

## Interaction between Genetic Vulnerability and the Family Environment in the Clinical Course of a Patient with Autism Spectrum Disorder and Schizophrenia: A Case Report

Ana Paula Noronha<sup>1</sup>, Douglas Pavanello<sup>1</sup>, Felipe Alberton<sup>1</sup>, Lucas Schulz<sup>1</sup>, Raphaela Kurpan<sup>1</sup>, Sara Maciel<sup>1</sup> and Fabrício Bruno Cardoso<sup>1</sup>

<sup>1</sup>School of Medicine, Faculdade CENSUPEG, Joinville, Santa Catarina, Brazil.

**Abstract:** Autism spectrum disorder and schizophrenia are characterized by substantial clinical heterogeneity and may share neurodevelopmental vulnerabilities, making it essential to understand how family and environmental factors influence functional trajectories. This study aimed to report the clinical course of a young man with autism spectrum disorder requiring level 1 support and schizophrenia, with emphasis on the role of the family environment, early intervention, and longitudinal follow-up. This was a qualitative, descriptive, exploratory, longitudinal single-case study. Data were obtained through a semi-structured interview with the adoptive mother and the participant, review of clinical records, home observation, a genogram, and an ecomap. The participant's early life was marked by social vulnerability, family instability, domestic violence, and substance use within the biological family context. In contrast, adoption by a stable caregiver, continuous follow-up beginning at two years of age, an autism diagnosis at three years of age, multidisciplinary care, and an established support network contributed to clinical stability, continuity of education, enrollment in higher education, preservation of family bonds, and autonomy consistent with his support needs. The case suggests that a responsive family environment, early intervention, and continuous interdisciplinary care may promote positive functional outcomes without eliminating the underlying biological vulnerability.

**Keywords:** Autism Spectrum Disorder; Schizophrenia; Early Intervention; Family Relations; Case Report.

### INTRODUCTION

Developmental-Behavioral Pediatrics is a field of pediatrics devoted to understanding the interactions among biological processes, brain development, and environmental factors that influence child development. Rather than focusing exclusively on the identification of developmental milestones or diagnostic confirmation, this field advocates a longitudinal and integrated assessment of the child that encompasses cognitive, motor, communication, behavioral, emotional, and adaptive domains, as well as the relationships among the child, the family, and the surrounding environment. This perspective underpins the contemporary concept of developmental surveillance, in which the early identification of risk and protective factors enables timely interventions capable of modifying neurodevelopmental trajectories and improving functional outcomes across the lifespan (Esin *et al.*, 2026).

Among the conditions addressed in Developmental-Behavioral Pediatrics, autism spectrum disorder (ASD) is notable for its marked clinical heterogeneity. It is characterized by persistent deficits in social communication and social interaction, together with restricted and repetitive patterns of behavior, interests, or activities. Beyond its core features, ASD shows considerable variation in clinical presentation,

severity, cognitive profile, comorbidities, and required level of support, making individualized and continuous assessment essential. Individual differences in sensory and social processing may also extend to social touch, with touch avoidance emerging as a central disposition associated with how autistic adults evaluate social touch experiences (Mello *et al.*, 2025). Recent evidence indicates that structured screening programs can identify children at risk during the first years of life and achieve high diagnostic stability when combined with specialized clinical assessment and longitudinal follow-up (Esin *et al.*, 2026).

Over recent decades, advances in developmental neuroscience have shown that the first years of life constitute a period of intense brain plasticity, characterized by the rapid formation and reorganization of experience-dependent neural circuits. During this period, environmental factors strongly influence processes such as synaptogenesis, synaptic pruning, myelination, and the functional organization of cortical networks, particularly in regions associated with executive functions, emotional self-regulation, attention, and social cognition. Conversely, early adverse experiences, including neglect, environmental deprivation, and chronic stress, can alter the maturation of these networks and produce

persistent cognitive, emotional, and behavioral consequences (Rachmany *et al.*, 2026).

This neurobiological knowledge provides the rationale for early intervention in children with ASD. Contemporary models of intensive behavioral and developmental intervention, including naturalistic parent-mediated approaches and family-centered interdisciplinary programs, have demonstrated consistent gains in language, cognition, adaptive behavior, and social interaction, particularly when initiated before five years of age. Although effects on the core features of autism are more variable, there is broad agreement that early intervention enhances functional development by taking advantage of critical periods of heightened brain plasticity (Avula *et al.*, 2025).

Within this context, the family is no longer viewed merely as the environment in which the child lives but assumes a central role as a therapeutic agent in development. The quality of family interactions, access to support networks, and active caregiver participation directly influence the response to intervention and the development of functional autonomy. Family-assessment tools such as the genogram and ecomap broaden understanding of the biopsychosocial factors involved in care by identifying relational patterns, vulnerability factors, available community resources, and potential barriers to treatment, thereby supporting an approach that is genuinely centered on the child and family (Cervený, 2014; Santana & Silva, 2022).

Although the benefits of early intervention are well established for ASD, longitudinal reports describing the course of individuals with dual neuropsychiatric vulnerability remain scarce, particularly when autism spectrum disorder and schizophrenia coexist. Understanding how reorganization of the family environment, together with developmental surveillance and interdisciplinary intervention initiated during sensitive periods of neurodevelopment, may modify adaptive functioning and support needs remains an important scientific and clinical challenge.

This study was therefore undertaken to examine longitudinally the clinical trajectory of an individual with dual neuropsychiatric vulnerability and to understand how changes in the family environment, combined with developmental surveillance and early intervention, may promote

more favorable functional outcomes over time. Accordingly, this report describes the clinical case and discusses its course in light of the principles of Developmental-Behavioral Pediatrics, developmental neuroscience, and family-centered care.

## MATERIALS AND METHODS

This qualitative single-case study used a descriptive, exploratory, and longitudinal design grounded in the principles of Developmental-Behavioral Pediatrics and family-centered care. A case-study approach was selected because it allows the in-depth investigation of complex phenomena within their natural context and supports an understanding of the interactions among biological, environmental, family, and psychosocial factors that influence human developmental trajectories.

The participant was a 20-year-old man living in Joinville, Santa Catarina, Brazil, with diagnoses of autism spectrum disorder (ASD) requiring level 1 support and schizophrenia, for which he received regular psychiatric follow-up. The case was purposively selected because of the coexistence of two clinically complex neuropsychiatric conditions, together with a history of early intervention and longitudinal follow-up since childhood. These characteristics enabled the analysis of factors related to clinical course, adaptive functioning, and the development of autonomy over time.

The study comprised a longitudinal analysis of the participant's clinical and developmental trajectory from early childhood to young adulthood. At the time of the home assessment in May 2025, he was 20 years old and had been receiving regular multidisciplinary follow-up since two years of age. The analysis incorporated retrospective information provided by the family, clinical records made available by the caregivers, and data collected during the home assessment. This strategy enabled a chronological reconstruction of major events related to psychomotor development, the diagnostic process, therapeutic interventions, environmental changes, and functional outcomes across the life course.

Data were collected during a previously scheduled home visit at the family's residence in the João Costa neighborhood of Joinville, Santa Catarina. The visit lasted approximately 1 hour and 20 minutes and was conducted by the researchers using a semi-structured interview, direct

observation of the home environment and family interactions, and family-assessment tools.

The interview was conducted with the adoptive mother, who was the participant's primary caregiver, and was supplemented by information provided by the participant and by analysis of clinical documents made available by the family. To ensure sufficient depth, a previously developed interview guide addressed the following assessment domains:

- sociodemographic characteristics of the participant and family;
- gestational and neonatal history and psychomotor developmental milestones;
- biological and adoptive family history, including psychiatric disorders and chronic diseases;
- diagnostic process for autism spectrum disorder and schizophrenia;
- clinical and psychiatric course across development;
- history of multidisciplinary interventions received since childhood;
- current and previous pharmacological treatments;
- adaptive functioning, autonomy, and activities of daily living;
- education, academic trajectory, and occupational participation;
- family relationships, emotional bonds, and parenting strategies;
- communication, social interaction, and behavioral skills;
- biopsychosocial protective and vulnerability factors;
- community participation, leisure activities, and the quality of formal and informal support networks.

A genogram and an ecomap were developed as family-assessment tools. The genogram covered three generations and enabled the identification of hereditary history related to neuropsychiatric disorders, family bonds, significant life-cycle events, and potential genetic and psychosocial vulnerability factors. The ecomap graphically represented the relationships among the participant, his family, and different support systems, including primary health care, specialized services, educational institutions, the social assistance network, relatives, friends, and other community resources, thereby enabling assessment of the strength, functionality, and quality of these connections.

Systematic observations during the home visit addressed the physical environment, accessibility

of the residence, family organization, communication among family members, the participant's spontaneous behavior, level of autonomy, social interaction, participation in household activities, and environmental resources potentially related to development and longitudinal care.

Data were organized chronologically and subjected to descriptive and interpretive analysis integrating information from interviews, clinical observations, documents provided by the family, and family-assessment tools. Findings were interpreted in light of current scientific evidence in Developmental-Behavioral Pediatrics, developmental neuroscience, early intervention, autism spectrum disorder, schizophrenia, and family-centered care. This integrated approach supported an understanding of how biological, environmental, and psychosocial factors influenced the participant's developmental trajectory, functioning, and support needs.

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki; Brazilian Law No. 14,874 of May 28, 2024, which governs research involving human participants in Brazil; and the ethical standards of the Brazilian National System of Research Ethics involving Human Participants. The guidelines of National Health Council Resolution No. 466/2012 and other applicable supplementary regulations were also observed. The participant and his legal guardian authorized the use of the information by signing the informed consent form and the assent form, where applicable. Anonymity, data confidentiality, and full protection of the participant's identity were ensured throughout all stages of the study.

## RESULTS

D. was a 20-year-old man living in Joinville, Santa Catarina, who had been adopted and diagnosed with autism spectrum disorder (ASD) requiring level 1 support at three years of age. He was subsequently diagnosed with schizophrenia, for which he currently received regular psychiatric follow-up and remained clinically stable. According to the family report, D. was born into a context of marked biopsychosocial vulnerability. His biological parents were experiencing homelessness and had a history of domestic violence, family instability, and psychoactive substance use.

During the pregnancy, the biological family's circumstances were monitored by the health care

team. The nurse responsible for this follow-up developed a bond with the case and subsequently assumed custody of the child at the request of the biological parents, becoming his adoptive mother. This event marked an important turning point in D.'s developmental trajectory because it enabled his placement in a stable, nurturing, and structured family environment from early childhood.

Regular follow-up had begun at two years of age. The diagnosis of ASD at three years of age subsequently enabled the organization of care strategies specifically addressing his neurodevelopmental needs. From that point onward, the family sought multidisciplinary and educational support, promoting continuous developmental surveillance, stimulation of adaptive skills, and mitigation of potential secondary difficulties involving communication, social interaction, and autonomy. The adoptive mother's active participation was described as central to this process, both through coordination with health services and through maintenance of a structured and predictable routine.

Throughout childhood and adolescence, D. received care from specialized services, including institutional support through APAE, as well as clinical and psychiatric follow-up. The reported trajectory suggests that a responsive family network promoted adherence to interventions, emotional stability, and the progressive development of functional skills. Despite ASD-related challenges, including behavioral rigidity, social interaction difficulties, and a need for predictability, favorable progress was observed in functional communication, family participation, and adaptation to everyday demands.

Schizophrenia was diagnosed during adolescence or young adulthood, increasing the clinical complexity of the case. According to the information obtained, the condition was currently controlled through regular psychiatric follow-up and medication, including risperidone and fluoxetine. The observed clinical stability underscores the importance of continuity of treatment, medication adherence, and family support in preventing decompensation and maintaining functioning.

At the time of the home assessment, D. maintained family bonds, participated in educational activities, and demonstrated autonomy consistent with his support needs. His enrollment in a higher education program in Graphic Design was an

important functional marker because it demonstrated continuity of education, occupational interests, engagement in academic activities, and the development of a life plan. This finding is especially relevant given the coexistence of ASD and schizophrenia, as it shows that longitudinal support may promote positive adaptive outcomes even in the presence of dual neuropsychiatric vulnerability.

Observation of the home environment showed family organization, relational stability, and care strategies emphasizing predictability, emotional support, and encouragement of autonomy. The adoptive mother demonstrated knowledge of D.'s clinical, behavioral, and emotional needs and served as his primary caregiver and coordinator of the support network. Communication among family members was functional, with consistent emotional bonds and daily support for the participant's needs.

Analysis of the genogram identified vulnerability factors in the biological family related to social exclusion, family instability, domestic violence, and substance use. These factors pose important risks to child development, particularly when present during pregnancy and the first years of life. In contrast, the adoptive family served as a protective factor by providing emotional stability, continuous care, access to specialized services, and support for the development of adaptive skills.

The ecomap showed a support network comprising the adoptive family, health services, psychiatric follow-up, APAE, a higher education institution, and community resources. Coordination among these systems appears to have contributed to sustained clinical stability, increased social participation, and reduced functional barriers. The strength and quality of these connections indicate that D.'s care extended beyond the medical setting and involved a broader family, educational, community, and therapeutic support network.

Overall, the results indicate that D.'s trajectory was initially marked by risk factors, particularly those related to the biological family context and early social vulnerability. Nevertheless, adoption by a stable caregiver, regular follow-up initiated at two years of age, diagnosis of ASD at three years of age, access to specialized services, and organization of a support network contributed to a positive functional course. D. currently demonstrates clinical stability, preserved family bonds, continued education, social participation,



and progressive autonomy, reinforcing the importance of early intervention, family-centered care, and longitudinal surveillance in cases of substantial neuropsychiatric complexity.

Integration of data from the family interview, home observation, genogram, and ecomap made it possible to organize the main risk and protective

factors across the participant's trajectory. This synthesis illustrates the coexistence of substantial early vulnerabilities and protective factors that promoted reorganization of care, clinical stability, and the progressive development of autonomy (Table 1).

**Table 1:** Summary of risk and protective factors identified across the participant's trajectory

| <b>Risk factors</b>                                         | <b>Protective factors</b>                                                              |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Birth in a context of marked social vulnerability           | Adoption by a stable and responsive caregiver                                          |
| Biological parents experiencing homelessness                | Early placement in a structured family environment                                     |
| History of domestic violence in the biological family       | Adoptive mother with a health care professional background                             |
| Psychoactive substance use in the biological family context | ASD diagnosed at three years of age                                                    |
| Possible early exposure to psychosocial stressors           | Longitudinal developmental surveillance                                                |
| Dual neuropsychiatric vulnerability: ASD and schizophrenia  | Regular multidisciplinary and psychiatric follow-up                                    |
| Risk of social isolation and adaptive impairments           | Access to specialized services, including APAE                                         |
| Need for support with routine organization and autonomy     | Continuity of education and enrollment in a higher education program in Graphic Design |
| Clinical complexity associated with medication management   | Active family, educational, community, and therapeutic support network                 |

**Source:** Authors, 2026

The integrated analysis of these factors suggests that the functional outcomes observed in D. cannot be attributed exclusively to the diagnoses or pharmacological treatment. Rather, they reflect the interaction among early diagnosis, continuous family support, access to specialized services, and maintenance of an active support network throughout development.

## DISCUSSION

The findings show that the participant's clinical trajectory cannot be understood in terms of a single diagnosis, but instead reflects the interaction among dual neuropsychiatric vulnerability, environmental context, and longitudinal follow-up. In the case described, regular follow-up began at two years of age, ASD was diagnosed at three years, and schizophrenia was diagnosed later. The participant remained clinically stable, maintained family bonds, participated in education, and developed increasing autonomy.

### Dual Vulnerability

The coexistence of ASD and schizophrenia is consistent with literature describing both

conditions as part of a neurodevelopmental continuum, with overlapping genetic and environmental factors and atypical developmental trajectories (Guerrera *et al.*, 2024). This perspective does not erase diagnostic differences, but it helps explain why individuals with ASD and schizophrenia spectrum disorders share impairments in social cognition and overall functioning (Pinkham *et al.*, 2020; Oliver *et al.*, 2021).

Comparative studies show that individuals with ASD and schizophrenia have similar levels of impairment in emotion processing, theory of mind, and social perception, with few consistent differences between the clinical groups (Pinkham *et al.*, 2020; Oliver *et al.*, 2021; Rashidi *et al.*, 2025). Overlap is also observed in cognitive empathy, personal distress, and functional impairment, whereas deficits in processing speed, working memory, and other neurocognitive domains tend to be more pronounced in schizophrenia (Corbera *et al.*, 2021; Rashidi *et al.*, 2025; Ozbek *et al.*, 2023). In the present case, this dual vulnerability helps explain difficulties in

social interaction, predictability, adaptation, and clinical management without reducing the participant's functioning to an inevitable deterioration of his condition.

### Family Environment

A central feature of the case is that the adoptive environment did not eliminate biological vulnerability but appears to have modified its functional expression over the course of development. Adoption by a stable caregiver placed the child at an early age in a nurturing and structured environment that represented a turning point in his developmental trajectory.

This interpretation is consistent with studies of adoption and early adversity. Children exposed to institutional deprivation improve after adoption but often retain residual deficits, indicating improvement rather than complete recovery (Keil *et al.*, 2022). Family cohesion and expressiveness may act as protective factors, whereas family conflict is associated with a greater risk of executive dysfunction (Keil *et al.*, 2022). Early parenting interventions may also support more normative patterns of neural function in children exposed to adversity (Bick *et al.*, 2019). In this case, the adoptive mother's responsiveness, organization of daily routines, and coordination of the support network appear to have modified the developmental trajectory rather than produced diagnostic remission.

### Early Intervention

The findings also support the Developmental-Behavioral Pediatrics framework, according to which longitudinal surveillance and early identification of risk and protective factors enable care to be reorganized and secondary difficulties to be reduced. In this case, regular follow-up began at two years of age, and the diagnosis of ASD at three years enabled the organization of strategies tailored more specifically to the participant's neurodevelopmental needs.

The literature on early autism intervention indicates that developmental, behavioral, and naturalistic approaches improve outcomes in language, social communication, and adaptive behavior, although effect sizes vary across studies (Sandbank *et al.*, 2023; Franz *et al.*, 2022; Godel *et al.*, 2022). Evidence also suggests that gains in adaptive behavior and symptoms may be maintained after intensive intervention initiated before 30 months of age (Estes *et al.*, 2015). Treatment responses are heterogeneous, and more

rapid improvement during the first months tends to indicate a more favorable trajectory (Godel *et al.*, 2022). Thus, the distinctive feature of this case appears to be not only the early initiation of treatment, but also the maintenance of continuous surveillance, multidisciplinary follow-up, and longitudinal adjustment of care to changing needs.

### Functioning and Autonomy

Diagnosis should not be treated as the central outcome because the literature shows that adults with ASD frequently experience poorer quality of life, lower social participation, less independence, and a greater impact of psychiatric comorbidities (Barneveld *et al.*, 2014; Orsmond *et al.*, 2013; Erarkadaş *et al.*, 2025). Among adolescents and adults with ASD, quality of life is associated with psychiatric comorbidity, level of independence, educational or occupational activity, and adaptive functioning (Knüppel *et al.*, 2018). In both ASD and schizophrenia, negative symptoms also predict poorer quality of life and social functioning (Corbera *et al.*, 2021).

Within this context, the most relevant outcome is functional. The participant demonstrated clinical stability, continued education culminating in enrollment in higher education, preservation of family bonds, social participation, and autonomy consistent with his support needs. These indicators are particularly meaningful because they contrast with the increased risk of social isolation, dependence, and poorer quality of life reported in cohorts of adults with ASD (Barneveld *et al.*, 2014; Knüppel *et al.*, 2018). The principal contribution of this case is therefore to show that, even in the presence of dual neuropsychiatric vulnerability and early adversity, a responsive family environment, early intervention, a support network, and longitudinal follow-up may promote a more favorable functional trajectory.

### CONCLUSION

The home visit highlighted the importance of family support and interdisciplinary care for individuals with autism spectrum disorder (ASD) and co-occurring schizophrenia. The case suggests that a stable, supportive, and structured family environment, combined with continuous multidisciplinary follow-up, may promote social and cognitive development and improve quality of life.

The report also reinforces the essential role of active developmental surveillance and health care networks in identifying vulnerabilities,

coordinating care, and providing longitudinal follow-up to patients and families in high-risk contexts.

Although the findings cannot be generalized from a single case, they demonstrate the relevance of a person-, family-, and community-centered humanized approach that promotes autonomy, social inclusion, and continuity of mental health care from childhood through the transition to adulthood.

## REFERENCES

1. American Psychiatric Association. "Diagnostic and statistical manual of mental disorders (5th ed.)." *American Psychiatric Publishing*. (2013).
2. Avula, S., Mandefro, B. T., Sundara, S. V., Lu, X., Busmail, H., Weerakoon, S., & Malasevskaja, I. A. "The Impact of Early Intensive Behavioral and Developmental Interventions on Key Developmental Outcomes in Young Children With Autism Spectrum Disorder: A Narrative Review." *Cureus* 17.9 (2025): e92055-e92055.
3. Barneveld, P. S., Swaab, H., Fagel, S., Van Engeland, H., & de Sonnevile, L. M. "Quality of life: A case-controlled long-term follow-up study, comparing young high-functioning adults with autism spectrum disorders with adults with other psychiatric disorders diagnosed in childhood." *Comprehensive psychiatry* 55.2 (2014): 302-310.
4. Bick, J., Palmwood, E. N., Zajac, L., Simons, R., & Dozier, M. "Early parenting intervention and adverse family environments affect neural function in middle childhood." *Biological psychiatry* 85.4 (2019): 326-335.
5. Cerveny, C. M. de O. "O livro do genograma (1ª ed.)." *Roca*. (2014).
6. Corbera, S., Wexler, B. E., Bell, M. D., Pearlson, G., Mayer, S., Pittman, B., & Assaf, M. "Predictors of social functioning and quality of life in schizophrenia and autism spectrum disorder." *Psychiatry research* 303 (2021): 114087.
7. Duncan, B. B., Schmidt, M. I., & Giugliani, E. R. "Medicina ambulatorial: condutas de atenção primária baseadas em evidências." *Artmed Editora*, (2022).
8. Erarkadaş, M., Özmeral Erarkadaş, K., & Şişmanlar, Ş. G. "Autism spectrum disorder beyond childhood: A comprehensive assessment of activities of daily living and social functioning in turkish adults." *Journal of Autism and Developmental Disorders* (2025): 1-16.
9. Esin, I. S., Demirdöğen, E. Y., Akıncı, M. A., Turan, B., Ürük, G. T. K., Ucuz, I. I., & Dursun, O. B. "Long-Term Outcomes of Early Autism Spectrum Disorder Screening: Prevalence and Diagnostic Stability in a Decade-Long Cohort from Türkiye." *Brain Sciences* 16.1 (2025): 62.
10. Estes, A., Munson, J., Rogers, S. J., Greenson, J., Winter, J., & Dawson, G. "Long-term outcomes of early intervention in 6-year-old children with autism spectrum disorder." *Journal of the American Academy of Child & Adolescent Psychiatry* 54.7 (2015): 580-587.
11. Franz, L., Goodwin, C. D., Rieder, A., Matheis, M., & Damiano, D. L. "Early intervention for very young children with or at high likelihood for autism spectrum disorder: An overview of reviews." *Developmental Medicine & Child Neurology* 64.9 (2022): 1063-1076.
12. Godel, M., Robain, F., Kojovic, N., Franchini, M., Wood de Wilde, H., & Schaer, M. "Distinct patterns of cognitive outcome in young children with autism spectrum disorder receiving the Early Start Denver Model." *Frontiers in Psychiatry* 13 (2022): 835580.
13. Gomes, P. T., et al. "Autismo no Brasil: Uma revisão sistemática da literatura." *Revista Brasileira de Enfermagem*, 72.3 (2019): 760–767.
14. Guerrera, S., Pontillo, M., Chieppa, F., Passarini, S., Di Vincenzo, C., Casula, L., & Vicari, S. "Autism spectrum disorder and early psychosis: a narrative review from a neurodevelopmental perspective." *Frontiers in Psychiatry* 15 (2024): 1362511.
15. Gusso, G., & Lopes, J. M. C. "Tratado de Medicina de Família e Comunidade: Princípios, Formação e Prática." *Artes Medicas*, (2018).
16. Keil, M. F., Leahu, A., Rescigno, M., Myles, J., & Stratakis, C. A. "Family environment and development in children adopted from institutionalized care." *Pediatric research* 91.6 (2022): 1562-1570.
17. Knüppel, A., Telléus, G. K., Jakobsen, H., & Lauritsen, M. B. "Quality of life in adolescents and adults with autism spectrum disorder: Results from a nationwide Danish survey using self-reports and parental proxy-

- reports." *Research in Developmental Disabilities* 83 (2018): 247-259.
18. McCoy, S. M., et al. "Pharmacological management of behavioral and psychiatric comorbidities in autism spectrum disorder." *Journal of Clinical Psychopharmacology*, 40.2 (2020): 145–154.
  19. Mello, M., Fusaro, M., Aglioti, S. M., & Minio-Paluello, I. "Centrality of touch avoidance in social touch experiences in autism." *Journal of Autism and Developmental Disorders* (2025): 1-17.
  20. Oliver, L. D., Moxon-Emre, I., Lai, M. C., Grennan, L., Voineskos, A. N., & Ameis, S. H. "Social cognitive performance in schizophrenia spectrum disorders compared with autism spectrum disorder: a systematic review, meta-analysis, and meta-regression." *JAMA psychiatry* 78.3 (2021): 281-292.
  21. Orsmond, G. I., Shattuck, P. T., Cooper, B. P., Sterzing, P. R., & Anderson, K. A. "Social participation among young adults with an autism spectrum disorder." *Journal of autism and developmental disorders* 43.11 (2013): 2710-2719.
  22. Owen, M. J., Sawa, A., & Mortensen, P. B. "Schizophrenia." *The Lancet*, 388.10039 (2016): 86–97.
  23. Ozbek, S. U., Sut, E., & Bora, E. "Comparison of social cognition and neurocognition in schizophrenia and autism spectrum disorder: a systematic review and meta-analysis." *Neuroscience & Biobehavioral Reviews* 155 (2023): 105441.
  24. Pinkham, A. E., Morrison, K. E., Penn, D. L., Harvey, P. D., Kelsven, S., Ludwig, K., & Sasson, N. J. "Comprehensive comparison of social cognitive performance in autism spectrum disorder and schizophrenia." *Psychological medicine* 50.15 (2020): 2557-2565.
  25. Rachmany, L., Abreu, F., Walker, V., O'Neill, O., Sargin, D., & Teixeira, C. M. "Neurodevelopmental effects of early life stress: PFC and cognition." *Neuroscience & Biobehavioral Reviews* (2026): 106663.
  26. Rashidi, A. G., Oliver, L. D., Moxon-Emre, I., Hawco, C., Dickie, E. W., Pan, R., & Ameis, S. H. "Comparative analysis of social cognitive and neurocognitive performance across autism and schizophrenia spectrum disorders." *Schizophrenia Bulletin* 52.1 (2026): sbaf005.
  27. Sandbank, M., Bottema-Beutel, K., LaPoint, S. C., Feldman, J. I., Barrett, D. J., Caldwell, N., & Woynaroski, T. "Autism intervention meta-analysis of early childhood studies (Project AIM): updated systematic review and secondary analysis." *Bmj* 383 (2023).
  28. da Veiga Santana, L. S., & da Silva, E. A. "Implantação da estratificação de risco familiar em unidade de saúde." *Revista Recien-Revista Científica de Enfermagem* 12.37 (2022): 435-441.
  29. Zeidan, J., Fombonne, E., Scora, J., Ibrahim, A., Durkin, M. S., Saxena, S., & Elsabbagh, M. "Global prevalence of autism: A systematic review update." *Autism research* 15.5 (2022): 778-790.

**Source of support:** Nil; **Conflict of interest:** Nil.

**Cite this article as:**

Noronha, A. P., Pavanello, D., Alberton, F., Schulz, L., Kurpan, R., Maciel, S. & Cardoso, F. B. "Interaction between Genetic Vulnerability and the Family Environment in the Clinical Course of a Patient with Autism Spectrum Disorder and Schizophrenia: A Case Report." *Sarcouncil Journal of Medical Series* 5.8 (2026): pp 1-8.