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PARENTS KNOWLEDGE ABOUT AUTISM SPECTRUM DISORDER AMONG A SAMPLE OF PRIMARY HEALTH CARE CENTERS OF BAGHDAD/ AL-KHARK 2024

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ABSTRACT

Background: Autism spectrum disorder (ASD) is a neurodevelopmental condition that primarily affects young children, impacting their social interaction, communication, and behavior. Early diagnosis plays a crucial role in improving outcomes, supporting families, and enabling timely access to appropriate interventions. It can enhance social integration and promote greater independence in adulthood. Objective: The study aimed to assess parents' knowledge about ASD and examine the association between parental sociodemographic factors and their knowledge level. Subjects and Methods: A cross-sectional study was carried out in Baghdad/Al-Khark from March 1 to August 31, 2024. A total of 400 parents attending primary health care centers were selected using a convenient sampling method. Data collection was conducted through a structured questionnaire divided into two sections: one assessing parental knowledge about ASD and the other covering sociodemographic variables. Statistical analysis was performed using the Chi-square test, with a p-value of <0.05 considered statistically significant. Results: The most represented age group was 30-39 years (43.75%), and the majority were females (78.75%). Parents with a bachelor's degree or higher accounted for 92% of the sample and showed higher levels of knowledge (72.25%). However, no statistically significant association was found between knowledge level and variables such as age, gender, occupation, or education. Overall, most parents demonstrated fair knowledge about ASD. Conclusion: Parents generally had a fair level of knowledge about ASD, with better understanding noted among younger, educated, and employed females. More educational efforts are needed, particularly targeting males and those with lower education, to improve awareness of ASD's etiology, symptoms, assessment, and diagnosis.

KEYWORDS: Knowledge, Autism, Spectrum, Disorder, Primary Health Care Centers.

INTRODUCTION

Autism spectrum disorder (ASD) is a highly heterogeneous neurodevelopmental condition characterized by persistent deficits in social communication and interaction, alongside restricted interests and repetitive behaviors.^[1] Children with ASD typically display poor social-emotional reciprocity, limited non-verbal communication, and difficulties in forming and sustaining social relationships. Other common features include sensory sensitivity, anxiety, depression, self-injury, impulsivity, and inattention.^[2] These challenges often continue into adulthood, contributing to mental health issues, educational and occupational difficulties, and a reduced quality of life.^[3] The concept of autism has evolved significantly since the early 20th century, initially linked to schizophrenia by Eugen Bleuler. It wasn't until the 1940s that autism was recognized as a separate condition in children, and

formally included in the DSM-III in 1980.^[4] Today, autism is better understood as a spectrum rather than a singular disorder. Epidemiological data show a global increase in ASD prevalence, with recent CDC estimates indicating 1 in 36 children in the U.S. are diagnosed with ASD.^[5] It affects all racial and socioeconomic groups, though boys are four times more likely to be diagnosed than girls. Globally, about 28.3 million people live with ASD.^[6] The rising prevalence may be attributed to greater awareness, broader diagnostic criteria, and improved screening.^[7] In Iraq, WHO data from 2019 estimated around 300 cases per 100,000 people, with current figures suggesting 89.4 per 10,000 childrenapproximately 72,000 individuals.^[8] ASD is believed to result from a complex interaction of genetic and environmental factors. While syndromic ASD is linked to known genetic syndromes such as Rett and Fragile X, non-syndromic forms involve polygenic influences and

environmental exposures.^[9] Twin and family studies suggest heritability rates between 40% and 90%.^[10] Specific genetic markers like GABRG3 SNP rs208129 have been identified among Iraqi Arabs as predictive of ASD.^[11] ASD diagnosis is based on DSM-5 criteria, emphasizing persistent deficits in social communication and restricted, repetitive behavior patterns.^[12] Diagnosis remains challenging due to heterogeneity and long wait times.^[13] Early screening—recommended at 18 and 24 months-can significantly improve developmental outcomes.^[14] Tools like the M-CHAT-R/F and STAT are commonly used in early detection.^[15] Management of ASD includes behavioral therapies such as Applied Behavior Analysis (ABA), cognitive behavioral therapy (CBT), occupational therapy, and medication for comorbid symptoms.^[16] There is no cure, but interventions can greatly enhance functioning and quality of life. Parental involvement is critical, both in early recognition and ongoing care. Educated and supported parents contribute significantly to therapy success and child development outcomes.^[17] Therefore, strengthening parent knowledge and engagement is vital for improving early diagnosis and long-term prognosis in ASD. Objectives of the study to assess the parent's knowledge about Autism spectrum disorder and to determine the association of sociodemographic data with the parent's knowledge about autism spectrum disorder.

METHOD

This cross-sectional study with analytic elements was conducted over a ten-month period, from February 1 to December 1, 2024, with data collection occurring between March 1 and August 31, 2024. The research was carried out in Baghdad within the Al-Karkh Health Directorate, which comprises 12 primary healthcare sectors. Three sectors—Abu Ghraib, Al Eadl, and Al Kharkh—were randomly selected using a lottery method. These sectors collectively contain 35 primary healthcare centers (PHCCs), from which 10 (approximately 30%) were also randomly selected for inclusion in the study. The target population consisted of adult parents (aged ≥ 18 years) attending any of the selected PHCCs. Parents with an autistic child were excluded to avoid bias. The required sample size was calculated using the standard formula for cross-sectional study^[18], resulting in a minimum of 384 participants. To account for nonresponses and improve reliability, the sample was increased to 400, with 40 participants recruited from each PHCC. Data collection was done through structured, face-to-face interviews using a validated and Arabic-translated questionnaire reviewed by two family medicine consultants, one psychiatric consultant, and the research supervisor. The tool comprised two main parts: sociodemographic variables (age, gender, occupation, education), and 28 knowledge-based questions about ASD covering etiology, symptoms, diagnosis, treatment, and prognosis. Responses were scored (1 for correct, 0 for incorrect/unknown), with total scores categorized as poor (<50%), fair (50–75%), or good (>75%) knowledge.^[19] A pilot study was conducted on 10 parents to assess the questionnaire's clarity and logistics; no significant revisions were needed. These participants were excluded from the main analysis. Ethical approval was granted by the Medical Committee at Al-Nahrain College of Medicine and the Al-Karkh Health Directorate. Verbal informed consent was obtained from all participants. Data analysis was conducted using SPSS version 27. Frequencies and percentages described categorical variables. Chi-square test examined associations between categorical data, while t-tests and Mann-Whitney U tests were used for comparing group means, depending on data normality. A p-value ≤ 0.05 was considered statistically significant.

RESULTS

In (**Table 1**), it was observed that most participants were aged 30-39 years (43.75%) followed by the 18-29 age group (29.75%). A majority of the participants were female (78.75%). In terms of education, a high proportion had a Bachelor's degree or higher (72.25%). Occupation-wise, the largest group was Governmental employed (54%), with 34.25% non-Governmental employed. 50% of them have fair knowledge and 45% have poor knowledge while only 5% have good knowledge. As in fig 1.

| Table (| 1): Sociodemogr | aphic character | ristics of parents. |
|---------|-----------------|-----------------|---------------------|
|---------|-----------------|-----------------|---------------------|

| Variables | | No. [total = 400] | % |
|--------------------------|--|-------------------|-------|
| | 18-29 | 119 | 29.75 |
| A go (voorg) | 30-39 | 175 | 43.75 |
| Age (years) | 40-49 | 70 | 17.5 |
| | \geq 50 | 36 | 9 |
| Sov | Male | 85 | 21.25 |
| Sex | Female | 315 | 78.75 |
| | Primary | 44 | 11 |
| Education | Secondary | 67 | 16.75 |
| Bachelors/ Higher degree | | 289 | 72.25 |
| | Governmental employed | 216 | 54 |
| Occupation | Non-Governmental employed | 137 | 34.25 |
| | Others: house wife, student, retired from work | 47 | 11.75 |
| Knowledge | Governmental employed | 216 | 54 |

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| Others: house wife, student, retired from work 47 11.75 | Non-Governmental employed | 137 | 34.25 |
|---|--|-----|-------|
| | Others: house wife, student, retired from work | 47 | 11.75 |



Figure (1): Distribution of parent knowledge level regarding autism spectrum disorder.

In (**Table 2**), the results showed that the understanding of ASD's etiology and prevalence was varied among parents. While 23.75% correctly knew that ASD is not caused by a lack of motherly warmth, only 20.5% did not

believed that the use of electronic devices contributed to the disorder. Knowledge about ASD being common in boys (47%) and associated with genetics arena (44.5%).

Table (2): Response of participant's parent regarding knowledge about Etiology and prevalence of autism spectrum disorder

| Knowledge statements about Etiology and Provelence | | Correctly Answered | |
|--|---|--------------------|-------|
| KIIU | Knowledge statements about Etiology and Trevalence | | 100% |
| 1 | The prevalence rate of autism spectrum disorder in world is 1-2% | 137 | 34.25 |
| 2 | Advanced paternal age is a risk factor for autism spectrum disorder | 160 | 40 |
| 3 | Children who have a brother or sister with autism spectrum disorder are more likely to develop the disorder | 196 | 49 |
| 4 | Boys are four times as likely than girls to Have autism spectrum disorder | 188 | 47 |
| 5 | Vaccines can cause autism spectrum disorder | 234 | 58.5 |
| 6 | Autism spectrum disorder is caused by a lack of motherly warmth | 95 | 23.75 |
| 7 | Children who use electronic phones and watch on smart TV and tablets are one of the causes of having | 87 | 20.5 |
| / | autism spectrum disorder | 02 | 20.5 |
| 8 | Autism is genetics causes and consanguineous marriage | 178 | 44.5 |
| 9 | Metal poisoning can cause autism spectrum disorder | 96 | 24 |
| 10 | Pregnancy and Lobar issue can cause autism spectrum disorder | 148 | 37 |

In (Table 3), knowledge of ASD symptoms and behaviors showed that 31.25% did not believed symptoms do not manifest before the age of 2 years. ASD child May not play with toys the way they are Intended 71.25% choice the wright answer and 75.5%

correctly answered regarded the statement five Individuals with autism spectrum disorder suffer from resistance to changing routine and attachment to strange things and unfamiliar.

Table (3): Responses of participant parents regarding knowledge about symptoms and associated behaviors of autism spectrum disorder

| Knowledge statements about Symptoms and Debayions | | Correctly Answered | |
|---|---|---------------------------|-------|
| KIIO | Knowledge statements about Symptoms and Denaviors | | 100% |
| 1 | Individuals with autism spectrum disorder may be uncoordinated or clumsy | 112 | 28 |
| 2 | Symptoms of autism spectrum disorder do not appear before the age of 2 years | 125 | 31.25 |
| 3 | Children with autism spectrum disorder may not play with toys the way they are Intended | 285 | 71.25 |
| 4 | Many individuals with autism spectrum disorder don't response to his name when he is called | 234 | 58.5 |
| 5 | Individuals with autism spectrum disorder suffer from resistance to changing routine and attachment | 302 | 75.5 |
| 5 | to strange things and unfamiliar | 0.02 | 10.0 |

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In (Table 4), when assessing knowledge of ASD diagnosis, 40.25% correctly answered that the disorder could not only be diagnosed after the age of However, 31% do not believe that brain imaging can diagnose ASD, and only 29% knowing that not only a medical

doctor could diagnose it. In statement of ASD can progress to adulthood 75.25% have true answered, and in statement OD that ASD diagnosis based on behavioral observations and parent interviews 78.25% truly answered.

Table (4): Response of participating parents regarding knowledge about Assessment and Diagnosis of Autism spectrum disorder

| 12 | Knowledge statements about Assessment and Diagnosis | | Correctly Answered | |
|-----|---|-----|---------------------------|--|
| n | | | 100% | |
| 1 | A diagnosis of autism spectrum disorder can only be made by a medical doctor | 116 | 29 | |
| 2 | Autism spectrum disorder can be diagnosed with brain imaging | 124 | 31 | |
| (1) | Diagnosis of ASD depends on conducting some tests and questionnaires specific to children | 64 | 16 | |
| 4 | It's possible for Autism spectrum disorder to progress in adulthood | 301 | 75.25 | |
| 5 | Autism spectrum disorder can't be Diagnosed after the age of 4 years | 161 | 40.25 | |
| 6 | Diagnosis of autism spectrum disorder is primarily based on behavioral observations and parent interviews | 313 | 78.25 | |

In (Table 5), for ASD treatment, 67.75% understood that factors like age and IQ impact treatment success, and 81.75% were aware of the benefits of social and

behavioral skills training. Conversely, (23%) correctly did not believed that dietary restrictions could be an effective treatment.

Table (5): Responses of participant parent regarding knowledge about treatment of autism spectrum disorder.

| Knowledge statements about Treatment | | Correctly Answered | |
|--------------------------------------|--|--------------------|--------------|
| KIIO | Knowledge statements about 11 eatment | | 100% |
| 1 | Restricting certain foods (e.g., gluten) is an Effective treatment for autism spectrum disorder | 94 | 23.5 |
| 2 | Intellectual quotient (i.e., IQ) and age affect treatment success for children with autism spectrum disorder | 271 | 67.75 |
| 2 | Social and behavioral skills training is an effective treatment for some individuals with autism spectrum | 377 | 81 75 |
| 5 | disorder | 541 | 01.75 |
| 4 | There is no beneficial medication available for individuals with autism spectrum disorder | 268 | 67 |
| 5 | Auditory and hearing tests are important part in the treatment | 280 | 70 |

In (Table 6), awareness about the prognosis and outcomes of ASD varied, with 71.5% recognizing that independent living is often challenging for individuals with ASD. Meanwhile, 55.25% did not thought that ASD

symptoms remain unchanged throughout life. In statement of that 70% of ASD have an additional mental health problem 63% correctly answered.

Table (6): Responses of participant parent regarding knowledge about Outcomes and Prognosis of autism spectrum disorder.

| Vnewladze statements about Outcomes and Prognosis | | Correctly Answered | | |
|---|---|---------------------------|-------|--|
| KIIU | Knowledge statements about Outcomes and Frognosis | | 100% | |
| 1 | Up to 70% of individuals with autism spectrum disorder also have an additional Mental health diagnosis (e.g., anxiety, mental retardation and hyper activity) | 252 | 63 | |
| 2 | Many individuals with autism spectrum disorder have difficulties living and working Independently in adulthood | 286 | 71.5 | |
| 3 | Symptoms of autism spectrum disorder do not change throughout an individual's life | 221 | 55.25 | |
| 4 | Autism spectrum disorder only affects Children | 183 | 45.75 | |

In (Table 7), when comparing sociodemographic factors with knowledge levels, parents with bachelor's and higher degree education levels (92.85%) were more

likely to have high knowledge. No significant associations were found for age, sex, occupation or education.

Table (3.7): Association of parents' sociodemographic characteristics and their knowledge level about autism spectrum disorder.

| Variables | | Low knowledge [n = 172] | | moderate knowledge [n = 200] | | High knowledge [n=28] | | P-Value* |
|-------------|-------|----------------------------|-------|---------------------------------|-------|--------------------------|-------|----------|
| | | No. | % | No. | % | No. | % | |
| Age (years) | 18-29 | 57 | 47.90 | 61 | 51.26 | 1 | 0.84 | |
| | 30-39 | 57 | 32.57 | 97 | 55.43 | 21 | 12.00 | 0.25 |
| | 40-49 | 32 | 45.71 | 32 | 45.71 | 6 | 8.57 | |

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| | ≥ 50 | 26 | 72.22 | 10 | 27.78 | 0 | 0.00 | |
|------------|---------------------------|-----|-------|-----|-------|----|-------|------|
| Sov | Male | 41 | 48.24 | 40 | 47.06 | 4 | 4.71 | 0.14 |
| Sex | Female | 131 | 41.59 | 160 | 50.79 | 24 | 7.62 | 0.14 |
| | Primary | 30 | 68.18 | 14 | 31.82 | 0 | 0.00 | |
| Education | Secondary | 37 | 55.22 | 28 | 41.79 | 2 | 2.99 | 0.09 |
| | Bachelors/Higher Degree | 105 | 36.33 | 158 | 54.67 | 26 | 9.00 | |
| | Governmental Employed | 77 | 35,65 | 116 | 53.70 | 23 | 10.65 | |
| Occupation | Non-Governmental Employed | 72 | 52.55 | 60 | 43.80 | 5 | 3.65 | 0.22 |
| - | Others | 23 | 48.94 | 24 | 51.06 | 0 | 0.00 | |

* Chi-square test was used.

DISCUSSION

Parents' awareness and knowledge about Autism Spectrum Disorder (ASD) play a crucial role in the early recognition and intervention of the condition, which is associated with improved developmental outcomes.^[20,21] In this study, the majority of participants were women, accounting for over three-quarters of the sample. This aligns with a study in Najaf by Abd Alkazam et al. (2022), which also reported higher female participation^[22], and contrasts with findings from Saudi Arabia by A. Mohammed et al. (2024), where male participation was higher.^[21] This gender difference may reflect that women, particularly mothers, are often the primary caregivers and more frequently present at primary health care centers. Participants with a Bachelor's degree or higher represented the majority. consistent with the study by Yahyaa et al. (2024) in Ramadi.^[23] Iraq's adult literacy rate of 88.4% ^[24] supports the likelihood of educated participants in urban settings.

Regarding knowledge of etiology and prevalence, more than half of the parents correctly rejected the myth linking vaccines to autism, in line with studies by Gabi's et al. (2022) and Hasan et al. (2020), which emphasized the lack of scientific evidence connecting vaccines and ASD.^[25,26] However, a significant proportion still lacked clarity on other misconceptions, such as the use of electronic devices or maternal coldness causing autism. Only a minority correctly rejected these false beliefs, echoing findings from studies in Al-Nasiriya and Hilla.^[26,27] On symptoms and behaviors, three-quarters recognized difficulties in routine changes and unusual attachments as signs of ASD, reflecting global understanding described by Sathyaprasad et al. (2022).^[28] Yet, knowledge about the early appearance of symptoms before age two remained low, a trend similarly observed in studies by Yahyaa et al. (2024) and Hasan et al. (2020).^[23,26] More than half understood that children with ASD may not respond when called, confirming previous findings. Parents showed moderate knowledge regarding assessment and diagnosis, with over three-quarters acknowledging that ASD diagnosis is primarily based on behavioral observations and parent interviews, consistent with Lemler et al. (2024) and Makino et al. (2021).^[29,30] However, only half were aware that diagnosis could occur before age four, and few knew that specific diagnostic tools and trained medical personnel are essential, echoing diagnostic access issues reported in African contexts by Aderinto (2023).^[31] Concerning

treatment, the majority recognized the value of behavioral interventions, such as social and behavioral skills training, aligning with Park et al. (2023).^[32] About two-thirds were aware that medications could help manage ASD-related symptoms, reflecting a growing public understanding, supported by studies in Iraq and Arabia.^[33,34] However, views on dietary Saudi interventions gluten-free diets remained like inconclusive, as seen in the systematic review by Reissmann et al. (2020).^[35] In terms of outcomes and prognosis, most parents acknowledged the challenges individuals with ASD face in achieving independence and employment, in line with findings by Anderson et al. (2021) and Lugo-Marin et al. (2019) regarding cooccurring mental health issues.^[36,37] Overall, 50% of parents in this study had fair knowledge, a result that aligns with other Iraqi studies such as those in Hilla and Najaf^[33,26], and somewhat higher than knowledge levels reported in China and France.^[38] Knowledge was best among females, employed individuals, and those with higher education, but the associations were not statistically significant-similar to patterns noted by Rosenbrock et al. (2021) and AlAlmaei et al. (2023). $[^{34,21}]$ These findings underline the need for community-based educational efforts, especially targeting less educated and male populations, to enhance early recognition and support for children with ASD.

CONCLUSION

The research revealed that the majority of parents in Bagdad city/Al-Khark possess an adequate understanding of autism. The most comprehensive knowledge was observed among younger individuals, females, parents with a high level of education, and employed individuals. However, there was no significant association between age, sex, education, or occupation.

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