

Original Article

Oral health knowledge, attitude, and performance of the parents of 3–12-year-old autistic children

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ABSTRACT

Background: This study aimed to assess the oral health knowledge, attitude, and performance of the parents of autistic 3–12-year-old.

Materials and Methods: This descriptive cross-sectional study evaluated 50 parents of autistic 3–12-year-old in Isfahan city. The oral health knowledge, attitude, and performance of the parents were evaluated using a self-administered questionnaire with closed questions, after confirming its validity and reliability. Data were analyzed using independent *t*-test, one-way ANOVA, Pearson's correlation coefficient, regression analysis, and Cronbach's alpha ($\alpha = 0.05$).

Results: Of children, 32 (64%) were males and 18 (36%) were females. A total of 28 (56%) fathers and 22 (44%) mothers participated in this study. The mean age of the children and parents was 8.12 ± 2.4 years and 39.6 ± 6.8 years, respectively. The mean age at the time of diagnosis of autism was 4.08 ± 1.33 years. Of all children, 24 (46.2%) had a previous dental history. The mean scores of the knowledge and attitude of the parents were 5.2 ± 1.7 out of 11, and 16.1 ± 3.1 out of 30, respectively. Of demographic variables, order of child birth had a significant correlation with attitude of the parents, and those with one single child had significantly higher attitude score ($P = 0.03$).

Conclusion: The oral health knowledge, attitude, and performance of the parents of autistic children in Isfahan city were lower than expected, which calls for knowledge enhancement strategies in this respect.

Key Words: Attitude, autism, knowledge, oral health, parents, performance

Received: 30-Nov-2020

Revised: 11-Mar-2021

Accepted: 30-Sep-2021

Published: 21-Mar-2022

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INTRODUCTION

Children with specific needs such as those with psychological problems require specific attention with respect to oral and dental care.^[1] Autism, also known as autism spectrum disorder (ASD), is a congenital neurodevelopmental disability associated with significant social, communication, and behavioral

impairment. It also causes significant problems in communication with peers. Its prevalence rate is 1–2 per 1000, and it is 4 times more common in males.^[2] The prevalence of autism has greatly increased since 1980, partly due to advances in diagnostic techniques, referral patterns, availability of healthcare facilities and

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How to cite this article: Hajiahmadi M, Nilchian F, Tabrizi A, Gosha HM, Ahmadi M. Oral health knowledge, attitude, and performance of the parents of 3–12-year-old autistic children. Dent Res J 2022;19:24.

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services, and enhanced public knowledge, resulting in diagnosis at an earlier age.^[3] A number of factors, including genetics, are believed to be implicated in the pathogenesis of ASD.^[4] Other etiologic factors include postencephalitis infection or sepsis, autoimmune conditions, and Vitamin D deficiency.^[3] ASD can manifest with different levels of severity.^[4,5] The prominent signs and symptoms gradually manifest after 6 months of age, and are established by 2–3 years and continue to adulthood. Its characteristic signs and symptoms include social communication inability, limited interests, and repetitive behaviors. Impaired nutrition is also common, but is not necessary for diagnosis.^[5-7] Some autistic children may have sensory, visual, auditory, cognitive or epileptic impairments as well, which can significantly comprise their oral hygiene and dental care.^[8]

Evidence shows higher prevalence of dental caries and gingival disease in patients with neurodevelopmental impairments.^[9] Autistic children often have poorer oral hygiene and periodontal conditions due to the absence of adequate hand skills required for toothbrushing and dental flossing.^[7,9,10] Furthermore, autistic children often prefer soft and sweet foods and retain the food in their mouth longer than usual, which further contribute to the development of caries. Moreover, psychostimulant or anticonvulsant medications are often prescribed for patients with ASD, which have side effects such as generalized gingival hyperplasia.^[11] Damaging oral habits such as bruxism, tongue thrusting, and lip biting are more prevalent among autistic children as well.^[12] Furthermore, autistic patients are at high risk of dental caries, and are more prone to traumatic dental injuries.^[13]

Autistic children often have several medical and behavioral conditions that complicate their dental treatment. They often show self-harming and aggressive behaviors, and have odd responses to sensory stimuli. They also have mood disorders and phobias that can lead to head and neck or oral injury.^[14] In general, the public knowledge about ASD in developing countries is much lower than that in developed countries. As a result, autistic patients in developing countries do not often receive the necessary medical and dental services.^[15]

Due to the specific condition and specific needs of autistic children, their parents are mainly responsible for their oral hygiene.^[11] The parents of autistic children should be informed about the significance of

good oral hygiene for their autistic children and must have a positive attitude towards it. They should have adequate knowledge about oral care maintenance for their children because poor oral hygiene in such patients can adversely affect their mastication and speech and lead to pain, sleep disorders, decreased self-confidence, and decreased quality of life.^[16-18] Considering all the above, this study aimed to assess the oral health knowledge, attitude, and performance of the parents of 3–12-year-old autistic children.

MATERIALS AND METHODS

This study has been supported by a grant from Isfahan University of Medical Sciences, Isfahan, Iran NO: (399362). This descriptive cross-sectional study evaluated 50 parents of 3–12-year-old autistic children in Isfahan city in spring and summer of 2020. The parents were selected from a treatment center for autistic patients and also the autism clinic of Khorshid Hospital in Isfahan city by simple random sampling. We presented to the aforementioned centers and obtained the list of all patients. Fifty patients were randomly selected from the list using a table of random numbers. The parents were contacted and those willing to participate in the study were enrolled. The sample size was calculated to be 50 assuming the mean knowledge, attitude and performance scores with maximum error of 2.8, 1.85, and 0.23, respectively, $\alpha = 0.05$, $\beta = 0.2$ and study power of 80%.

The inclusion criterion was parents of autistic children who were willing to participate in the study. The exclusion criterion was not answering over 20% of the questions of the questionnaire.

The parents were enrolled after signing informed consent forms. They were also ensured about the confidentiality of their information.

Data regarding the oral health knowledge, attitude, and performance of the parents were collected by using a self-administered questionnaire, which included 24 questions in three domains of knowledge (11 questions), attitude (6 questions), and performance (7 questions). In addition, the questionnaire had a demographic section, asking for demographic information of patients and their parents including the age and gender of the parent filling out the questionnaire, his/her occupation and level of education, number of children, birth order of the autistic child, and his/her previous dental history.

One of the parents (father or mother) was requested to fill-out the questionnaire. In addition, they received an educational pamphlet regarding oral health after returning the completed questionnaire. The severity of autism of children (level 1, 2, or 3) was also recorded.^[19]

To assess the face validity and content validity of the questionnaire, it was administered among 5 faculty members of the Pediatric Dentistry Department of School of Dentistry of Isfahan University of Medical Sciences. To assess the content validity, the content validity ratio (CVR), and the content validity index (CVI) were calculated. The faculty members were requested to express their opinion regarding the relevance of attitude questions and determine their necessity using the following rating scale:

- 1: Highly relevant
- 2: Moderately relevant requiring modification
- 3: Poorly relevant.

CVI was calculated by the sum of “highly relevant” and “moderately relevant, requiring modification” scores for each question divided by the total number of faculty members (raters). Since the CVI score was calculated to be >0.79 , the content validity of the questionnaire was confirmed.

Regarding CVR, since the number of rater faculty members was 5, the minimum acceptable validity was 0.99; we obtained a CVR >0.99 ; thus, the content validity was confirmed.

In addition, they were requested to comment on each question and provide their suggestions. Questions that were rated 2 and 3 were either deleted or modified until they were approved by the panel of experts. Finally, the opinion of the faculty members regarding the face validity of the questionnaire was also asked. In designing the attitude questions, the main principles of attitude questionnaires were followed. For instance, the sentences were written in the present tense and did not suggest the correct answer in any way.

The finalized questionnaire was then piloted on 20 parents. To determine the reliability of the questionnaire, the Cronbach's alpha was applied to assess the reliability of the knowledge and attitude questions, and test-retest reliability method was performed on 20% of the participants to determine the reliability of the performance questions. To determine the reliability of the knowledge and attitude questions by using the Cronbach's alpha, first, 20 parents filled out the questionnaire, and the Cronbach's alpha was

calculated based on their responses. If the obtained Cronbach's alpha value was <0.75 , the problematic questions were modified. Finally, the reliability of the entire questionnaire was confirmed with a Cronbach's alpha = 0.87.

The scoring system of the questions was as follows: In the knowledge domain, each correct answer was scored 1, and each incorrect answer was scored 0. Since the total number of knowledge questions was 11, the total score of this domain ranged from 0 to 11. Scores 0–5 indicated poor, scores 6–7 indicated moderate, and scores 8–11 indicated high knowledge level. In the attitude domain, each answer choice could be scored based on a 1–5 Likert scale. Score 1 indicated completely disagree, and score 5 indicated completely agree. Since the total number of questions in this section was 6, the total domain score ranged from 6 to 30. Scores ≤ 15 indicated poor, scores 16–25 indicated moderate, and scores >25 indicated good attitude towards oral health. With regard to performance, the responses to the questions were tabulated and reported.

The reliability of the knowledge, attitude and performance domains of the questionnaire was calculated to be 0.88, 0.88, and 0.83, respectively.

Data were analyzed using SPSS version 22 (SPSS Inc., IL, USA) through the independent *t*-test, one-way ANOVA, Pearson's correlation coefficient, regression test, and Cronbach's alpha. The level of significance was set at 0.05.

RESULTS

Of children, 32 (64%) were male and 18 (36%) were female. A total of 28 (56%) fathers and 22 (44%) mothers participated in this study. The mean age of children and parents was 8.12 ± 2.4 years (range 3–12 years) and 39.6 ± 6.8 years (range 24–52 years), respectively. The mean age at the time of diagnosis of autism was 4.08 ± 1.33 years (range 1–7 years). Table 1 presents other demographic information of participants. Of all children, 24 (46.2%) had a history of previous dental history.

The mean scores of knowledge and attitude of the parents were 5.2 ± 1.7 out of 11, and 16.1 ± 3.1 out of 30, respectively.

Of demographic variables, none of them had a significant correlation with the knowledge score of the parents ($P > 0.05$). However, birth order of the autistic

Table 1: Demographic information of participants

Factor	Category	Frequency (%)
Level of education of the parent	Illiterate	2 (4)
	Elementary school	1 (2)
	Middle school	2 (4)
	High-school diploma	13 (26)
	Bachelor's degree	16 (32)
	Master's degree	11 (22)
Occupation of the parent	Doctorate degree or higher	5 (10)
	Worker	6 (12)
	Employee	12 (24)
	Businessman	13 (26)
	Housewife	13 (26)
Birth order of autistic child	Other	6 (12)
	First child	37 (74)
	Second child	11 (22)
	Third child	2 (4)
Number of children in the family	One	30 (60)
	Two	15 (30)
	Three	4 (8)
	Four	1 (2)

child in the family had a significant correlation with attitude ($P = 0.03$) such that parents whose first child was autistic acquired a higher attitude score. No other demographic variable had a significant correlation with attitude of the parents. The severity of autism had no significant correlation with the knowledge or attitude score of the parents either ($P > 0.05$).

Table 2 shows the frequency of different levels of oral health knowledge and attitude of the parents. Table 3 shows the frequency of responses to performance questions. As shown, most parents (74%) reported using a toothbrush and fluoridated toothpaste as the main tool for oral hygiene of their autistic child. Most parents (60%) reported that their autistic child brushed once a day in the past month. The most commonly reported toothbrushing technique was a combination of all methods (62%). Regarding the position of the parent, when brushing for the child, standing in front of the child (42%) was the most commonly reported position. The majority of the parents reported occasional consumption of sugary snacks and drinks by their autistic child (54%). The majority of the parents (48%) reported not using a supplemental oral hygiene measure. Furthermore, most parents (82%) reported using a regular toothbrush for their autistic child.

DISCUSSION

This study assessed the oral health knowledge, attitude, and performance of the parents of autistic

3–12-year-old. With regard to oral health performance of the parents, the frequency of toothbrushing of autistic children was once a day and the majority of them did not brush their teeth by themselves. These results were in line with those of Vajawat and Deepika.^[20] They reported that 66% of autistic children in their study brushed once daily. However, frequency of use of mouthwash was higher in their study population (supervised autistic children) compared with the corresponding rate in our study. The reason may be the overall low knowledge level of the public regarding the benefits of mouthwashes in Iran. Furthermore, concerns of the parents with regard to accidental swallowing of the mouthwash can be another reason for low frequency of consumption of mouthwash in our study.

Murshid^[21] in their study in Saudi Arabia evaluated the dental knowledge of the parents of autistic children. He reported that from the perspective of the parents, the best time to seek dental treatment would be after the development of caries and toothache. However, in our study, the majority of the parents reported the best time to seek dental treatment to be the first 6 months after eruption of the first primary tooth. This difference can be attributed to the national parental education programs that are held for new parents in Iran. Both studies reported inadequate oral health knowledge level of the parents. Also, the majority of the parents in their study reported that they autistic children could not brush by themselves, which was in agreement with our results in this respect. Daneshvar *et al.*,^[22] in Rash evaluated the oral health status and oral health performance of autistic children, and reported higher mean knowledge score and superior oral hygiene performance of the parents of autistic children (such as frequency of toothbrushing) compared with the control group. The difference between their results and ours may be due to the difference in sample size, since our sample size was smaller than theirs. In a similar study, Magoo *et al.*,^[23] in India, showed that 40.4% of the parents reported seeking dental treatment only when the child had a dental problem while the majority of parents (26%) in our study believed that a dental visit is required within the first 6 months after eruption of the first primary tooth. As mentioned earlier, higher knowledge level of the parents in this respect in our study can be due to their participation in nationwide parental education programs held in Iran. In the study by

Magoo *et al.*,^[23] 82.7% of the parents reported that their children brushed their teeth once a day, which was close to the 60% value found in our study. However, only 6% of the parents reported brushing for their autistic child, which was different from our result in this respect. Similar to our study, the use of regular toothbrush had the highest frequency in their study. Relatively similar results obtained in the two studies can be attributed to relatively similar cultures and socioeconomic status of the study populations. Dave *et al.*^[24] reported that 78% of autistic children in their study brushed once a day, which was close to the 60% rate in our study. The majority of the

parents helped their children in toothbrushing (and not brushing for them), which was in line with our results. Also, most children used regular toothbrush. However, the frequency of use of mouthwash in their study was higher than that in our study. Similar to our study, they reported poor oral health knowledge of the parents of autistic children.

Despite the increasing rate of children with special needs such as autistic patients, either due to increased prevalence of such conditions or improved diagnosis, their oral and dental problems are not often considered a priority due to the high frequency of other medical problems of such patients. Thus, regular educational programs are required to emphasize on the significance of oral hygiene and oral healthcare in such patients. Online education, books, brochures, and pamphlets can also help in this respect. Further descriptive and interventional studies are also required to detect the main problems of such patients and find strategies to prevent or address them. Also, educational courses regarding dental management of autistic children should be scheduled for dental students to enhance

Table 2: Frequency of different levels of oral health knowledge and attitude of the parents

Domain	Category	Frequency (%)
Knowledge	Poor	25 (50)
	Moderate	22 (44)
	High	3 (6)
Attitude	Poor	20 (40)
	Moderate	30 (60)
	Good	0

Table 3: Frequency of responses to the performance questions

Question	Answer choices	Frequency (%)
Main tool used for oral hygiene of your child	Toothbrush and fluoridated toothpaste	37 (74)
	Toothbrush and nonfluoridated toothpaste	11 (22)
	Toothbrush alone	2 (4)
Frequency of toothbrushing of autistic child in the past month	Irregular or never	3 (6)
	Once a week	2 (4)
	Two or three times a week	7 (14)
	Once a day	30 (60)
	Twice or more per day	8 (16)
Technique of toothbrushing	Back-and-forth, horizontal	3 (6)
	Up-and-down, vertical	10 (20)
	Circular, rotational	4 (8)
	A combination of all	31 (62)
	No response	2 (4)
Your position when brushing for your child	I don't brush for my child	11 (22)
	Standing behind him	13 (26)
	Standing in front of him	21 (42)
	Supine	2 (4)
	Seated	3 (6)
Frequency of having sugary snacks and drinks by your child in the past month	Three times a day or more	2 (4)
	Twice a day	9 (18)
	Once a day	12 (24)
	Occasionally, not every day	27 (54)
	Supplemental oral hygiene method	Mouthwash
	Tongue brush	7 (14)
	None	24 (48)
Type of toothbrush used for the autistic child	Regular	41 (82)
	Modified	5 (10)
	Electric	4 (8)

their knowledge about the behavioral control and treatment needs of autistic patients.

CONCLUSION

The oral health knowledge, attitude, and performance of the parents of autistic children in Isfahan city were lower than expected. Thus, oral hygiene knowledge enhancement appears to be a priority for the parents of autistic children since enhanced knowledge leads to more positive attitude, and improves performance.

Financial support and sponsorship

Nil.

Conflicts of interest

The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or nonfinancial in this article.

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