Internal MedicineToday
Gonabad University of Medical Sciences
Autumn 2024. Vol 30. Issue 4

Research Paper

The Relationship Between Repetitive Behaviors and Communication Skills in Autistic Children

Mohammad Rezaei[1], Hoorieh Darvishi[1]*

1. Autism Spectrum Disorders Research Center, Hamadan University of Medical Sciences, Hamadan, Iran

Use your device to scan and read the article online

Citation Rezaei M, Darvishi H. [The Relationship Between Repetitive Behaviors and Communication Skills in Autistic Children]. Internal Medicine Today. 2024; 30(4): 148-152.

:https://doi.org/10.22034/imtj.2024.30.4.148

CC BY NC

Received: March 10, 2025
Accepted: June 21, 2026
Published: September 29, 2024

Keywords:
Autism,
Communication skills,
Mental Health,
Repetitive,
Behaviors

ABSTRACT

Aims Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by significant deficits in social interaction and cognitive abilities, along with atypical behavioral patterns, such as repetitive movements. These features often lead to communication impairments, resulting in social isolation and marginalization. This study aims to investigate the relationship between communication skills and repetitive behaviors among children with ASD.

Materials & Methods In the current study, a sample of 45 children with autism spectrum disorder (ASD group) was systematically selected from autism centers in Tehran, while 45 typically developing children (control group), matched for age and gender, were recruited from kindergartens. The Children's Communication Checklist (CCC) was administered to rigorously assess participants' communication competencies. Additionally, the Repetitive Behaviors Scale (RBS) was employed to quantitatively evaluate the prevalence and specific characteristics of repetitive behaviors exhibited by the subjects.

Findings According to the descriptive analysis, the participants' average age ranged from 5 to 12 years. Furthermore, the analytical results revealed a statistically significant association between communication skills and repetitive behaviors ($p < 0.05$, $r = 0.7$). The outcomes of this investigation suggest a significant correlation between communication abilities and repetitive behaviors in children on the autism spectrum.

Conclusion This study finds a significant relationship between communication skills and repetitive behaviors in children on the autism spectrum. Reducing behavioral issues may improve communication skills, thereby enhancing quality of life for these children and their families. The results can help rehabilitation professionals, especially speech and language therapists, improve their services.

Corresponding Author:
Hoorieh Darvishi
Address: Autism Spectrum Disorders Research Center, Hamadan University of Medical Sciences, Hamadan, Iran.
Tel: +989182765171
Email: hoorieh.darvishi77@gmail.com

Introduction

Autism is a long-term neurodevelopmental condition that affects social interaction [1], communication [2], and behavior [3]. While restricted and repetitive behaviors [4] or interests (RBs) are essential for diagnosing autism, they are also found in other developmental disorders. RBs are generally characterized as repetitive activities or interests that occur frequently and may interfere with everyday functioning.

Repetitive behaviors are a core characteristic of Autism Spectrum Disorder (ASD) [5] and significantly impact communication and social interactions. These behaviors, which include motor stereotypies [6-8] and insistence on sameness, are associated with impairments in social interaction and communication. The presence of multiple forms of these behaviors may be associated with greater autism symptom severity [9]. The motivation behind these behaviors is complex, involving mechanisms such as sensory reinforcement and stress reduction, and is linked to neurobiological alterations in brain regions like the basal ganglia [10].

Children with Autism Spectrum Disorder (ASD) often face substantial challenges in communicative behaviors, which can lead to significant difficulties in social interactions and adversely affect their quality of life. These children commonly experience impairments in both verbal

and non-verbal communication skills, such as challenges in emotional expression, interpreting body language, and sustaining eye contact [11]. These impairments may lead to social isolation, diminished learning opportunities, and difficulties in establishing friendships. Furthermore, these communication challenges can hinder their interactions with peers and adults, potentially exacerbating anxiety and depression [12].

These repetitive behaviors can exacerbate social isolation and hinder the development of social skills, further complicating communication with peers and adults. Addressing these behaviors through targeted interventions is crucial for improving social communication and reducing anxiety and depression in individuals with ASD [13].

Understanding the underlying mechanisms and impacts of repetitive behaviors is essential for developing effective treatments and enhancing the quality of life for those affected by ASD.

In this study, the relationship between repetitive behaviors and communication skills in children with autism was examined. It is hypothesized that lower levels of repetitive behaviors would be associated with better communication and social skills.

The findings of this study may improve understanding of the communication challenges experienced by children with autism and may inform the development of educational and therapeutic strategies. Ultimately, this research can assist teachers, parents, and mental health professionals in designing better strategies to improve the social and communication skills of children with autism, considering their repetitive behaviors.

Despite the growing body of global research on the relationship between repetitive behaviors and communication skills in autism, context-specific evidence from Iran remains limited. The cultural, linguistic, and healthcare system characteristics of Iran may influence both the manifestation of autistic traits and the accessibility and effectiveness of interventions. Furthermore, most existing tools and studies are validated in Western populations, and their direct applicability to the Iranian pediatric context requires empirical investigation. This study aims to address this critical gap by examining this relationship within a sample of Iranian children, using instruments adapted and validated for Persian speakers. By doing so, it seeks to generate locally relevant data that can inform the development of culturally sensitive assessment protocols and tailored therapeutic strategies. The findings are intended to directly contribute to refining diagnostic and intervention practices by Iranian rehabilitation specialists, speech-language therapists, and special educators, ultimately aiming to improve service delivery and outcomes for children with ASD and their families in Iran.

Materials and Methods

A cross-sectional study was conducted using convenience sampling. The study included 45 children with a formal diagnosis of Autism Spectrum Disorder (ASD) based on DSM-5 criteria [14], recruited from the Autism Rehabilitation Center in Tehran. A control group of 45 typically developing (TD) children, matched to the ASD group by age and sex, was recruited from kindergartens in Tehran. All children were aged between 6 and 12 years.

Assessment of Autism Severity, Cognitive Profile, and Comorbidities

The severity of autism symptoms was assessed using the Gilliam Autism Rating Scale–Third Edition (GARS-3). Children in the ASD group were required to have a score indicating moderate severity to be included. To further characterize the sample and assess basic developmental and communication skills, we administered the Ages & Stages Questionnaires, Third Edition (ASQ-3). The ASQ-3 is a parent-completed developmental screening tool. The focus was on the Communication domain of the ASQ-3 to confirm that participants possessed a fundamental level of language comprehension and expressive skills, thereby excluding children with profound language delays. Children with known co-occurring intellectual disability (based on prior medical/psychological records), neurological disorders (e.g., epilepsy), genetic syndromes, or significant sensory impairments (e.g., hearing loss, blindness) were excluded from the study. This was confirmed through a review of available medical records and a brief clinical interview conducted by the research team, which included consultation with a child psychiatrist.

Parent Training and Verification of Questionnaire Responses

Prior to data collection, a brief training session was conducted for all participating mothers to ensure consistent understanding of the questionnaire items. The training included a verbal explanation of each scale (CCC and RBS-R), examples of how to score behaviors, and an opportunity for questions. To monitor response accuracy, a researcher reviewed completed questionnaires with each mother immediately after submission to clarify any ambiguous responses and confirm consistency with observed behaviors.

Procedure

After explaining the study objectives and obtaining informed consent from the parents or primary caregivers, data were collected in a quiet, private room at the respective centers. Parents from both the ASD and the control groups completed the Children's Communication Checklist (CCC) and the Repetitive Behavior Scale (RBS). The questionnaire completion process took approximately 30 minutes per participant. The study was carried out between October 2024 and December 2024.

Instruments used

The Children's Communication Checklist (CCC)

The Children's Communication Checklist (CCC) was developed to assess communication impairments, with particular emphasis on pragmatic aspects of social communication that may be overlooked by conventional language assessments. Additionally, it encompasses qualitative dimensions of speech and language. The

checklist for assessing qualitative dimensions of speech and language effectively integrates social relationships and restricted interests, and consists of 70 items [15]. All items, except for four, attained a Content Validity Index (CVI) greater than 85. Subsequent to revisions, these four items demonstrated enhanced scores. The overall CVI was established to be above 75. The internal consistency coefficients were reported to range from 0.66 to 0.74. Furthermore, the test-retest reliability, assessed after a two-week interval, was determined to exceed 90 [16].

Repetitive Behavior Scale (RBS)

The Repetitive Behavior Scale–Revised (RBS-R) is a questionnaire designed to assess restricted and repetitive behaviors (RRBs) in individuals with autism. A validation study involving 320 caregivers yielded a robust five-factor structure, encompassing "Ritualistic/Sameness Behavior," "Stereotypic Behavior," "Self-injurious Behavior," "Compulsive Behavior," and "Restricted Interests." The scale demonstrated high internal consistency and strong interrater reliability, indicating its effectiveness for use in outpatient settings. Overall, the RBS-R shows promise as a reliable and valid tool for assessing RRB in autism, and it has 43 questions [9]. The Persian RBS-R showed excellent reliability (α=0.924) and validity (AUC=0.917), establishing it as a valid and reliable tool in Iran [19].

Gilliam Autism Rating Scale–Third Edition (GARS-3)

The Gilliam Autism Rating Scale–Third Edition (GARS-3) is a norm-referenced instrument used to assess the severity of autism spectrum disorder in individuals aged 3 to 22 years. It consists of 56 items grouped into six subscales: Restrictive/Repetitive Behaviors, Social Interaction, Social Communication, Emotional Responses, Cognitive Style, and Maladaptive Speech. The total standard score classifies autism severity as mild, moderate, or severe. The scale has demonstrated good psychometric properties. The internal consistency reliability coefficients for the subscales range from 0.84 to 0.91, and the test-retest reliability is reported to be 0.90. Content and criterion-related validity have also been well established, with the GARS-3 effectively differentiating individuals with ASD from those with other developmental disorders [20]. The scale has been validated in Persian, demonstrating high internal consistency (Cronbach's α ranging from 0.81 to 0.92) and good test-retest reliability (r = 0.89) in Iranian children with ASD [22].

Ages & Stages Questionnaires, Third Edition (ASQ-3)

The Ages & Stages Questionnaires, Third Edition (ASQ-3) is a parent-completed developmental screening tool designed to identify potential delays in children between 1 month and 5½ years of age. It assesses five key domains: Communication, Gross Motor, Fine Motor, Problem Solving, and Personal-Social. For the purpose of this study, the Communication domain was specifically utilized to confirm a foundational level of language comprehension and expression in participants. The ASQ-3 has demonstrated strong reliability and validity. Internal consistency coefficients for the domains typically range from 0.75 to 0.82, and test-retest reliability is reported at approximately 0.92. Concurrent validity with established measures like the Bayley Scales of Infant Development is high, with correlations ranging from 0.76 to 0.85 [21]. The Persian version of the ASQ-3 has shown strong reliability, with test-retest reliability coefficients between 0.85 and 0.93 and internal consistency ranging from 0.74 to 0.88 across domains [23].

Data analysis

Data were analyzed using IBM SPSS Statistics (version 20). Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize the demographic and clinical characteristics of the participants. An independent-samples t-test was employed to compare the scores of repetitive behaviors and communication skills between the ASD and control groups. The relationship between communication skills and repetitive behaviors was examined separately in each group using Pearson's correlation coefficient. A p-value of less than 0.05 was considered statistically significant for all analyses.

Findings

Demographic and Group Comparisons

The study included 45 children in the ASD group and 45 children in the control group, matched for gender (18 girls and 27 boys in each group) and age. The mean age was 9.02 ± 3.06 years in the ASD group and 9.68 ± 1.34 years in the control group; the difference was not statistically significant ($p = 0.186$).

As shown in Table 1, independent samples t-tests revealed significant differences between the groups in the core variables of interest. Compared with the control group, children with ASD had significantly higher repetitive behavior scores and significantly lower communication skills scores ($p \leq 0.001$ for both comparisons).

Correlational Analysis

A Pearson correlation analysis was conducted to examine the relationship between communication skills and repetitive behaviors within each group (Table 2). A strong, statistically significant negative correlation was observed in the ASD group ($r = -0.704$, $p \leq 0.001$), indicating that higher repetitive behavior scores were associated with lower communication skills scores. In contrast, no significant correlation was observed in the control group ($r = 0.077$, $p = 0.615$).

Table 1. Comparison of communication skills and repetitive behavior scores between the control and ASD groups.

Group	Control	ASD	P-value
	Mean±SD	*Mean±SD*	
Repetitive behavior	3.24±2.31	26.82±17.67	≤0.001
Communication skills	151.73±5.58	113.91±22.20	≤0.001

Table 2. Correlations between communication skills and repetitive behavior scores in the control and ASD groups.

Variables	Repetitive behavior correlation Coefficient	
	ASD	control
Communication skill	-0.704	0.077

Correlation is significant at the 0.01 level.

Discussion

One of the studies that provided empirical support for the research was conducted by Autism and colleagues. This investigation focused on adolescents with autism, with a mean age of 13 years, and explored the interrelationships among emotion regulation, social communication skills, and repetitive behaviors. The findings indicated a robust correlation between emotion regulation and both social communication skills and repetitive behaviors, while a moderate correlation was observed between social communication skills and repetitive behaviors. In our study, the correlation between these two variables was stronger. However, our sample size was smaller than that of the referenced study. Nevertheless, the research involved a younger cohort, implying that the maturation of social skills at an older age and an enhanced comprehension of emotional states may serve as mediating factors influencing the relationship between social communication skills and repetitive behaviors [17].

A separate study demonstrated that greater autism symptom severity was associated with more pronounced repetitive behaviors and poorer social communication skills [18]. These findings are consistent with the results of our study.

The strong negative correlation found in this study aligns with the core characteristics of ASD, where repetitive behaviors often serve as a barrier to social engagement and communication. The findings are consistent with previous research, such as Tsai et al. (2020), who also reported that more severe autism symptoms, including social communication deficits, are linked to an increase in repetitive behaviors [18]. The absence of a significant correlation in the control group suggests that the observed relationship may be more pronounced in children with ASD.

Several limitations of this study should be acknowledged. First, the use of a convenience sample and a relatively small sample size may limit the generalizability of the findings. Second, the cross-sectional design precludes causal inferences regarding the relationship between repetitive behaviors and communication skills. Future longitudinal research with larger, more diverse samples is needed to explore the directional nature of this relationship and the potential mediating role of factors like emotion regulation.

Despite these limitations, the results have important practical implications. They suggest that the relationship between repetitive behaviors and communication skills may warrant consideration when developing intervention strategies for children with ASD. Rehabilitation professionals, especially speech-language therapists, can integrate strategies for managing repetitive behaviors into their therapy plans to enhance overall communicative outcomes and quality of life for these children.

Ethical Considerations

Ethical Approval and Informed Consent:

The study was approved by the Ethics Committee of Hamadan University of Medical Sciences & Health Services, Deputy of Research (Scientific Code: 140105043232). Informed consent was obtained from all parents or legal guardians of the participating children. They were informed about the study's purpose, procedures, and their right to withdraw at any stage without any consequences. The confidentiality of all collected data was strictly maintained throughout the research process.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of Interest

The authors declare that they have no conflicts of interest related to this article.

Funding

This study received no external funding.

Authors' Contributions

Article search and writing: Hoorieh Darvishi; Article search and information categorization: Mohammad Rezaei; Initial idea presentation, scientific validation of sources, editing, and final approval of the text: Mohammad Rezaei; Assistance in resource search and text editing: Hoorieh Darvishi.

Acknowledgments

The authors thank Hamadan University of Medical

Sciences for providing the facilities and support required to conduct this study.

References

[1]. Karal MA, Wolfe PS. Social story effectiveness on social interaction for students with autism: a review of the literature. Educ Train Autism Dev Disabil. 2018;53(1):44-58. [DOI: 10.1177/215416471805300105]

[2]. Zhou X, Wong PCM. Hyperscanning to explore social interaction among autistic minds. Neurosci Biobehav Rev. 2024;163:105773. [DOI: 10.1016/j.neubiorev.2024.105773] [PMID]

[3]. Iles A. Autism spectrum disorders. Prim Care. 2021;48(3):461-73. [DOI: 10.1016/j.pop.2021.04.003] [PMID]

[4]. Uljarević M, Frazier TW, Jo B, Billingham WD, Cooper MN, Youngstrom EA, et al. Big data approach to characterize restricted and repetitive behaviors in autism. J Am Acad Child Adolesc Psychiatry. 2022;61(3):446-57. [DOI: 10.1016/j.jaac.2021.08.006] [PMID]

[5]. Thom RP, McDougle CJ. Repetitive thoughts and behaviors in autism spectrum disorder: a symptom-based framework for novel therapeutics. ACS Chem Neurosci. 2023;15;14(6):1007-16. [DOI: 10.1021/acschemneuro.2c00731] [PMID]

[6]. Watt N, Wetherby AM, Barber A, Morgan L. Repetitive and stereotyped behaviors in children with autism spectrum disorders in the second year of life. J Autism Dev Disord. 2008;38(8):1518-33. [DOI: 10.1007/s10803-007-0532-8] [PMID] [PMCID]

[7]. Syriopoulou-Delli CK, Zygopoulou M. Robot enhanced interventions and repetitive and stereotyped behaviors in children with autism spectrum disorder: a scoping review. Res Soc Dev. 2021;10(11):e564101120269. [DOI: 10.33448/rsd-v10i11.20269]

[8]. Grossi E, Caminada E, Goffredo M, Vescovo B, Castrignano T, Piscitelli D, et al. Patterns of restricted and repetitive behaviors in autism spectrum disorders: a cross-sectional video recording study. Preliminary report. Brain Sci. 2021;11(6):678. [DOI: 10.3390/brainsci11060678] [PMID]

[9]. Lam KS, Aman MG. The repetitive behavior scale-revised: independent validation in individuals with autism spectrum disorders. J Autism Dev Disord. 2007;37:855-66. [DOI: 10.1007/s10803-006-0213-z] [PMID]

[10]. Lewis MH, Bodfish JW. Repetitive behavior disorders in autism. Ment Retard Dev Disabil Res Rev. 1998;4(2):80-89. [DOI: 10.1002/(SICI)1098-2779(1998)4:2<80::AID-MRDD4>3.0.CO;2-0]

[11]. Volden J. Autism spectrum disorder. In: Cummings L, editor. Research in clinical pragmatics. Cham: Springer; 2017. p. 59-83. [DOI: 10.1007/978-3-319-47489-2_3]

[12]. Kanner L. Autistic disturbances of affective contact. Nerv Child. 1943;2(3):217-50. [Link]

[13]. Kuzminskaite E, Begeer S, Hoekstra RA, Groenman AP. Social communication difficulties and restricted repetitive behaviors as predictors of anxiety in adults with autism spectrum disorder. Autism. 2020;24(7):1917-23. [DOI: 10.1177/1362361320934218] [PMID] [PMCID]

[14]. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5-TR). Fifth Edition. Arlington, VA; 2013. [Link]

[15]. Bishop, D.V., Development of the children's communication checklist (CCC): a method for assessing qualitative aspects of communicative impairment in children. J Child Psychol Psychiatry. 1998;39(6):879-91. [PMID]

[16]. Kazemi Y, Mahmoodi F, Zarifiyan T, Shirazi T S. Adaptation of the children's communication checklist- second edition (CCC-2) to Persian and determining its psychometric values. J Res Rehab Sci. 2014;10(2):281-91. [DOI: 10.22122/jrrs.v10i2.1662]

[17]. Martínez-González AE, Cervin M, Piqueras JA. Relationships between emotion regulation, social communication and repetitive behaviors in autism spectrum disorder. J Autism Dev Disord. 2022 Oct;52(10):4519-27. [DOI: 10.1007/s10803-021-05340-x] [PMID] [PMCID]

[18]. Tsai CH, Chen KL, Li HJ, Chen KH, Hsu CW, Lu CH, et al. The symptoms of autism including social communication deficits and repetitive and restricted behaviors are associated with different emotional and behavioral problems. Sci Rep. 2020;10(1):20509. [DOI: 10.1038/s41598-020-76292-y] [PMID] [PMCID]

[19]. Jenabi E, Rabiei N, Seyedi M, Rezaei M, Soltanian AR, Bashirian S, et al. The psychometric properties of the Iranian version of social communication questionnaire (SCQ) in children with autism spectrum disorder. Adv Autism. 2023;9(2):192-200. [DOI: 10.1108/AIA-12-2021-0048]

[20]. Gilliam JE. Gilliam Autism Rating Scale. 3rd ed. Austin (TX): PRO-ED; 2014. [Link]

[21]. Squires J, Bricker D. Ages & Stages Questionnaires. 3rd ed. Baltimore (MD): Brookes Publishing; 2009. [Link]

[22]. Gorji R, Hassanzadeh S, Ghasemzadeh S, Qolamali Lavasani M. Sensitivity and specificity gilliam autism rating scale (GARS) in diagnosis autism spectrum disorders: Systematic review. Shefaye Khatam. 2020;8(4):80-9. [DOI: 10.29252/shefa.8.4.80]

[23]. Shariatpanahi G, Vameghi R, Ghanbari N, Barekati SH, Lornejad HR, Abolghasemi N. Cultural adaptation, validation, and standardization of a developmental screening tool (ASQ-3) in Iranian children. Iran J Child Neurol. 2024;18(2):55-71. [DOI: 10.22037/ijcn.v18i2.39595] [PMID] [PMCID]