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# DEPRESSION, ANXIETY AND STRESS AMONG MOTHERS OF AUTISTIC CHILDREN IN BAGHDAD: PREVALENCE AND ASSOCIATED FACTORS

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#### ABSTRACT

Background: Raising a child with autism spectrum disorder (ASD) is a stressful and challenging experience may affect all family members; however, mother being the main care- giver is at a higher risk to suffer from depression, anxiety, psychological stress and other mental or physical problems, impacting the mother's quality of life. Study objectives were to assess the prevalence of symptoms of depression, anxiety, and stress among mothers of children with (ASD) and to identify associated factors. Method: This cross-sectional study was conducted in National Center for Autism / Child Protection teaching hospital / Medical City Complex in Baghdad between 1/ September/2024 to 25 /December/ 2024. The study was conducted with a total of 210 participants. Questionnaire method was used in the study. The questionnaire included "Socio- demographic Characteristics Form" and Depression, Anxiety and Stress Scale (DASS 21). Chi square was used for analysis. The analysis of the research data was performed with SPSS 29.0 statistical program. Results: Out of the 226 distributed questionnaires, 210 mothers participated (response rate 92.9%). Results showed the overall levels of depression, anxiety and stress were 35.7, 13.8, and 40.5% respectively. Depression, anxiety and stress levels were significantly associated with age of mother, marital status, level of education and number of children (p=0.001, p=0.007, p=0.0001 and p=0.039 successively). Moreover child order, the presence of another family member with autism, child age at autism diagnosis, degree of autism and presence of other diseases show a significant association with levels of depression, anxiety and stress (p=0.011, p=0.005, p=0.010, p=0.0001 and p=0.002 in order). Conclusion: On the basis of the findings in this study, there is a significant burden of mental health challenges among mothers of children with ASD. The overall prevalence of depression, anxiety and stress was notably high. Increasing public awareness about autism and providing early detection and interventions for distressed caregivers of children with autism may be helpful in improving healthy functioning of parents and the entire family.

KEYWORDS: Depression, Anxiety, Stress, Mothers, Autism Spectrum Disorder, Baghdad.

#### INTRODUCTION

Caregiving of children diagnosed with autism spectrum disorder (ASD) is challenging due to the heterogeneous and chronic nature of autism, and broad range of possible co-occurring conditions.<sup>[1]</sup> Lack of the child's communication and socialization skills, low ability for self-caring in daily routines, and societal barriers such as inadequate school system services to address needs and lack of other support resources may challenge families raising a child with ASD.<sup>[2]</sup>

Autism spectrum disorder is a neurodevelopmental(NDD) disorder characterized by qualitative impairments in social interaction,

communication and repetitive stereotyped behavior.<sup>[3]</sup>

Children with ASD show a very high rate of comorbidity with other disorders, like being developmental retardation or intellectual disabilities and language, motoric problems and Attention deficit hyperactivity disorder (ADHD) which is the most common comorbidity in individuals with ASD (28.2%).<sup>[4]</sup>

The cause of ASD is not yet fully known. However, it is understood to result from a combination of environmental and genetic influences. Studies of monozygotic (identical) twins indicate a 76% chance that both children will develop ASD, confirming a strong

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genetic basis/heritability and a significant contribution from environmental factors.<sup>[5]</sup>

Recent estimates suggest that 1 in 36 children are diagnosed with ASD.<sup>[6]</sup> The present increase in the number of ASD diagnoses is concerning.

Raising a child who suffers from an NDD can be challenging for parents, as it might affect their relationships and social lives. Furthermore, it might require more attention and a different set of parenting skills compared with raising a typically developed child, in addition to the need to learn about health services and become an advocate for their child. All of these factors could increase the parents' risk of developing disorders, psychological such as anxiety and depression.<sup>[7,8]</sup> Families of typically developing children or those diagnosed with other disabilities such as Down syndrome, cerebral palsy, and intellectual disabilities are less stressed compared to families of children with ASD.<sup>[9,10]</sup> The consequences of having an autistic child within the family may affect all family members; however, as mothers are usually the primary caregivers, they are more likely to suffer from emotional problems and psychological stress.<sup>[11]</sup>

Mothers are reported to be more depressed owing to their need to balance between the needs of the child and household chores, and without any added help, they might feel isolated, over-burdened and dissatisfied with their life.<sup>[7]</sup>

Mothers have also reported of not getting enough sleep, lack of participation in exercises, not having regular, nutritious diet and failing to seek any medical advice for them resulting in: clinical anxiety and depression, isolation from social gatherings, social activities, higher stress and poor quality of life.<sup>[7,9,10]</sup> The expected risk of psychopathologies among the mothers of children with cognitive problems can be intensified by the socio-economic condition of the family.<sup>[10]</sup> Although the overall burden of psychiatric morbidities among these mothers is quite high and associated with poor outcomes in children, policies and practices mainly serve only the children with neurodevelopmental disorder.<sup>[1]</sup>

There were various factors (psychological, social, educational, financial and future concern) identified which caused stress in parents having children with autism but future concern of the child was a factor in which parents experienced more stress than other factors.<sup>[12]</sup>

The aims of our study were to (1) determine the prevalence of stress, anxiety, and depressive symptoms among mothers of children with ASD, and to (2) examine the associations of sociodemographic characteristics of mothers and autistic children with these outcomes.

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#### METHODOLOGY

**Study Design:** A cross-sectional study design was used. **Study Settings:** The study was carried out in National Center for Autism / Child Protection teaching hospital / Medical City Complex

Study surveys were distributed and collected between 1/ September /2024 to 25/December/ 2024.

**Study population and sample size:** Mothers of children with autism between the ages of 1–16 years visiting the targeted center were approached with a questionnaire sheet to cover the calculated required minimum sample size which is 196. The sample size was calculated by using Cochran formula, based on 95% level of significance, assuming that the prevalence of depression, anxiety and stress among mothers of autistic children is 50% with accepted margin error 7% and to overcome the non-response bias, 15% of the sample was added to the final sample size. Out of the 226 interviewed participants, 210 participated, with a response rate of (92.9%).

**Ethical consideration:** The Central ethical committee at the Arab Board of Health Specialization approval was obtained. A brief meeting was held with the administrator of human resources in the above mentioned institution to provide an explanation of the nature and purpose of the study and to obtain permission for interviewing mothers of autistic children. The researcher ensured that all the participants informed about the study's purpose and methods.

**Data Collection Tools:** A validated questionnaire including two main sections was used for collecting data. The first part included "Sociodemographic Characteristics Form" of mother and child, the second part included "Depression, Anxiety and Stress Scale (DASS 21)".

*Sociodemographic characteristics form:* This section includes questions prepared by the researchers for mother (age, marital status, job, residence, educational level and income) and for autistic child (child sex, child age, child age at time of diagnosis with autism, degree of autism, comorbidity with other disorders, child order in the family, number of brothers and sisters in the family and presence of other family member with autism).

*Depression, Anxiety and Stress Scale (DASS 21):* The Arabic version of DASS-21 is a standardized assessment tool for depression, anxiety, and stress symptoms, with each of the three domains, focused on several items. These items direct the recipient to only describe their experiences during the last week. Each domain contained 7 questions which could be scored from 0 (never), 1 (slightly), 2 (sometimes) to 3 (Always).<sup>[13]</sup> Table (1) reports the limit values for the DASS-21).

A55-21.					
Level	Depression	Anxiety	Stress		
Normal	0–9	0–7	0–14		
Mild	10–13	8–9	15-18		
Moderate	14–20	10-14	19–25		
Severe	21-27	15–19	26–33		
Extremely severe	28+	20+	34 +		

 Table 1: Limit values for individual subscale in DASS-21.

**Statistical analysis:** The collected data were coded, entered, presented, and analyzed by computer using the available data base software program statistical package of IBM SPSS-29 (IBM Statistical Packages for Social Sciences- version 29, Chicago, IL, USA). Data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimummaximum values).

The significance of difference of different percentages (qualitative data) were tested using Pearson Chi-square test ( $\Box^2$ -test) with application of Yate's correction or Fisher Exact test whenever applicable. Statistical significance was considered whenever the P value was equal or less than 0.05.<sup>[14]</sup>

#### RESULTS

#### **Demographic Characteristics of the Participants** Mother-related factors

Out of the 226 interviewed mothers, 210 participated (response rate 92.9%). The age of (46.7%) of them

ranged between 25 and 34 years whereas those of 40 years and more represent (20.5%). Married participants were (72.9%) and (10.5%) were separated. More than two thirds (71.4) of the respondents were housewives. The majority of participants(87.1%) lived in urban areas. However, mothers' education was different, (28.6) completed primary education and only (18.6%) held university degrees and most of them (65.7%) were of middle –income families.

#### Child-related factors

Most of the children (67.1%) were male The mean age of the children with ASD was  $5.1 \pm 2.2$  years, while the mean age at time of diagnosis with autism was  $2.3\pm0.8$  years. More than one-thirds (38.6%) of the children were with  $2^{nd}$  degree autism which requiring substantial support and (28.6%) had  $3^{rd}$  degree autism which requiring two-thirds of children had comorbidity with ADHD. A total of 34.3% of children were the  $1^{st}$  child in the family. About one-quarter (25.7%) of mother indicated the presence of other family member with autism.

Mother-related factors		No.	%
Age (years)	<20years	3	1.4
	2024	30	14.3
	2529	54	25.7
	3034	44	21.0
	3539	36	17.1
	=>40years	43	20.5
	Mean±SD (Range)	32.1±7.4	(17-47)
Marital status	Married	153	72.9
	Separated	22	10.5
	Divorced	21	10.0
	Widowed	14	6.7
Occupation	Governmental employee	51	24.3
	Private employee	9	4.3
	Housewife	150	71.4
	Student	-	-
	Retired	-	-
Number of children	<b>≤</b> 2	102	48.6
Number of children	>2	108	51.4
Residence	Urban	183	87.1
	Rural	27	12.9
Level of education	Illiterate	6	2.9
	Read & Write	15	7.1
	Primary school	60	28.6
	Intermediate school	54	25.7
	Secondary school	23	11.0
	Institute	13	6.2

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Tuble It Demographic characteristics of the staated participants (mother related factors).
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	College & Higher	39	18.6
Average monthly income	Good	18	8.6
	Middle	138	65.7
	Poor	54	25.7

# Table 3: Demographic characteristics of the studied participants (child-related factors).

Chid-related factors		No.	%
Child gov	Mala Famala	141	67.1
Ciniu sex	Male Female	69	32.9
		1	0.5
		10	4.8
Child age (years)	One Two Three Four	50	23.8
Clinu age (years)	Five years & more Mean±SD (Range)	48	22.9
		101	48.1
		5.1±2.2	(1y9m-13y)
		1	0.5
	< One year One	36	17.1
Child age at diagnosis with autism	Two Three Four	111	52.9
	Five veer	49	23.3
	Moon+SD (Pango)	9	4.3
	Wean±SD (Range)	4	1.9
		2.3±0.8	(8m-5y)
	I: Requiring Support	36	17.1
Degree of autism	II: Requiring Substantial Support	81	38.6
	III: Requiring Very Substantial Support	60	28.6
	IV: Requiring Intensive Support	33	15.7
Child have other diseases	Ves No	138	65.7
		72	34.3
Child order in the family		72	34.3
		63	30.0
	First Second Third Fourth	36	17.1
	Fifth Sixth	30	14.3
		3	1.4
		6	2.9
Other family member with	Yes	54	25.7
autism	No	156	74.3

Prevalence of depression, anxiety and stress symptoms

severe levels of depression, anxiety and stress were 35.7, 13.8, and 40.5% respectively (figure 1).

Overall, the combined prevalence for mild to extremely





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# Depression, Anxiety and Stress levels and studied variables

#### 1. Maternal-related factors

Maternal age is significantly associated with depression, anxiety, and stress (p = 0.001). Younger caregivers (<25 years) report higher levels of depression, anxiety and stress.

Marital status is significantly associated with depression, anxiety, and stress (p = 0.007). Separated, divorced, or widowed caregivers experience higher level of depression, anxiety and stress compared to married caregivers.

Level of education shows a significant association with depression, anxiety, and stress (p = 0.0001). Lower educational levels (primary school or below) associated with higher level of depression and stress.

Number of children is significantly associated with depression, anxiety and stress (p = 0.039). Mothers with more than two children are significantly more stressed.

Although, there is no significant association between maternal occupation, economic status and residence, housewives report higher levels of depression, anxiety and stress compared to employed mothers and mothers from lower-income families experience higher levels of stress and depression.

#### 2. Child Order and Family Composition

There is a significant association between child order in the family and maternal depression, anxiety, and stress (p = 0.011). Mothers of first-born children are more likely to experience depression compared to later-born children.

The presence of another family member with autism is significantly associated with depression, anxiety, and stress (p = 0.005), indicating that having a sibling or relative with autism may increase psychological distress.

#### 3. Autism-Related Factors

Child age at autism diagnosis is significantly associated with depression, anxiety, and stress (p = 0.010). Caregivers of children diagnosed at an older age experience higher psychological distress.

Degree of autism shows a significant association with depression, anxiety, and stress (p = 0.0001). More severe autism (Level III and IV) associated with higher maternal distress.

Presence of other diseases in the child is significantly associated with depression, anxiety, and stress (p = 0.002), suggesting that comorbid conditions increase psychological distress. Table (4) and (5) details these results.

		Depression Anxiety Stress Scale-Short Form (DASS-21)								
		Normal Depression Anxiety Stress				P value				
		No.	%	No.	%	No.	%	No.	%	
	<25years	3	14.3	15	20.0	3	10.3	12	14.1	0.001*
	2529	3	14.3	17	22.7	13	44.8	21	24.7	
Age (years)	3034	3	14.3	24	32.0	8	27.6	9	10.6	
	3539	6	28.6	12	16.0	2	6.9	16	18.8	
	=>40years	6	28.6	7	9.3	3	10.3	27	31.8	
Marrital status	Married	21	100	55	73.3	23	79.3	54	63.5	0.007*
Warital status	Separated/Div./Wid.	-	-	20	26.7	6	20.7	31	36.5	
	Govern. employee	7	33.3	13	17.3	11	37.9	20	23.5	0.064
Occupation	Private employee	-	-	1	1.3	1	3.4	7	8.2	
	Housewife	14	66.7	61	81.3	17	58.6	58	68.2	
Level of education	Illiterate/ Read & write	-	-	19	20.	-	-	2	2.4	0.0001*
	Primary school	-	-	24	32.0	12	41.4	24	28.2	
	Intermediate school	9	42.9	20	26.7	3	10.3	22	25.9	
	Secondary school	3	14.3	6	8.0	3	10.3	11	12.9	
	Institute	3	14.3	-	-	6	20.7	4	4.7	
	College & Higher	6	28.6	6	8.0	5	17.2	22	25.9	
No. of children	<=2 children	12	57.1	45	60.0	12	41.4	33	38.8	0.039*
in the family	>2 children	9	42.9	30	40.0	17	58.6	52	61.2	
Average monthly income	Good	3	14.3	3	4.0	3	10.3	9	10.6	0.053
	Middle	18	85.7	51	68.0	20	69.0	49	57.6	
	Poor	-	-	21	28.0	6	20.7	27	31.8	
Desidence	Urban	21	100	63	84.0	26	89.7	73	85.9	0.257
Residence	Rural	-	-	12	16.0	3	10.3	12	14.1	
*Significant difference between percentages using Pearson Chi-square test ( $c^2$ -test) at 0.05 level.							-			

# Table 4: Association between demographic (mother-related) criteria with level of Depression, Anxiety and Stress.

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		Depression Anxiety Stress Scale-Short Form (DASS-21)								
		Normal Depression			Anxiety		Stress		P value	
		No.	%	No.	%	No.	%	No.	%	
01.111	Male	12	57.1	51	68.0	18	62.1	60	70.6	0.621
Cilliu sex	Female	9	42.9	24	32.0	11	37.9	25	29.4	
	Two & less	-	-	3	4.0	2	6.9	6	7.1	0.081
Child aga (yaara)	Three	3	14.3	23	30.7	3	10.3	21	24.7	
Cilliu age (years)	Four	9	42.9	13	17.3	11	37.9	15	17.6	
	Five years & more	9	42.9	36	48.0	13	44.8	43	50.6	
Child ago	One & less	-	-	9	12.0	11	37.9	17	20.0	0.010*
Child age at diagnosis with auti sm	Two	10	47.6	42	56.0	9	31.0	50	58.8	
	Three	9	42.9	19	25.3	7	24.1	14	16.5	
	Four years & more	2	9.5	5	6.7	2	6.9	4	4.7	
Degree of autism	Level I	9	42.9	9	12.0	-	-	18	21.2	0.0001*
	Level II	9	42.9	27	36.0	18	62.1	27	31.8	
	Level III	-	-	21	28.0	11	37.9	28	32.9	
	Level IV	3	14.3	18	24.0	-	-	12	14.1	
Child have other disea ses	Yes	21	100	45	60.0	15	51.7	57	67.1	0.002*
	No	-	-	30	40.0	14	48.3	28	32.9	
Child order in the fam ily	First	3	14.3	36	48.0	6	20.7	27	31.8	0.011*
	Second	9	42.9	21	28.0	12	41.4	21	24.7	
	Third	3	14.3	6	8.0	8	27.6	19	22.4	
	Fourth & more	6	28.6	12	16.0	3	10.3	18	21.1	
Other family member	Yes	3	14.3	15	20.0	15	51.7	21	24.7	0.005*
with autism	No	18	85.7	60	80.0	14	48.3	64	75.3	
*Significant difference between percentages using Pearson Chi-square test ( $c^2$ -test) at 0.05 level.										

Table 5: Association between demographic (child-related) criteria with level of maternal Depression, Anxiety and Stress.

#### DISCUSSION

The abilities and needs of autistic people vary and can evolve over time. While some people with autism can live independently, others have severe disabilities and require life-long care and support<sup>[15]</sup>, which implies a high workload and ongoing concern for the caregiver.

This study investigated the prevalence of depression, anxiety, and stress symptoms among mothers of children with autism spectrum disorder (ASD) in Baghdad, Iraq, and identified associated sociodemographic and child-related factors. The findings revealed a notable prevalence of psychological distress, with 35.7% of mothers experiencing depression, 13.8% anxiety, and 40.5% stress (ranging from mild to extremely severe levels). These results underscore the significant emotional burden faced by mothers as primary caregivers of children with ASD and align with global evidence highlighting the psychological toll of raising a child with a neurodevelopmental disorder.

The prevalence of depression (35.7%) in this study is comparable to findings from similar research in nearby countries. For instance, a 2022 study in Saudi Arabia by Alghamdi et al. reported a severe depression rate of 30.8% among mothers of autistic children using the DASS-21, with an overall prevalence (mild to severe) approaching 60% when including milder cases.<sup>[16]</sup> Similarly, a 2023 study in Bangladesh by Islam et al. found that 48.6% of mothers of children with ASD

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experienced depression, assessed via the Patient Health Questionnaire-9 (PHQ- 9).<sup>[17]</sup> The lower anxiety rate (13.8%) in our study contrasts sharply with regional data, such as a 2021 study in Saudi Arabia by Alhuzimi, which reported a 49.2% prevalence of anxiety among mothers during the COVID-19 pandemic, measured with the Generalized Anxiety Disorder-7 (GAD-7) scale.<sup>[18]</sup> Stress prevalence (40.5%) aligns more closely with a 2023 study in Iran by Mohammadi et al., which noted a 44% stress rate among mothers using the Perceived Stress Scale (PSS).<sup>[19]</sup> These differences may stem from variations in assessment tools, sample characteristics, or contextual stressors like the lingering effects of the pandemic in earlier studies, cultural attitudes toward mental health, or access to support systems.

Globally, recent studies show a broader range of prevalence. A 2024 study in China by Chen et al. reported depression and anxiety rates of 52.3% and 47.1%, respectively, among mothers of autistic children, using the DASS-21, far exceeding our findings.<sup>[20]</sup> In contrast, a 2023 U.S.-based study by Ekas et al. found lower rates of depression (28%) and anxiety (19%) among mothers, assessed with the Hospital Anxiety and Depression Scale (HADS), possibly reflecting better access to mental health resources.<sup>[21]</sup> The stress prevalence in our study (40.5%) is consist tent with a 2022 Australian study by Whitehead et al., which reported a 42% rate using the Parenting Stress Index.<sup>[22]</sup> The lower anxiety rate in our study (13.8%) compared to

these findings could be attributed to underreporting due to social stigma or the specific coping mechanisms employed by Iraqi mothers, which warrant further exploration.

The significant association between maternal age and psychological distress (p = 0.001), with younger mothers (<25 years) reporting higher levels of depression, anxiety, and stress, is consistent with regional and international findings. A study in Jordan(2023) by Al-Jaafreh et al., where mothers under 30 showed elevated anxiety (55%) and depression (40%) using the DASS-42.<sup>[23]</sup> This may reflect limited life experience or fewer coping resources among younger caregivers.

Older mothers ( $\geq$ 40 years) in our study exhibited higher stress, consistent with a 2021 Turkish study by Yılmaz et al., which linked prolonged caregiving to chronic stress.<sup>[24]</sup>

Marital status also emerged as a significant factor (p = 0.007), with separated, divorced, or widowed mothers experiencing higher distress levels than married mothers. This finding echoes research in Turkey by Kütük et al. (2021), which reported that single mothers of autistic children faced increased depression and stress due to the absence of spousal support<sup>[25]</sup>, a finding also noted in a 2022 Egyptian study by Elbahnasawy et al.<sup>[26]</sup> and in a 2023 Saudi study by Alsaad et al.<sup>[27]</sup> In the Iraqi context, where familial and social support networks are culturally significant, the loss of a partner may exacerbate feelings of isolation and overburden.

Education level (p = 0.0001) and number of children (p = 0.039) were also significantly associated with psychological outcomes. Mothers with lower education (primary school or below) and those with more than two children reported higher distress levels. These findings align with a study in Lebanon by Obeid et al. (2020), which linked lower maternal education to increased stress, possibly due to limited access to information about ASD or fewer adaptive coping strategies.<sup>[28]</sup> The association with the number of children mirrors results from an UAE study by Alneyadi et al. (2023), where larger family sizes correlated with heightened maternal stress, reflecting the added caregiving demands.<sup>[29]</sup>

## **Child-Related Factors**

Child order (p = 0.011) and the presence of another family member with autism (p= 0.005) significantly influenced maternal distress. Mothers of first-born autistic children reported higher depression, a finding consistent with a study in Qatar by Al-Kandari et al. (2022), which suggested that the initial shock and adjustment to an ASD diagnosis in a first child may intensify emotional strain.<sup>[30]</sup> The increased distress linked to additional family members with autism aligns with a 2023 Brazilian study by Santiago et al., which found a 1.8 fold increase in depression risk in such families, indicating that cumulative caregiving

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responsibilities amplify psychological burden.<sup>[31]</sup>

Autism severity (p = 0.0001) and the presence of comorbidities (p = 0.002) were strongly associated with higher maternal distress, aligning with global trends. A study in the United Arab Emirates by Almansour et al. (2020) found that mothers of children with severe ASD (Level III or IV) and comorbidities like ADHD experienced significantly higher stress and depression.<sup>[32]</sup>

The association between child age at diagnosis and maternal distress (p = 0.010) is noteworthy. Mothers of children diagnosed at older ages reported greater psychological distress, possibly due to prolonged uncertainty or delayed access to interventions. This contrasts with a 2022 Omani study by Al-Mamari et al., where early diagnosis (before age 3) correlated with initial high stress (50%) but lower long-term distress due to early interventions.<sup>[33]</sup>

#### Limitations

Limitations include the cross-sectional design, which precludes causality inference, and the reliance on interview-reported data, which may be influenced by recall bias or stigma. The study's focus on a single center in Baghdad limits generalizability to rural or other urban Iraqi populations. Future research should employ longitudinal designs and include fathers or other caregivers to provide a comprehensive view of family dynamics.

#### CONCLUSION

In conclusion, this study reveals a substantial prevalence of depression, anxiety, and stress among mothers of autistic children in Baghdad, with significant associations to maternal and child-related factors. While broadly consistent with regional and global findings, the results reflect unique challenges tied to Iraq's socioeconomic and healthcare landscape. Addressing these issues requires a multi-faceted approach to support maternal mental health and enhance family well- being.

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