



# **Knowledge, Experience and Confidence of Saudi Dental Practitioners towards Treating Patients on the Autism Spectrum; A Cross-Sectional Study**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

**Introduction:** Children with ASD face various obstacles to professional dental care that are prominent causes to stop seeking dental care. The main barriers are behavioral problems and trouble finding a dentist who treats ASD children.

**Materials and Methods:** This is a cross sectional study conducted among the dental practitioners of Saudi Arabia using an online survey. Online questionnaire was constructed consisting of questions related to personal, professional, and demographic data followed by questions including knowledge, experience and confidence in managing patients with ASD.

**Results:** Only 18% had previously treated an autistic child, 14% had treated autistic adults and 16% having treated both with 52% with no past exposure. Maximum score of 3.86 was attained when inquired about knowing where to find further information and guidance for treating autistic patients.

**Conclusion:** Overall knowledge and confidence level of participants is low regarding autistic patients.

*Keywords: Autism; dental health; dental professionals; knowledge.*

## 1. INTRODUCTION

Autistic spectrum disorders (ASD) are a group of neuro-developmental conditions that comprises of autism, Asperger's syndrome and pervasive developmental disorders-not otherwise specified (PDD-NOS). The three basic attributes of ASDs are impairments of mutual social connections, problems in communication, and limited ranges of behaviors and interests. People with autism have considerable language delays, social and communication problems, and intellectual disability. Though, those with Asperger's disorder have no clinically significant cognitive and language delay [1,2].

Though the treatment for autistic disorders is usually behavioral therapies, medicines are often prescribed to manage some of the signs of autism. These consist of antidepressants, antipsychotic, anticonvulsant and CNS stimulant drugs. Several of these medications have systemic and oral side effects and should be addressed on a dental visit. Antipsychotic medications may cause motor disorders that disturb speech and swallowing and cause xerostomia as well as orthostatic hypotension. A multidisciplinary style and family support are essential in designing a dental intervention for these patients in order to prevent anxiety [3,4].

Children with ASD face various obstacles to professional dental care that are prominent causes to stop seeking dental care. The main barriers are behavioral problems and trouble finding a dentist who treats ASD children. Autistic people also have greater levels of coinciding mental health disorders such as anxiety. While dental visits can trigger anxiety in many (with around 36% of adults having some form of dental anxiety) the increased susceptibility to clinical levels of anxiety can make dental visits very difficult for autistic patients [5-7].

A study done in United Kingdom revealed that dental professionals exhibited high knowledge levels, but merely moderate confidence in handling their autistic patients. The lower levels of confidence reported may be justified by the fact that 56% of the dental practitioners never had autism education. Indeed, special care as well as pediatric dentists (who have received more training and seen more autistic patients) demonstrated substantially higher confidence scores than general dentists [8].

Another study conducted in United States reported that the participants disclosed their readiness was influenced by their hands-on personal experiences, reflection, re-collection from previous patients, mentors and coworkers. Some fresh dentists were given opportunities to treat patients with ASD during their predoctoral education. The participants stressed on individualization and desensitization techniques with visual, auditory, tactile, olfactory, and gustatory adaptations [9].

There is no particular behavioral management method for all ASD patients. Preceding information, such as the type of ASD or the existence of certain concomitant pathologies can help foresee the patient's likely behavior. Therefore, collecting all the information in a preliminary interview with the parents of the patient is advised. Recognizing these factors will permit personalized behavioral management approaches to be designed and simplifies the planning of dental treatment [10]. So the Need of the study was that dentists should be aware of the methods and techniques needed for the management of autism spectrum patients. Hence the aim of the study was to determine the knowledge and experience of dental practitioners towards the management of ASD patients and to determine the association of knowledge, experience and confidence with gender, work experience and qualification of dental practitioners.

## 2. MATERIALS AND METHODS

### 2.1 Study Design

This is a cross sectional study conducted among the dental practitioners of Saudi Arabia using an online survey.

### 2.2 Study Sample

500 dental surgeons were used in this study and were contacted using social media utilizing convenient sampling technique.

### 2.3 Study Instrument

Online questionnaire was constructed consisting of questions related to personal, professional, and demographic data followed by questions including knowledge, experience and confidence in managing patients with ASD.

## 2.4 Instrument Validity and Reliability

A pilot study was conducted by sending the survey to 20 participants and the data will be inserted in SPSS version 22 to determine the reliability by using Chronbach's coefficient alpha (value: 0.790). Validity of the questionnaire was tested by sending it to experienced researchers in REUbut no changes were made.

## 2.5 Statistical Analysis

Collected data was analyzed using SPSS version 22, where descriptive as well as inferential statistics were conducted. Comparisons between groups were made with the value of significance kept under 0.05 using Chi-square test. Data was tested for normality, which showed that it was not normally distributed; therefore we had to conduct a Non-parametric test. Spearman's correlation was conducted to assess correlation between confidence with work experience and qualification.

## 3. RESULTS

A total of 500 dentists participated in this study, with a power of sample of '0.83', which is very good (Table 1). Regarding gender ratio, 51% were males and 40% females, 54% were general dentists and 46% consultants/specialists. 47% had 1-3 years of experience, 29.2% had 3-6 years and 23.7% had more than 6 years of clinical experience. Only 18% had previously treated an autistic child, 14% had treated autistic adults and 16% having treated both with 52% with no past exposure (Figs. 1, 2).

Table 2 shows the overall responses to the knowledge related questions asked in the survey. The overall level of knowledge of participants was found to be average, as knowledge related questions such as autistic children being interested in social interaction, possibility of independent living, autistic patients having no

empathy and lack of eye contact as a symptom showed around 50% of correct responses.

Table 3 shows the mean scores of participants regarding their self-efficacy or confidence level in managing autistic patients in their clinical practice. Maximum score of 3.86 was attained when inquired about knowing where to find further information and guidance for treating autistic patients. Whereas lowest score of 3.39 was observed when inquired about treating adult patients with autism. It can be noted that 1 was considered as least confident and 7 being most confident.

Table 4 discloses the comparison of knowledge related questions with gender, which did not find any statistically significant association except for one variable, which was autistic people feeling no empathy, which was answered correctly by males mostly.

Table 5 also compared the knowledge related responses with participants qualifications and multiple statistically significant associations were seen (p-value<0.05). It can be noticed from the results that specialists/consultants showed much better knowledge as compared to general practitioners when inquired about autism associated with lack of eye contact (p-value: .000), autism and no empathy (p-value: .002), autism and challenging behavior (p-value: .000) and a few more questions mentioned in the table.

Table 6 and 7 shows the spearman's correlation between self-efficacy with qualification and work experience, respectively. Since the data was not normally distributed, we performed spearman's correlation test since it is a non-parametric test. It can be noticed in both tables that all correlations are positive with statistically significant association. It means that having higher qualification and more work experience will increase the confidence level of dentists while managing autistic patients in their practice.

**Table 1. Power of sample**

Mean	3.56
Std Deviation	1.73
Sample size	500
Alpha	0.05
Sample mean	3.76
Standard Error of Mean	0.02
Critical Value	1.87
Beta	0.04
<b>Power</b>	<b>0.83</b>



Fig. 1. Work experience distribution of the study participants

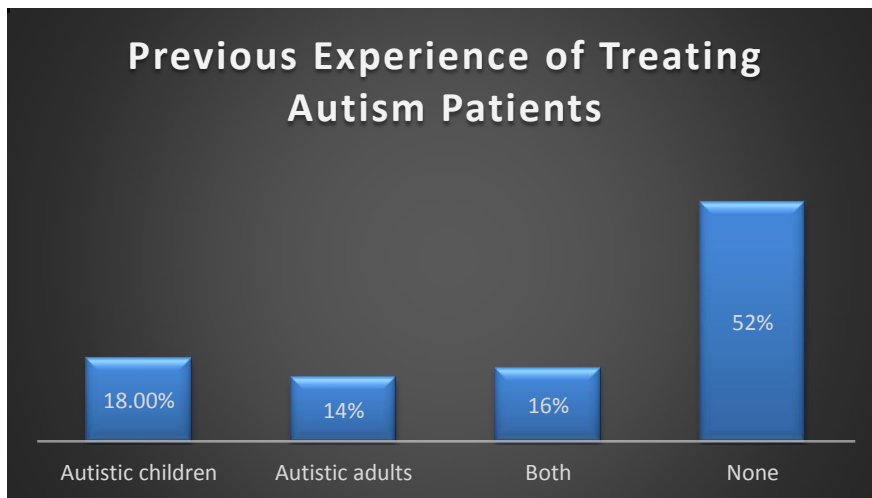


Fig. 2. Previous experience of participants in treating autistic patients

#### 4. DISCUSSION

This study aimed to assess the knowledge and confidence levels of dental professionals towards the management and treatment of autistic patients. A study conducted by Eades et al. [8], among the UK based dentists revealed that the level of their knowledge was quite high when inquired about the autistic patients management. It was noted from their findings that the large majority of dentists (more than 85%) had provided with the correct responses related to the management of autistic patients. Moreover, their self-efficacy scores ranged from 4.09 (General practitioner) and 5.22 (specialist). However, they did not correlate their scored with qualifications and work experience. When compared these findings with our results, it can

be noted that the percentage of correct responses was considerably low (50-65%) as compared to the UK based study. Additionally, the mean scores of our participants were also lower (minimum 3.39 and maximum 3.86) than the British dentists.

The overall readiness of our study subjects is low towards the management of autistic patients. One of the barriers concerning dental care for autistic or any special needs patients is whether dental students are adequately prepared to manage such patients. The positive correlation between work experience and qualification with higher confidence explains why there is a need to establish new standards for dental care education programs to ensure prospects to prepare future dental professionals to deliver

high-quality dental care to patients with special needs [6].

It can be noted from our findings that the dental professionals lack knowledge regarding the symptoms and accurate diagnostic features of Autism. This lack of knowledge of medical evaluations and their outcomes complicates the treatment of such patients. In fact, the bulk of people with ASD exhibit behavioral challenges when receiving medical or dental care. Additionally, the amount of daily stress is greater than in the general populace because of communication shortfalls, poor comprehension of social cues and the problem in generalization of what they have learned in a particular context [11].

The question is, how we can improve the level of dentist’s knowledge? One of the recommended approaches is to shift to a patient-centered model of care. The suggestion is to expand the time that students consume in community settings and manage some dental school clinics as patient-centered delivery systems. This changeover to a patient-centered model will reveal more dental practitioners to the variety of patients they will expectedly face in their practice and offer increased prospects for hands-on learning skills, both of which are essential when managing children with ASD [4,12].

One of the limitations of survey-based study is that the a few respondents may not feel encouraged to provide accurate and honest answers, which may affect the findings.

**Table 2. Knowledge related questions and their responses**

<b>Knowledge Related Questions</b>	<b>Responses (%)</b>
People with autism can be interested in social interaction	True: 51.6% False: 48.4%
Independent living is not possible for autistic people	True: 52.8% False: 47.2%
People with autism feel no empathy or affection	True: 47% False: 53%
A lack of eye contact is necessary for a person to be considered autistic	True: 58.3% False: 41.7%
Autism cannot be diagnosed in adulthood	True: 39.5% False: 60.5%
Most people with autism also have intellectual disabilities	True: 41.1% False: 58.9%
Females are more difficult to diagnose with autism than males	True: 42.7% False: 57.3%
People with autism always display challenging behaviors	True: 66% False: 34%
Autistic people have difficulty with non-literal language and non-verbal communication (eg body language and gesturing)	True: 64.4% False: 35.6%
Additional mental health conditions (e.g. anxiety, depression) are more prevalent in individuals diagnosed with autism than in the general population	True: 67% False: 33%
People with autism can show unusual reactions to sensory experiences (eg lights, touch, sounds etc)	True: 70% False: 30%
Autistic people are more prone to interpersonal violence than non-autistic people	True: 62.3% False: 37.7%
Change in routine and uncertainty are often upsetting for autistic people	True: 64.8% False: 35.2%
More than half of people diagnosed with autism do not talk	True: 57.9% False: 42.1%

**Table 3. Self-efficacy (confidence) scores of study participants related to Autistic patients management**

<b>Self-efficacy (Confidence) related questions</b>	<b>Mean scores (SD)</b>
Recognizing the signs and symptoms of autism in children	3.56 (1.73)
Recognizing the signs and symptoms of autism in adults	3.61 (1.67)
Treating autistic children	3.54 (1.83)
Treating autistic adults	3.39 (1.78)
Knowing where to find further information and guidance for treating autistic people	3.86 (1.83)
Knowing what adjustments could be made to facilitate treatment for autistic people	3.69 (1.82)
Making adjustments in your own practice to facilitate treatment for autistic people	3.61 (1.84)
Knowing the relevant local care pathways/services for people on the autism spectrum	3.61 (1.77)

1= Least confident, 7= Most confident

**Table 4. Comparison of gender with knowledge related questions**

<b>Knowledge Related Questions</b>	<b>Males</b>	<b>Females</b>	<b>p-value</b>
People with autism can be interested in social interaction	No statistically significant association		.064
Independent living is not possible for autistic people	No statistically significant association		.906
People with autism feel no empathy or affection	True: 51% False: 49%	True: 43% False: 57%	.042
A lack of eye contact is necessary for a person to be considered autistic	No statistically significant association		.105
Autism cannot be diagnosed in adulthood	No statistically significant association		.165
Most people with autism also have intellectual disabilities	No statistically significant association		.933
Females are more difficult to diagnose with autism than males	No statistically significant association		.174
People with autism always display challenging behaviors	No statistically significant association		.702
Autistic people have difficulty with non-literal language and non-verbal communication (eg body language and gesturing)	No statistically significant association		.131
Additional mental health conditions (e.g. anxiety, depression) are more prevalent in individuals diagnosed with autism than in the general population	No statistically significant association		.506
People with autism can show unusual reactions to sensory experiences (eg lights, touch, sounds etc)	No statistically significant association		.587
Autistic people are more prone to interpersonal violence than non-autistic people	No statistically significant association		.131
Change in routine and uncertainty are often upsetting for autistic people	No statistically significant association		.694
More than half of people diagnosed with autism do not talk	No statistically significant association		.474

**Table 5. Comparison of qualification with knowledge related questions**

<b>Knowledge Related Questions</b>	<b>General Dentist</b>	<b>Specialist/ Consultant</b>	<b>p-value</b>
Knowingly treated autistic patients?	Yes, child: 21% Yes: adult: 13% Both: 19% None: 48%	Yes, child: 14% Yes: adult:23% Both: 15% None: 48%	.011
People with autism can be interested in social interaction	No statistically significant association		.455
Independent living is not possible for autistic people	No statistically significant association		.481
People with autism feel no empathy or affection	True: 53% False: 47%	True: 39% False: 61%	.002
A lack of eye contact is necessary for a person to be considered autistic	True: 67% False: 33%	True: 48% False: 52%	.000
Autism cannot be diagnosed in adulthood	No statistically significant association		.196
Most people with autism also have intellectual disabilities	No statistically significant association		.747
Females are more difficult to diagnose with autism than males	True: 49% False: 51%	True: 35% False: 65%	.002
People with autism always display challenging behaviors	True: 70% False: 30%	True: 61% False: 39%	.042
Autistic people have difficulty with non-literal language and non-verbal communication (eg body language and gesturing)	No statistically significant association		.089
Additional mental health conditions (e.g. anxiety, depression) are more prevalent in individuals diagnosed with autism than in the general population	No statistically significant association		.084
People with autism can show unusual reactions to sensory experiences (eg lights, touch, sounds etc)	True: 79% False: 21%	True: 59% False: 41%	.000
Autistic people are more prone to interpersonal violence than non-autistic people	True: 67% False: 33%	True: 56% False: 44%	.010
Change in routine and uncertainty are often upsetting for autistic people	True: 69% False: 31%	True: 60% False: 40%	.039
More than half of people diagnosed with autism do not talk	True: 63% False: 37%	True: 52% False: 48%	.020

**Table 6. Correlation of Qualification with self-efficacy (confidence)**

<b>Self-efficacy (Confidence) related questions</b>	<b>Spearman's Correlation (Qualification)</b>
Recognizing the signs and symptoms of autism in children	Spearman: .165 P: .000
Recognizing the signs and symptoms of autism in adults	Spearman: .130 P: .003
Treating autistic children	Spearman: .149 P: .001
Treating autistic adults	Spearman: .153 P: .001
Knowing where to find further information and guidance for treating autistic people	Spearman: .203 P: .000
Knowing what adjustments could be made to facilitate treatment for autistic people	Spearman: .219 P: .000

Making adjustments in your own practice to facilitate treatment for autistic people	Spearman: .127 P: .004
Knowing the relevant local care pathways/services for people on the autism spectrum	Spearman: .244 P: .000

**Table 7. Correlation of Work experience with self-efficacy (confidence)**

<b>Self-efficacy (Confidence) related questions</b>	<b>Spearman's Correlation (Work experience)</b>
Recognizing the signs and symptoms of autism in children	Spearman: .187 P: .000
Recognizing the signs and symptoms of autism in adults	Spearman: .224 P: .003
Treating autistic children	Spearman: .306 P: .000
Treating autistic adults	Spearman: .223 P: .000
Knowing where to find further information and guidance for treating autistic people	Spearman: .209 P: .000
Knowing what adjustments could be made to facilitate treatment for autistic people	Spearman: .247 P: .000
Making adjustments in your own practice to facilitate treatment for autistic people	Spearman: .184 P: .004
Knowing the relevant local care pathways/services for people on the autism spectrum	Spearman: .242 P: .000

## 5. CONCLUSION

Overall knowledge and confidence level of participants is low regarding autistic patients. There is no statistically significant difference between genders regarding the knowledge. Confidence levels increase with the increase in work experience and qualification. There is a need of improving the educational setup for undergraduate dentists regarding the autistic patients' diagnosis and dental treatment.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

The Institutional Review Board (IRB) of Riyadh Elm University has approved your research proposal titled "Knowledge, experience, and confidence of Saudi dental practitioners toward treating patients on the autism spectrum; a cross sectional study," which was submitted to the

Research Center with the registration number FRP/2021/329/380 (REU).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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