning appropriate intervention. Further studies with larger samples and consistent assessment methods are needed to better understand pragmatic language profiles in individuals with AuDHD.

7. Clinical Implications of the Current Review

The findings obtained from the selected studies have important implications for clinical practice, especially in the area of speech-language pathology. Pragmatic language difficulties were observed across individuals with ASD, ADHD and co-occurring ASD and ADHD, highlighting the need for detailed communication assessment during evaluation. Early identification of these difficulties may help clinicians better understand communication needs and support appropriate intervention planning. Understanding communication characteristics in individuals with co-occurring ASD and ADHD may also assist speech-language pathologists in developing more individualized strategies for improving social communication skills.

8. Limitations of the Current Review

Certain limitations should be considered while interpreting the findings of the present review. First, only a small number of studies specifically examined pragmatic language profiles in individuals with co-occurring ASD and ADHD. Second, variations in participant age groups, study designs and assessment methods resulted in differences across findings. Third, some included studies examined ASD and ADHD separately rather than focusing specifically on AuDHD populations. In addition, incomplete reporting of methodological details in some studies made direct comparison of findings more challenging.

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