ORIGINAL RESEARCH

The Jordanian Population's Knowledge, Attitudes, and Willingness to Help People with Autism: A Cross-Sectional Study

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Objective: To assess the knowledge and attitudes of the general public in Jordan towards autism. In addition, we aimed to assess their awareness of various treatment options for autism, and their attentiveness and willingness to assist.

Methods: A cross-sectional survey was conducted in Jordan for the period between April and May 2022 using an online questionnaire developed based on a literature review. A total of 833 individuals in Amman city completed the questionnaires assessing participant demographics, knowledge of and attitude towards ADS, awareness of management options, perception, and ability to help. Using logistic regression, the odds ratios (ORs) and 95% confidence intervals (CIs) for those who are more likely to be informed about autism were determined.

Results: The participants' overall understanding of autism spectrum disorder was poor, with a mean score of 6.2 (SD: 3.1) out of 17, or 36.5%. The participants showed a moderately positive attitude towards autism, with an average agreement of 60.9% for government support for ADS children. The items about management options auditory integration training therapy had the highest level (50.1%). Additionally, the participants showed a moderate to high level of attention and ability to help people with autism. The majority confirmed that they see the need to implement changes in public facilities to meet the needs of autistic patients (71.8%). When compared to others, females, aged below 30, single, with family income less than 500 JD, holding a bachelor's degree, and working outside the healthcare field had a higher likelihood of knowing more about the autism spectrum condition (p ≤ 0.05).

Conclusion: Our research illustrates the lack of awareness and knowledge among the Jordanian population regarding autism. To fill this gap, educational awareness programs should be conducted to promote Jordanian knowledge regarding autism and find ways in which communities, organisations, and governments can support so as to allow for early diagnoses and an appropriate treatment plan and therapy for autistic children.

Keywords: attitude, autism, Jordan, knowledge, public

Introduction

Autism is a neurodevelopmental disorder that affects up to 10 out of every 1000 children around the world.[1] Autism is a spectrum of conditions that influence communication and behavior and typically develop by age two.[2] It's characterized by problems with social interaction and communication, as well as by doing things in a repetitive way.[3] Different comorbid disorders, such as learning challenges, attention deficit disorder, seizure disorder, and cognitive impairment, can occur in children with autism.[4] There are different risk factors for autism, which include having a sibling with diagnosed autism, having certain conditions (Down syndrome, fragile X, tuberous sclerosis, and Rett syndromes), having a very low birth weight (prematurity), parental exposure to air pollution and chemicals, maternal comorbidities (obesity, diabetes mellitus, metabolic syndrome, and immune system disorders), viral infections, and older parents.[2,5,6] Males are three to four times more likely to have autism than females, and other conditions such as fragile X syndrome, tuberous

sclerosis, Tourette's syndrome, and epilepsy are all risk factors for autism.[5] In addition to this, drug use while pregnant has also been noted as a risk factor. A retrospective case study demonstrated the effects of maternal valproic acid consumption during pregnancy on the newborn's autism.[7] Congenital rubella has even been linked in several studies to autism.[8,9] Cerebral palsy, another rather common medical disease, is also associated with a high prevalence of autism in children.[10]

Compared to other developmental disabilities, autism is significantly more likely to be associated with significant financial consequences.[11] However, there are interventions that can be used to improve social interaction and communication, and they can even raise IQ scores when used early in development.[12–14] Rapid intervention is essential since intensive behavioral therapies may be less successful on older children.[15] The prognosis and developmental outcomes are greatly influenced by diagnosis at a younger age.[15] The increase in awareness of the disease among the general public has contributed to earlier diagnosis ages.[16] Early diagnosis is needed to start multidisciplinary treatment as soon as possible, which in turn makes the outcome better.[17,18] The general public frequently holds false beliefs about the causes of disorders and the available interventions.[19] Such attributions are likely to delay the behaviour of seeking help and are partially to blame for the significant stigma that autism families must endure.[19]

There is no medical treatment that can cure autistic people. As soon as the diagnosis is verified, the only thing that the child's caretakers can do to help them gain new skills such as talking, gazing into their eyes, playing with peers, walking, and socializing is to implement special behavioral therapy.[20] In order to improve early diagnosis and treatment, which will result in a better prognosis, it is crucial that the community has a deeper awareness of the ASD spectrum.[21] A higher level of awareness is associated with a lower age at diagnosis, which ultimately is associated with better treatment outcomes. In order to identify knowledge gaps and provide appropriate intervention, establishing the public's awareness of autism in Jordan has become a crucial problem to examine. Therefore, the aim of this study was to examine the public's knowledge, attitudes, and willingness to help people with autism in Jordan. The specific objectives for this study are to examine the level of public knowledge of autism and its associated predictors. In addition, we aimed to examine public attitudes towards this disorder and their willingness to help.

Method
Study Design
A cross-sectional study using an online survey was conducted in Jordan between April and May 2022.

Sampling Strategy
Using convenience sampling, eligible individuals were identified and invited to participate in the study. Facebook and WhatsApp were utilized to reach out to the general public and invite them to participate in this study. All subjects freely granted their informed consent; consequently, written consent was not required. Detailed descriptions of the study's aims and objectives were provided at the beginning of the survey. The inclusion criteria were participants who were at least 18 years old and were residing in Jordan. Participants who were under 18 or who could not read or understand Arabic were not invited to participate.

Study Tool
In this study, we developed our own questionnaire tool to assess public awareness of and attitudes towards autism based on previous literature.

The public knowledge assessment scale was developed based on a previously developed questionnaire instrument to investigate public awareness of autism in Saudi Arabia and was adapted to be used in our study.[21]

The attitude scale was developed based on a comprehensive assessment of the literature. We assessed the participants' attitudes towards autism, their awareness of various treatment options for autism, and their attentiveness and willingness to assist using a previously constructed tool by Liu et al.[22] The original study by Liu et al examined knowledge, attitudes, and perceptions of autism in a sample of preschool teachers. Their tool was designed based on previous literature.[23]

Our questionnaire consisted of five sections, including a total of forty-two questions. Seven sociodemographic characteristics of the participants were examined in the first section. The second element of the questionnaire consisted of 17 yes/no questions concerning knowledge of autism. Each successful response was assigned a value of one, and each incorrect response was assigned a value of zero. The highest possible score was 17, with higher scores indicating better knowledge. By means of knowledge questions, participants' understanding of autism's risk factors, symptoms, implications, and treatment options was assessed. The third element of the questionnaire consisted of nine 5-point Likert scale questions (ranging from strongly disagree to strongly agree) that assessed the participants' attitudes toward autism. The fourth element consisted of five yes or no questions that assessed participants' knowledge of available autism management options. Using four 5-point Likert scale questions, the final segment assessed participants' attention and capacity to assist (ranging between strongly disagree and strongly agree).

Translation and Adaptation of the Original Questionnaire

In Jordan, Arabic is both the official language and the language most commonly spoken by the general population. Therefore, this questionnaire was translated into Arabic (without a specific dialect) so that it could be readily understood and completed. This questionnaire was translated using the technique of forward and backward translation. This translation technique does not rely on word-by-word translation, but rather on preserving the actual meaning of the research items.

Piloting Phase

Expert clinical pharmacists examined the final questionnaire tool to determine its external validity. Furthermore, the questionnaire tool was administered to a group of individuals from the general public to complete it and give their opinion on its presentation and understandability. They confirmed that it is easy to fill out and that they have not faced any issues. Cronbach's alpha for the knowledge and attitude items was 0.829 and 0.771, respectively, which reflect good and acceptable internal consistency.

Statistical Analysis

Using descriptive statistics, the demographic characteristics of the individuals were described. Normality of the data was checked by the histogram and through skewness and kurtosis measures, which confirmed that the data is normally distributed; therefore, continuous data were reported as the mean ± standard deviation. Percentages were reported for categorical data (frequencies). Cronbach's alpha reliability measure was used to check the reliability of the knowledge and attitude scales. Using logistic regression, the odds ratios (ORs) and 95% confidence intervals (CIs) for those who are more likely to be informed about autism were determined. The cut-off for the logistic regression was based on the participants' average knowledge score (6.2). (standard deviation: 3.1). As the data was normally distributed, at-test for independent samples and a one-way analysis of variance test were used to compare the average knowledge scores of various demographic groups. Using SPSS, the statistical analyses were conducted (version 27).

Results
Participants' Demographic Characteristics

A total of 833 individuals participated in this study. More than half of them (54.1%) were females. Almost half of them (57.0%) were younger than 30 and single (52.3%). One-third of the study participants (31.2%) reported that they are working outside the healthcare sector and unemployed (31.1%). A total of 68.4% of the participants reported that they hold a bachelor's degree, and 66.4% reported that their family's monthly income is below 500 Jordanian dinars (JOD). Only 8.4% of the participants reported that they have a family member diagnosed with autism. Sociodemographic characteristics of the study participants are presented in Table 1.

Table 1 Sociodemographic Characteristics of the Study Participants

Demographic Variable	Frequency	Percentage
Gender		
Female	451	54.1%
Age category		
18–23 years	304	36.5%
24–29 years	171	20.5%
30–34 years	107	12.8%
35–39 years	64	7.7%
40–49 years	110	13.2%
50 years and over	77	9.2%
Marital status		
Single	436	52.3%
Married	340	40.8%
Divorced	35	4.2%
Widowed	22	2.6%
Employment status		
Work outside the healthcare area	260	31.2%
Unemployed	259	31.1%
Student	187	22.4%
Work inside the healthcare area	84	10.1%
Retired	43	5.2%
Education		
Secondary school level or lower	188	22.6%
Bachelor degree	570	68.4%
Higher education	75	9.0%
Family monthly income		
Less than 500 JD	553	66.4%
500–1000 JD	207	24.8%
1000–1500 JD	48	5.8%
1500 JD and more	25	3.0%
Family member with autism		
Yes	70	8.4%

Abbreviation: JD, Jordanian Dinar.

Participants' Knowledge About Autism

The mean participants' autism knowledge score was 6.2 (SD: 3.1) out of 17 (which is equal to 36.5%of the maximum attainable score), reflecting a weak level of knowledge about the disease. The mean autism knowledge score showed a statistically significant difference between participants from different demographic groups based on their employment status ($p \leq 0.05$). Table 2 reports the knowledge score stratified by participants' characteristics.

Predictors of Better Knowledge About Autism

Binary logistic regression analysis identified that females are 30% more likely to be knowledgeable about autism ($p \leq 0.05$). On the other hand, unemployed participants were 30% less likely to be knowledgeable about autism ($p \leq 0.05$), refer to Table 3.

Attitude Towards Autism

Overall, participants showed a moderately positive attitude towards autism, with an average agreement (answering an attitude item with either agree or strongly agree) percentage of 60.9%. The most commonly agreed upon statements were that "government funding should be provided to facilitate the recruitment of staff in kindergartens to meet the needs of these children", "the government should allocate more resources to provide services for children with special needs", and

Table 2 Knowledge Score Stratified by Participants Characteristics

Demographic Variable	Mean (SD)	P-value
Gender		
Female	6.4 (3.0)	0.083
Male	6.0 (3.1)	
Age category		
18–23 years	6.0 (2.9)	0.088
24–29 years	6.3 (3.2)	
30–34 years	5.7 (2.9)	
35–39 years	5.4 (3.1)	
40–49 years	6.7 (2.9)	
50 years and over	6.8 (3.6)	
Marital status		
Single	6.0 (3.1)	0.102
Married	6.4 (3.0)	
Divorced	6.7 (3.5)	
Widowed	5.2 (3.1)	
Employment status		
Work inside the healthcare area	6.5 (3.0)	0.037*
Work outside the healthcare area	6.4 (3.0)	
Unemployed	5.7 (2.9)	
Student	6.2 (3.2)	
Retired	6.8 (3.3)	
Education		
Secondary school level or lower	6.1 (2.9)	0.393
Bachelor degree	6.3 (3.1)	
Higher education	5.8 (2.8)	
Family monthly income		
Less than 500 JD	6.2 (3.1)	0.763
500–1000 JD	6.2 (3.1)	
1000–1500 JD	6.2 (2.7)	
1500 JD and more	6.8 (3.1)	
Family member with autism		
No	6.2 (3.0)	0.579
Yes	6.0 (3.5)	

Note: *p≤0.05.

Table 3 Binary Logistic Regression Analysis

Variable	Odds Ratio (95% Confidence Interval)	P-value
Gender		
Male (Reference group)	1.00	0.048*
Female	1.3 (1.0–1.7)	
Age category		
18–23 years (Reference group)	1.00	
24–29 years	0.9 (0.7–1.3)	0.615
30–34 years	0.7 (0.5–1.1)	0.086
35–39 years	1.2 (0.7–2.0)	0.539
40–49 years	1.3 (0.8–1.9)	0.260
50 years and over	1.5 (0.9–2.4)	0.106
Marital status		
Single (Reference group)	1.00	
Married	1.2 (0.9–1.6)	0.251
Divorced	1.8 (0.9–3.6)	0.093
Widowed	0.7 (0.3–1.8)	0.512
Employment status		
Retired (Reference group)	1.00	
Unemployed	0.7 (0.5–0.9)	0.016*
Work outside the healthcare area	1.2 (0.9–1.6)	0.193
Student	1.0 (0.7–1.4)	0.975
Work inside the healthcare area	1.2 (0.7–1.8)	0.531
Education		
Secondary school level or lower (Reference group)	1.00	
Bachelor degree	1.2 (0.9–1.6)	0.193
Higher education	0.6 (0.4–1.0)	0.072
Family monthly income		
Less than 500 JD (Reference group)	1.00	
500–1000 JD	0.8 (0.6–1.1)	0.228
1000–1500 JD	1.2 (0.7–2.2)	0.499
1500 JD and more	1.4 (0.6–3.2)	0.370
Family member with autism		
No (Reference group)	1.00	0.752
Yes	0.9 (0.6–1.5)	

Note: *p≤0.05.

Table 4 Participants' Response Concerning Attitude Items

Item Number	Variable	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	"Children with special needs must be included in regular schools"	12.2%	17.5%	25.8%	28.1%	16.3%
2	"All kindergartens must allow children who need special education to attend their classes until they can go to specialized centers"	4.7%	11.8%	25.2%	42.1%	16.2%
3	"Kindergartens must allow parents to be in the classroom for children with special needs"	5.0%	19.8%	31.5%	30.7%	13.0%
4	"All preschools should have special education teachers and therapists to provide services for children with special needs who attend classes there"	2.8%	6.8%	20.3%	38.2%	31.9%
5	"Government funding should be provided to facilitate the recruitment of staff in kindergartens to meet the needs of these children"	2.9%	6.0%	15.2%	36.6%	39.3%
6	"Parents must help defray the cost of services within preschools"	8.2%	14.4%	28.6%	30.3%	18.6%
7	"The government should allocate more resources to provide services for children with special needs"	3.1%	5.6%	15.8%	37.2%	38.2%
8	"Insurance policies should be modified to include coverage for developmental disorders such as chronic disabilities"	3.4%	7.0%	18.2%	35.2%	36.3%
9	"Parents are responsible for obtaining services for their children with special needs"	6.4%	9.6%	24.5%	37.3%	22.2%

"insurance policies should be modified to include coverage for developmental disorders such as chronic disabilities", with 75.9%, 75.4%, and 71.5%, respectively. The least commonly agreed-upon statement was that "kindergartens must allow parents to be in the classroom for children with special needs" with 43.7%. Table 4 shows participants' responses to all attitude items, Table 4.

Awareness of Available Management Options for Autism

When the participants were examined in terms of their awareness of the available options for the management of autism, the most commonly reported management options were "auditory integrative therapy", providing regular organized training, and therapeutic interventions to develop the relationship with the patient with 50.1%, 48.7%, and 46.3%, respectively. Table 5 shows participants' responses concerning their awareness of available management options for autism items.

Table 5 Participants' Response Concerning Awareness of Available Management Options for Autism Items

Variable	Percentage (Yes)
Auditory integrative therapy	50.1%
Regular organized training	48.7%
Therapeutic interventions to develop the relationship with the patient	46.3%
Sensory Integrative Therapy	44.7%
Applied Behavioral Analysis	37.9%

Table 6 Participants' Attention and Ability to Help People with Autism

Item Number	Variable	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	"I feel ready to deal with children with special needs"	8.8%	13.9%	28.2%	30.4%	18.7%
2	"I am interested in attending a training in Childhood Behavioral and Developmental Disorders"	3.4%	12.1%	26.2%	40.6%	17.8%
3	"I am eager to be a partner in treating and improving the condition of autistic patients, for example using visual aids and medications"	1.7%	9.6%	28.5%	39.9%	20.4%
4	"I see the need to implement changes in public facilities to meet the needs of autistic patients"	2.2%	5.3%	20.8%	39.5%	32.3%

Attention and Ability to Help

When the participants were examined in terms of their attention and ability to help people with autism, they showed a moderate to high level of agreement towards this concept, with an average agreement (answering an attitude item with either agree or strongly agree) percentage of 59.9%. The most commonly agreed-upon statement was that "they see the need to implement changes in public facilities to meet the needs of autistic patients" with 71.8%, and the least commonly agreed upon statement was that "they feel ready to deal with children with special needs" with 49.1%. Table 6 shows participants' attention and ability to help people with autism.

Discussion

Autism spectrum disorder (ASD) is one of the more serious neurological developmental disorders that is usually diagnosed below the age of three years. ASD imposes a heavy economic burden on society and the patients' families. These patients require considerable care, demanding significant financial resources.[24] Early intervention may lead to better outcomes in some patients. Epidemiological studies have shown a rapid increase in the prevalence of ASD in recent years, with a prevalence of four to five-times more in boys than girls.[1]

The aim of this study was to examine the public's knowledge, attitudes, and perceptions to help people with autism in Jordan. The core findings of our study are that: 1) the public's knowledge in Jordan about autism was poor 2) females were more likely to be knowledgeable about autism, 3) moderately positive attitude towards autism was identified among the general public, and 4) attention and the ability to help people with autism were moderately observed among the Jordanian population.

Our participants were not sufficiently aware of autism disorder, they displayed poor knowledge in this section. The mean knowledge score among the study participants was 6.2 (SD: 3.1) out of 17 (which is equal to 36.5% of the maximum attainable score), reflecting a poor level of knowledge about the disease. The poor knowledge displayed by our participants is similar to other studies such as one conducted in Saudi Arabia exploring the disorder knowledge of the general community,[21] in preschool teachers in China 2016[22] and one conducted in Pakistan, in 2018, among parents.[25] Overall, there is a lack of awareness in other crucial subject areas, like evidence-based services, but there is some familiarity with the topography of autism among the general public.[26] In patients with autism spectrum disorder (ASD), early diagnosis and management may improve outcomes for some people.[27] Prior studies have identified a number of advantages to greater public understanding of autism. Reduced stigma toward autistic people is a frequently mentioned advantage across groups and situations, in addition to better identification and earlier service availability.[28] People with a low level of awareness of autism frequently harbor harmful assumptions about autistic people and bully them.[29] For autistic people, these situations are linked to lower self-esteem,[30] reluctance to self-disclose diagnosis,[31] and feeling socially isolated from peers.[32] On the other hand, a higher level of understanding about autism has been linked to fewer stigmas, higher acceptance of autistic people, less overt bias against autism, and more favorable initial impressions of autistic people.[24,31] Therefore, raising awareness about autism among the general public is essential for eliminating stigma and enhancing the general wellbeing of people with autism.

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Knowledge of autism has been demonstrated to be beneficial in a variety of settings and for a number of general demographic groups. Greater parental empowerment was linked to greater knowledge of autism. In a separate study, neurotypical classmates of middle schoolers with autism demonstrated only limited understanding of the condition.[33] With more information, however, neurotypical peers had more favorable opinions of their autistic peers.[34]

In our study, females were 30% more likely to be knowledgeable about autism (p≤0.05). On the other hand, unemployed participants were 30% less likely to be knowledgeable about autism (p≤0.05). This was confirming the findings of previous studies, which demonstrated a higher level of knowledge among females.[21,25,35] The fact that females are more interested than males in studying diseases could be one explanation.[24,36,37] One of these studies found that there was a sizable knowledge gap between men and women, with women having a higher understanding of psychiatric disorders.[38]

In our study, the participants showed a moderately positive attitude toward autism. The majority of the participants confirmed that government funding should be provided to facilitate the recruitment of staff in kindergartens to meet the needs of these children and to allocate more resources to provide services for them. In addition, they confirmed that insurance policies should be modified to include coverage for developmental disorders such as chronic disabilities. However, a lower proportion of the participants confirmed that kindergartens must allow parents to be in the classroom for children with special needs. Prior research highlighted the high cost of necessary care and significant insurance coverage gaps for people with autism.[39] Governments and insurance companies should increase the coverage of services related to ASD in response to the rising prevalence rate of the disorder.[39] In order to enhance the public's attitude towards autism, a higher level of knowledge about the disorder is needed.[38] Public perception about autism is shaped by their knowledge about the disease, which ultimately will be reflected in their attitude toward it. This could be improved by using social media to provide more details and shed light on how truthful, factual, or generalizable the representations of autism in popular media are.[38]

Conclusion

It can be safely concluded that there is a lack of awareness and insufficient knowledge about autism among the Jordanian population, which may have delayed early identification and providing appropriate intervention, leading to unsatisfactory outcomes in ADS patients. More funds should be allocated to increase public knowledge, enhance their attitude towards patients with autism, and improve the services provided for this group of patients. Significant efforts should be made to increase community awareness of autism through organizations and governments that can support early diagnosis and an appropriate treatment plan and therapy for autistic children.

Data Sharing Statement

All data are available on reasonable request from the corresponding author.

Ethical Approval

The study was approved by the Institutional Review Board at Isra University, Amman, Jordan gave their clearance with IRB No. SREC/22/03/36. This study was conducted in accordance with the World Medical Association (WMA) Declaration of Helsinki.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

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