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Echoes of Understanding: An In-Depth Exploration of Autism Awareness and Community Support Initiatives in the Al-Baha Region of Saudi Arabia

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ABSTRACT: This research delves into Autism Spectrum Disorder (ASD), a complex neurodevelopmental condition characterized by social interaction challenges, communication difficulties, and repetitive behaviors. This study evaluates levels of ASD awareness, emphasizing the crucial role of knowledge dissemination in the absence of definitive diagnostic tools. The study involved 1752 participants, primarily females (90.8%), aged 15-25 (61.7%), and single (35.4%). The majority had a bachelor's degree (69.1%) and were employed outside healthcare (59.8%), with an income of ≥ 5000 SAR/month (43.7%). Only 6.2% acknowledged family autism links. Findings revealed that 75.9% exhibited weak ASD knowledge, with notable gender differences. Females generally displayed lower ASD knowledge levels, while marital status, employment, and education level did not significantly impact awareness. Participants' familiarity with ASD ranged from 12.4% to 79%, with the internet and social media being prominent information sources (67.15%). Despite varying levels of awareness, certain aspects of ASD, such as its neurological origin and communication deficits, were relatively well-understood. Regarding caregiving, education, and advocacy, a majority supported government funding for specialized services in preschools (71.1%) and endorsed integrating autistic children into mainstream schools (62.5%). Awareness of autism care approaches varied, with behavioral management perceived as the most effective (35.9%). However, there was limited awareness of other interventions such as Occupational Therapy and Nutritional Therapy. In conclusion, the study identified significant deficits in ASD awareness among participants, emphasizing the need for targeted educational campaigns and increased governmental support for preschool education and resources catering to individuals with special needs.

1. INTRODUCTION

Autism Spectrum Disorder (ASD) is a childhood developmental condition marked by various social, behavioral, and communication challenges (Hodges et al., 2020). Anatomical and functional alterations in the brain accompany ASD, exhibiting a spectrum of severity from moderate to severe. Individuals with severe cases often require extensive assistance and ongoing support, displaying a proclivity for repetitive behaviors and resistance to changes in their daily routines. Affecting one in every 44 children, ASD transcends racial and ethnic boundaries, making it one of the most prevalent developmental impairments among children (Maenner et al., 2018). The incidence of ASD has risen over the past two decades, possibly attributed to increased awareness, leading caregivers to seek screening and diagnosis from specialists (Maenner et al., 2018). Diagnosing ASD remains challenging, as there are no direct tests or specific biomarkers available. Instead, diagnosis relies on observing the child's behavior. In 2013, the Diagnostic and Statistical Manual of Mental Disorders (DSM)-5 consolidated the ASD spectrum, incorporating pervasive developmental disorder and Asperger's disorder. ASD is associated with various mental disorders, including attention deficit hyperactivity disorder

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(ADHD), social anxiety disorder, depression, and intellectual disability (Posar et al., 2015). The age of diagnosis varies, with some children identified as early as 18 months, while others require an additional 18 months for confirmation, causing delays in treatment initiation. Early intervention significantly enhances verbal and cognitive abilities, especially for those with more acute symptoms. Factors contributing to diagnosis delays in Saudi Arabia include limited information and awareness among both the community and healthcare staff. Various screening instruments, such as the Modified Checklist for Autism in Toddlers (M-CHAT) and the Communication and Symbolic Behavior Scales (CSBS), are employed, with the Autism Diagnostic Observation Schedule-2 (ADOS-2) considered the "gold standard (Alyami et al., 2022). Risk factors for ASD encompass genetic and environmental variables, including maternal use of certain medications during pregnancy, advanced parental age, and maternal health conditions like hypertension or infections. Genetic and chromosomal disorders, such as the Fragile X chromosome, may contribute to ASD (Modabbernia et al., 2017). Additionally, exposure to neurotoxic chemicals has been linked to changes in the GABAergic, glutamatergic, serotonergic, and dopaminergic systems in ASD (Quaak et al., 2013). Numerous myths and misconceptions surround autism spectrum disorder including the unfounded belief that vaccines contribute to its development. Contrary to such notions, the World Health Organization (WHO) asserts that there is no documented link between vaccines and ASD, including the MMR vaccine (Gabis et al., 2022). It is crucial to dispel these misconceptions to ensure accurate public understanding. ASD lacks a definitive medical cure, emphasizing the importance of initiating specialized behavioral therapies upon confirmation of the diagnosis (Okoye et al., 2023). Caregivers play a pivotal role in helping ASD patients acquire essential skills, such as communication, eye contact, social interaction, and physical activities. The management of ASD incurs substantial costs, encompassing both direct expenses, such as healthcare, and indirect costs, like additional educational support, especially for children with intellectual disabilities (Tathgur & Kang, 2021). This financial burden can strain families and, in many instances, lead to maternal job loss. Recognizing the economic impact underscores the urgency of fostering community and healthcare worker awareness about the ASD spectrum. Improved understanding is pivotal for early diagnosis and intervention, contributing to a more favorable prognosis. Consequently, assessing the general public's awareness of typical infant development and ASD in Saudi Arabia becomes imperative. Identifying knowledge gaps and implementing appropriate interventions will contribute significantly to enhancing overall awareness and facilitating better outcomes for individuals with ASD.

2. MATERIALS AND METHODS

2.1. Study Design

A cross-sectional study was undertaken in Saudi Arabia spanning from August 2020 to August 2023. The research employed an online survey tool to investigate the knowledge of the general population in Saudi Arabia concerning typical child development and autism spectrum disorder

2.2. Questionnaire Tool

The present investigation employed a meticulously validated survey methodology, as detailed by Liu (Liu et al., 2016) serving as the fundamental instrument for data collection. This survey, consisting of a comprehensive set of 32 inquiries, underwent a rigorous process of systematic categorization to ensure precision in addressing the overarching research objectives. The inaugural segment, comprising eight inquiries, was meticulously designed to elicit demographic information from the study subjects. Subsequently, a discerning focus was directed towards a segment encompassing 15 binary format items, strategically positioned to meticulously scrutinize the participants' familiarity with ASD. Each correct response within this domain was attributed a numerical value of one, ultimately contributing to the computation of a cumulative knowledge score, with a maximum attainable score of 15. The topics under consideration spanned a spectrum, ranging from a nuanced understanding of ASD symptoms and behaviors, appreciation of standard child development, recognition of the pivotal role of early diagnosis in treatment efficacy, exploration of causative factors and associated risk elements, discernment of appropriate treatment methodologies, comprehensive understanding of the disorder's etiology, and a nuanced grasp of its prevalence. The third segment of the survey comprised four items, each presented on a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). This segment served as a nuanced exploration of participants' perspectives concerning caregiving and advocacy for children affected by ASD. Delving into attitudes regarding the distinctive needs of autistic children, prerequisites for their educational and instructional needs, opinions on governmental financial support, considerations for resource allocation dedicated to autistic children, and the inclusivity of insurance policies for this demographic, this section aimed to capture the multifaceted nature of participant viewpoints. Moving forward, the fourth section featured three items, also presented on a 5-point Likert scale, with the intent of assessing participants' interest levels and perceived effectiveness regarding ASD. This segment aimed to unravel participant attitudes towards ASD-related matters, offering insights into the nuanced interplay of interest and perceived efficacy. The final segment of the survey was crafted to gauge participants' awareness levels concerning interventions and strategies dedicated to the holistic well-being of individuals grappling with ASD. This segment comprised six binary format items, intricately designed to probe participants' familiarity with a spectrum of interventions and strategies devised to enhance the quality of life for individuals navigating the challenges posed by ASD.

Table 1
Exploring and Analyzing the Demographic Characteristics of Participants in the Study

Parameters	N	%	Mean
Age Group			
15-25	1080	61.7	
26-36	247	14.2	
37-47	397	22.7	
48-58	28	1.7	26.64± 9.73
Gender			
Male	162	9.2	
Female	1590	90.8	
Total Knowledge			
Low knowledge	1329	75.9	
Average knowledge	387	22.1	
High knowledge	36	2.1	8.41 ± 2.91
Marital Status			
Single	620	35.4	
Married	609	34.8	
Divorced	303	17.3	
Widow	220	12.6	
Highest Qualification			
Postgraduate	63	3.6	
Graduate	1211	69.1	
High School	307	17.5	
Intermediate	108	6.2	
Promary Level	54	3.1	
Illitrate	9	0.5	
Employment Status			
Healthcare Sector	1047	59.8	
Non-health Sector	422	24.1	
Unemployed	142	8.1	
Retired	4.7	4.7	
Housewife	58	3.3	
Region			
AL-Baha	1342	76.6	
Alaqiq	36	2.1	
Algara	40	2.3	
Alhojra	36	2.1	
Almandaq	46	2.6	
Bany Alhassan	45	2.6	
Bhaljureshi	99	5.7	
Gamid Alznad	36	2.1	
Qilwa	72	4.1	
Monthly Income (SAR)			
≥5000	504	43.7	
5 - 7 000	99	5.6	
7-10000	216	12.3	
10,000 – 15,000	243	13.8	
>15000	99	5.6	
≥16000	1	0.1	
17000-30000	13	1.3	
No-income	577	32.9	
Is there a presence of autism spectrum disorder in any first relatives' degree			
Yes	116	6.2	
No	1400	79.8	

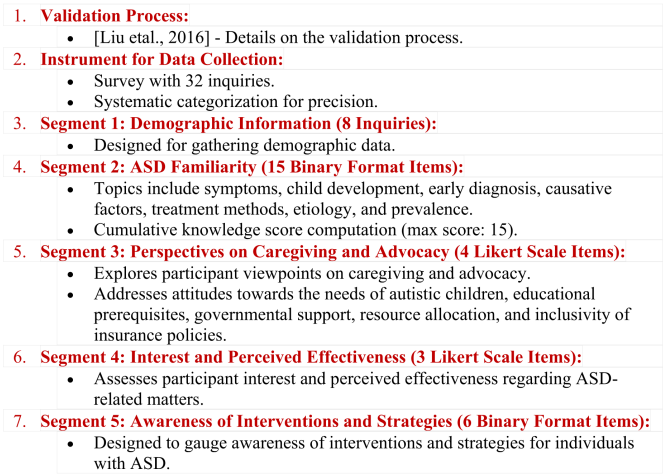

Figure 1. Overview of the Methodology in Flowchart Form

2.3. Statistical Analysis

Data analysis for this investigation employed Statistical Packages for Social Sciences version 27 (SPSS Inc., Chicago, IL, USA). Categorical data were reported in terms of frequency and percentage. To ensure data normality, histograms and normality measures were employed, indicating a normal distribution. Continuous variables, such as participants' autism knowledge scores, were presented as mean (SD). An independent sample t-test and a one-way analysis of variance (ANOVA) were utilized to compare mean autism knowledge scores across different demographic groups. Fisher's least significant difference (LSD) post hoc test identified sources of significant variation within each group. The mean participants' autism knowledge score (8.41) served as a cutoff point in binary logistic regression analysis to discern factors influencing participants' knowledge of autism. A confidence interval of 95% ($p < 0.05$) was applied to signify the statistical significance of results, with the level of significance set at 5%.

3. RESULTS

3.1. Participants' Demographic Characteristics

This investigation engaged a total of 1752 participants to comprehensively explore and analyze various facets. Notably, the majority of the participants, constituting 90.8% of the cohort, identified as males. The age distribution within the study cohort revealed that a significant proportion, specifically 61.7%, fell within the age range of 15 to 25 years. A closer examination of the participants' marital status unveiled that a considerable portion, accounting for 35.4%, identified as single. Educational backgrounds showcased a noteworthy trend, with 69.1% of the participants having attained a bachelor's degree. Diversifying the analysis, employment status revealed that a substantial 59.8% of the subjects were actively engaged in occupations beyond the healthcare sector. Financial demographics shed light on the economic standing of the participants, with 43.7% reporting a monthly income

equal to or exceeding 5000 Saudi Riyals (SAR). Exploring familial connections to autism, responses indicated that 6.2% of participants acknowledged the presence of first-degree relatives with autism, while a predominant 79.8% denied such familial associations. For a detailed and nuanced understanding of the demographic composition, Table 1 presents a comprehensive breakdown of the various characteristics inherent in the study participants.

3.2. In-depth Exploration of Autism: Understanding the Characteristics, Causes, and Current Insights into Autism Spectrum Disorder (ASD)

The study aimed to assess participants' knowledge regarding autism spectrum disorder. The overall findings indicate that a significant majority, 75.9%, exhibited a weak understanding of ASD, while 22.1% demonstrated an average knowledge, and a smaller proportion, 2.1%, possessed a high level of knowledge. A detailed breakdown based on gender revealed notable differences. Among the total female participants, comprising 90.8% of the study population, a substantial 77.02% had low knowledge, 19.5% displayed average knowledge, and only 1.0% exhibited high knowledge regarding ASD. In contrast, among the 9.2% male participants, 5.7% had low knowledge, 2.6% had average knowledge, and 1.0% had high knowledge. The chi-square analysis yielded a significant result, with a chi-square value of 78.982 and a p-value of 0.0001, indicating a statistically significant difference in ASD knowledge between male and female participants. Interestingly, marital status did not appear to influence the overall knowledge of participants about ASD, as indicated by a Pearson Chi-Square value of 0.608. This implies that participants' marital status was not associated with variations in their understanding of ASD. Similarly, employment status did not demonstrate a statistically significant relationship with the participants' overall knowledge of ASD. The Pearson Chi-Square value of 3.533 suggested no significant difference in ASD knowledge based on employment status among the participants. Educational differences among participants were also explored, and the analysis indicated no significant correlation between the level of education and the overall knowledge of ASD. The Pearson Chi-Square value of 113.022 emphasized that educational backgrounds did not play a substantial role in determining participants' knowledge about ASD. The study revealed gender-based disparities in ASD knowledge among participants, with females generally having lower knowledge levels. However, marital status, employment status, and educational differences did not emerge as significant factors influencing the overall knowledge of participants about ASD. Table 2 provides a clear overview of the distribution of knowledge levels across different demographic characteristics.

3.3. Knowledge of Strategies Pertaining to the Care of Autistic People

A total of 15 inquiries were disseminated among participants to gauge their comprehension of autism spectrum disorder (ASD). The distribution of correct responses to the knowledge items exhibited a range between 12.4% and 79%. Notably, 36.5% of participants asserted possessing prior familiarity with ASD, while 18% professed a lack of knowledge, and an additional 45.5% admitted to a state of ignorance regarding this disorder. The acquisition of information pertaining to ASD demonstrated distinct sources, with 67.15% of participants relying on internet and social media platforms for enlightenment, and 21.1% obtaining awareness through familial and social networks. Conversely, a minimal fraction acquired knowledge through television exposure and institutional courses pursued during their academic endeavors. The highest percentage of accurate responses was evident in items addressing the origins of ASD, with 82.2% acknowledging ASD as a neurological disorder impacting behavioral, learning, interactive, and communicative aspects. Further, 43.7% correctly identified excessive television and electronic device usage as non-contributors to the development of autism in children. Regarding communication deficiencies, 86.4% recognized deficits in both verbal and non-verbal communication in autistic individuals. Concurrently, 74.3% acknowledged characteristic behaviors such as speech repetition and motor activities like flapping or spinning. Concerning demographic prevalence, 33.4% of participants subscribed to the belief that ASD is more prevalent in males than females, while 61.5% lacked awareness on this matter. Only 35.4% were accurate in understanding that autism exhibits familial patterns, with a significant 64.6% maintaining the misconception that it does not. Emotional stress within families was recognized by 53.3% of participants, acknowledging issues such as discrimination, stigma, bullying, and societal non-acceptance of autistic individuals. In the study cohort, 37% reported direct engagement with autistic children, while 63% indicated no prior interactions with individuals diagnosed with autism spectrum disorder. Table 3 delineates the cognitive acumen and consciousness pertaining to autism spectrum disorders, along with associated factors, among the study participants and Table 4 presents a matrix expounding the intricate interconnections among variables under investigation, complemented by significance tests rigorously adjusted for multiple comparisons using Holm's method.

3.4. Perceptions regarding the care and advocacy for children with autism spectrum disorders

Four distinct elements were employed to investigate the perspectives held by participants concerning the caregiving, educational initiatives, and advocacy efforts dedicated to children with autism. Among the consensus viewpoints, a prevailing sentiment emerged that emphasized the necessity for government funding to be earmarked specifically for the facilitation of staff employment in preschools, catering to the unique requirements of these children, with a notable agreement rate of 71.1%. Another commonly endorsed notion was the belief that the government should allocate an augmented pool of resources to enhance the provision of services tailored to the needs of children with special requirements, garnering a concurrence rate of 73.5%. Furthermore, a substantial majority,

Table 2
Comprehensive Insights into Total Knowledge and Socio-Demographic Data: A Holistic Examination of Information and Demographic Factors in a Given Table

Total Knowledge * Gender											
Total Knowledge Gender	**Low Knowledge**		**Average Knowledge**		**High Knowledge**		**Total**		**Pearson Chi-Square**	**Significance**	**95% Confidence Interval** **Lower Bound** **Upper Bound**
Male	99	5.7%	45	2.6%	18	1.0%	162	9.2%			
Female	1230	70.2%	342	19.5%	18	1.0%	1590	90.8%	78.982[a]	.000[b]	0.000 0.000
Total	1329	75.9%	387	22.1%	36	2.1%	1752	100.0%			
Total Knowledge * Marital status											
Total Knowledge Marital status	**Low Knowledge**		**Average Knowledge**		**High Knowledge**		**Total**		**Pearson Chi-Square**	**Significance**	**95% Confidence Interval** **Lower Bound** **Upper Bound**
Single	469	26.8%	137	7.8%	14	0.8%	620	35.4%			
Married	461	26.3%	137	7.8%	11	0.6%	609	34.8%			
divorced	230	13.1%	66	3.8%	7	0.4%	303	17.3%	.608[a]	.370[b]	0.360 0.379
widow	169	9.6%	47	2.7%	4	0.2%	220	12.6%			
Total	1329	75.9%	387	22.1%	36	2.1%	1752	100.0%			
Total Knowledge * Employment status											
Total Knowledge Employment status	**Low Knowledge**		**Average Knowledge**		**High Knowledge**		**Total**		**Pearson Chi-Square**	**Significance**	**95% Confidence Interval** **Lower Bound** **Upper Bound**
Working outside health sector	317	18.1%	97	5.5%	8	0.5%	422	24.1%			
Working inside health sector	792	45.2%	231	13.2%	24	1.4%	1047	59.8%	3.533[a]	.247[b]	0.238 0.255
Educated housewife	48	2.7%	10	0.6%	0	0.0%	58	3.3%			
Retired	61	3.5%	20	1.1%	2	0.1%	83	4.7%			
Unemployed	111	6.3%	29	1.7%	2	0.1%	142	8.1%			
Total	1329	75.9%	387	22.1%	36	2.1%	1752	100.0%			
Total Knowledge * The educational level											
Total Knowledge The educational level	**Low Knowledge**		**Average Knowledge**		**High Knowledge**		**Total**		**Pearson Chi-Square**	**Significance**	**95% Confidence Interval** **Lower Bound** **Upper Bound**
Un-educated	0	0.0%	9	0.5%	0	0.0%	9	0.5%			
Primary education	45	2.6%	9	0.5%	0	0.0%	54	3.1%			
Intermediate education	99	5.7%	0	0.0%	9	0.5%	108	6.2%	113.022[a]	.333[b]	0.323 0.342
High School	208	11.9%	90	5.1%	9	0.5%	307	17.5%			
University	941	53.7%	252	14.4%	18	1.0%	1211	69.1%			
Post-graduate	36	2.1%	27	1.5%	0	0.0%	63	3.6%			
Total	1329	75.9%	387	22.1%	36	2.1%	1752	100.0%			

Table 3
Participants' familiarity and comprehension of autism spectrum disorders, along with their awareness of associated factors.

Knowledge and Awareness about Autism Spectrum Disorders	N	%
I have prior knowledge of autism spectrum disorder I don't know	797	45.5
No	315	18.0
Yes	640	36.5
What is your source of information about autism?	108	6.2
Courses	370	21.1
Family & Friends	1175	67.1
Internet & Social Media	99	5.7
TV		
Choose the option that best fits your autism concept	1441	82.2
Neurological disorder	144	8.2
Rare disorder	122	7.0
Mental disorder	45	2.6
Disease has a cure		
Children develop autism as a result of watching television and using electronic devices a lot.	500	28.5
I don't know	487	27.8
No	765	43.7
Yes		
The autistic child suffers from deficiencies in verbal communication (speech) and non-verbal	1513	86.4
communication (body movements, facial movements, gestures, etc.)	59	3.4
Yes	180	10.3
No		
I don't know		
The child with autism exhibits behaviours such as (repeating speech, flapping / spinning)	1302	74.3
Yes	45	2.6
No	405	23.1
I don't know		
Autism is more prevalent among male children than females	585	33.4
Yes	90	5.1
No	1077	61.5
I don't know		
People with autism suffer from resistance to changing routines and attachment to unfamiliar things	1274	72.7
Yes	36	2.1
No	442	25.2
I don't know		
Does autism run in families?	621	35.4
Yes	1131	64.6
No		
In your opinion, do you think that autism has a cure?	711	40.6
yes	189	10.8
No	852	47.8
I don't know		
Is there disease awareness in your area?	603	34.4
Yes	1149	65.6
No		
Which of these pressures does the family face more? Economic pressures (treatment costs).	450	25.7
Social pressures (denial of health care services and participation in any outside activity).	369	21.1
Emotional stress (discrimination, stigma, bullying, and society's lack of acceptance of the child).	933	53.3
The majority of individuals with autism disorder have a mental disability concurrent with autism	531	30.3
disorder	414	23.6
Yes	807	46.1
No		
I don't know		
Some individuals with autism display distinctive abilities and high skills	1464	83.6
|Yes	27	1.5
No	261	14.9
I don't know		
Have you ever dealt with an autistic child?	648	37
Yes	1104	63
No		

Table 4
Thepresentation of a matrix elucidating the interrelations among study variables,accompanied by significance tests meticulously adjusted for multiplecomparisons employing Pearson Correlation

Pearson Correlation	Where do you live?	Age Category	Marital status	Gender	Employment status	Educational level	Monthly income	Total Knowledge
Where do you live?	1							
Age Category	0.02	1						
Marital status	0.009	-.147**	1					
Gender	-.171**	-0.011	0.022	1				
Employment status	0.002	.495**	-.413**	0.006	1			
Educational level	-0.012	-0.012	-0.01	0.027	0.007	1		
Monthly income	0.023	-0.009	-0.022	-.264**	-0.016	.171**	1	
Total Knowledge	-.053*	-0.002	-0.008	-.157**	-0.017	-0.011	.102**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

at a percentage of 61.7%, expressed the perspective that all preschools should incorporate specialized education programs designed for children with autism spectrum disorder thereby ensuring comprehensive and apt training. In tandem with this, 62.5% of the participants advocated for the integration of children with ASD into mainstream school settings, affirming the importance of inclusivity and diversity in educational environments. A nuanced aspect that gained recognition in the study was the stance regarding financial responsibilities. A significant portion, constituting 62.5%, agreed that parents should bear the financial burden for the services offered to autistic children in educational institutions. This multifaceted exploration of attitudes is succinctly summarized in Table 5, which delineates the participants' collective stance on the caregiving, educational, and advocacy dimensions related to children with autism.

3.5. Fascination and Perceived Effectiveness

Three key instruments were employed to delve into participants' inclinations and their assessments of effectiveness in the realm of autism management. Notably, the participants exhibited the most pronounced consensus in expressing their keen interest in engaging with and attending a specialized training program tailored for children with special needs, with an agreement rate of 67.3%. This underscores a substantial level of enthusiasm and commitment among the participants towards enhancing their understanding and skills in catering to the unique requirements of individuals with autism spectrum disorder. Furthermore, a significant proportion of participants, accounting for 74.3%, concurred on the importance of supporting ASD patients through a multifaceted approach involving visual aids and medications. This acknowledgment reflects a recognition of the diverse and comprehensive nature of interventions required for effective autism management, extending beyond mere educational initiatives to encompass holistic support mechanisms. In a parallel vein, 56.3% of

Table 5
Consolidated perspectives of participants concerning caregiving, educational, and advocacy dimensions pertaining to children diagnosed with autism.

Parents should cover the expenses for services offered to autistic children in schools?		
	N	%
Strongly disagree	98	5.6
Disagree	424	24.2
Neither Agree nor Disagree	134	7.6
Agree	237	13.5
Strongly agree	859	49
Children with ASD should be integrated into regular school settings.		
Strongly disagree	85	4.9
Disagree	117	6.7
Neither Agree nor Disagree	469	26.8
Agree	70	4.0
Strongly agree	1011	57.7
All preschools should offer special education for ASD kids to ensure proper training		
Strongly disagree	127	7.2
Disagree	156	8.9
Neither Agree nor Disagree	180	10.2
Agree	674	38.4
Strongly agree	615	35.1
The government should allocate increased resources for children with ASD.		
Strongly disagree	20	1.14
Disagree	279	15.9
Neither Agree nor Disagree	206	11.7
Agree	445	25.4
Strongly agree	802	45.7

participants expressed a sense of preparedness to effectively engage and work with children diagnosed with ASD. This self-assessment underscores the importance of confidence and readiness among professionals and individuals involved in the care and education of individuals with autism. Table 6 serves as a visual representation, encapsulating the extent of agreement among participants regarding their interests and perceived efficacy in the context of autism management. This comprehensive exploration sheds light on the participants' perspectives and readiness to actively contribute to the nuanced and dynamic field of ASD care.

Table 6
Participants' Engagement and Perceived Effectiveness in Autism Management

I am interested in participating and attending a training program for special needs children		
	N	%
Strongly disagree	125	7.1
Disagree	94	5.3
Neither Agree nor Disagree	354	20.2
Agree	535	30.5
Strongly agree	644	36.8
I am pleased to support ASD patients through visual aids and medications		
Strongly disagree	27	1.5
Disagree	146	8.3
Neither Agree nor Disagree	276	15.7
Agree	984	56.1
Strongly agree	319	18.2
I feel well-prepared to work with children with ASD.		
Strongly disagree	350	20.0
Disagree	247	14.1
Neither Agree nor Disagree	224	12.7
Agree	714	40.8
Strongly agree	271	15.5

3.6. Awareness of Strategies Dedicated to the Care of Individuals with Autism

When queried about their awareness of various approaches dedicated to the care of individuals with autism, participants provided nuanced insights. Notably, approximately half of the respondents, constituting 35.9%, expressed agreement with the notion that Behavioral management stands out as the most effective approach for managing autism. This indicates a prevailing acknowledgment among participants regarding the significance of behavioral interventions in the comprehensive care and support of individuals on the autism spectrum. Following closely, a notable proportion of participants, at 19.6%, recognized the value of Occupational Therapy as a key management approach for autism. This underscores an awareness of the importance of addressing sensory and motor challenges in the holistic care of individuals with autism. Additionally, nutritional therapy garnered recognition from 18.4% of participants, highlighting an emerging understanding of the potential impact of dietary interventions in autism management. Educational and school-based therapies secured acknowledgment from 9.8% of participants, affirming the role of academic environments in tailored interventions. Further down the spectrum, medication treatment received acknowledgment from 9.4% of participants, suggesting an awareness of the role of pharmaceutical interventions in specific cases. Lastly, Cognitive Behavioral Therapy (CBT) was recognized by 6.9% of participants, reflecting an understanding of the potential benefits of cognitive and behavioral interventions in the context of autism. For a comprehensive overview, Table 7 below encapsulates the percentage distribution of participants' awareness of various approaches dedicated to the care of individuals with autism. This collective awareness sheds light on the diverse perspective's participants holds regarding the most effective strategies in the management of autism.

Table 7
Cognizance of Approaches Dedicated to the Care of Individuals with Autism

Are you aware about interventions provided to Autism patients	
Behavioural management therapy	35.9%
Cognitive behaviour therapy	6.9%
Educational and school-based therapies	9.8%
Medication treatment	9.4%
Nutritional therapy	18.4%
Occupational therapy	19.6%

4. DISCUSSION

This research endeavor sought to investigate the cognitive acumen of the populace in Al-Baha, Saudi Arabia, concerning ASD. Furthermore, the study aimed to evaluate variables linked to a precise comprehension of ASD. Additionally, an exploration of the participants' attitudes towards autism and their cognizance of methodologies dedicated to the caregiving of individuals with autism was undertaken. The pivotal outcomes derived from our investigation reveal a notable deficiency in the level of autism-related knowledge among study participants. In assessing participants' attitudes towards the care and advocacy of children with autism, several consensus points emerged. Participants widely concurred on the necessity for government funding to facilitate staff employment in preschools, particularly to cater to the specific needs of children with autism. There was a strong endorsement for increased governmental allocation of resources to enhance services for children with special needs. Additionally, there was a prevalent opinion favoring amendments to insurance policies to encompass coverage for developmental disorders as chronic disabilities. Of particular note was the unanimous agreement among participants regarding the imperative for all preschools to integrate special education teachers and therapists to cater to the requirements of children with special needs attending these institutions. The study participants also demonstrated a high degree of consensus on the need for alterations in public facilities

to accommodate the needs of autistic patients. Noteworthy is their expressed eagerness to actively contribute to the treatment and enhancement of conditions for autistic patients, exemplified by their endorsement of interventions such as the utilization of visual aids and medications. Moreover, participants exhibited heightened awareness of behavioral management therapy that includes development programs and auditory integration therapy as approaches specifically devoted to the care of individuals with autism. These findings collectively illuminate the nuanced landscape of knowledge, attitudes, and awareness among the study participants concerning autism-related matters. A precedent study conducted in the United States revealed that approximately 90% of participants exhibited proficient knowledge of ASD across domains such as diagnosis, symptoms, etiology, and therapy (Rouphael et al., 2023). Contrarily, only 75% of participants demonstrated substantial knowledge of ASD, aligning with the findings of a prior study conducted in Saudi Arabia. Despite participants' prior exposure to information about ASD, the current study identified a pervasive lack of understanding and numerous misconceptions about the disorder among participants. Similar patterns of insufficient knowledge have been documented in previous research within the Middle East region, including Lebanon and Oman, where students and professionals exhibited inadequate knowledge about ASD (Mustafa et al., 2024). An Australian survey indicated that, while the majority of participants were familiar with the term ASD, there existed a notable knowledge gap regarding the condition's etiology and impact. Notably, a considerable proportion of Australians incorrectly associated ASD with a purported reaction to the MMR vaccine, despite the World Health Organization's explicit statement that no evidence links any vaccine to autism (Thorsteinsson et al., 2020). Furthermore, misconceptions about the treatment of ASD were identified in another study, with participants erroneously believing that children with ASD are incapable of attending public school (Robledo & Donnellan, 2016). As highlighted earlier, the multifaceted origins of ASD involve a combination of genetic and environmental factors (Genovese & Butler, 2020). In an additional African study, a deficiency in comprehension of ASD was observed not only among communities but also among healthcare providers and educators (Aderinto et al., 2023). These collective findings underscore the imperative for comprehensive educational initiatives to rectify misconceptions, dispel inaccurate beliefs, and enhance awareness surrounding ASD across diverse populations and geographic regions (Aderinto et al., 2023).

A predominant representation of females, comprising approximately 94% of the study participants, was observed. Noteworthy similar with previous research suggesting that females tend to exhibit a higher awareness of autism disorder when knowledge is compared by gender. The rationale behind this gender difference might be attributed to the reported inclination of females toward the study of diseases (Estrin et al., 2021). Several studies have demonstrated a substantial knowledge disparity between males and females, with the latter exhibiting a heightened awareness of specific psychiatric illnesses (Sagar-Ouriaghli et al., 2019). Additionally, a significant proportion of the current study's participants were below the age of 15-25 years old underscoring a potential lack of awareness of autism spectrum disorder within younger age cohorts. A parallel observation in a prior study indicated that older participants tended to possess more experience than their younger counterparts. Contrarily, one study posited that, while there may be gender-related differences in knowledge, neither age nor educational attainment exerted a discernible impact on the level of knowledge about ASD (Kim & Chung, 2022). An examination of ASD knowledge in China reported that gender and socioeconomic status were pivotal demographic variables influencing awareness. The multifaceted nature of public knowledge about ASD is underscored by the interplay of numerous variables, including cultural differences and diverse information sources, encompassing the internet, social media, and television (Yu et al., 2020). These factors collectively contribute to the discernible disparities in public knowledge regarding ASD. A preceding investigation focusing on the comprehension of autism spectrum disorder among healthcare professionals in Saudi Arabia discerned that approximately fifty percent of them exhibited a moderate to poor level of knowledge concerning ASD (Abualhommos et al., 2022). Notably, the study identified pronounced gaps in their understanding, particularly with respect to the origins and comorbidities associated with the disorder. Another pertinent study emphasized the imperative for increased knowledge acquisition among healthcare providers and educators in the realm of ASD. Furthermore, this body of research underscored that, within the spectrum of healthcare professionals, pediatricians and psychiatrists demonstrated the highest levels of expertise in ASD (Grzadzinski et al., 2021). This highlights a critical need for targeted educational interventions, particularly among healthcare personnel who may play pivotal roles in the identification, diagnosis, and management of individuals with ASD. Enhancing the knowledge base of healthcare providers and educators is instrumental in fostering an environment that is conducive to the optimal care and support of individuals affected by ASD. In our investigation, we observed that the highest percentages of accurate responses were associated with items related to knowledge about the symptoms and behavior of children with autism spectrum disorder. Conversely, the lowest percentages of correct answers were found in items concerning knowledge about the treatment and etiology of ASD. This aligns with the outcomes of a prior study conducted in China and the USA, highlighting the prevalent misunderstanding of pharmaceutical treatments for ASD within the general public. Recognizing the risk factors for ASD assumes paramount importance in mitigating the likelihood of having children with the disorder (Zhou et al., 2020). Early detection emerges as a pivotal factor in improving outcomes, with potential positive impacts on a child's linguistic, cognitive, and adaptive behaviors. Timely intervention, ideally before the age of four, contributes to enhancing a child's social behavior and daily skills. It is crucial to note that early detection is not always a straightforward process, as it hinges significantly on

the healthcare provider's level of education and adherence to ASD guidelines. Furthermore, as indicated by a previous study, the interval between the initial observation of a child's behavior and the confirmed diagnosis could extend up to two years. This underscores the intricate nature of the diagnostic process, highlighting the reliance on healthcare providers' education levels and the diligent execution of established ASD guidelines (Alrehaili et al., 2023). It emphasizes the need for streamlined processes and heightened awareness to facilitate early detection and intervention, thereby positively influencing the developmental trajectory of individuals with ASD. Our study uncovered a noteworthy discrepancy in knowledge between individuals with a first-degree relative diagnosed with autism and those without such familial connections, consistent with earlier research findings. Research has previously indicated that individuals with direct interactions with autism spectrum disorder patients tend to possess enhanced knowledge due to their accrued experiences. A significant majority of participants in our study advocated for government initiatives, expressing agreement that funding should be made available to preschools to bolster staffing for meeting the specific needs of children with ASD (Crompton et al., 2020). Participants also called for increased government allocation of resources to provide services for children with special needs, emphasizing the necessity for all preschools to have special education teachers and therapists. The consensus among participants aligns with the broader body of research, wherein numerous studies underscore the pivotal role of government involvement in augmenting awareness of ASD and providing support to families with autistic individuals. Recommendations from prior studies include the initiation of nationwide awareness campaigns to elevate understanding. Drawing attention to international perspectives, a 2015 Australian study highlighted disparities in government support, particularly for older adolescents with ASD, leading to adverse consequences such as decreased opportunities for secondary school education and future employment (Rasheed, 2023). This deficiency in support translated into significantly lower employment rates for individuals with ASD compared to those with other disabilities or without disabilities. Moreover, the impact of inadequate support from school professionals in the education system was observed in contributing to the social isolation and withdrawal of ASD students from their schools (Rasheed, 2023). Government funding, as evidenced in studies, played a crucial role in educating parents and teachers about ASD, emphasizing the importance of comprehensive support systems in enhancing the overall well-being and educational experiences of individuals with ASD (Jaffal & M, 2022). Given the perceived substantial cost associated with the treatment of developmental disorders, a consensus among the majority of participants in our study emphasized the importance of insurance policies incorporating coverage for developmental disorders. This viewpoint aligns with findings from a previous study, which quantified the lifetime costs of treating autism spectrum disorder patients in the United Kingdom and the United States. The study revealed that costs were significantly higher for individuals with intellectual disabilities, emphasizing the economic impact of ASD on both direct and indirect treatment expenses (Buescher et al., 2014). Moreover, another study highlighted the financial implications of special education services for ASD children, indicating a 76% higher cost compared to non-ASD students. The additional financial burden on educational institutions was illustrated by ASD students requiring approximately $8610 more in school-related costs than their non-ASD counterparts (Lavelle et al., 2014). These economic considerations underscore the importance of inclusive insurance policies to alleviate financial burdens on families affected by ASD. It is noteworthy that early diagnosis and intervention for autism have demonstrated a profound impact on treatment outcomes, contributing to improved efficacy and a reduction in the severity of the disorder, particularly in cognitive and behavioral aspects.

Understanding and appreciating the array of interventions available for children diagnosed with autism spectrum disorder (ASD) is not merely a matter of knowledge; it's a gateway to unlocking the full potential and improving the quality of life for these individuals. Delving into recent data, we find a rich tapestry of interventions, each offering a unique set of tools and strategies tailored to address the multifaceted needs of children on the autism spectrum. At the forefront of awareness stands behavioral management therapy, a cornerstone in the treatment landscape, recognized by approximately 35.9% of respondents. This form of therapy embodies a nuanced approach, encompassing an amalgamation of techniques aimed at reshaping behaviors, nurturing social skills, and honing communication abilities. Through structured interventions and positive reinforcement, children with autism learn not just to navigate social interactions, but to thrive within them, forging meaningful connections and fostering a sense of belonging. Closely intertwined with behavioral management therapy is cognitive behavior therapy, acknowledged by 6.9% of participants. This therapeutic modality provides a scaffold for individuals with autism to navigate the labyrinth of their emotions, offering strategies to mitigate anxiety, manage stress, and cultivate resilience. By delving into the inner workings of thought patterns and behavioral responses, cognitive behavior therapy equips children with autism with the tools to navigate the complexities of their internal landscape, fostering emotional well-being and empowering self-advocacy. Education and school-based therapies emerge as pivotal pillars in the intervention framework, capturing the attention of 9.8% of respondents. These interventions operate at the nexus of academia and holistic development, weaving together specialized instruction, individualized education plans (IEPs), and tailored accommodations to create a conducive learning environment for children with autism. By recognizing and honoring the unique learning styles and needs of each child, educational interventions strive not only to impart knowledge but to nurture a love for learning, fostering intellectual curiosity and paving the path for academic achievement. In tandem with these psychosocial interventions, medication treatment emerges as a vital component, identified by 9.4% of participants. While not a panacea, medications play a pivotal role in managing

co-occurring conditions such as attention deficit hyperactivity disorder (ADHD), anxiety, or depression, thereby alleviating barriers to optimal functioning and enhancing overall well-being. When used judiciously and in conjunction with other therapeutic modalities, medication treatment can serve as a catalyst for positive change, empowering children with autism to thrive in diverse domains of their lives.

Nutritional therapy takes center stage as a holistic approach to wellness, capturing the attention of 18.4% of respondents. Grounded in the belief that food is medicine, nutritional interventions focus on optimizing dietary habits, addressing nutritional deficiencies, and promoting gut health to support cognitive function and overall well-being. By harnessing the power of nutrition to nourish both body and mind, these interventions lay the groundwork for sustained vitality and resilience, fostering a robust foundation for growth and development. Occupational therapy emerges as a linchpin in the intervention continuum, recognized by 19.6% of participants. This holistic approach encompasses a spectrum of interventions aimed at enhancing daily living skills, refining sensory processing abilities, and fostering independence in children with autism. Through a repertoire of activities spanning from fine motor exercises to sensory integration techniques, occupational therapists empower children to engage meaningfully in their daily routines, navigate sensory stimuli, and participate fully in the world around them. The tapestry of interventions available for children with autism spectrum disorder is as diverse as the spectrum itself, spanning from behavioral and cognitive therapies to educational, medical, nutritional, and occupational interventions. By deepening our understanding and appreciation of these interventions, we not only enrich the lives of children with autism but create a more inclusive and compassionate society where every individual is valued and empowered to thrive. While there is currently no definitive treatment for ASD, studies have suggested that certain behaviors, when adopted by pregnant women, may contribute to the prevention of autism (Lu et al., 2022). This underscores the broader significance of awareness campaigns not only in fostering early diagnosis but also in disseminating information that may aid in preventative measures.

Research published in the New England Journal of Medicine reveals that abnormalities in the brain development of autistic children can emerge as early as the second trimester of pregnancy. To potentially prevent autism in the developing fetus from conception, pregnant women are advised to reduce toxin exposure, maintain a healthy diet, and attend regular visits to both their family physician and obstetrician (Shen & Piven, 2017). Our study reveals a knowledge gap in the community regarding ASD, particularly evident among males and younger participants. It underscores the need for increased attention from public health professionals towards non-communicable disorders, including psychiatric and developmental disabilities, due to their significant impact on community productivity. This places a collective responsibility on national policymakers and healthcare practitioners to enhance overall knowledge and dispel misconceptions. To address these gaps, we propose the implementation of awareness campaigns, distribution of informative materials such as leaflets and booklets, and utilization of multimedia platforms like Facebook, Twitter, and local television channels. These strategies aim to augment community knowledge about ASD and foster positive attitudes towards individuals affected by the disorder. However, certain limitations must be acknowledged. The cross-sectional study design hinders the establishment of causal relationships between study variables. Additionally, the study's skewed gender distribution, with 90.8% of participants being females, may impact the generalizability of our findings.

5. CONCLUSION

Our study indicates a restricted level of knowledge among participants regarding autism. Advocating for the improvement of educational services for autism spectrum disorder children, we recommend that government funds be allocated for this purpose. A heightened commitment to providing financial resources from the government is essential to support children with special needs. Moreover, adjustments in public facilities are imperative to meet the specific requirements of individuals with ASD. To foster a better understanding of ASD within the community and cultivate a more positive attitude towards individuals with ASD, we propose a comprehensive and informed educational effort across various media platforms. These educational campaigns should prioritize enhancing public knowledge about the treatment options and the etiology of ASD. By disseminating accurate information through these channels, we aim to bridge the existing knowledge gap and contribute to a more inclusive and supportive societal environment for individuals with ASD.

CONFLICTS OF INTEREST

The authors report no conflicts of interest.

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The research adhered to the principles outlined in the Declaration of Health Affairs and obtained approval from the Institutional Review Board of Al-Baha University (IRB number: KFH/IRB20112022/6).

AUTHOR CONTRIBUTIONS

S beigh and MAAlshehri- Conceptualization, Investigation, Formal Analysis, Writing - Original Draft. S Alzahrani and L Abdallah:: Formal Analysis, Writing - Original Draft. N Fahad: Writing - Review & Editing, Z Alghamd: Conceptualization, Investigation, Formal Analysis, supervision, Writing - Review & Editing. Y Alghamd: Investigation, Writing - Original Draft, A Jabbar and W Babiker: Investigation, Writing - Original Draft, R Ahmad and BAbdalla: Review & Editing. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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