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## AUTISTIC SEVERITY AND PSYCHIATRIC COMORBIDITY AMONG CHILDREN WITH AUTISM SPECTRUM DISORDER

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### ABSTRACT

**Background:** Autism Spectrum Disorder is a neurodevelopmental disorder with unclearly identified psychopathology. **Aim:** To assess the severity of autism and psychiatric comorbidity among children with autism. **Subjects and Method: Design:** A descriptive study was utilized. **Setting:** study conducted at outpatient clinics of the Psychiatric Department, Mansoura University Hospitals. **Subject:** study include a sample of (84) preschool children diagnosed with autism. **Tools:** Data collected using three tools; I- Demographic and developmental characteristics of children, and clinical condition of mothers during pregnancy, II- Gilliam Autism Rating Scale, and III- Mini International Neuropsychiatric Interview for children. **Results:** Revealed that 72% of studied children with moderate autism severity. Siblings number, age of the mothers during pregnancy, mother comorbid physical complaint during pregnancy, and child age of walking, related significantly to autism severity. More than two thirds (68%) of children with autism comorbid with psychiatric disorders. Anxiety is the most common (35.7%) followed by attention deficit hyperactivity disorder (32.1%). Numbers of comorbid disorders are related significantly to autism severity. **Conclusion:** Numbers of comorbid disorders related significantly to autism severity. Moreover, the severity of autism related significantly to socio-demographic, developmental characteristics and psychiatric co-morbidity. **Recommendations:** Caring of comorbid psychiatric disorders may alleviate autistic severity, consequently, comorbid psychiatric disorders should be considered in assessment and intervention of children with autism.

**Keywords:** Autistic severity, Autism spectrum disorder, Psychiatric Co-morbidity.

## **INTRODUCTION**

Autism Spectrum Disorder (ASD) is a pervasive neuro-developmental disorder in which the main deficiencies influence children's development. A relative or complete absence of reciprocal social interactive abilities is the main symptom seen in children with ASD. These children commonly with less frequent eye contact and direct fewer facial languages toward their parents (Cassidy, 2013; Peterson, Piazza, & Volkert, 2016). A significant problem in communication is another essential indication in children with ASD. Preschool children diagnosed with ASD may exhibit deviation in spoken language or maybe totally nonverbal. Children may simply echo "repeat" what they hear without importance. Some children can be able to speak, but express a lack of pragmatic communication abilities (Germain et al., 2015; Van Santen et al., 2013).

Moreover, symptoms of ASD involve behavioral deviations. Children with autism may involve in monotonous movements, such as flapping their hands, flipping their fingers in the opposite of their eyes, running on tiptoe, pacing back and forth, and so on. Things may be used in uncommon habits, such as tapping or spinning them or frequently flicking a doll's eyes shut and open. Those children exhibit extreme attention to unusual subjects, holding to definite rituals, demanding to make activities in a particular command, or following the identical route to a destination. Repetitive movements occasionally develop self-injurious behaviors (Turkington & Anan, 2007).

Prevalence of ASD enlarged in the previous 15–20 years from five cases per 10,000 to current estimates of 1 in 50 for autism spectrum disorders. In 2019, the center for disease control and prevention (CDC) issued that about 1 in 54 children has been recognized with ASD. ASD is described to occur in all racial, ethnic, and socioeconomic groups. Researches in Europe, North America, and Asia has acknowledged individuals with ASD with about 1% average prevalence. Prevalence was reported of 2.6% in South Korea (Maenner et al., 2020).

The prevalence of autism in the Arab communities varies from 1.4 cases every 10,000 children in Oman to 29 every 10,000 children in the United Arab Emirates. Moreover, many influences might participate to a lower incidence of autism in Arab communities. Maybe, it is habitually problematic for a child with autism to be diagnosed appropriately, as pediatricians are somewhat inexpert in the diagnosis and managing of psychiatric disorders. On the whole, there a smaller number of psychiatrists specifying in childhood developmental problems in the Middle East (Amr et al., 2012; Elbahaey et al., 2016).

There is sufficient evidence indicating that children with ASD often have psychopathological comorbidity paying further to the large variability in the ASD clinical

presentation. Comorbid symptoms and disorders characterized by an additional handicap for the affected children, need significant care, and become an emphasis for intervention and medical treatment. ASD symptoms overlap with that of a variety of complaints, including attention deficit hyperactivity disorder (ADHD), intellectual disability (ID), and language disorders in addition to psychiatric disorders such as obsessive-compulsive disorder (OCD), oppositional defiant disorder (ODD), depression, anxiety, and schizophrenia (Belardinelli, Raza, & Taneli, 2016; Brookman-Fraze, Stadnick, Chlebowski, Baker-Ericzén, & Ganger, 2018; Fuld, 2018).

Comorbidity assessing in children with ASD presents a definite challenge, ASD has been hypothesized to have social impairments as part of their main symptoms; in contrast, social impairments in other disorders, such as ADHD, ID, and language impairment (LI), are mostly viewed as a subordinate concern of further main symptoms. Furthermore, ADHD, ID, and language disorders are more commonly comorbid with ASD than would be predictable by casual (Şahin et al., 2018; Tarbox, Dixon, Sturmey, & Matson, 2014).

Comorbid psychiatric disorders symptoms and basic characteristics of ASD may be interacting and challenging to discriminate. For Example, there is a debate about the kind of connection between ASD and ADHD, whether they should be considered as comorbid disorders, whether they are separate disorders with overlapping symptomatology or disorders that lie on a range of symptomatology (Kentrou, de Veld, Mataw, & Begeer, 2019; Mansour, Dovi, Lane, Loveland, & Pearson, 2017). Moreover, another important obstacle to the study of comorbid conditions is the heterogeneity of indicators showed by persons with ASD. Such persons often vary significantly in mental and adaptive functioning, and the nature and severity of autistic activities differ and change with development (Amr et al., 2012; Tye et al., 2019).

## **AIM OF STUDY**

To explore autistic severity and psychiatric comorbidity among children with autism spectrum disorder through research objectives:

1. Evaluate the severity of autistic symptoms.
2. Identify possible risk factors increasing the severity of autism.
3. Identify the relation between autism and children demographic characteristics, developmental condition and clinical characteristics of mothers.

**SUBJECT AND METHOD:****Design**

The current study used a descriptive research design.

**Subjects:**

A convenient sample of 84 preschool children diagnosed with ASD. Diagnoses of ASD were made by a child psychiatrist established on criteria of Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria (American Psychiatric Association (APA), 2013). All preschool children with the diagnosis of ASD attend the identified setting three months from the beginning of September 2019 to the end of November 2019, will be eligible to be included in the study.

**Setting:**

The present study was done at the outpatient clinics of the psychiatric department of Mansoura University Hospitals affiliated with Mansoura University. The outpatient clinics provide psychiatric management for adult psychotic, neurotic, and addictive disturbances. In addition, it provides assessment, diagnosis, and management for children with psychotic and neurotic disturbances. The child psychiatry clinic runs every Monday each week as the investigators interviewed children and their relatives.

**Tools of data collection:**

To fulfill the objectives of current study, three tools were used in the current study.

**Tool (I):** Personal and Clinical Data Sheet developed by the authors in the Arabic language. It included; children demographic characteristics like; age, sex, siblings, residence, parental consanguinity, parental education, and parental occupation. clinical data included the history of Clinical data of mothers of studied children during pregnancy and labor, illness duration, history of psychiatric disorders, family history of psychiatric disorders, also, developmental conditions of studied children.

**Tool (II):** Gilliam Autism Rating Scale "GARS", GARS is a 56 items for assessment of individuals aged from 3:22 years who have severe behavioral problems that may be indicative of autism. This scale is a highly standardized test (Gilliam, 1995). Scoring system of GARS follow the following: low; less than or equal 79, moderate; 80:120, high; more than 121. The Arabic version was translated and validated by Mohamed, (2006); Internal consistency of the Arabic version of GARS was determined using Cronbach's alpha

technique as .92 in Egypt. Test-retest reliability revealed coefficients alpha of .94 for the Arabic version of GARS.

**Tool (III):** Mini International Neuropsychiatric Interview for children (MINI-KID) (Sheehan et al., 1998): The Mini-Kid originally developed by Sheehan et al, 1998 as a continued version to the adult version. The Mini-Kid follows the criteria of Diagnostic and Statistical Manual "version IV" of psychiatric disorders and evaluates 17 Axis one disorders " anxiety disorders including OCD, mood disorders, attention deficit disorder, alcohol/substance abuse or dependence, conduct, eating disorders and psychotic disorders". The Mini-Kid as an international measure has its reliability and validity of child and adolescent psychopathology. The test-retest (intra-rater) reliability of The Mini-Kid is high and very high for all psychiatric mentioned disorders. The Arabic version was translated and validated by Ghanem & Salah (1992).

#### **Ethical Consideration:**

Ethical consideration was got from the "Research Ethics Committee of the Faculty of Nursing – Mansoura University" regarding conducting the study (Ref. no. P.0955). Acceptance was obtained from the directors of the outpatient clinics to conduct the study upon a letter issued from the Faculty of Nursing included the aim of the study. Children's caregivers' acceptance to participate was obtained verbally, as the study is not a clinical trial, after clarification of the aim of the research and certain that data will be used solitary for the research purposes confidentially. Children caregivers involved in the study were certain about the privacy of the data collected. Apprising children's relatives, included in the study, about their rights to reject or to withdraw at any time without consequences. Each caregiver who refused to remain in the study their questionnaire was omitted from the study. Consent for publication: Children's caregivers' acceptance to publish the data was obtained verbally after assuring that data will be used only for the research purposes confidentially. Data collection tools were coded to escape remove the declaration of any personal data regarding the sample. Patients and their caregivers participated voluntarily.

#### **Statistical Analysis:**

Data were coded, organized, categorized, and relocated into specially considered presentations. Analysis completed using SPSS software version 24 developed by IBM. One-sample Kolmogorov-Smirnov test was used to assess the normality of data. Categorical variables were labeled using numbers and percentages. Continuous variables were showed using mean and standard deviation for parametric data. Two groups were compared using the Student *t*-test.

Analysis of Variance (ANOVA) was used for the comparison of means for more than two groups (parametric data). When the probability of error is less than 5% ( $p < 0.05$ ), results were considered significant, non-significance when the probability of error is higher than 5% ( $p > 0.05$ ) and highly significant when the probability of error is less than 0.1% ( $p < 0.001$ ). The minor p-value indicates a more significant level.

## RESULTS:

**Figure (1):** showed that more than two-thirds (72%) of studied children had a moderate level of autism, more than one-fifth (21.4%) of them had a high level of autism.

According to **figure (2)**, less than one-third of studied children (32%) were free from comorbid psychiatric disorders and more than two thirds (68%) of children with ASD comorbid with psychiatric disorders. In relation to one-third of studied children (32%) were comorbid with three psychiatric problems. 14.3% of studied children comorbid with five psychiatric problems while, 11% of them comorbid with two psychiatric disorders.

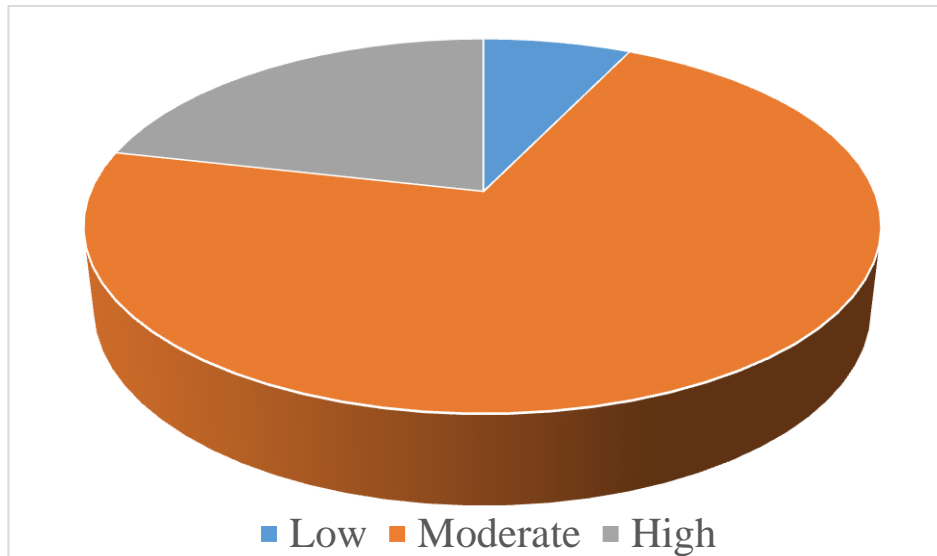
**Table (1):** revealed that, more than one-third (35.7%) of studied children comorbid with GAD, less than one-third (32.1%) of them comorbid with ADHD, more than one-quarter (27.4%) of studied children comorbid with mood difficulties, one-quarter (25%) comorbid with motor tics, more than one-fifth (22.6%) of them comorbid with OCD.

**Table (2):** showed that less than three-quarters (73.8%) of studied children were males, the age of more than half (51.2%) of them was five years old, the vast majority (91.7%) of them live in urban. More than one-third of studied children had one or two siblings, less than one half (45.2%) of them were the youngest among their siblings. Less than one-third (31%) of studied children had a relative diagnosed with psychiatric disorders while more than one-third (34.5%) of parents of studied children were consanguine. More than half of both parents of studied children had a middle education, more than half (63.1%) of mothers were housewives, while, more than half (58.8%) of fathers were employees. The table showed that autism scores not significantly varied according to sex, age in years, residence, birth order, relatives with a psychiatric disorder, parental consanguinity, mother education, father education, mother occupation, and father occupation. There was a significant difference between the score of autism and the number of siblings, children with no siblings had a higher autism score. Six years old studied children had a higher autism score than those who had five and four years old. Studied children whose mothers were employees, were lower in autism score.

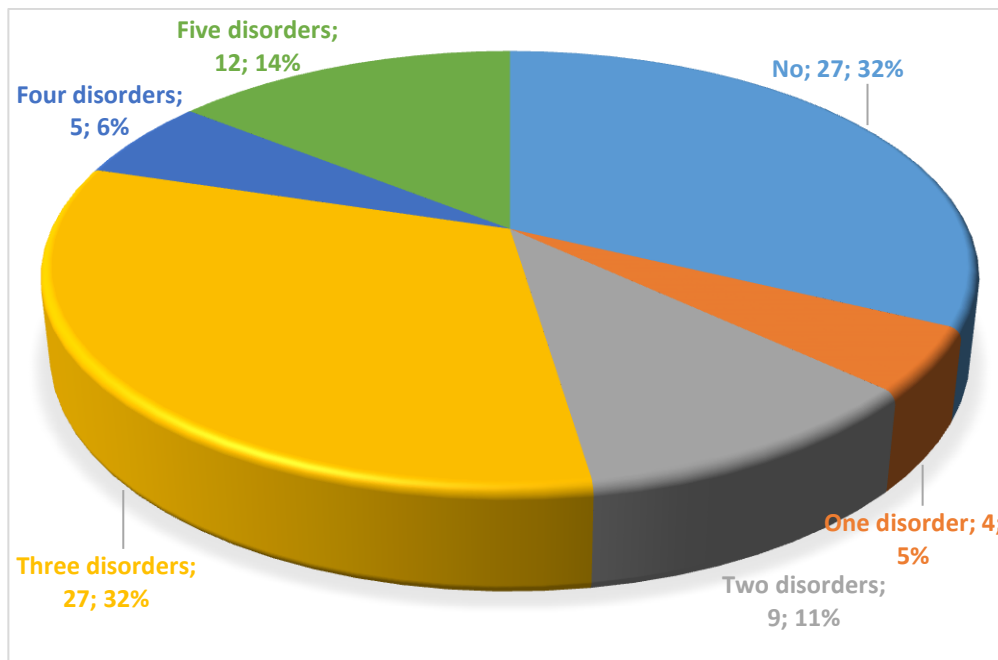
**Table (3):** revealed that more than three quarters (77.4%) of mothers of studied children were from 18 to 40 years old, they were not diagnosed with a physical disease during pregnancy. Less than one-third (31%) of studied children had a gestational age of fewer than 32 weeks, and more than half (59.5%) of them delivered by cesarean section. More than one-quarter (27.4%) of studied children admitted to incubator after birth while one-third (33.3%) of them born with a weight less than 2500 g. None of the mothers were exposed to smoking, alcohol, or radiology during pregnancy. The table showed that autism scores not significantly varied according to medication during pregnancy, gestational age, labor type, incubator admission, and birth weight. There was a significant difference between the score of autism and the age of the mother during pregnancy and comorbid physical complaints during pregnancy, mothers whose age during pregnancy was more than 40 years, or had a comorbid physical complaint during pregnancy their children with ASD were higher in autism score.

**Table (4):** showed that the age of teething for more than one-fifth (21.7%) of studied children was 12 months or more, while, age of walking for one-quarter of them was 18 months or more. Age at the beginning of symptoms for more than two-fifth (44%) was more than 12 months up to 24 months. more than half (59.5%) of studied children reported watching animated movies moreover, more than one-third of them reported Playing with smartphones, tablets, or computers. The table showed that autism scores not significantly varied according to the age of teething, age at the beginning of symptoms, watching animated movies, time consumed in watching animated movies, playing with smartphones, tablets or computers, time of paying with smartphones, tablets or computers. There was a significant difference between the score of autism and the age of child walking, children with ASD whose age of walking were 18 months or more were higher in autism score. The table showed children with ASD whose age of beginning of symptoms were late, they were higher in autism score.

**Table (5):** showed that autism scores not significantly varied according to mood difficulties, panic attacks, OCD, Tourette disorder, motor tics, vocal tics, ADHD, and coping disorders. There was a significant difference between a score of autism and generalized anxiety and the number of comorbid psychiatric disorders, children with ASD with comorbid generalized anxiety were higher in autism score, moreover, children with ASD without comorbid psychiatric disorders were lower in autism score.



**Figure (1):** Frequency distribution of autism severity levels (n=84)



**Figure (2):** Distribution of studied children according to numbers of co-morbid psychiatric disorders in each child (n= 84)



**Table (1):** frequency distribution of comorbid psychiatric disorders among studied children (n=84)

| Co-morbid psychiatric disorders       | Not present |      | Present |      |
|---------------------------------------|-------------|------|---------|------|
|                                       | N           | %    | N       | %    |
| A. Major depression                   | 84          | 100  | -       | -    |
| B. Suicide                            | 84          | 100  | -       | -    |
| C. Mood Difficulties                  | 61          | 72.6 | 23      | 27.4 |
| D. Hypomania                          | 84          | 100  | -       | -    |
| E. Panic Attack                       | 73          | 86.9 | 11      | 13.1 |
| F. Agoraphobia                        | 82          | 97.6 | 2       | 2.4  |
| G. Separation anxiety disorder        | 80          | 95.2 | 4       | 4.8  |
| H. Social Phobia                      | 84          | 100  | -       | -    |
| I. Special Phobia                     | 80          | 95.2 | 4       | 4.8  |
| J. OCD                                | 65          | 77.4 | 19      | 22.6 |
| K. PTSD                               | 84          | 100  | -       | -    |
| L. Alcohol Abuse                      | 84          | 100  | -       | -    |
| M. Drug Abuse                         | 84          | 100  | -       | -    |
| N. Tourette disorder                  | 69          | 82.1 | 15      | 17.9 |
| N. Motor Tics                         | 63          | 75   | 21      | 25   |
| N. Vocal Tics                         | 69          | 82.1 | 15      | 17.9 |
| O. ADHD                               | 57          | 67.9 | 27      | 32.1 |
| P. Conduct Disorder                   | 84          | 100  | -       | -    |
| Q. Oppositional Defiant Disorder ODD  | 82          | 97.6 | 2       | 2.4  |
| R. Psychotic Disorders                | 84          | 100  | -       | -    |
| S. Anorexia Nervosa                   | 82          | 97.6 | 2       | 2.4  |
| T. Bulimia Nervosa                    | 81          | 96.4 | 3       | 3.6  |
| U. Generalized anxiety disorder (GAD) | 54          | 64.3 | 30      | 35.7 |
| V. Coping. Disorders                  | 72          | 85.7 | 12      | 14.3 |

**Table (2):** Autism score variance concerning personal characteristics of the studied children and their relatives (n=84)

| Demographic characteristic               |                        | No | %    | Mean $\pm$<br>S.D. | Test of<br>sig | P    |
|--|------------------------|----|------|--------------------|----------------|------|
| Sex                                      | Male                   | 62 | 73.8 | 108.65 $\pm$ 14.39 | t=             | .466 |
|  | Female                 | 22 | 26.2 | 111.18 $\pm$ 13.7  | .736           |      |
| Age in years                             | 4 years                | 32 | 38.1 | 109.59 $\pm$ 15.55 | F=             | .161 |
|  | 5 years                | 43 | 51.2 | 107.42 $\pm$ 14.16 | 1.869          |      |
|  | 6 years                | 9  | 10.7 | 117.33 $\pm$ 1.87  |                |      |
| Residence                                | Urban                  | 77 | 91.7 | 108.62 $\pm$ 14.57 | t=             | .142 |
|  | Rural                  | 7  | 8.3  | 99 $\pm$ 4.24      | 1.482          |      |
| Siblings Numbers                         | No sibling             | 9  | 10.7 | 118.67 $\pm$ 7.62  | F=             | .004 |
|  | One sibling            | 30 | 35.7 | 103.67 $\pm$ 15.65 |                |      |
|  | Two siblings           | 30 | 35.7 | 113.9 $\pm$ 9.78   |                |      |
|  | Three or more siblings | 15 | 17.9 | 105.8 $\pm$ 16.43  |                |      |
| Birth order                              | The youngest           | 38 | 45.2 | 111.32 $\pm$ 10.53 | F=             | .444 |
|  | The median             | 28 | 33.3 | 108.5 $\pm$ 16.95  |                |      |
|  | The oldest             | 18 | 21.4 | 106.33 $\pm$ 16.23 |                |      |
| Relatives with a<br>psychiatric disorder | No                     | 58 | 69   | 108.91 $\pm$ 14.59 | t=             | .696 |
|  | Yes                    | 26 | 31   | 110.19 $\pm$ 13.45 | .392           |      |
| Parental<br>Consanguinity                | No                     | 55 | 65.5 | 106.62 $\pm$ 14.6  | t=             | .071 |
|  | Yes                    | 29 | 34.5 | 95.4 $\pm$ 13.97   | 1.625          |      |
| Mother Education                         | Literate               | 9  | 10.7 | 110.78 $\pm$ 12.42 | F=             | .465 |
|  | Middle education       | 46 | 54.8 | 110.7 $\pm$ 12.16  |                |      |
|  | High education         | 29 | 34.5 | 106.65 $\pm$ 17.4  |                |      |
| Mother Occupation                        | House Wife             | 53 | 63.1 | 109.49 $\pm$ 14.74 | F=             | .168 |
|  | Employee               | 3  | 3.6  | 94.33 $\pm$ 1.53   |                |      |
|  | Handicraft             | 28 | 33.3 | 110.57 $\pm$ 13.13 |                |      |
| Father Education                         | Literate               | 12 | 14.3 | 117.58 $\pm$ 5.87  | F=             | .090 |
|  | Middle education       | 44 | 52.4 | 108.16 $\pm$ 14.8  |                |      |
|  | High education         | 28 | 33.3 | 107.57 $\pm$ 14.8  |                |      |
| Father Occupation                        | Employee               | 49 | 58.3 | 109.6 $\pm$ 14.71  | t=             | .851 |
|  | Handicraft             | 35 | 41.7 | 109.66 $\pm$ 13.6  | .036           |      |

**Table (3):** Autism score variance concerning clinical data of mothers of studied children during pregnancy and labor (n=84)

| Clinical data                                      |                              | N  | %    | Mean ±<br>S.D. | Test<br>of sig | P    |
|--|------------------------------|----|------|----------------|----------------|------|
| Age of Mother During<br>Pregnancy                  | Less than 18 years           | 10 | 11.9 | 113.6± 2.88    | 4.033          | .021 |
|  | From 18 to 40 years          | 65 | 77.4 | 107.17± 15.31  |                |      |
|  | More than 40 years           | 9  | 10.7 | 120± 3.43      |                |      |
| Comorbid Physical<br>Complaint During<br>Pregnancy | No                           | 63 | 75   | 107.6± 15.74   | t=<br>2.957    | .004 |
|  | Yes                          | 21 | 25   | 114.43± 5.42   |                |      |
| Medication During<br>Pregnancy                     | No                           | 71 | 84.5 | 108.68± 14.89  | .957           | .342 |
|  | Yes                          | 13 | 15.5 | 112.77± 8.98   |                |      |
| Gestational Age                                    | 28 weeks or less             | 3  | 3.6  | 114.67± .58    | F=<br>.601     | .551 |
|  | > 28 weeks up to 32<br>weeks | 23 | 27.4 | 111.3± 10.64   |                |      |
|  | > 32 weeks up to 36<br>weeks | 58 | 69   | 108.24± 15.64  |                |      |
| Labor Type   | Normal                       | 34 | 40.5 | 107.94± 15.49  | t=<br>.529     | .469 |
|  | Cesarean section             | 50 | 59.5 | 110.24± 13.29  |                |      |
| Incubator Admission                                | No                           | 61 | 72.6 | 108.07± 15.03  | t=<br>1.316    | .192 |
|  | Yes                          | 23 | 27.4 | 112.61± 11.26  |                |      |
| Birth Weight                                       | Less than 2500 gm            | 28 | 33.3 | 109.04± 16.34  | F=<br>.828     | .440 |
|  | 2500 gm up to 3500<br>gm     | 53 | 63.1 | 108.87± 13.25  |                |      |
|  | More than 3500 gm            | 3  | 3.6  | 119.67± .58    |                |      |

**Table (4):** Autism score variance concerning developmental conditions of studied children (n=84)

| Developmental Conditions                               |                              | N  | %    | Mean ± S.D.   | Test of sig | P    |
|--|------------------------------|----|------|---------------|-------------|------|
| Age of Teething  | Less than 12 months          | 66 | 78.6 | 108.08± 14.77 | t=          | .076 |
|  | 12 months or more            | 18 | 21.4 | 113.83± 10.93 | 1.826       |      |
| Age of Walking   | Less than 18 months          | 63 | 75   | 107.16± 14.8  | t=          | .015 |
|  | 18 months or more            | 21 | 25   | 115.76± 9.82  | 2.482       |      |
| Age at the beginning of symptoms                       | 12 months or less            | 6  | 7.1  | 103.33± 10.25 | F= 2.453    | .092 |
|  | > 12 months up to 24 months  | 37 | 44   | 106.57± 16.54 |             |      |
|  | > 24 months up to 36 months  | 41 | 48.9 | 112.66± 11.57 |             |      |
| Watching animated movies                               | No                           | 34 | 40.5 | 107.47± 19.2  | t=          | .131 |
|  | Yes                          | 50 | 59.5 | 111.24± 9.1   | 1.526       |      |
| Time consumed in watching animated movies              | No                           | 33 | 39.3 | 106.12± 19.38 | F= 2.247    | .089 |
|  | one hour or less             | 15 | 17.9 | 117.2± 4.1    |             |      |
|  | > one hour up to two hours   | 19 | 22.6 | 109.68± 9.3   |             |      |
|  | > two hours up to four hours | 17 | 20.2 | 108.12± 9.8   |             |      |
| Playing with smartphones, tablets or computers         | No                           | 51 | 60.7 | 113.02± 11.5  | t=          | .102 |
|  | Yes                          | 33 | 39.3 | 103.58 ± 16.1 | 1.137       |      |
| Time of Playing with smartphones, tablets or computers | No                           | 51 | 60.7 | 113.02± 11.5  | F= 2.407    | .092 |
|  | one hour or less             | 15 | 17.9 | 103.87± 10.2  |             |      |
|  | > one hour up to two hours   | 12 | 14.3 | 105± 18.2     |             |      |
|  | > two hours up to four hours | 6  | 7.1  | 100± 24.9     |             |      |

**Table (5):** Autism score variance concerning comorbid psychiatric conditions of studied children (n=84)

| Comorbid psychiatric conditions |      | Mean $\pm$<br>S.D. | Test of<br>sig | P    |
|---------------------------------|------|--------------------|----------------|------|
| Mood Difficulties               | No   | 109.80 $\pm$ 14.7  | t= .550        | .585 |
|                                 | Yes  | 108.00 $\pm$ 12.9  |                |      |
| Panic Attack                    | No   | 108.58 $\pm$ 13.5  | t= .998        | .338 |
|                                 | Yes  | 114.18 $\pm$ 17.9  |                |      |
| OCD                             | No   | 108.92 $\pm$ 15    | t= .460        | .647 |
|                                 | Yes  | 110.63 $\pm$ 11.1  |                |      |
| Tourette disorder               | No   | 108.14 $\pm$ 14.4  | t= 1.817       | .082 |
|                                 | Yes  | 114.67 $\pm$ 12.2  |                |      |
| Motor Tics                      | No   | 108 $\pm$ 15.3     | t= 1.477       | .144 |
|                                 | Yes  | 113.24 $\pm$ 9.3   |                |      |
| Vocal Tics                      | No   | 107.16             | t= 2.136       | .082 |
|                                 | Yes  | 119.20             |                |      |
| ADHD                            | No   | 107.58 $\pm$ 15.8  | t= 1.642       | .104 |
|                                 | Yes  | 112.96 $\pm$ 9.2   |                |      |
| Generalized anxiety             | No   | 106.83 $\pm$ 15.2  | t= 2.197       | .031 |
|                                 | Yes  | 113.77 $\pm$ 11    |                |      |
| Coping Disorders                | No   | 109.63 $\pm$ 14.7  | t= .497        | .620 |
|                                 | Yes  | 107.42 $\pm$ 10.8  |                |      |
| Numbers of comorbid disorders   | None | 103.37 $\pm$ 17.8  | F= 2.542       | .035 |
|                                 | 1    | 108.50 $\pm$ 9.8   |                |      |
|                                 | 2    | 116.56 $\pm$ 4.3   |                |      |
|                                 | 3    | 108.59 $\pm$ 14    |                |      |
|                                 | 4    | 119.60 $\pm$ 4.6   |                |      |
|                                 | 5    | 114.83 $\pm$ 7     |                |      |

## DISCUSSION:

Studying the severity of ASD and psychiatric comorbidity is a vital trial to identify the psychopathology of ASD. It is observed that the studied children have psychiatric

comorbidities in the form of a generalized anxiety disorder, ADHD, mood difficulties, motor tics, and OCD respectively.

It is well accepted that diagnosing ASD is hard work relating to the unique clinical and subclinical indicators among individuals (Hossain et al., 2020). Children with ASD have determined impairments in social communication and social interaction and exhibit restricted repetitive shapes of behaviors, interests, or activities. These diagnostic features of ASD place children at a greater disadvantage for developing psychiatric comorbidities (American Psychiatric Association, 2013).

The justification for this result looks clear, as children with ASD existing difficulties in social communication that may precipitate the appearance of psychiatric comorbidities such as anxiety disorders and mood disorders. Secondly, there seems to be a relation between the repetitive behaviors and the compulsive rituals of OCD and motor tics. Another reason may be the unmet needs for protective and therapeutic psychiatric services for children with ASD which remain to extend the holes between mental health problems and energies help in the same. In addition, the continued burden of psychosocial stressors across a lifetime may resulting in increasing psychiatric comorbidities over time.

These findings are closed to previous study results. Eight evaluations described the prevalence of anxiety disorders amongst individuals with ASD, which ranged from 1.47% to 54% across studies (Hollocks et al., 2019; Lai et al., 2019; Lugo Marín et al., 2018; Richa et al., 2014; Skokauskas & Gallagher, 2009; Van Steensel et al., 2011; Van Steensel & Heeman, 2017; Zahid & Upthegrove, 2017; Zoromba et al., 2017). For example, Hollock and colleagues (2019) informed the pooled prevalence of anxiety disorders and OCD as 42% and 22% among participants with ASD respectively. Another review by Van Steensel and colleagues (2011) valued anxiety disorders among 2121 adolescents and children with ASD in a meta-analytic review, that mentioned the joint prevalence as 39.6% and 34.8% in fixed and random effects models, respectively.

Another study that examined the nature of psychiatric comorbidity in persons with ASD found high rates of psychiatric comorbidity in the form of BD, OCD, psychotic spectrum disorders (Nahar, Thippeswamy, Shanker Reddy, Kishore, & Chaturvedi, 2019). In addition, Vannucchi and colleagues (2014) found the prevalence of bipolar disorders ranged from 6% to 21.4% across studies. Lugo Marin and colleagues (2018) found the prevalence of mood disorders and ADHD was 18.8% 25.7 among participants with ASD

respectively. Another review by Hudson and colleagues (2019) assessed depressive disorders in 66 research and described the present and lifetime prevalence as 12.3% and 14.4%, respectively. Also, Lai and colleagues (2019) reported the pooled prevalence of ADHD as 28% among participants with ASD.

In another way, other studies indicated very high prevalence rates of ADHD in ASD are regular with other research studies [e.g., 87% (Ames & White, 2011); 83% (Frazier et al., 2001); 53% (Sinzig, Walter, & Doepfner, 2009)]. Conversely, some research studies have reported lower values of ADHD in those with ASD (e.g., (Simonoff et al., 2008).

The current study findings show that autism scores not significantly varied according to sex, age in years, residence, birth order, relatives with a psychiatric disorder, parental consanguinity, mother education, mother occupation, father education, and father occupation. On the other hand, there was a significant difference between the score of autism and the number of siblings, children with no siblings had a higher autism score. Six years old studied children had a higher autism score than those who had five and four years old. Studied children whose mothers were employees, were lower in autism score.

These results in agreement with a study conducted to examine the influence of demographic variables on the severity of autistic symptoms in Arab children and demonstrated that the housewives described more autistic symptoms. In addition, sex, family size, father and mother education, father occupation, income, and residence were not significantly correlated with the severity of ASD (Amr, Bu Ali, et al., 2012). By contrast, this result controverts previous findings in a study that included 308 boys and 112 girls with ASD which reported that boys with ASD have higher raw means score than girls (Lundström et al., 2019).

Contrary to the current study findings, a recent study stated that the father's employment status and perceived child weight were the significant predictors of autism severity and suggested that paternal unemployment might have resulted in higher parental participation in early intervention for their children (Eow, Gan, Lim, Awang, & Mohd Shariff, 2020).

According to the current study results, there was a significant difference between a score of autism and age of the mother during pregnancy and comorbid physical complaint during pregnancy, mothers whose age during pregnancy was more than 40 years, or had a

comorbid physical complaint during pregnancy their children with ASD were higher in autism score.

There is growing doubt that ASD does not have a single cause but it is a multifaceted disorder with a triad of (communication difficulties, social impairment, repetitive behavior) that has distinct reasons but often co-occur (Freitag, 2007). These results are consistent with an Egyptian study that presented that higher parental age (mother 35 years) at birth was established in 23% of children with ASD in comparison to 9.5% of the control group and the variance was statistically significant (El-Baz, Ismael, & El-Din, 2011). In addition, other studies found that the parenteral characteristic related to an increased risk of ASD include advanced maternal age (King, Fountain, Dakhllallah, & Bearman, 2009; Kolevzon, Gross, & Reichenberg, 2007). On the other hand, Reichenberg and colleagues (2006) illustrated that advanced maternal age showed no association with ASD.

There was a significant difference between the score of autism and the age of child walking, children with ASD whose age of walking was 18 months or more were higher in autism score. In agreement with these results, a previous study documented that the age of first walking was related to the severity of the core of autistic symptoms. Even though the motor presentation is not part of the diagnostic criteria for ASD, motor deficits are shared, have been documented as an accompanying feature since the initial descriptions of the phenotype, and are suggested as a basic ASD characteristic (Reindal et al., 2019).

In addition, Lane, Harpster, and Heathcock (2012) studied in a small sample (n = 30) of children discussed for possible ASD, those who received ASD diagnosis tended to have more delays in fine and gross motor fields matched with children not diagnosed as ASD. In a prospective study of 30 children with early motor delays, as well as delayed walking the majority were found to have at least one neurodevelopment disorder.

In addition, the current study results reveal that children with ASD whose age of beginning of symptoms were late; they were higher in ASD scores. Conversely, Mishaal, Ben-Itzhak, and Zachor (2014) demonstrated that higher symptom severity of ASD reported being in children with ASD diagnosed at an early age.

The results of the current study support the findings of previous studies investigating the relationship between psychiatric comorbidity and the severity of ASD. The current study established that there was a significant difference between the score of ASD and comorbid



psychiatric disorders, an especially generalized anxiety disorder. Children with ASD experiencing comorbid generalized anxiety were higher in ASD scores. In general, children with ASD without comorbid psychiatric disorders had lower scores of ASD. Similarly, Memari et al., (2012) reported that individuals with psychiatric comorbidities would present with higher scores in ASD severity as behavioral, communication, and social variables.

In an Egyptian study, it is found that 90% of the patients were connected with one or more comorbid conditions, the incidence of more than one comorbidity commonly associated with severe level of ASD (Elbahaey et al., 2016). In addition, another study on OCD in children with ASD reported that children with ASD and experiencing OCD have higher levels of symptom severity.

In a similar vein, a study conducted in a pediatric ASD sample concluded that higher levels of ADHD and ASD severity were significantly associated with higher numbers of comorbid psychiatric disorders. Moreover, this study showed that higher levels of ADHD and ASD symptom severity were related to higher levels of somatic complaints, anxiety and depression, aggressive behavior, and thought, social, and attentional problems (Mansour et al., 2017).

## **CONCLUSIONS**

Nowadays, it is an urgent time to give more attention to psychiatric nursing interests in autism spectrum disorder (ASD). Comorbid symptoms and illnesses showed an added impediment in the affected children, need extensive consideration, and become attention for intervention. Moreover, indicators of comorbid psychiatric conditions and core symptoms of ASD may be overlapping and hard to discriminate. Well identification of such disorder and comorbid psychiatric disorders enhance the skills of psychiatric and mental health nurses to deliver adequate and optimal for those patients.

The current study explored the association between the severity of autism and demographic and developmental characteristics of children, the clinical condition of mothers during pregnancy and labor, and psychiatric comorbidity among children diagnosed with ASD to identify possible risk factors increasing the severity of autism. Implications for practice includes, Numbers of comorbid disorders related significantly to autism severity. Moreover, the severity of autism related significantly to socio-demographic, developmental characteristics and psychiatric co-morbidity. Therefore, the main recommendation of current findings is caring of comorbid psychiatric disorders that

may alleviate autistic severity. Moreover, comorbid psychiatric disorders should be considered in assessment and intervention of children with autism spectrum disorder.

#### Abbreviations

ASD: Autism spectrum disorder, ADHD: Attention deficit hyperactivity disorder, CDC: Center of disease control and prevention, ID: Intellectual disability, ODD: Oppositional defiant disorder, OCD: Obsessive-compulsive disorder, LI: language impairment, MINI-KID: Mini International Neuropsychiatric Interview for children, GARS: Gilliam Autism Rating Scale, SPSS: Stands for Statistical Product and Service Solutions, ANOVA: Analysis of variance test.

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Authors' contributions: M Z, primary investigator, design of the research, data collection and analysis and writing design, results and gathering the primary manuscript. H E, writing introduction, tool adaptation. A L, writing results. O E, data analysis, and A E, writing discussion and final reviewing the manuscript. All authors have read and approved the manuscript submission in this case.

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## شدة التوحد والأمراض النفسية المصاحبة بين الأطفال المصابين باضطراب طيف التوحد

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### الخلاصة

الخلفية: اضطراب طيف التوحد هو اضطراب في النمو العصبي والتي مازالت طبيعته غير مفهومة. الهدف: تقييم شدة التوحد والأمراض النفسية المشتركة بين الأطفال المصابين بالتوحد. طرق البحث: تم استخدام دراسة وصفية. المكان: الدراسة أجريت في العيادات الخارجية لقسم الطب النفسي بمستشفيات جامعة المنصورة. عينة الدراسة: الدراسة شملت عينة قوامها (84) طفلاً مصابين بالتوحد في مرحلة ما قبل المدرسة. الأدوات: تم جمع البيانات باستخدام ثلاث أدوات؛ الخصائص الديموغرافية والنمائية للأطفال، والحالة السريرية للأمهات أثناء الحمل، مقياس تقييم التوحد جيليم الطبعة الثانية، والمقابلة العصبية النفسية الدولية المصغرة للأطفال. النتائج: كشفت أن 72% من الأطفال الذين شملتهم الدراسة يعانون من توحد متوسط الشدة. عدد الأشقاء، وعمر الأمهات أثناء الحمل، والشكوى الجسدية المرضية للأم أثناء الحمل، وسن الطفل عند المشي، عوامل ترتبط بشكل ذي دلالة بشدة التوحد. أكثر من ثلثي (68%) الأطفال المصابين بالتوحد يعانون من اضطرابات نفسية مصاحبة. يعتبر القلق هو الأكثر شيوعاً (35.7%) يليه اضطراب نقص الانتباه وفرط الحركة (32.1%). ترتبط أعداد الاضطرابات المرضية المشتركة ارتباطاً ذو دلالة معنوية بشدة التوحد. الخلاصة: ترتبط عدد الاضطرابات المرضية المصاحبة لاضطراب طيف التوحد بشدته. علاوة على ذلك، ترتبط شدة التوحد ارتباطاً ذو دلالة معنوية بالخصائص الاجتماعية والديموغرافية والنمائية والمرضاة النفسية المشتركة. التوصيات: العناية بالاضطرابات النفسية المرضية المشتركة قد تخفف من حدة التوحد، وبالتالي يجب أخذ في الاعتبار الاضطرابات النفسية المرضية المصاحبة للتوحد عند تقييم وتقديم التدخل للأطفال المصابين بالتوحد.