Clinico-demographic Profile and Associated Factors of Children with Autism Spectrum Disorder

Sharma A, Karki U, Sah R, Amatya A

Child and Adolescent Psychiatry Unit

Kanti Children's Hospital,

Kathmandu, Nepal.

Corresponding Author

Utkarsh Karki

Child and Adolescent Psychiatry Unit,

Kanti Children's Hospital,

Kathmandu, Nepal.

E-mail: karkiutkarsh@gmail.com

Citation

Sharma A, Karki U, Sah R, Amatya A. Clinico-demographic Profile and Associated Factors of Children with Autism Spectrum Disorder. *Kathmandu Univ Med J.* 2026; 95(2): **Online First.**

ABSTRACT

Background

Autism Spectrum Disorder is a neurodevelopmental disorder with symptoms manifesting in early childhood.

Objective

To determine the clinical and sociodemographic profile of children with Autism Spectrum Disorder and identify associated factors.

Method

A descriptive cross-sectional study was conducted among children diagnosed with Autism Spectrum Disorder. Children were recruited consecutively at the Child and Adolescent Psychiatry Unit, Kanti Children's Hospital, Nepal. The study duration was from 1st August 2023 to 31st January 2024. The study was approved by Institutional Review Board of Kanti Children's Hospital. A semi-structured proforma and Childhood Autism Rating Scale, Second Edition were used to assess the children. Data were entered and analysed using IBM SPSS version 16.0.

Result

The sample included 145 children. Mean age of diagnosis was 44.1 months (SD ± 18.7). Majority of them were 119 (82.1%) male, 85 (58.6%) belonged to nuclear family, and 69 (47.5%) were single child. Male to female ratio was 4.5:1. The mean paternal and maternal ages at the time of conception were 32.1 years (SD ± 6.5) and 27.7 years (SD ± 5.2), respectively. Most common source of referral was doctors/ health workers 66 (45.5%), parents themselves 45 (31%) and relatives 15 (10.3%). The main reason for visit was speech delay 135 (93.1%) and poor socio emotional reciprocity 76 (52.4%). Mean childhood autism rating score was 34.9 (SD ± 4.3), with 108 (74.4%) having mild-to-moderate autism severity. Sibling status was significantly associated with autism severity (p= 0.042) as children without siblings were more likely to exhibit mild to moderate symptoms compared to those with one or more siblings.

Conclusion

The study shows higher rate of Autism Spectrum Disorder among males and diagnosis at an early age. Presence of a sibling may affect autism severity.

KEY WORDS

Autism spectrum disorder, Autism severity, Children, Clinical profile, Nepal

INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by persistent deficit in social communication, restricted, repetitive pattern of behavior interests or activities.[1] Recently, there has been an increase in prevalence of ASD. According to World Health Organization (WHO), 1 in 127 individuals are found to have ASD globally.[2] Epidemiological studies estimate that ASD affect approximately 1 in 160 individuals worldwide, contributing to over 7.6 million disability-adjusted life years and representing 0.3% of the global disease burden.[3]

A few studies done in Nepal have highlighted early age at diagnosis, higher rate of ASD among males and also explored early behavioral signs among Nepalese children with ASD, underscoring the limited scope of existing research.[4,5] Despite a large amount of research on ASD globally, limited data are available regarding ASD in Nepal.

This study aimed to determine the clinical and socio demographic profile and examine the association between socio demographic and clinical variable in children with ASD presenting to the Child and Adolescent Psychiatry (CAP) Unit at Kanti Children's Hospital (KCH), Kathmandu, Nepal.

METHODS

A descriptive cross-sectional study was conducted with children diagnosed with ASD between 1st August 2023 to 31st January 2024 encompassing 6 months. Ethical approval was obtained from Institutional Review Board (IRB) of KCH (Reference Number: 471). The study was conducted at the CAP unit of KCH, Kathmandu, Nepal. Nonprobability sampling strategy, that is consecutive sampling method, was used in this study. Inclusion criteria was all children diagnosed with ASD visiting CAP OPD and whose parents or caregivers were willing to participate. A total of 145 children were consecutively recruited after taking written informed consent from parents/guardians

KCH is a tertiary care center in Bagmati province of Nepal. The first dedicated CAP service in Nepal was established at KCH, Kathmandu in collaboration with non – government organizations (NGOs). Recently this unit has been integrated into the government health care system.[6] The CAP unit at KCH provides outpatient and inpatient services to CAA with neurodevelopmental disorders and mental health problems. The multidisciplinary team comprises of child and adolescent psychiatrists, psychiatrists, clinical psychologists, social workers and nurses. Child and Adolescent Psychiatrist or Psychiatrist first evaluates the child and family which is followed by another evaluation by a clinical psychologist.

For the diagnosis of ASD, all cases had undergone a detailed clinical evaluation based on unstructured psychiatric interview and observation with both child and parent/s by a child and adolescent psychiatrist or psychiatrist followed by a clinical psychologist. Childhood Autism Rating Scale (CARS) (2nd Edition Revised) was used to diagnose and measure the severity of ASD. The tool evaluates 15 functional domains, including relating to people, imitation, emotional response, body use, object use, adaptation to change, visual response, listening response, taste/smell/touch response, fear or nervousness, verbal communication, nonverbal communication, activity level, level and consistency of intellectual response, and general impressions. Each domain was scored on a 7-point Likert scale ranging from 1 (within normal limits for age) to 4 (severely abnormal), utilizing 0.5 increments for intermediate presentations. A total composite score was calculated by summing the ratings across all 15 domains, yielding a potential range of 15 to 60. Cumulative scores were categorized based on established clinical cutoffs: scores between 15 and 29.5 indicated no to minimal symptoms of ASD, scores from 30 to 36.5 indicated mild-to-moderate symptoms of ASD and scores from 37 to 60 designated severe ASD.

A semi structured proforma was used during a one to one in-depth interview with parents, to collect details such as sociodemographic profile and clinical profile.

Data were entered and analysed using IBM SPSS version 16.0.[7] Descriptive statistics were used to calculate frequencies, percentage and mean. Chi-square was used for categorical variables (p-value <0.05 was taken as significant) and Spearman's correlation was used for continuous variables.

RESULTS

A total of 145 children with ASD were included in the study. Shapiro-Wilk test and Kolmogorov-Smirnov tests of normality revealed that the continuous variables; CARS score and age were found to be normally distributed.

The mean age of the study population was 44.1 months (SD ± 18.7). Out of 145 children, 119 (82.1%) participants were male and 73 (50.3%) were from Bagmati Province. A total of 58.6% (n = 85) of the family type was nuclear, 30.3% (n = 44) of joint family, and 11% (n = 16) from extended family. A total of 66.9% (n = 97) families were from urban area. Majority did not have siblings (47.5%, n=69) and belonged to upper middle income socioeconomic status (42.7%, n=62). The above mentioned findings are described in table 1.

Table 2 describes the clinical profile of children with ASD. Mean age of father was 32.1 (± 6.55) years and that of mother was 27.7 (± 5.2) years. The most common source of referral was doctors/health workers (45.5%, n=66), followed by parents themselves (31%, n=45) and relatives (10.3%, n=15). The most common reason for visit was speech delay (93.1%, n = 135) followed by poor social interaction (52.4%, n=76) and poor eye contact (49.6%, n

Table 1. Socio-demographic profile (n= 145)

Socio -demographic variables		n (%)
Age in months	Mean: 44.1 (SD:±18.7)	
Gender		
Male		119 (82.1)
Female		26 (17.9)
Province		
Koshi		18 (12.4)
Madhesh		10 (6.9)
Bagmati		73 (50.3)
Gandaki		11 (7.5)
Lumbini		21 (14.4)
Karnali		1 (0.6)
Sudurpaschim		11 (7.5)
Domicile		
Rural		48 (33.1)
Urban		97 (66.9)
Family Type		
Nuclear		85 (58.6)
Extended		16 (11)
Joint		44 (30.3)
Siblings		
Single child		69 (47.5)
More than one child		76 (52.4)

Table 2. Clinical variables (n = 145)

Clinical variables	n (%)
Father's Age in year	32.1 (SD:±6.5)
Mother's Age in year	27.7 (SD:±5.2)
Source of referral	
Doctors/ health workers	66 (45.5%)
Self	45 (31%)
Relatives	15 (10.3%)
Social media	12 (8.2%)
School	7 (4.8%)
Reason of visit	
Speech delay	135 (93.1%)
Poor socio emotional reciprocity	76 (52.4)
Poor eye contact	72 (49.6%)
Regression	11 (7.5%)
Others	5 (3.4)
Family history of Neurodevelopmental Disorders (NDD)	
Yes	23 (15.8%)
No	122 (84.1%)
Screen time	
Yes	135 (93.1%)
No	10 (6.9%)
Type of most viewed screen	
Smartphone	106 (78.5%)
Television	26 (19.2%)
IPad/ tablets	3 (2.2%)
Involved in intervention	
Yes	16 (11.1%)
No	129 (88.9%)
Delivery	
Spontaneous Vaginal Delivery (SVD)	91 (62.7%)
Cesarean Section (CS)	54 (37.2%)
CARS score	Mean: 34.9(SD: ±4.3)
CARS severity	
Mild to moderate	108 (74.4%)
Severe	37 (25.5%)

= 72). Family history of neurodevelopmental disorders was present in 15.8% (n=23) of study sample. Only 11.1% (n=16) children with ASD were receiving interventions at the time of visit to KCH. Majority of the children were delivered via spontaneous vaginal delivery (62.7%, n=91), term babies (91%, n=132) and appropriate for gestational age (84.1%, n=122). The mean CARS score was 34.9 (SD:±4.3) falling in the range of mild to moderate severity. Majority (74.4%, n=108) of participants had mild to moderate symptoms of ASD.

Table 2 describes the association of sociodemographic and clinical variables with autism severity. Sociodemographic variables were examined for association with the autism score (categorized into two groups; mild to moderate and severe). Although there are differences between the two autism score groups among various variables, none of these associations were found to be statistically significant.

Correlation of age in months of children, father's and mother's age at the time of conception with autism severity score is described in table 4. Spearman's rank-order correlation was performed to examine the relationship between age of children, father's age at conception, mother's age at conception and the dependent variable i.e. autism severity score. The results indicate that age in months showed very weak negative correlation with autism severity score and it was not statistically significant (r =-0.130, p= 0.120). Father's age and mother's age at conception showed very weak positive correlation with autism severity score and it was not statistically significant (r =0.061, p= 0.466) and (r =0.129, p= 0.121).

DISCUSSIONS

In our study, there were 145 children diagnosed with ASD. The mean age of diagnosis (AoD) in this population was 44.1 months (SD ± 18.7). This finding is similar to a study done at a private clinic in Nepal on 2025 that found 42 months as the mean AoD in children with ASD.[4] However mean AoD in our study of 44.1 months, is earlier compared to another study done in Nepal on 2015 that found 58 months as the mean AoD in children with ASD.[8] An earlier AoD observed in our study may reflect heightened awareness among both the community and professionals, along with expanded

Table 3. Association of sociodemographic and clinical variables with autism severity (n-145)

Category		Autism Score		
		Mild to Moderate	Severe	p-value (chi-square)
Family type	Nuclear	71.7% (n=61)	28.2% (n=24)	0.956 (0.091)
	Non-Nuclear	74% (n=37)	26% (n=13)	
Siblings	Single child	84.1% (n=58)	15.9% (n=11)	0.042 (9.9882)
	More than One	65.7% (n=50)	34.3% (n=26)	
Delivery	SVD	69.2% (n=63)	30.8% (n=28)	0.092 (2.843)
	LSCS	83.3% (n=45)	16.7% (n=9)	

Table 4. Spearman's correlation of clinical variables with total score of autism (n=145)

Category	Correlation coefficient	Sig. (2-tailed)
Age in months	-.130	.120
Father's age at conception	.061	.466
Mother's age at conception	.129	.121

availability of child and adolescent mental health (CAMH) services and a greater number of professionals delivering care to this population. Majority (82.1%) of the children were male. From our study, male to female ratio was found to be 4.5:1 which is comparable with western literature which shows the male to female ratio of 4:1.[9] Half of the participants were from Bagamati Province, which may be attributed to the hospital's location in Kathmandu, where healthcare facilities are more developed and awareness of mental health issues is higher compared to other regions.

The majority of children in the study were from nuclear families and were first-born. The higher proportion of nuclear families may mirror the ongoing transition in family patterns within urban areas of Nepal. Parental attention, awareness and concern could be a possible mechanism for first born children being more frequently diagnosed with ASD.[10]

The mean maternal and paternal ages at conception were 27.7 (SD:±5.2) and 32.1 years (SD:±6.5), respectively. Several studies have demonstrated that advanced parental age is significantly associated with an increased risk of ASD in offspring.[11] Doctors or health workers were the primary source of referrals followed by parents and relatives of the child and information from social media. This could reflect the increase in awareness among medical professionals regarding autism and the study site being a tertiary care center could be another reason for referral mainly from doctors or health workers. In out study, significant proportion (93.1%) of parents reason for visit was speech and language delay followed by poor socio emotional reciprocity (52.4%). In a study of 420 children, delayed/deviant language development was observed in 55.9% of children and abnormal socio-emotional development in majority (64.7%) of children as parental concerns for very early signs of autism. These findings highlights that parental concerns about early signs of autism are primarily centred on communication and social interaction difficulties.[12] In our study, screen exposure was observed in 93.1% of the children. Smartphones were the most common source of screen use (78.5%). These findings are consistent with a previous study conducted at the same center that examined screen time patterns among preschoolers.[13] This indicates the easy availability and access of smartphones among Nepalese families.

Most children in our sample were delivered by spontaneous vaginal delivery (SVD). Previous studies have reported an increased risk of ASD among children delivered by caesarean section (CS).[14,15] Notably, in our study, CS accounted for only 37.2% of deliveries. Majority (88.9%) of the children were not receiving early intervention. The high proportion of children not receiving early intervention may be due to limited awareness of early signs of ASD, scarcity of early intervention services in the broader healthcare system, and delayed referral patterns, as many children present directly to the tertiary referral center KCH after significant developmental concerns become evident.

The majority of the sample (74.4%) fell within the mild to moderate range of autism severity based on CARS scores. In our study, family type whether nuclear or non-nuclear did not significantly influence severity. Although there was no significant influence of family type on autism score severity, studies have shown that autistic child in a non-nuclear shows significant reduction in child severity scores following intervention, which highlights the importance of family structure in shaping outcomes in early intervention programs for autism, highlighting the benefit to share responsibilities among many members to care for the child, decreasing the stress on parents by shared caregiving.[16] However, sibling status was significantly associated with autism severity, as children without siblings were more likely to exhibit mild to moderate symptoms compared to those with one or more siblings. Till date there are no studies reflecting this finding similar to our study. We hypothesize that this outcome of autism severity exhibited more in children with one or more siblings may be due to the divided care between the child with autism and other neurotypical sibling and parents having difficulty managing the time needed for special care and intervention. This finding of sibling status and relation with autism severity can be an area for further research. Nevertheless, it has been seen in previous studies that, having older sibling/s was associated with better social communication abilities in children with ASD, in addition to age and cognitive ability.[17,18] The mode of delivery also did not show a statistically significant relationship with severity, although CS deliveries tended to have a higher proportion of mild

to moderate cases compared to SVDs. Studies have shown that children born via CS have a slightly increased likelihood of autism diagnosis, but it is often linked to underlying genetic or environmental factors than CS itself. It has been reported previously in studies that the association may be due to confounding factors as indication of the emergency procedure.[19] These findings suggest that among the factors examined, sibling status may play a role in the variability of autism severity, while family structure and mode of delivery appear less influential within this sample.

The present study examined the relationship between children's age in months, father's age at conception, mother's age at conception with total autism score in children with ASD. The findings revealed weak correlations between these variables and autism scores and none of the associations were statistically significant. These results suggest that, within the present sample, these demographic factors were not strongly associated with the autism severity. Regarding children's age in months and autism scores the findings suggest that autism severity did not substantially change with increasing age in the sample. This finding may be explained by the fact that core characteristics of autism, such as social communication difficulties and repetitive behaviors tend to remain relatively stable across early childhood, although the manifestation of symptoms may vary with developmental stages.[20] With regard to father's age at conception and autism score some studies have reported that children of older fathers may show greater autism severity, although findings across studies remain inconsistent.[21] The absence of a significant association in the present study may be due to factors such as a relatively small sample size, limited variability in paternal age, or the influence of other environmental and genetic factors. There are no studies suggesting an association between mother's age at conception and autism severity but systematic review and meta-analysis found that higher maternal age is linked with a greater likelihood of autism diagnosis in children, with risk increasing as maternal age increases.[22] Likewise in our study, mothers' age at conception had a non-significant relationship with autism scores.

Several limitations should be considered when interpreting the findings of our study. This study is limited by the use of a standard CARS instrument that has not been culturally adapted or psychometrically validated for the Nepalese population. As it is a hospital-based study, the findings cannot be generalized; however, they have clinical relevance. Non-probability consecutive sampling was used, which may introduce selection bias. Children presenting to a specialized CAP service may differ from those in the community in terms of symptom severity, access to healthcare, and parental awareness. Some information such as prenatal, perinatal, and developmental history relied on parental recall, which may be subject to recall bias.

Despite these limitations, our study has several strengths. First, it provides important clinical and sociodemographic data on children with ASD from Nepal, where research on ASD remains limited. By examining children presenting to the CAP unit at KCH in Kathmandu, the study contributes valuable insights into the clinical profile, referral patterns, and sociodemographic characteristics of children with ASD in a tertiary care setting. In addition, diagnoses were made through multidisciplinary evaluation by child and adolescent psychiatrists, psychiatrists and clinical psychologists. The study also included a relatively adequate sample of 145 children and explored associations between sociodemographic and clinical variables with autism severity, contributing to the limited regional literature exploring potential factors associated with autism severity.

CONCLUSION

The study demonstrates a higher prevalence of ASD in male children and a positive trend toward early diagnosis, which supports timely intervention. Results also suggest that sibling presence may influence autism severity. Future research in Nepal requires larger, longitudinal, multicentre, and community-based samples to fully clarify epidemiology, developmental outcomes, and demographic influences (e.g., parental age). Clinically, these findings emphasize the critical need for early identification, expanded intervention services, strengthened CAMH infrastructure, and a decentralized multidisciplinary care system operating outside Kathmandu.

REFERENCES

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th Revised Ed. Washington, DC: American Psychiatric Publishing; 2013. [Full Text | DOI] doi: https://doi.org/10.46692/9781447314592.023.
2. World Health Organization. Autism spectrum disorders [Internet]. Geneva: World Health Organization; 2023 [cited 2026 Mar 10]. Available from: https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disordershttps://apps.who.int/gb/ebwha/pdf_files/WHA67/A67_17-en.pdf
3. World Health Organization. Comprehensive and coordinated efforts for the management of autism spectrum disorders: report by the Secretariat. Geneva: World Health Organization; 2014. Available from: https://apps.who.int/gb/ebwha/pdf_files/WHA67/A67_17-en.pdf
4. Karki U, Jha A, Parajuli S, Sharma A, Gurung B, Bhattarai D. Clinico Socio-Demographic Profile of Children with Autism Spectrum Disorder from a Mental Health Clinic in Nepal: An Observational Study. *J Nepal Med Assoc.* 2025 Apr;63(284):229-233. [Full Text | DOI] doi: 10.31729/jnma.8937. Epub 2025 Apr 30. PMID: 41769015; PMCID: PMC12831841.
5. Shrestha M, Suwal R, Thapa N, Thapa Chhetri S, Kunwor B, Regmi SK, et al. Early Behavioural Signs among Nepalese Children with Autism Spectrum Disorder: A Descriptive Cross-sectional Study. *J Nepal Med Assoc*. 2024 Feb 29;62(271):207-210. [Full Text | DOI] doi: 10.31729/jnma.8499. PMID: 39356783; PMCID: PMC10924478.
6. Karki U, Shrestha S, Singh RM, Amatya A, Dhonju G, Jha A. Prescription Patterns in Child and Adolescent Psychiatry Outpatient from a Child and Adolescent Psychiatry Unit in Nepal. *JPAN.* 2025 Nov 4;14(2):50-5. [Full Text | DOI] doi: https://doi.org/10.3126/jpan.v14i2.86053

7. SPSS Inc. SPSS for Windows, Version 16.0 [computer software]. Chicago (IL): SPSS Inc.; 2007.

8. Shrestha R, Dissanayake C, Barbaro J. Age of Diagnosis of Autism Spectrum Disorder in Nepal. *J Autism Dev Disord.* 2019 Jun;49(6):2258-2267. [PubMed | DOI] doi: 10.1007/s10803-019-03884-7. PMID: 30701436.

9. Baio J, Wiggins L, Christensen DL, Maenner MJ, Daniels J, Warren Z, et al. Prevalence of Autism Spectrum Disorder Among Children Aged 8 Years - Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2014. *MMWR Surveill Summ*. 2018 Apr 27;67(6):1-23. doi: 10.15585/mmwr.ss6706a1. Erratum in: MMWR Morb Mortal Wkly Rep. 2018 May 18;67(19):564. doi: 10.15585/mmwr.mm6719a8. Erratum in: MMWR Morb Mortal Wkly Rep. 2018 Nov 16;67(45):1280. doi: 10.15585/mmwr.mm6745a8. PMID: 29701730; PMCID: PMC5919599.

10. Rosenberg RE, Landa R, Law JK, Stuart EA, Law PA. Factors affecting age at initial autism spectrum disorder diagnosis in a national survey. *Autism Res Treat.* 2011;2011:874619. [Full Text | DOI] doi:10.1155/2011/874619. PMCID: PMC3420379

11. Dehesh T, Mosleh-Shirazi MA, Jafari S, Abolhadi E, Dehesh P. A assessment of the effects of parental age on the development of autism in children: a systematic review and a meta-analysis. *BMC Psychol.* 2024 Nov 22;12(1):685. [Full Text | DOI] doi: 10.1186/s40359-024-02184-9. PMID: 39578893; PMCID: PMC11583425.

12. Guinchat V, Chamak B, Bonniau B, Bodeau N, Perisse D, Cohen D, et al. Very early signs of autism reported by parents include many concerns not specific to autism criteria. *Res Autism Spectr Disord.* 2012;6(2):589–601. [Full Text | DOI] doi:10.1016/j.rasd.2011.10.005

13. Karki U, Amatya A, Joshi P, Sharma A, Bhattarai D, Sravanti L. Pattern of Screen Time in Preschool Children and Associated Factors from a Child and Adolescent Psychiatry Unit in Nepal. *J Indian Assoc Child Adolesc Ment Health*. 2025;21(3):228-234. [Full Text | DOI] doi:10.1177/09731342251345897

14. Al-Zalabani AH, Al-Jabree AH, Zeidan ZA. Is cesarean section delivery associated with autism spectrum disorder? *Neurosciences (Riyadh)*. 2019 Jan;24(1):11–15. [Full Text | DOI] doi:10.17712/nsj.2019.1.20180303.

15. Curran EA, O'Neill SM, Cryan JF, Kenny LC, Dinan TG, Khashan AS, et al. Research review: birth by caesarean section and development of autism spectrum disorder and attention-deficit/hyperactivity disorder: a systematic review and meta-analysis. *J Child Psychol Psychiatry.* 2015;56(5):500–508. [Full Text | DOI] doi:10.1111/jcpp.12351.

16. Kumar N, Goyal A, Agarwal N, Bharat R, Baptist R, Agarwal P. Impact of Family Structure on Parental Stress and Child Severity Scores After Early Intervention Therapy in Children with Autism. *Indian J Pediatr.* 2026 Apr;93(4):414. doi: 10.1007/s12098-025-05966-0. Epub 2026 Jan 24. PMID: 41577887.

17. Ben-Itzchak E, Zukerman G, Zachor DA. Having Older Siblings is Associated with Less Severe Social Communication Symptoms in Young Children with Autism Spectrum Disorder. *J Abnorm Child Psychol*. 2016 Nov;44(8):1613-1620. doi: 10.1007/s10802-016-0133-0. PMID: 26843212.

18. Ben-Itzchak E, Nachshon N, Zachor DA. Having Siblings is Associated with Better Social Functioning in Autism Spectrum Disorder. *J Abnorm Child Psychol.* 2019 May;47(5):921-31. doi: 10.1007/s10802-018-0473-z. PMID: 30280363.

19. Curran EA, Dalman C, Kearney PM, Kenny LC, Cryan JF, Dinan TG, et al. Association between obstetric mode of delivery and autism spectrum disorder: a population-based sibling design study. *JAMA Psychiatry.* 2015 Sep;72(9):935-42. [Full Text | DOI] doi:10.1001/jamapsychiatry.2015.0846.

20. Hus V, Gotham K, Lord C. Standardizing ADOS domain scores: separating severity of social affect and restricted and repetitive behaviors. *J Autism Dev Disord.* 2014 Oct;44(10):2400-12. doi: 10.1007/s10803-012-1719-1. PMID: 23143131; PMCID: PMC3612387.

21. Rieske RD, Matson JL. Parental Age at Conception and the Relationship with Severity of Autism Symptoms. *Dev Neurorehabil.* 2020 Jul;23(5):265-270. doi: 10.1080/17518423.2019.1645222. Epub 2019 Jul 29. PMID: 31355686.

22. Sandin S, Hultman CM, Kolevzon A, Gross R, MacCabe JH, Reichenberg A. Advancing maternal age is associated with increasing risk for autism: a review and meta-analysis. *J Am Acad Child Adolesc Psychiatry.* 2012 May;51(5):477-486.e1. doi: 10.1016/j.jaac.2012.02.018. Epub 2012 Apr 5. Erratum in: J Am Acad Child Adolesc Psychiatry. 2012 Jun;51(6):660. PMID: 22525954.