

Prevalence of Mood Disorders among Autistic Children: A review article

Khaled Abd-allah Abd-elbaser^a, Abdallah Mohammed Elnasr^{a*}, Nessren Ali Mohammed^b, Ali Helmi Bakri^a

^aDepartment of Pediatrics, Faculty of Medicine, South Valley University, Qena, Egypt

^bDepartment of Public Health and Community Medicine, Faculty of Medicine, Sohag University, Sohag, Egypt

Abstract

Background: Autism spectrum disease (ASD) represented as a collection of neurodevelopmental disorders marked by reduced reciprocal socializations and communications. Mood conditions are frequent in autism spectrum disease (ASD).

Objectives: The present work aimed to evaluate prevalence, symptoms and treatment of different types of mood disorders in kids with autism spectrum disorder (ASD), with ages between 2 to 16 yrs.

Methods: We have searched literature in Pub Med and Google scholar.

Conclusion: Early age, male gender, low socioeconomic states, residence, consanguinity, old parent's age, represented conditions that are accompanying with a raised hazard for ASD in population. Mood disorder including anxiety, bipolar disorders, depressions, and obsessive-compulsive disease (OCD) beside attention deficit hyper-activity disorders (ADHD) are the utmost occurring co morbidities. Selective serotonin reuptake inhibitor (SSRI) and anti-psychotics were defined for mood disorders management.

Keywords: Anxiety; Attention deficit hyper-activity disorder; Autism, Mood disorders; Obsessive – compulsive disorder.

*Correspondence: abdo2010354433@gmail.com

DOI: 10.21608/svuijm.2021.64719.1099

Received: 5 February, 2021.

Revised: 1 March, 2021.

Accepted: 8 March, 2021.

Published: 11 February, 2024

Cite this article as: Khaled Abd-allah Abd-elbaser, Abdallah Mohammed Elnasr, Nessren Ali Mohammed , Ali Helmi Bakri (2024). Prevalence of Mood Disorders among Autistic Children: A review article. *SVU-International Journal of Medical Sciences*. Vol.7, Issue 1, pp: 324-333.

Copyright: © Abd-elbaser et al (2024) Immediate open access to its content on the principle that making research freely available to the public supports a greater global exchange of knowledge. Users have the right to Read, download, copy, distribute, print or share link to the full texts under a [Creative Commons BY-NC-SA 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/)

Introduction

Through the past eras, Autism Spectrum Disorder (ASD) incidence had increased dramatically (Baio et al., 2018). Features of kids with (ASD) involved by central deficitting in societal communications and restricting deeds, concurrent motor in-coordination and/or intellectual inability exhibitions (Ketcheson et al., 2021).

Negative results for ASD can be aggravated by psychiatric co morbidities (Matson and Cervantes 2014), that are related to more adaptive behavior damages in autistic people (Kraepel et al. 2017). A cohort study based on Swedish population evaluated the danger of depression. There was an elevated danger among people with ASD generally, with more danger among people with ASD without intellectual inability than among people with ASD and intellectual inability (Rai et al., 2018).

Predictors of ASD Prevalence

In spite of international reviews of growing incidence of ASD, there's no epidemiologic information for ASD in Egypt (Alnemary et al., 2017; Taha & Hussein, 2014). While the Societal Solidarity Ministry has expected, there are 800,000 persons with ASD in Egypt (Al-Masry Al-Youm, 2017).

Age

The Centers for Diseases Controlling and Preventing (CDC) calculated about 1.68% of American kids aging of 8-yrs (or 1 in 59 kids) had been detected with ASD (Baio et al., 2018). ASD may be detected as earlier 2-yrs old; majority of kids are not detected with ASD till afterward 4-yrs old (CDC, 2016). One probable cause can be that the case recognition by the family was postponed until motor and speech progress (Raina et al., 2017).

Race

Caucasian kids are constantly recognized with ASD more frequent than black or Hispanic kids (Baio et al., 2018).

Gender

One of the most important results in ASD studies is that boys diagnosed with ASD with higher rates in comparison to girls. However, remarkably little studies had centered at the

causes for this difference (Halladay et al., 2015). Males provided with ASD in a higher percentage in comparison to female kids was pronounced in many preceding researches (Ros-Demarize et al., (2020) Hrdlicka et al., 2016; Sapmaz et al., 2018; Mathew et al., 2019).

Many researchers suggested the participation of well-known sexually dimorphous factors including X-linkage, imprinting, and sexual steroid hormone level (Werling, 2016).

Parent age

ASD hazard in correlation with parent age, specifically parental age, become studied in several research, and elevated parent age is one of the maximum continuously recognized ASD perinatal risk-factor (Guinchat et al., 2012; Sandin et al., 2012). Both older mother's age and older father's age independently seemed to have an effect on ASD danger (Shelton et al., 2010). A variety of probable mechanisms can motivate these relations, counting epigenetically alteration, confounding by genetical liability or societal determinant of generative ages, and arbitration by age-related gestation hazards (Lee and McGrath, 2015).

Familial records:

Family history of autoimmune disorder has been as well accompanied with elevated hazard of ASD (Keil et al., 2010) findings can recommend some shared genetic liability; Parental immune-mediated disorders (Zerbo et al., 2015).

Home and socio-economic status

Previous research had documented a correlation among ASD and urbanicity (i.e. elevated chance of autism in urban vs. rural district) (Lai et al., 2012; Lauritsen et al., 2014; Hoang et al., 2019).

Results from Saudi Arabia revealed that the kids majority detected with autism have a families of lower socio-economic requirements with un-satisfactory incomes (Amr et al., 2012). Consanguinity

Consanguineous marriage is one of the environmental factors that can make contributions to ASD development (Bitar et al .(2020). ,Oommen et al., 2018). In Nadeem et al., (2019). study in Pakistan; consanguinity become discovered in (43.4%) of autistic kids.

This can be attributed to the truth that (ASD) has each genetic and environmental elements in its etiology (Mamidala et al., 2015).

The Diagnostical and Statistical Manual of Mental Conditions, 5th Edition criteria

In accordance to the Diagnostical and Statistical guidelines of Mental Conditions, 5th version (DSM-5; American Psychiatric Association, 2013), ASD is detected on the foundation of sign groups: (a) societal communications deficiente and (b) the existence of repeating actions and limited interests. For kids to be identified with ASD, they should suite the entire 3 standards below societal communications: deficiente in (a) socioemotional exchange; (b) non-verbal communicative deeds; and (c) improving, preserving, and knowledge relationships (Tager-Flusberg, 2016).

The American Academy of Pediatrics (AAP) strategies suggested developing monitoring at 9, 15 and 30-mths well kid visits and autism definite monitoring at 18-mths and once more at 24 or 30-mths (Ellerbeck et al., 2015).

Primary caution for ASD concerned bad eye contact, bad responding to names, displaying and sharing deficiency, no gesticulating by 12-mths, and language or societal capabilities losing. Monitoring equipment for ASD on this populace involving the Adapted Check-list for Autism in Toddlers, Reviewed, with Following-up (M-CHAT-R/F) and Survey of Well-being of Young Children (SWYC) (Robins et al., 2014).

Symptoms of ASD

The signs of ASD are categorized into extensive classes: the central and the minor signs (American Psychiatric Association, 2013). The central signs include decreased language abilities and societal interactions, in addition to repeating and stereotypic deeds presence (American Psychiatric Association, 2013; Weitlauf et al., 2014). In the other hand, minor symptoms included complications like self-injuries, hyperactivity, aggressions, and cooccurring psychiatric issues which include anxiety and depression (Kaat et al., 2013).

Kids with (ASD) (American Psychiatric Association 2013) are highly probably to fulfill criteria for extra spiritual health issues (Salazar et al., 2015). These

usually take the shape of both adopting (e.g. anxiety or depressed moods) and expressing (e.g. behavior issues, opposed actions or hyperactivity) issues. They were recognized as a supply of specific trouble and unmet want for people and the families (Cadman et al., 2012).

Attention Deficit Hyper-Activity Disorder (ADHD):

At the neuro-psychological levels, each ADHD and ASD current problems in executing functions, even if EF deficiente may fluctuate among the conditions. Repressive disorder is feature of ADHD, while in ASD dominant consistency and concept of mind deficiente have a main function (Lukito et al., 2017). Numerous research had revealed that kids affected by both diseases usually present a greater extreme psychiatric load. It was found that kids with each ASD and ADHD have been much more probable to have behavior troubles or anxiety or despair signs than ASD-kids only (Mansour et al., 2017).

Alexithymia

Alexithymia is frequent in ASD (Poquerusse et al., 2018).

alexithymia has a nondependent property that stemming from autistic signs and make a contribution to emotionally damages, and ultimately to mood conditions, in those with ASD (Bird and Cook, 2013).

Alexithymia and ASD share several coinciding functions in emotionally, societally, cognitive verbally and non-verbal – realms, with various levels of convergent effects on their person and societal actions and lives. This places the inspiration for studying the character in their complicated relationships in the context of emotionally dispensation (Poquerusse et al., 2018).

Anxiety issues

Anxiety issues is frequently happened disorder and are metanalytically predicted to be incidence in nearly 40% of ASD-youth (van Steensel et al., 2011). The most frequent co morbid Anxiety disease concerned societal phobia (17–30%), unique phobias (30–44%), comprehensive Anxiety condition (15–35%), separation Anxiety condition (9–38%) and obsessive-compulsive condition (OCD; 17–37%) (van Steensel et al., 2011).

Aging is one of the capacities and varying risk-factors. Most research recorded that anxiety in ASD-kids rises from pre-school to youth. Possibly, the postponed cognitive and motor improvements in ASD-kids don't allow the recognitions and expressions of anxiety symptoms till youth (Davis et al., 2011).

There are more research revealing that anxiety signs are similarly prevalent in boys and women with ASD (Worley et al., 2010; Vasa et al., 2013). This can be defined by the theory that the mutual neuro-biological disfunctions in boys and women with ASD have a superseding impact on psycho-pathology, causing similar anxiety level in both genders with ASD (Brereton et al., 2006).

Obsessive-compulsive disorder (OCD)

OCD is a chronic disorder characterised by repeating invasive thought and obsessive acts which are ego-dystonic (i.e., not pleasant, upsetting and opposed) (American Psychiatric Association, 2013) even as the repeating patterns of deeds endemic to ASD are thought to be ego-syntonic (i.e., pleasant, not distressing and not opposed). Meier et al., (2015) observed that people with an initially diagnosing with ASD had a 2-fold elevated chance of co morbid of OCD, while people primary diagnosed of OCD showing almost 4-fold elevated chance of a next diagnosing of ASD.

Depression

Persons with ASD show conventional DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, 2013) depressive signs (e.g. sadness, reduced satisfaction in most actions, cognitive and somatic signs, and suicidality). They can also show more abnormal presentations of depression (Chandrasekhar and Sikich, 2015).

Girls can display a steeper growth in depressive signs during youth, on par with usually growing girls, while boys with ASD might have increased signs in school-age years (as compared to normally growing kids and to girls with ASD) that persevere into adult (Gotham et al., 2015). Depressive signs can also be much more probably to persevere in kids who're undergoing bullying or more socio-communicating problems (Rai et al., 2018).

Bipolar disorder

The bi-polar disease is a persistent and complicated mood condition characterised by a mixture of manic (bi-polar mania), hypo-manic and depressive (bi-polar depressions) episodes, with considerable subsyndromal signs usually exist among principal mood episodes (Grande et al., 2016). Several studies show raised rates of mood conditions among ASD-youth, involving bi-polar disease (BD) (Borue et al., 2016). The incidence of co morbid BD in ASD associates has been calculated at 7% (Skokauskas et al., 2015). A diagnosing of BD was documented in 5.2% of over 4,000 ASD-youth visiting centers of community mental health (Rosenberg et al., 2011).

Aggressive deeds

Previous studies recommended that competitive actions are more frequent among ASD-kids than in different populaces (Farmer & Aman, 2011; Mayes et al., 2012). The reasons of irritability and aggression are multi-factorial: understanding difficulties, decreased capacity to communicate and express their wishes and needs, reduced confrontation skills, conflicts with colleagues and authority figures, psychosocietal disfunction, un-diagnosed pain, mood and anxiety conditions (Nazzari, 2011).

Management of mood conditions

Cognitive conduct therapy (CBT)

CBT is a primary line of management for anxiety in usually improving kids, and there's rising proof that CBT may be useful for anxiety in ASD kids (Sukhodolsky et al., 2013). Random controlled studies had revealed CBT to be a successful therapy for anxiety, but it can be more successful for elevated functioning persons (Van Steensel et al., 2015).

Pharmacologic treatments

Atypical anti-psychotics

Risperidone and aripiprazole are accepted by the Food and Drug Administration (FDA) for the management of irritability accompanied with the ASD diagnosing. Risperidone is accepted in kids at minimum 5-yrs old and aripiprazole is accepted for kids at minimum 5-yrs old and

aripiprazole is accepted for kids at minimum 6-yrs old (DeFilippis and Wagner, 2016).

Typical anti-psychotics

Haloperidol was one of the first drugs investigated to be used in ASD. Research of acute therapy with haloperidol were displayed advantages in the regions of hyper-activity, temper tantrums, retreat, stereo-typical actions, and easing studying on discernment responsibilities (DeFilippis and Wagner, 2016).

Anti-depressants

Anti-depressants have been taken into consideration to be used in ASD due to the noted signs of repeating, ritualistic actions and persistence on limited patterns of routines.

Selective serotonin reuptake inhibitors (SSRIs), tricyclic anti-depressants, and different anti-depressants were investigated in cases with ASD (DeFilippis and Wagner, 2016).

SSRIs are prearranged for the therapy of disorders frequent comorbidity with ASD like depressions, anxiety and obsessive-compulsive actions (Williams et al., 2013). Stimulants /Atomoxetine/Alpha-2- agonists Signs of (ADHD) are generally located with ASD diagnosing, that has caused investigate the efficacy and tolerability of ADHD therapies on this cases populace. Numerous researches have tested the efficiency of methylphenidate (MP) for signs of inattentions, hyper-activity, and impulsivity among ASD cases (DeFilippis and Wagner, 2016).

See summarizing Tables (1-3).

Table.1.Summary of predictors of ASD prevalence

Predictor	Significant	Reference
Age	ASD diagnosis at early age	CDC (2016) . Baio et al., (2018). Raina et al.,(2017).
Race	Mostly identified in Caucasian children	Baio et al., (2018).
Gender	ASD higher rate diagnosis in males than females.	Ros-Demarize et al., (2020). Sapmaz et al., (2018). Mathew et al., (2019).
Parental age	Increased maternal ages is a frequently recognized ASD perinatal risk factors.	Guinchat et al., (2012). Sandin et al.,(2012). Shelton et al.,(2010).
Familial history	Family history of autoimmune disorders was also accompanying with raised chance of ASD.	Zerbo et al., (2015) . Keil et al., (2010).
Residence and socioeconomic status	An association between ASD and urbanicity and low socioeconomic standards	Lai et al., (2012). Lauritsen et al., (2014). Hoang et al.,(2019). Amr et al.,(2012).
Consanguinity	Consanguineous marriage contributed to ASD development	Bitar et al.(2020). Nadem et al., (2019).

Table.2. Summary of ASD associated mood disorders

Mood disorder	Significant	Reference
Attention Deficit Hyper-activity Disorder	ASD-kids in addition to ADHD were further expected to have behavioral issues or anxiety or depressing signs	Mansour et al., (2017).
Anxiety disorders	Prevalent in about 40% of autistic kids and adolescents	van Steensel et al., (2011). Davis et al., (2011).
Obsessive-compulsive disorder	Persons with ASD primary diagnosing had a 2-fold elevated danger of co morbid of OCD	Meier et al., (2015).
Alexithymia	Alexithymia is frequent in autistic children contributed to emotionally damages, and eventually to mood conditions	Bird and Cook , (2013). Poquerusse et al., (2018).
Depression	Persons with ASD exhibition traditional DSM-5 depressive symptoms	Chandrasekhar and Sikich, (2015).
Bi-polar disorder	Increased rate of mood conditions among ASD-youth, involving bi-polar diseases	Borue et al., (2016). Skokauskas et al., (2016).
Aggressive behavior	Aggressive actions are more frequent among ASD kids than in other people	Farmer and Aman, (2016). Mayes et al., (2012).

Table.3. Summary of pharmacological treatment of ASD associated mood disorders

Pharmacological treatment	Significant	Reference
Atypical antipsychotics	Risperidone is accepted in kids at minimum 5-yrs old and aripiprazole is accepted in kids at minimum 5-yrs old and aripiprazole is accepted in kids at minimum 6-yrs old	(DeFilippis and Wagner, 2016).
Typical antipsychotics	Haloperidol displayed advantages in the points of hyper-activity, temper tantrums, withdrawal, stereo-typical actions, and easing education on discriminating tasks	(DeFilippis and Wagner, 2016).
Anti-depressants	SSRIs are agreed for the management of disorders usual co morbid with ASD like	(DeFilippis and Wagner, 2016).

	depressions, anxiety and obsessive-irresistible actions	
Stimulants /Atomoxetine/Alpha-2- agonists	methylphenidate for signs of inattention, hyper-activity, and impulsivity	(DeFilippis and Wagner, 2016).

References

- **Al-Masry Al-Youm .(2017)**. 800000-egyptians-estimated-have-autism-societal-solidarity-minister. Retrieved from <https://www.egyptindependent.com/800000-egyptians-estimated-have-autism-societal-solidarity-minister/>.
- **Alnemary F, Alnemary F, Alamri Y. (2017)**. Autism research: Where does the Arab world stand? *Review Journal of Autism and Developmental Disorder*, 4(2), 157–164.
- **American Psychiatric Association.(2013)**. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington: American Psychiatric Publishing.
- **Amr M, Bu Ali W, Hablas H, Raddad D, El-Mehesh F, El-Gilany AH, et al.(2012)**. Sociodemographic factors in Arab children with autism spectrum disorders. *Pan Afr Med J*; 13:65.
- **Baio J, Wiggins L, Christensen DL, Maenner MJ, Daniels J, Warren Z, et al.(2018)**. Prevalence of Autism Spectrum Disorder Among Children Aged 8 Years Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2014. *MMWR Monitoring Summaries*,67(6): 1–23.
- **Bird G and Cook R (2013)**. Mixed emotions: The contribution of alexithymia to the emotional symptoms of autism. *Translational Psychiatry*, 3, e285 10.1038/tp.61.
- **Bitar T, Gerges P, Kassab MC, Hallit S, et al. (2020)**. Factors associated with Autism Spectrum Disorder: a case-control study in the Lebanese population. *Epidemiology Biostatistics and Public Health*. 17(1). <https://www.researchgate.net/publication/342520779>
- **Borue X, Mazefsky C, Rooks BT, et al.(2016)**. Longitudinal Course of Bipolar Disorder in Youth With High-Functioning Autism Spectrum Disorder. *J Am Acad Child Adolesc Psychiatry*,55(12):1064-1072.
- **Brereton AV, Tonge BJ, Einfeld SL. (2006)**. Psycho-pathology in children and adolescents with autism compared to young people with intellectual inability. *J Autism Dev Disord* ,36(7):863–70.
- **Cadman T, Eklund H, Howley D, Hayward H, Clarke H, Findon J, et al. (2012)**. Caregiver burden as people with autism spectrum disorder and attention-deficit/hyper-activity disorder transition into adolescence and adulthood in the United Kingdom. *Journal of the American Academy of Child and Adolescent Psychiatry*; 51(9):879–888.
- **CDC.(2016)**. Data and Statistics. Autism Spectrum Disorder. Resource Document. [Last accessed on Jul 03]. Available from: <http://www.cdc.gov/ncbddd/autism/data.html> .
- **Chandrasekhar T and Sikich L. (2015)**. Challenges in the diagnosis and treatment of depression in autism spectrum disorders across the lifespan. *Dialogues Clin Neurosci*; 17(2):219–227.
- **Davis TE, III, Hess JA, Moree BN, Fodstad JC, Dempsey T, Jenkins WS, et al. (2011)**. Anxiety symptoms across the lifespan in people diagnosed with autistic disorder. *Res Autism Spectr Disord*, 5(1):112–118.
- **DeFilippis M and Wagner KD. (2016)**. Treatment of Autism Spectrum Disorder

in Children and Adolescents. *Psychopharmacol Bull*; 46(2):18-41.

- **Diagnostic and Statistical Manual of Mental Disorders. (2013).** DSM-5 Fifth edition Arlington, VA: American Psychiatric Association.
- **Ellerbeck K, Smith C, Courtemanche A. (2015).** Care of children with autism spectrum disorder. *Prim Care*, 4(2):85-98.
- **Farmer CA and Aman MG.(2011).** Aggressive behavior in a sample of children with autism spectrum disorders. *Research in Autism Spectrum Disorders*; 5(1):317–323.
- **Gotham K, Brunwasser SM, Lord C.(2015).** Depressive and Anxiety Symptom Trajectories From School Age Through Young Adulthood in Samples With Autism Spectrum Disorder and Developmental Delay. *Journal of the American Academy of Child & Adolescent Psychiatry*; 54(5):369–376.
- **Grande I, Berk M, Birmaher B, Vieta E.(2016).** Bi-polar disorder. *Lancet*. 387(10027):1561-1572.
- **Guinchat V, Thorsen P, Laurent C, Cans C, Bodeau N, Cohen D. (2012).** Pre-, peri- and neonatal risk factors for autism. *Acta Obstet Gynecol Scand*. 91(3):287-300.
- **Halladay AK, Bishop S, Constantino JN, et al. (2015).** Sex and gender differences in autism spectrum disorder: summarizing evidence gaps and identifying emerging areas of priority. *Mol Autism*. 2015;6:36. Published 2015 Jun 13. doi:10.1186/s13229-015-0019-y
- **Hoang VM, Le TV, Chu TTQ, et al.(2019).** Prevalence of autism spectrum disorders and their relation to selected socio-demographic factors among children aged 18-30 months in northern Vietnam, 2017. *Int J Ment Health Syst*; 13:29.
- **Hrdlicka M, Vacova M, Oslejskova H, et al. (2016).** Age at diagnosis of autism spectrum disorders: is there an association with socioeconomic status and family self-education about autism?. *Neuropsychiatr Dis Treat*; 12:1639-1644.
- **Kaat AJ, Gadow KD, Lecavalier L.(2013).** Psychiatric symptom impairment in children with autism spectrum disorders. *J Abnorm Child Psychol*; 41(6):959-969.
- **Keil A, Daniels JL, Forssen U, Hultman C, Cnattingius S, Söderberg KC et al.(2010).** Parental autoimmune diseases associated with autism spectrum disorders in offspring. *Epidemiology*,21(6):805-8.
- **Ketcheson LR, Pitchford EA, Wentz CF.(2021).** The Relationship Between Developmental Coordination Disorder and Concurrent Deficiting in Societal Communication and Repeating Deeds Among Children with Autism Spectrum Disorder. *Autism Res.* doi: 10.1002/aur.2469. Epub ahead of print. PMID: 33421296.
- **Kraper CK, Kenworthy L, Popal H, Martin A, Wallace GL.(2017).** The gap between adaptive behavior and intelligence in autism persists into young adulthood and is linked to psychiatric comorbidities. *Journal of Autism and Developmental Disorders*, 47(10), 3007–3017
- **Lai DC, Tseng YC, Hou YM, Guo HR. (2012).** Gender and geographic differences in the prevalence of autism spectrum disorders in children: Analysis of data from the national inability registry of Taiwan. *Research in Developmental Disabilities*; 33:909–915.
- **Lauritsen MB, Astrup A, Pedersen CB, et al.,(2014).** Urbanicity and autism spectrum disorders. *J Autism Dev Disord*; 44(2):394-404.
- **Lee BK and McGrath JJ. (2015).** Advancing parental age and autism:

- multi-factorial pathways. *Trends Mol Med.* 21(2):118–25.
- **Lukito S, Jones CRG, Pickles A, Baird G, Happé F, et al.(2017).** Specificity of executive function and theory of mind performance in relation to attention-deficit/hyper-activity symptoms in autism spectrum disorders. *Mol Autism*; 8:60. 10.1186/s13229-017-0177-1
 - **Mamidala MP, Kalikiri MK, Praveen Kumar PT, Rajesh N, Vallamkonda OR, Rajesh V. (2015).** Consanguinity in India and its association with autism spectrum disorder. *Autism Res.* 8(2):224-8.
 - **Mansour R, Dovi AT, Lane DM, Loveland KA, Pearson DA.(2017).** ADHD severity as it relates to comorbid psychiatric symptomatology in children with Autism Spectrum Disorders (ASD). *Res Dev Disabil*; 60: 52–64.
 - **Mathew NE, Burton KLO, Schierbeek A, Črnčec R, Walter A, Eapen V. (2019).** Parenting preschoolers with autism: Socioeconomic influences on wellbeing and sense of competence. *World J Psychiatry*; 9(2):30-46.
 - **Matson JL and Cervantes PE.(2014).** Commonly studies comorbid psychopathologies among persons with autism spectrum disorder. *Research in Developmental Disabilities*, 35, 952–962.
 - **Mayes SD, Calhoun SL, Aggarwal R, Baker C, Mathapati S, Anderson R, et al.,(2012).** Explosive, oppositional, and aggressive behavior in children with autism compared to other clinical disorders and typical children. *Research in Autism Spectrum Disorders*, 6(1): 1–10.
 - **Meier SM, Petersen L, Schendel DE, Mattheisen M, Mortensen PB, Mors O.(2015).** Obsessive-compulsive disorder and autism Spectrum disorders: Longitudinal and offspring risk. *PLoS One*; 10:1–12.
 - **Nazzer A. (2011).** Psychopharmacology of autistic spectrum disorders in children and adolescents. *Pediatr Clin North Am*; 58:85-97.
 - **Oommen A, AlOmar RS, Osman AA, Aljofi HE.(2018).** Role of environmental factors in autism spectrum disorders in Saudi children aged 3-10 years in the Northern and Eastern regions of Saudi Arabia. *Neurosciences (Riyadh)*. 23(4):286-291.
 - **Poquerusse J, Pastore L, Dellantonio S, Esposito G .(2018).** Alexithymia and autism spectrum disorder: A complex relationship. *Frontiers in Psychology*, 9, 1196 10.3389/fpsyg.2018.01196.
 - **Rai D, Culpin I, Heuvelman H, Magnusson CMK, Carpenter P, Jones HJ, et al.(2018).** Association of Autistic Traits With Depression From Childhood to Age 18 Years. *JAMA Psychiatry*; 75(8):835-843.
 - **Raina SK, Chander V, Bhardwaj AK, et al. (2017).** Prevalence of Autism Spectrum Disorder among Rural, Urban, and Tribal Children (1-10 Years of Age). *J Neurosci Rural Pract.* 8(3):368-374.
 - **Robins DL, Casagrande K, Barton M, et al.(2014).** Validation of the modified checklist for autism in toddlers, revised with follow-up (M-CHAT-R/F). *Pediatrics*; 133:37-45.
 - **Ros-Demarize R, Bradley C, Kanne SM, Warren Z, Boan A, Lajonchere C, et al. (2020).** ASD symptoms in toddlers and preschoolers: An examination of sex differences. *Autism Res*; 13(1):157-166.
 - **Rosenberg RE, Kaufmann WE, Law JK, Law PA.(2011).** Parent Report of Community Psychiatric Comorbid Diagnoses in Autism Spectrum Disorders. *Autism Res Treat.* 2011:1–10.
 - **Salazar F, Baird G, Chandler S, Tseng E, O’Sullivan T, Howlin P, et al. (2015).** Co-occurring psychiatric disorders in preschool and elementary school-aged children with autism spectrum disorder. *Journal of Autism and*

- Developmental Disorders; 45(8):2283–2294.
- **Sandin S, Hultman CM, Kolevzon A, Gross R, MacCabe JH, Reichenberg A. (2012).** Advancing maternal age is associated with increasing risk for autism: a review and meta-analysis. *J Am Acad Child Adolesc Psychiatry.* 51(5):477-486.
 - **Sapmaz D, Baykal S, Akbaş S.(2018).** The Clinical Features of Comorbid Pediatric Bi-polar Disorder in Children with Autism Spectrum Disorder. *J Autism Dev Disord;* 48(8):2800-2808.
 - **Shelton JF, Tancredi DJ, and Hertz-Picciotto I.(2010).** Independent and dependent contributions of advanced maternal and paternal ages to autism risk. *Autism Res,* 3(1):30–9.
 - **Skokauskas N and Frodl T.(2015).** Overlap between Autism Spectrum Disorder and Bi-polar Affective Disorder. *Psycho-pathology,* 48(4):209–216.
 - **Sukhodolsky DG, Bloch MH, Panza KE, Reichow B. (2013).** Cognitive-behavioral therapy for anxiety in children with high-functioning autism: a meta-analysis. *Pediatrics;* 132(5):1341-1350.
 - **Tager-Flusberg H.(2016).** Risk Factors Associated With Language in Autism Spectrum Disorder: Clues to Underlying Mechanisms. *J Speech Lang Hear Res;* 59(1):143-154.
 - **Taha GR and Hussein H. (2014).** Autism Spectrum Disorders in Developing Countries: Lessons from the Arab World. In V. B. Patel (Ed.), *Comprehensive Guide to Autism* (pp. 2509–2531). New York, NY: Springer
 - **van Steensel FJA, Bögels SM, Perrin S.(2011).** Anxiety disorders in children and adolescents with autistic spectrum disorders: A meta-analysis. *Clinical Child and Family Psychology Review;* 14:302–317.
 - **Van Steensel FJA, Bogels SM.(2015).** CBT for anxiety disorders in children with and without autism spectrum disorders. *Journal of Consulting and Clinical Psychology;* 83(3):512–523.
 - **Vasa RA, Kalb L, Mazurek M, Kanne S, Freedman B, Keefer A, et al. (2013).** Age-related differences in the prevalence and correlates of anxiety in youth with autism spectrum disorders. *Res Autism Spectrum Disord,* 7(11):1358–69.
 - **Weitlauf AS, Gotham KO, Vehorn AC, Warren ZE.(2014).** Brief report: DSM-5 "levels of support:" a comment on discrepant conceptualizations of severity in ASD. *J Autism Dev Disord;* 44(2):471-476.
 - **Werling DM.(2016).** The role of sex-differential biology in risk for autism spectrum disorder. *Biol Sex Differ.* 7:58.
 - **Williams K, Brignell A, Randall M, Silove N, Hazell P.(2013).** Selective serotonin reuptake inhibitors (SSRIs) for autism spectrum disorders (ASD). *Cochrane Database Syst Rev ;*(8):CD004677.
 - **Worley JA, Matson JL, Sipes M, Koziowski AM. (2010):** Prevalence of autism spectrum disorders in toddlers receiving early intervention services. *Res Autism Spectrum Disord,* 5(2):920–5.
 - **Zerbo O, Qian Y, Yoshida C, Grether JK, Van de Water J, Croen LA.(2015).** Maternal Infection During Pregnancy and Autism Spectrum Disorders. *J Autism Dev Disord.* 45(12):4015-25.