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Original Research Article

Knowledge of Autism Spectrum Disorder among Health Care Professionals in Al-Diwaniyah, Iraq: A Cross-Sectional Study

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Abstract: ***Background*:** Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition for which early diagnosis is critical to ensure timely intervention and improved outcomes. Health care professionals, particularly physicians and nurses, play a key role in the early identification and referral of children with ASD. However, limited data are available regarding ASD-related knowledge among health care workers in Iraq. ***Objective***: This study aimed to determine the level of knowledge regarding ASD among health care professionals working in training hospitals in Al-Diwaniyah, Iraq, and to examine factors associated with knowledge levels. ***Methods*:** A descriptive, cross-sectional study was conducted among 447 physicians and nurses working in two training hospitals in Al-Diwaniyah. Data were collected using a Sociodemographic Data Form and the Autism Spectrum Disorder Knowledge Questionnaire. Descriptive statistics and Pearson chi-square tests were used to analyze the data. ***Results*:** Overall, 49% of participants demonstrated a moderate level of knowledge regarding ASD, 37.6% had good knowledge, and 13.4% had low knowledge. Knowledge levels were significantly associated with age, gender, marital status, educational level, professional experience, job title, workplace, working pattern, and sources of information ($p < 0.05$). Younger participants, those with higher education, academic nurses, and health care workers employed at Al-Diwaniyah Teaching Hospital exhibited higher knowledge levels. The internet was the most frequently reported source of ASD-related information, while participation in formal continuing medical education was limited. ***Conclusion*:** Health care professionals in Al-Diwaniyah demonstrated a predominantly moderate level of knowledge regarding ASD. Strengthening structured, evidence-based in-service training programs and integrating ASD-focused content into continuing professional education may enhance early recognition and referral, ultimately improving outcomes for children with ASD and their families.

Keywords: Autism Spectrum Disorder, Health Care Professionals, Knowledge Level, Early Diagnosis, Iraq.

1. INTRODUCTION

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by deficits in social communication and the presence of restricted and repetitive patterns of behavior, with a highly heterogeneous clinical presentation. While ASD may present with mild functional difficulties in some individuals, in others it may lead to a severe disability requiring lifelong intensive care and special education (Lord *et al*., 2018). Early symptoms of ASD include avoiding eye contact, not responding to one's name, limited facial expressions, lack of interest in interactive games, failure to share toys or objects, and difficulty recognizing others' emotional states (Christensen & Zubler, 2020). Behavioral interventions implemented following early diagnosis have been shown to reduce symptom severity by effectively utilizing the brain's neuroplasticity (Bargiela *et al*., 2016).

ASD is more prevalent in males and premature infants and is strongly associated with genetic factors (Anwar *et al*., 2018). In recent years, a substantial global increase in ASD prevalence has been reported. Current epidemiological data indicate a global median prevalence of approximately 100 per 10,000 individuals, although considerable regional variation exists (Zeidan *et al*., 2022). This increase in reported prevalence is largely attributed to expanded diagnostic criteria,

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improved public awareness, and diagnosis at earlier ages (Neggers, 2014).

Insufficient knowledge and awareness of ASD represent major barriers to improving the health and quality of life of children with autism, as these factors limit access to early diagnosis and intervention services that have been shown to be effective (Schreibman *et al*., 2015). Early diagnosis is critically important for enabling timely intervention for children with ASD and their families (Malcolm-Smith *et al*., 2013). However, although ASD symptoms typically emerge before 36 months of age, they are not always easily recognized by parents during this period. Consequently, pediatricians, family physicians, and nurses play a key role in identifying early signs of ASD during routine infant and child health follow-up visits. These health professionals are often the first providers to whom parents express concerns regarding their child's development (Heidgerken *et al*., 2005).

At present, there is no definitive treatment that eliminates the core symptoms of ASD, which places early diagnosis at the center of effective disease management (Poleg *et al*., 2019). Despite this, many children experience significant delays in the diagnostic process. These delays have been attributed to several factors, including delayed presentation to health care services by families, insufficient knowledge among health care providers, limited capacity of diagnostic centers, and geographic and socioeconomic barriers (Mazurek *et al*., 2019). The literature emphasizes that failure to recognize ASD symptoms during early childhood constitutes one of the most important obstacles to early diagnosis. Studies have shown that health care professionals may still hold inaccurate or insufficient knowledge regarding the developmental, cognitive, and emotional characteristics of ASD (Malow *et al*., 2016).

Research conducted in various countries indicates that knowledge and awareness of ASD remain inadequate both at the societal level and among health care professionals. A study conducted in India reported that interventions initiated after late diagnosis were insufficient to improve ASD-related symptoms (Russell *et al*., 2016). Similarly, research from Pakistan demonstrated a lack of ASD-related knowledge and awareness among both parents and health care workers (Anwar *et al*., 2018). In China, studies have shown that preschool teachers possess limited knowledge of ASD, highlighting the need for structured and systematic education programs for this group (Miller *et al*., 2014).

In developing countries, limited epidemiological data on ASD and the scarcity of specialized diagnostic and treatment centers further exacerbate these challenges. Although available evidence suggests increasing autism rates in Iraq, research in this field remains scarce, and the number of ASD-specific centers is insufficient. The absence of specialized child psychiatry clinics has resulted in many children being evaluated in adult psychiatric settings, where comorbid psychiatric conditions may remain unrecognized (Veatch *et al*., 2017). Children with or without a formal ASD diagnosis frequently present to health care institutions for various health concerns or routine check-ups and interact most often with physicians and nurses. Therefore, the level of ASD-related knowledge among health care professionals plays a decisive role in the quality of services provided, ranging from early diagnosis to effective care and referral processes. A review of the literature revealed no studies examining the level of knowledge regarding ASD among health care professionals in Iraq. Accordingly, this study aims to determine the level of ASD-related knowledge among health care professionals working in the city of Al-Diwaniyah, Iraq. The findings are expected to contribute to the development of strategies that support early diagnosis and to guide the planning of targeted in-service training programs.of practices that support early diagnosis and to guide the planning of in-service training programs.

2. MATERIALS AND METHODS

2.1. Study Design and Aim

This study was designed as a descriptive and cross-sectional study. The aim of the study was to determine the level of knowledge regarding Autism Spectrum Disorder among health care professionals working in training hospitals in the city of Al-Diwaniyah, Iraq, and to examine the association between knowledge levels and sociodemographic and professional characteristics.

2.2. Study Setting and Characteristics

The study was conducted in the city of Al-Diwaniyah, where two training hospitals provide health care services. The first hospital, Al-Diwaniyah Teaching Hospital, has a capacity of 400 beds and delivers services across 10 units, including emergency, neuropsychology, surgical resuscitation, cardiac resuscitation, consultation, ophthalmology, gastrointestinal diseases, and dialysis units. A total of 1,259 health care workers are employed at this hospital, including 274 physicians and 985 nurses.

The second hospital, Al-Diwaniyah Maternity and Children Teaching Hospital, has a capacity of 300 beds and provides services through seven units, including emergency services, pediatric counseling, women's counseling, genetics and hematological diseases, maternity ward, and premature birth unit. A total of 867 health care workers, including 75 physicians and 792 nurses, are employed at this hospital.

2.3. Population and Sample

The study population consisted of a total of 2,126 health care workers, including 349 physicians and 1,777 nurses, employed in the training hospitals located in the city of Al-Diwaniyah. Sample size calculation was

performed using the known population sample calculation method with a 5% margin of error and a 98% confidence interval, resulting in a required sample size of 436 health care workers. The final study sample consisted of 447 participants, who were selected through stratified sampling among physicians and nurses.

The inclusion and exclusion criteria were defined as follows:
Inclusion Criteria: Working in training hospitals in the city of Al-Diwaniyah, being a physician or a nurse, volunteering to participate in the study, being 18 years of age or older, and being able to read and write Arabic.

***Exclusion Criteria*:** Unwillingness to participate in the study, being a health care worker other than a physician or nurse, and inability to read or write Arabic.

2.4. Data Collection Procedure

Prior to the initiation of the study, institutional permission was obtained from the Iraqi Ministry of Health. Following this, ethical approval was received from the Non-Interventional Ethics Committee of Kırşehir Ahi Evran University, and the study was subsequently implemented. Due to the COVID-19 pandemic, data were collected online. A link containing information about the study and access to the online questionnaire was distributed via WhatsApp groups in which health care workers employed at the hospitals were registered.

After providing informed consent for voluntary participation, participants were granted access to the study questions. The online survey remained open until responses from 447 participants were obtained. Data collection was carried out over a three-month period, beginning on September 11, 2022, and ending on December 12, 2022.

2.5. Data Collection Instruments

Data were collected using the Sociodemographic Data Form and the Autism Spectrum Disorder Knowledge Questionnaire.

2.5.1. Sociodemographic Data Form

The Sociodemographic Data Form was developed by the researchers based on a review of the relevant literature. It consists of 14 items addressing participants' sociodemographic and professional characteristics, including age, gender, marital status, place of residence, education level, workplace, professional experience, duration of employment, job title, having a relative with autism, and sources of information about autism.

2.5.2. Autism Spectrum Disorder Knowledge Questionnaire

The Autism Spectrum Disorder Knowledge Questionnaire was developed by Hadi and Kassim (2020). The questionnaire consists of 27 statements related to the definition, causes, risk factors, early signs and symptoms, diagnosis, and treatment of ASD. Some of the statements are correct, while others are incorrect. Items 8, 17, and 23 contain incorrect statements and were therefore reverse scored. The remaining 24 statements were presented as correct. Responses to each item are recorded as "Yes" (3), "Not sure" (2), or "No" (1). Higher total scores indicate a higher level of knowledge regarding ASD. In the original study, knowledge levels were categorized as "low," "moderate," and "high," and the same categorization was applied in the present study.

2.6. Data Analysis

Statistical analyses were conducted using SPSS version 28 (Statistical Package for the Social Sciences). Data were analyzed using descriptive statistics, including frequency, percentage, mean, standard deviation, and range values (minimum–maximum). The Pearson chi-square test (χ^2) was used to examine the significance of differences between demographic characteristics and knowledge levels. A p value of less than 0.05 was considered statistically significant.

2.7. Ethical Considerations

Prior to conducting the study, written permission was obtained from the Iraqi Ministry of Health and the Al-Diwaniyah Health Department. Ethical approval was granted by the Non-Interventional Research Ethics Committee of Ahi Evran University (Date: 27/09/2022; Decision No: 2022-17/154). Informed consent was obtained from all health care workers who voluntarily participated in the study. Participants were also provided with the researchers' contact information to allow communication if needed.

3. RESULTS

A total of 447 health care workers employed in training hospitals in Al-Diwaniyah participated in the study. Examination of the descriptive characteristics of the participants revealed that 63% were between the ages of 21 and 29 years (29.70 ± 6.97), 61.3% were female, 54.1% were married, and 50.6% had children.

Table 1: Descriptive Characteristics of the Participants

Descriptive characteristics		n	%
Age	21-29	280	63
	30-39	135	30
	40-49	24	5
	50-59	8	2
Gender	Male	173	38.7
	Female	274	61.3

Descriptive characteristics		n	%
Marital status	Single	184	41.2
	Married	242	54.1
	Widowed	21	4.7
Having children	Yes	226	50.6
	No	221	49.4
Professional experience (years)	1-5	265	59.3
	6-10	98	21.9
	≥11	84	18.8
Place of residence	Urban	394	88.1
	Rural	53	11.9
Education level	High school / Associate degree	208	46.5
	Bachelor's degree	186	41.6
	Master's degree	53	11.9
Professional role	Doctor	81	18.1
	Academic nurse	158	35.3
	Tecnical nurse	79	17.7
	Registered nurse	71	15.9
	Medical asistant	58	13
Hospital of employment	Al-Diwaniyah Teaching Hospital	264	59.1
	Maternity&Children Teaching Hospital	183	40.9
Working pattern	Day shift	378	84.6
	Shift work	69	15.4
Liking the profession	Yes	412	92.2
	No	35	7.8
Having a family member with autism	Yes	33	7.4
	No	414	92.6
Having knowledge about ASD	Yes	394	88.1
	No	53	11.9
Sources of information about autism	Internet	236	52.8
	Friends and family	70	15.7
	Continuing medical education	89	19.9
	Other*	52	11.6
Total		447	100

*Other: Books. journals. video recordings. television programs. or films.

Regarding professional characteristics, 59.3% of the health care workers had 1–5 years of professional experience (6.37 ± 5.43), and 88.1% of the sample resided in urban areas. In terms of educational level, 46.5% of the participants held an associate degree or high school diploma. With respect to professional title, 35.3% were academic nurses. More than half of the participants (59.1%) were employed at Al-Diwaniyah Teaching Hospital, and the majority (84.6%) worked daytime shifts. In addition, 92.2% of the participants reported liking their profession, and 92.6% stated that they did not have a child with autism.

When sources of information regarding ASD were examined, 88.1% of the participants reported that they had knowledge about ASD, and 52.8% indicated that they obtained this information from the internet. Despite being health care workers employed in institutional settings, only 19.9% reported obtaining information through continuing medical education, which represents a noteworthy finding.

Table 2: Distribution of Health Care Workers' Knowledge Regarding Autism Spectrum Disorder

Item Statements	Yes		Not sure		No		X±SD	Evoluation
	n	%	n	%	n	%		
1. Autism Spectrum Disorder (ASD) is a neurological disorder that affects brain functioning.	285	64	38	9	124	27.7	2.36±0.89	Good
2. ASD is usually diagnosed within the first three years of a child's life.	251	56	49	11	147	32.9	2.23±0.92	Moderate
3. Genetic factors play an important role in the etiology of ASD.	193	43	89	20	165	36.9	2.06±0.89	Moderate
4. The majority of children with autism are male.	189	42	115	26	143	32	2.1±0.86	Moderate
5. Aggressive behavior toward others is a sign of autism in children.	222	50	58	13	167	37.4	2.12±0.93	Moderate
6. Children with autism can be diagnosed through behavioral observation.	301	67	56	13	90	20.1	2.47±0.81	Good
7. Children with ASD display repetitive and stereotyped behaviors and restricted interests.	229	51	98	22	120	26.8	2.24±0.85	Moderate
8. Children with autism can make eye contact. *(reverse scored)*	200	45	166	37	81	18.1	1.92±0.9	Moderate
9. Many children with autism experience hearing impairment.	172	39	102	23	173	38.7	2±0.88	Moderate

Item Statements	Yes		Not sure		No		X±SD	Evoluation
	n	%	n	%	n	%		
10. Some children with autism have heightened or reduced sensitivity to visual. auditory. olfactory. or tactile stimuli.	250	56	81	18	116	26	2.3±0.85	Moderate
11. Children with ASD exhibit impaired communication skills.	286	64	66	15	95	21.3	2.43±0.83	Good
12. Children with ASD exhibit impairments in social interaction.	278	62	50	11	119	26.6	2.36±0.87	Good
13. Most children with ASD exhibit uneven gross motor skills.	234	52	84	19	129	28.9	2.23±0.87	Moderate
14. Most children with ASD exhibit disorganized fine motor skills.	199	45	98	22	150	33.6	2.11±0.88	Moderate
15. Children with ASD have intellectual disability.	188	42	92	21	167	37.4	2.05±0.89	Moderate
16. Some children with ASD have special talents and abilities.	288	64	51	11	108	24.2	2.4±0.85	Good
17. Children with autism understand other people's emotions and feelings. *(reverse scored)*	235	53	83	19	129	28.9	1.76±0.87	Moderate
18. Most children with autism are intentionally negative and noncompliant.	291	65	48	11	108	24.2	2.41±0.85	Good
19. Children with autism may engage in self-injurious behaviors.	230	52	68	15	149	33.3	2.18±0.9	Moderate
20. Children with autism need fewer hours of sleep compared to their same-age peers. *(reverse scored)*	156	35	116	26	175	39.1	1.96±0.86	Moderate
21. Children with autism have poor attention.	253	57	61	14	133	29.8	2.27±0.89	Good
22. Some children with ASD show hypersensitivity or hyposensitivity to pain.	229	51	107	24	111	24.8	2.26±0.83	Moderate
23. It is difficult to distinguish autism from schizophrenia. *(reverse scored)*	200	45	82	18	165	36.9	1.92±0.9	Moderate
24. A child with ASD does not respond when called by name.	239	54	78	17	130	29.1	2.24±0.88	Moderate
25. Children with ASD show inappropriate attachment to specific toys or objects (e.g.. preferring to play with the same toy for hours).	293	66	42	9	112	25.1	2.4±0.86	Good
26. Children with autism prefer routine activities.	184	41	91	20	172	38.5	2.03±0.89	Moderate
27. Children with ASD have no perception of fear or danger (e.g.. crossing the street without looking right or left).	222	50	92	21	133	29.8	2.2±0.87	Moderate

Low (1.00–1.66), Moderate (1.67–2.33), and High (2.34–3.00). SD = standard deviation

As shown in Table.2, health care workers' levels of knowledge about autism were evaluated based on individual questionnaire items. According to participant responses, items 1, 6, 11, 12, 16, 18, 21, and 25 were identified at a "good" level of knowledge, whereas knowledge levels for the remaining items were generally at a "moderate" level. The items that received the lowest scores compared with others were: "Children with autism understand others' emotions and feelings" (Item 17), "It is difficult to distinguish autism from schizophrenia" (Item 23), "Children with autism can make eye contact" (Item 8), and "Children with autism need fewer hours of sleep than their same-age peers" (Item 20).

The overall knowledge score obtained from all ASD-related items indicated that 49% of the sample had a moderate level of knowledge about autism. In addition, 13.4% of participants demonstrated a low level of knowledge, while 37.6% exhibited a high level of knowledge regarding ASD.

Table 3: Knowledge levels regarding Autism Spectrum Disorder according to personal characteristics

	Knowledge level			Ki-Kare Test	
	Low	Moderate	High	X^2	p value
	n (%)	n (%)	n (%)		
Age (29.70±6.97)					
21-29	22 (36.6)	148 (67.6)	110 (65.5)	40.3	**0.001**
30-39	37 (61.6)	48 (21.9)	50 (29.8)		
40-49	0 (0)	18 (8.2)	6 (3.5)		
50-59	1 (1.8)	5 (2.3)	2 (1.2)		
Gender					
Male	5 (8.3)	110 (50.2)	58 (34.5)	36.8	**0.001**
Female	55 (91.7)	109 (49.8)	110 (65.5)		
Having children					
Yes	27 (45)	112 (51.1)	87 (51.8)	0.8	0.646
No	33 (55)	107 (48.9)	81 (48.2)		
Professional experience (6.37±5.43)					
1-5	22 (36.7)	140 (63.9)	103 (61.3)	26.8	**0.001**
6-10	14 (23.3)	40 (18.3)	44 (26.2)		
≥11	24 (40)	39 (17.8)	21 (12.5)		

	Knowledge level			Ki-Kare Test	
	Low	Moderate	High	X^2	p value
	n (%)	n (%)	n (%)		
Place of residence					
Urban	52 (86.7)	193 (88.1)	149 (88.7)	0.2	0.917
Rural	8 (13.3)	26 (11.9)	19 (11.3)		
Education level					
High school / Associate degree	49 (81.7)	112 (51.1)	47 (28)	60.9	**0.001**
Bachelor's degree	3 (5)	83 (37.9)	96 (57.1)		
Master's degree	8 (13.3)	24 (11)	25 (14.9)		

Table 4: Knowledge levels regarding Autism Spectrum Disorder according to personal characteristics

	Knowledge level			Ki-Kare Test	
	Low	Moderate	High	X^2	p value
	n (%)	n (%)	n (%)		
Professional role					
Doctor	1 (1.7)	42 (19.1)	38 (22.6)	60.8	**0.001**
Academic nurse	10 (16.7)	65 (29.7)	83 (49.4)		
Tecnical nurse	21 (35)	38 (17.4)	20 (11.9)		
Registered nurse	17 (28.3)	38(17.4)	16 (9.5)		
Medical asistant	11 (18.3)	36 (16.4)	11 (6.6)		
Hospital of employment					
Al-Diwaniyah Teaching Hospital	32 (53.3)	119 (54.3)	113 (67.3)	7.5	**0.023**
Maternity&Children Teaching Hospital	28 (46.7)	100 (45.7)	55 (32.7)		
Working pattern					
Day shift	55 (91.7)	190 (86.8)	133 (79.1)	6.9	**0.032**
Shift work	5 (8.3)	29 (13.2)	35 (20.9)		
Liking the profession					
Yes	58 (96.7)	201 (91.8)	153 (91)	2	0.366
No	2 (3.3)	18 (8.2)	15 (9)		
Having a family member with autism					
Yes	3 (5)	16 (7.3)	14 (8.3)	0.7	0.697
No	57 (95)	203 (92.7)	154 (91.7)		
Having knowledge about ASD					
Yes	59 (91.3)	185 (84.4)	150 (89.3)	9	**0.011**
No	1 (1.7)	34 (15.6)	18 (10.7)		

As shown in Tables 3 and Table 4, the distribution of health care workers' knowledge levels varied significantly according to several sociodemographic and professional variables. Statistically significant differences in knowledge levels were observed with respect to age, gender, marital status, educational level, years of professional experience, career title, and the health institution where participants were employed ($p < 0.050$). In contrast, having children and place of residence did not result in statistically significant differences in knowledge levels ($p > 0.050$).

When examined by age group, participants aged 21–29 years demonstrated the highest level of knowledge regarding ASD. In terms of gender, female participants exhibited higher knowledge levels than males. Married participants had higher knowledge levels compared with unmarried participants. Participants holding a bachelor's degree demonstrated the highest knowledge levels when educational status was considered. With regard to professional experience, health care workers with 1–5 years of experience had the highest knowledge levels. In addition, employees working at Al-Diwaniyah Teaching Hospital and those holding the title of academic nurse demonstrated higher levels of knowledge about autism.

Further analysis indicated that participants' sources of information regarding ASD, the health institution where they worked, and their working patterns were associated with statistically significant differences in knowledge levels ($p < 0.050$). In contrast, liking one's profession and having a family member with autism were not associated with statistically significant differences in knowledge levels ($p > 0.050$).

Health care workers employed at Al-Diwaniyah Teaching Hospital, those working daytime shifts, those who reported liking their profession, those who stated that they had knowledge about autism, and those who identified the internet as their primary information source were found to have higher levels of knowledge regarding ASD.

4. DISCUSSION

Autism Spectrum Disorder (ASD) affects millions of children worldwide and continues to pose substantial challenges for health care systems. Although the etiology of ASD has not yet been fully clarified, early diagnosis remains a cornerstone of effective management. Early identification enables timely intervention and has been associated with improvements in social interaction, communication skills, cognitive functioning, and adaptive behaviors (Fombonne, 2005; Rapin & Dunn, 1997). Health care professionals, particularly physicians and nurses, play a pivotal role in recognizing early signs of ASD, especially during routine child health visits (Barbaresi *et al*., 2006; Heidgerken *et al*., 2005). In developing countries, where access to specialized services is often limited, health care workers may represent the first and sometimes the only point of contact between families and the health system. Consequently, their level of knowledge can directly influence both the timing of diagnosis and access to appropriate intervention services.

In the present study, the majority of health care workers demonstrated a moderate level of knowledge regarding ASD, while a smaller proportion exhibited high knowledge levels. This finding is consistent with previous studies conducted in different cultural and health care contexts, which have similarly reported moderate or insufficient ASD-related knowledge among health professionals (Igwe *et al*., 2011; Imran *et al*., 2011). The predominance of moderate knowledge suggests that although general awareness of ASD exists, important gaps remain. These gaps are particularly evident in the recognition of early symptoms, differentiation of ASD from other neurodevelopmental or psychiatric conditions, and identification of appropriate referral pathways. Such deficiencies may contribute to delays in diagnosis and limit the effectiveness of early intervention efforts.

Age and professional experience were significantly associated with ASD knowledge levels in this study. Younger health care workers and those with fewer years of professional experience demonstrated higher levels of knowledge. This pattern likely reflects more recent exposure to updated diagnostic criteria, evidence-based practices, and contemporary educational curricula during professional training (Bakare *et al*., 2009; Garg *et al*., 2014). These findings underscore the importance of continuous professional development and regular updating of knowledge, particularly for more experienced staff whose initial education may not have incorporated current ASD frameworks.

Educational level and professional role also emerged as important determinants of ASD knowledge. Participants with higher educational attainment and those holding academic nursing positions achieved higher knowledge scores. This result aligns with previous research indicating that advanced education and professional specialization are associated with greater awareness and competence related to ASD (Zhang *et al*., 2018; Sampson & Sandra, 2018). Higher educational levels may facilitate critical appraisal of information, greater engagement with scientific literature, and increased participation in professional training activities, all of which may enhance ASD-related knowledge and clinical sensitivity.

Gender differences were observed in ASD knowledge levels, with female health care workers demonstrating higher knowledge compared to male participants. Similar findings have been reported in studies examining autism awareness among health professionals and students (Altay, 2019). This difference may be related to gender-based professional roles, caregiving expectations, and more frequent interaction with children and families in both professional and social contexts. Increased exposure to developmental and caregiving issues may contribute to greater familiarity with ASD-related signs and concerns among female health care workers.

The sources from which participants obtained information about ASD were also significantly associated with knowledge levels. The internet emerged as the most commonly used source of information, and participants who relied on online resources demonstrated higher knowledge scores. While internet-based information offers rapid and convenient access, the quality and reliability of online content can vary considerably (Rhoades *et al*., 2007). The relatively limited contribution of formal in-service training identified in this study highlights a gap in institutional educational support. This finding points to the need for structured, evidence-based training programs within health care institutions to ensure that health care workers receive consistent, accurate, and up-to-date information about ASD.

Overall, the findings of this study indicate that ASD knowledge among health care workers in Al-Diwaniyah is moderate and shaped by a combination of demographic, educational, and professional factors. In the absence of targeted educational interventions, existing knowledge gaps may continue to hinder early detection and timely referral of children with ASD. Strengthening structured continuing education programs, integrating ASD-focused content into routine professional training, and promoting access to reliable information sources may enhance early recognition processes. Such efforts have the potential to improve care pathways and ultimately contribute to better outcomes for children with ASD and their families.

5. CONCLUSION AND PRACTICAL IMPLICATIONS

This study demonstrates that health care workers in Al-Diwaniyah have an overall moderate level of knowledge regarding Autism Spectrum Disorder.

Knowledge levels were influenced by age, gender, educational attainment, professional role, work setting, and sources of information. These findings indicate that while a general level of awareness of ASD exists, important gaps remain that may delay early recognition and timely referral.

From a practical perspective, the results highlight the need to strengthen structured and evidence-based in-service training programs on ASD within health care institutions. Integrating ASD-focused content into continuing professional education, particularly for frontline health care workers, may contribute to improved early detection and more effective referral pathways. Furthermore, improving access to reliable and standardized educational resources may support timely diagnosis and ultimately contribute to better outcomes for children with ASD and their families.

Lımıtatıons And Strengths

This study has several limitations that should be considered when interpreting the findings. The cross-sectional design limits the ability to draw causal inferences. In addition, data were collected using self-report measures, which may be subject to response bias. The study was also conducted in a single province, which may limit the generalizability of the findings to other regions of Iraq.

Despite these limitations, the study has notable strengths. It is among the first studies to assess ASD-related knowledge among health care workers in Iraq and represents the first investigation conducted in the city of Al-Diwaniyah. The inclusion of a relatively large sample of physicians and nurses, together with the use of a standardized assessment tool, provides valuable baseline data. These findings offer an important foundation for future research and may inform the development of targeted educational and training interventions aimed at improving ASD-related knowledge among health care professionals.

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