Caregivers' Awareness Regarding Oral Health Care among Autistic Spectrum children

Mahmoud Waheed Mahmoud Ali [1]; Yosria Elsayed Hossein Hanafy [2]; Mahmoud Ahmed Mahmoud Mohamed Abdelmotelb [3]; Shimaa Abd Elrazek Yonis Bakheet [4]

1. Demonstrator of Community Health Nursing, Faculty of Nursing- Minia University.
2. Professor of Community Health Nursing- Faculty of Nursing –Minia University.
3. Lecturer of Pediatric and Community Dentistry- Faculty of Dentistry- Minia University.
4. Lecturer of Community Health Nursing- Faculty of Nursing –Minia University.

Abstract

Background: Children diagnosed with autism spectrum disorder are more likely to have poorer oral health and have trouble getting dental care. **The aim of the study:** To assess caregivers' awareness regarding oral health care among autistic spectrum children. **Design:** A descriptive design was utilized in the current study. **Setting:** Minia Hospital for Mental Health and Addiction Treatment in New Minia City. **Sample:** A purposive sample of 100 caregivers (parents or any first-degree relatives). **Data collection tools: Tool I**: A structured interview questionnaire that consisted of three parts: **part (1)** Socio-demographic characteristics of caregivers; **part (2)** Socio-demographic characteristics of autistic children, **part (3)** Knowledge of the caregivers regarding oral health care. **Tool II:** Attitude of the caregivers toward oral health care. **Tool III:** Practice of caregivers regarding oral health of their autistic children. **Results:** 50% of the studied sample had poor knowledge, 68% of them had negative attitude, and 65% of them had poor practice toward oral health care of autistic spectrum children. **Conclusions:** This study revealed that half of the sample had a poor knowledge level, more than two-thirds had a negative attitude, and about two-thirds had a poor practice level toward oral health care among the studied sample. **Recommendations:** conduction of an educational program to improve knowledge, attitude, and practice of caregivers\parents regarding oral health care of their autistic children.

Keywords: Autistic Spectrum children, Awareness, Caregivers, Oral Health Care

Introduction:

Autism Spectrum Disorders (ASD) are described as "a complex biological disorder that generally lasts for a person's entire life, beginning before the age of three years, in the developmental period, and causes delays or problems in many different ways in which a person develops or grows" According to the National Institute of Child Health and Human Development **(Ferrazzano et al., 2020).** The international classification of diseases defined autism spectrum disorders as pervasive developmental disorders (PDDs), a category of neurological disorders marked by deficits in the socializing and communication domains **(Ahmed et al.,2021).**

Over the past few decades, ASD has become more common, in affluent nations, the male-to-female ratio is approximately 4.3:1, and the prevalence of ASDs is currently estimated to be at least 60 per 10,000 people. The frequency of ASDs has increased over the last 30 years, with a current prevalence of around 1/100. According to a recent report, one in 68 children who are eight years old has autism **(Pi et al.,2020).** In Arab countries, the prevalence was estimated to be between 1.4 and 29 per 10,000 people (**Al-Mendalawi,2020)**. There were 5.4 ASD cases for every 1000 children in the Sharkia Governorate in Egypt **(Yousef, et al., 2021)**.

The families of ASD children as well as society at large bear a heavy burden from one of the fastest-growing diseases in the world which is ASD. When it comes to their dental health, children with ASD are more negatively impacted than those without ASD. The severity of ASD is positively correlated with the occurrence of caries lesions. Children with ASD tend to have worse oral hygiene, greater rates of dental calculus detection, and considerably more common episodes of gingivitis. Children diagnosed with ASD are more likely to suffer from traumatic injuries and different kinds of malocclusions **(Lu & Liu., 2022).**

Previous studies have indicated that children on the autistic spectrum may be more likely to develop tooth decay or other dental illnesses, as well as a higher chance of suffering the functional and psychological challenges linked to poor oral health. Several studies have demonstrated, for instance, that parents report worse oral health, including a higher risk of dental cavities, inadequate oral hygiene, and periodontal disease **(Alvares et al.,2023).**

A number of relatively small and limited-quality studies on the oral health of children with intellectual disabilities and/or autism were found in recent systematic reviews. These studies were evasive about whether the oral health of these children was more burdened with dental disease than that of children without intellectual disabilities or autism. Reduced access to dental services has been found in other systematic evaluations among children with impairments, including those with autism and intellectual disabilities **(Sherriff,2023).**

Caregivers of children with ASD is described as "someone who provides care for relatives who have become chronically ill, elderly, or disabled." **(Jarling et al.,2020).** They should get adequate education on dental hygiene and oral care, since poor dental hygiene can cause pain, a reduction in quality of life, and a decline in self-esteem. It can also interfere with speech and mastication. Caregivers should take the lead in actively promoting preventive dental health for their autistic children, since they bear the majority of the responsibility for their general health difficulties. As a result, caregivers of autistic children should possess a comprehensive understanding regarding oral hygiene habits, attitudes, and knowledge **(Alqahtani et al.,2023).**

Community nurses have the ability to play a significant role in oral health promotion since they make up the biggest group of healthcare professionals. In order to provide the best possible care for people's oral health, nurses help in oral health evaluations and procedures to maintain the wellbeing of oral health **(Stark et al., 2022).**

Significance to the study:

Between 60.6% and 67.3% of ASD persons had a pooled prevalence of dental caries, and between 59.8% and 69.4% had a pooled prevalence of periodontal disease (**Sami et al.,2023)**. Moreover, gingivitis is more common in children with ASD in the United States (US) and India, where it is 61.5% and 59.6%, respectively **(Mah et al., 2023)**.

In Egypt, a cross-sectional survey was done using a simplified oral hygiene index to assess the oral hygiene condition among a group of Egyptian autistic children, revealed that 100% of the studied autistic children have poor oral hygiene, so it was concluded that autistic children in Egypt required more dental care that should be delivered by proficient dental specialists **(Ahmed et al., 2021).**

Being in good oral health means that teeth, gums, and oral mucosal tissues are healthy and disease-free, it is a crucial aspect of overall wellness. Caregivers' oral health knowledge, attitudes, and behaviors can also help or impede their child's oral health care and practices that promote oral health **(Alyafei et al.,2020)**. Based on current literature review, there are insufficient studies which assess caregivers' awareness regarding oral health of autistic children **(AlHammad et al., 2020)**. Therefore, this study aimed to assess the awareness of caregivers regarding oral health care of their autistic children.

Subjects and methods

Aim of the study:

The current study aimed to assess caregivers' awareness regarding oral health care among autistic spectrum children.

Research Questions:

1 -What is the level of knowledge, attitude and practice of caregivers of autistic child regarding oral health of their children?

2- Is there a relation between socio-demographic data of caregivers and their level of knowledge, attitude responses and practice regarding oral health of their children?

Study Design:

Descriptive design was utilized to fulfill the aim of this study and answer the research questions.

Study Setting:

The study was conducted at the children's outpatient clinic at Minia Hospital for Mental Health and Addiction Treatment, while this hospital serves all nine districts of Minia governorate.

Study Population:

A purposive sampling of 100 caregivers (parents or any first-degree relatives) of autistic children were included in this study. Based on the last statistical record of Minia hospital for Mental Health and Addiction Treatment in 2023. Data were gathered over an interval of six months, from early February 2024 to the end of July 2024.

Data collection tools:

Three tools were used for the data collection

Tool I: A structured interview Questionnaire developed by the investigator based on the following literature review **(Como et al., 2022&Nagda, 2023&Sam et al., 2021).** This tool divided into 3 main parts:

- **Part 1: Socio demographic data of caregivers of autistic child** such as: age, sex, residence, level of education, occupation, consanguinity of parents.
- **Part 2: Socio demographic data of autistic child** such as: age, sex, birth order of the autistic child, number of children in the family, age of diagnosis with ASD and ASD severity.
- **Part 3: Knowledge of the caregivers regarding oral health care**: It included (19) true or false or don't know statements in the Arabic language to assess knowledge of caregivers regarding oral health, such as the impact of oral health on overall health, the importance of tongue cleaning, the role of toothpaste in preventing dental caries, the impact of deposits on teeth, the effect of daily flossing, etc.

Scoring System:

The scores for knowledge tool were calculated based on one point (1) for the correct answer and zero (0) for either false answer or "I don't know" answer. Therefore, the participants were considered to have a good level of knowledge if the total score ≥75 %. (≥14.25\19), average level of knowledge if the total score 50% - <75%. (9\19 - <14.25\19), and a poor level of knowledge if the total score ≤ 50%. (< 9\19).

Tool II: Attitude of the caregivers toward oral health care: This tool developed by the investigator based on reviewing the following literature **(Como et al., 2022& Krishnan et al., 2019).** It included (9) statements in the Arabic language to assess the attitude of caregivers regarding oral health. Such as their attitude regarding the same importance of oral health as well as physical health, cooking meals at home is better than restaurants, getting the child to eat healthy foods like carrots is easy, making the children eat non-sugary foods is difficult, there is no action to prevent teeth cavities, the necessity of regular dental visits, the necessity of cleaning children's teeth after meals, dental diseases are less dangerous than other health problems, going to dental clinics every six months is difficult. Four statements out of the nine attitude statements were coded inversely.

Scoring System:

The attitude statements were evaluated by using three -points Likert-scale; whereas 2= agree, 1=sometimes, 0= disagree, with minimum score =zero and maximum =18 and categorized into:

- Positive attitude ≥70%. (≥12.6\18).
- Negative attitude < 70%. **(**<12.6\18).

Tool III: Practice of caregivers regarding oral health of their autistic children: This tool developed by the investigator based on reviewing the following literature **(AlHumaid et al., 2020& Alqahtani et al., 2023& Krishnan et al., 2019)**, it included (12) statements in the Arabic language to assess the practice of caregivers regarding the oral health of their children. Such as if the caregivers brush their children's teeth every day, the teeth of children are brushed

twice daily, using fluoridated toothpaste in oral care, using the right amount of toothpaste during the cleansing of children's teeth, if oral hygiene aids like floss are used in oral care, etc.

Scoring system:

The reported practice part was evaluated by using two –points score; whereas done =1 and not done=0, with minimum score =zero and maximum score= 12, and categorized into:

- Poor level of practice < 60 %. (< 7.2\12).
- Good level of practice ≥ 60%. (≥ 7.2\12).

Validity and Reliability of tools:

Validity:

Tools of the study were tested for content validity by a jury panel of five experts in the field of the study who reviewed the tools for clarity, relevance, comprehensiveness, understanding, applicability and easiness. Based on experts' comments and recommendations modifications were made.

Reliability:

Reliability of the study questionnaire was calculated using Cronbach's alpha. Based on data analysis they were found to be highly reliable, coefficient alpha for knowledge questionnaire was 0.92, coefficient alpha for attitude scale was 0.85, coefficient alpha for practice questionnaire was 0.87.

Pilot Study:

A pilot study was conducted at the beginning of the study, it included 10% (10 cases) of the total sample. The pilot study was conducted for purpose to testing clarity, completeness, and to determine the time required for completing the tools of the study. According to the result of pilot study, the needed omissions and/ or additions were done. The sample of pilot study was included to the total sample as there was not modification in the tools of the study.

Ethical consideration:

An official permission to conduct the study was obtained from the Scientific Research Ethics Committees, Faculty of Nursing Minia University with approval number (REC20231241) on 5\12\2023. Two additional approvals were obtained from the director of Minia hospital for mental health and addiction treatment to conduct the study and from Scientific Research Ethics Committees of General Secretariat of Mental Health. Written and oral consent was obtained from caregivers. Furthermore, they had the right to withdraw from participating in the study at any time if they wanted.

Study Procedure:

Before conducting the study, an official letter included a brief explanation of the objectives of the study was granted from the dean of faculty of nursing Minia university to be directed to the director of Minia hospital for psychiatric health and addiction treatment to gain his approval to conduct the study. Another written approval was obtained from General Secretariat of Mental Health for data collection. Data were collected in (6) months, from the beginning of February (2024) to the end of July (2024). The investigator attended in the study setting 2 days/ week (every Monday and Wednesday from 9 am to 2 pm). The average numbers of interviewed caregivers were 5 Caregivers per day. At the start of interview, the investigator introduced himself for caregivers at the waiting area of the outpatient clinic, and then an elaboration of the purpose of the study was done to obtain their approval and oral /written consent. Each caregiver was individually interviewed using the study questionnaire. The investigator himself completed the study questionnaire for the illiterate caregivers. The time needed to fill the study questionnaire ranged from 10-15 minute based on the needed explanation. After collecting the data from all the subjects in the study, the researcher provided them with an educational brochure that included the definition and importance of oral health, the healthy and unhealthy foods/drinks that affect the health of teeth, the definition and right technique of teeth brushing, and top tips for maintaining oral health and healthy teeth of autistic children.

Statistical analysis:

Statistical Package for Social Studies (SPSS) version 22 was applied to arrange, classify, and analyze the collected data for qualitative and quantitative variables; the mean and standard deviations of the data were reported using descriptive statistics consequently. To demonstrate the relation between the quantitative measures, Pearson correlation was used. The Chi-square was utilized in tests of relation and a statistically significant difference was considered when the p-value ≤ 0.05 and high statistically significant the p-value ≤ 0.01

Results:

Table (1): Distribution of Socio-Demographic Data of Studied Caregivers (n=100), 2024 year.

Socio-Demographic data	No.	%
Age		
20-<30 yrs	19	19.0
31-<40 yrs	**66**	**66.0**
41+ yrs	15	15.0
Mean ±SD 35.58 ± 5.88		
Sex		
Male	38	38.0
Female	**62**	**62.0**
Residence		
Rural	**68**	**68.0**
Urban	32	32.0
Educational Qualification		
Illiterate	15	15.0
Read and write	13	13.0
Preparatory education	16	16.0
Secondary education		

Socio-Demographic data	No.	%
University education	18	18.0
Highly Educated (Master – Doctorate)	**32**	**32.0**
	6	6.0
working status		
Not working	43	43.0
Working	**57**	**57.0**
consanguinity between parents of autistic children		
No	**71**	**71.0**
Yes	29	29.0

SD= Standard Deviation

Table (1) Shows that 66% of the studied sample were aged 31 to 40 years, with a mean age ± SD of 35.58 ± 5.88; 62% of the responders were female, and 68% of the studied sample live in rural areas. Regarding their education, 32% had university education, 57% were working, and 71% of them have no consanguinity between parents of autistic children.

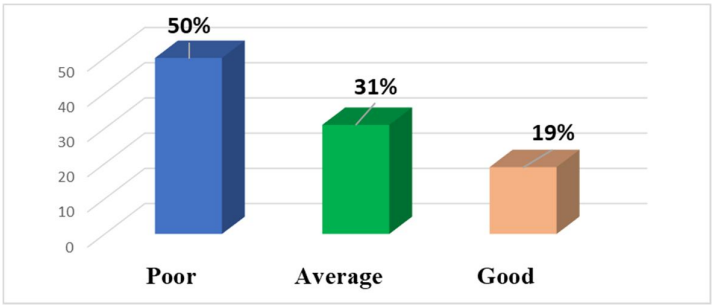

Figure 1: Percentage Distribution of Studied Caregivers according to their Total Knowledge Score Regarding Oral Health Care among Autistic Spectrum Children (n = 100), 2024 year.

Figure (1) Reveals that 50% of studied sample had a poor level of knowledge regarding oral health care of their autistic children, while 19% had good level of knowledge, and 31% were in the average range.

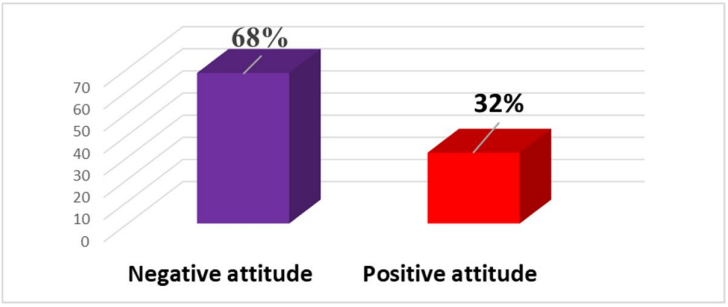

Figure 2: Percentage Distribution of Studied Caregivers according to their Total Attitude Score Regarding Oral Health Care among Autistic Spectrum Children (n = 100), 2024 year.

Figure (2) Explains that 68% of the studied sample had a negative attitude regarding oral health care of their autistic children, while 32% of studied sample had a positive attitude.

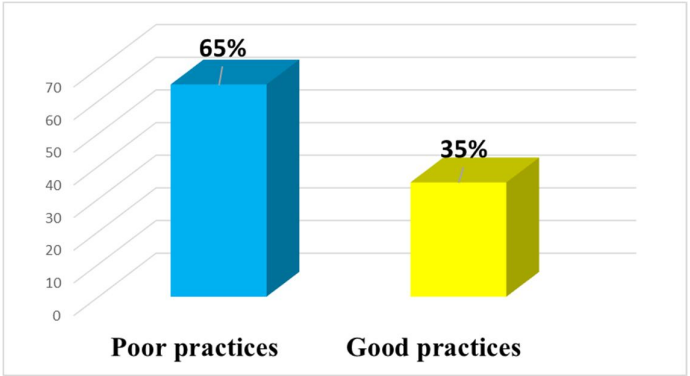

Figure 3: Percentage Distribution of Studied Caregivers according to their Total Practices Score Regarding Oral Health Care among Autistic Spectrum Children (n = 100), 2024 year.

Figure (3) Presents that 65% of the studied sample had a poor level of practice regarding oral health care of their autistic children, compared to 35% had a good level of practice.

Table (2): Relation Between Studied Caregivers' Total Knowledge Score Regarding Oral Health Care Among Autistic Spectrum Children and Their Demographic Data (n = 100), 2024 year.

Socio-Demographic data	Total knowledge						X^2	P-Value
	Poor		Average		Good			
	No	%	No	%	No	%		
Age								
20-<30 yrs	10	52.7	7	36.8	2	10.5	7.609	0.107 N.S
31-<40 yrs	29	43.9	20	30.3	17	25.8		
41+ yrs	11	73.3	4	26.7	0	0.0		
Sex								
Male	20	52.6	11	28.9	7	18.5	0.179	0.914 N.S
Female	30	48.4	20	32.2	12	19.4		
Residence								
Rural	43	63.2	20	29.4	5	7.4	22.79	0.000**
Urban	7	21.9	11	34.3	14	43.8		
Educational Qualification								
Illiterate	13	86.7	2	13.3	0	0.0	58.80	0.000**
Read and write	9	69.2	4	30.8	0	0.0		
Preparatory education	12	75.0	4	25.0	0	0.0		
Secondary education	12	66.7	6	33.3	0	0.0		
University education	2	6.2	15	46.9	15	46.9		
Highly Educated (Master – Doctorate)	2	33.3	0	0.0	4	66.7		
working status								
Working	22	38.6	18	31.6	17	29.8	11.63	0.003*
Not working	28	65.1	13	30.2	2	4.7		
consanguinity between parents of autistic children								
Yes	21	72.4	7	24.1	1	3.5	9.92	0.007*
No	29	40.8	24	33.8	18	25.4		

* Statistically significant at P – value ≤ .05 ** Statistically significant at P – value ≤ .01, chi-square for p-value

Table (2) Explains that the relationship between the total knowledge level of the studied sample regarding oral health of autistic spectrum children and their demographic data. While there are statistically significant differences between their total level of knowledge and their residence, educational level, working status, and consanguinity between parents of autistic children, where the p-values were (0.000, 0.000, 0.003, and 0.007), respectively.

Table (3): Relation Between Studied Caregivers' Total Attitude Score Regarding Oral Health Care among Autistic Spectrum Children and their Demographic Data (n = 100), 2024 year.

Socio-Demographic data	Total attitude				X^2	P-Value
	Negative		Positive			
	No	%	No	%		
Age						
20-<30 yrs	12	63.2	7	36.8	2.853	0.240 N.S
31-<40 yrs	43	65.2	23	34.8		
41+ yrs	13	86.7	2	13.3		
Sex						
Male	29	76.3	9	23.7	1.948	0.119 N.S
Female	39	62.9	23	37.1		
Residence						
Rural	54	79.4	14	20.6	11.132	0.000**
Urban	14	43.8	18	56.2		
Educational Qualification						
Illiterate	14	93.3	1	6.7	1 5.031	0.000**
Read and write	11	84.6	2	15.4		
Preparatory education	15	93.8	1	6.2		
Secondary education	18	100.0	0	0.0		
University education	10	31.3	22	68.7		
Highly Educated (Master – Doctorate)	0	0.0	6	100.0		
working status						
Working	32	56.1	25	43.9	8.568	0.003*
Not working	**36**	**83.7**	**7**	**16.3**		
consanguinity between parents of autistic children						
Yes	**29**	**100.0**	**0**	**0.0**	**19.221**	0.000**
No	39	54.9	32	45.1		

* Statistically significant at P – value ≤ .05 ** Statistically significant at P – value ≤ .01, chi-square for p-value

Table (3) shows that the relationship between studied caregivers' total attitude level regarding oral health care of autistic spectrum children and their demographic data. While there are statistically significant differences between their total level of attitude and their residence, educational level, working status, and consanguinity between parents of autistic children, where the p-values were (0.000, 0.000, 0.003, and 0.000), respectively.

Table (4): Relation Between Studied Caregivers' Total Practices Score Regarding Oral Health Care among Autistic Spectrum Children and their Demographic Data (n = 100), 2024 year.

Socio-Demographic data	Total Practices				X^2	P-Value
	Poor		Good			
	No	%	No	%		
Age						
20-<30 yrs	15	78.9	4	21.1	2.203	0.332 N.S
31-<40 yrs	40	60.6	26	39.4		
41+ yrs	10	66.7	5	33.3		
Sex						
Male	26	68.4	12	31.6	0.315	0.367 N.S
Female	39	62.9	23	37.1		
Residence						
Rural	55	80.9	13	19.1	23.56	0.000**
Urban	10	31.3	22	68.7		
Educational Qualification						
Illiterate	15	100.0	0	0.0	40.32	0.000**
Read and write	10	76.9	3	23.1		
Preparatory education	15	93.8	1	6.2		
Secondary education	14	77.8	4	22.2		
University education	11	34.4	21	65.6		
Highly Educated (Master – Doctorate)	0	0.0	6	100.0		
working status						
Working	32	56.1	25	43.9	4.57	0.026*
Not working	**33**	**76.7**	**10**	23.3		
consanguinity between parents of autistic children						
Yes	26	89.7	3	10.3	10.91	0.001*
No	39	54.9	32	45.1		

NS= Not statistically significance * statistically significant at P – value ≤ .05 ** statistically significant at P – value ≤ .01, chi-square for p-value

Table (4) Indicates that the relationship between studied caregivers' total practice level regarding oral health care of autistic spectrum children and their demographic data. While there are statistically significant differences between their total level of practice and their residence, educational level, working status, and consanguinity between parents of autistic children, where the p-values were (0.000, 0.000, 0.026, 0.001), respectively.

Table (5): Correlation Between Studied Caregivers' Total Knowledge, Attitude and Practices Regarding Oral Health Care for Children with Autism Spectrum Disorder (n = 100), 2024 year.

Variables	Total knowledge	Total Attitude	Total Practices
Total knowledge r. value P. value	1	0.681 .000**	0.711 .000**
Total Attitude r. value (P. value)	0.681 .000**	1	. 0.575 .000**
Total Practices r. value P. value	0.711 .000**	0.575 .000**	1

**** Correlation is significant at the 0.01 level (2- tailed). Pearson correlation for r. value**

Table (5) Indicates that there is a highly positive statistically significant correlation between caregivers' total knowledge, attitude, and practices of the sample under study regarding oral health care for children with ASD

Discussion:

Periodontal health and oral hygiene practices in children with autism tend to be lacking, evidenced by higher plaque and gingival indices. Additionally, xerostomia, often caused by medications, further elevates the risk of cavities and periodontal disease in these patients. **(Omer et al., 2024)** While numerous notable studies have been undertaken from a medical perspective, to assess the dental requirements of children with ASD. Only a small number of published research evaluated the caregivers" dental knowledge and oral hygiene practices of children with ASD **(Ahmed et al., 2022).** So, the aim of the current study was to assess caregivers' awareness regarding oral health care among autistic spectrum children.

Regarding socio-demographic data of the caregivers, the present study demonstrated that nearly two-thirds of the studied sample had an age range between 31 to 40 years old, and nearly two-thirds of the caregivers were female. On the same line, **Ngema, (2021),** who reported that the majority of the caregivers that took part in the study were female and more than half of them between the ages of 31 and 40. Similarly, **Alyafei et al., (2020),** reported that nearly fifty percent of them had an age between 31-40 years old, with nearly three-quarters of them were female. The majority of the caregivers are females is explained by the fact that mothers are the primary caregivers responsible for nurturing and caring for the children.

The results of the current study revealed that more than two-thirds of the caregivers lived in rural areas. This is contradicted by **Ibrahim et al., (2020),** who found that nearly sixty-six percent of the caregivers lived in urban areas, and nearly one-third of the studied sample had a university education. This is in harmony with **Alyafei et al., (2020),** who

stated that nearly thirty-three percent of the study population had university educated.

The findings of this study showed that more than half of the caregivers were working. This is consistent with **Ngema, (2021),** who presented that nearly two-thirds of caregivers were employed. In the same line, **Como et al., (2022),** showed that more than three-quarters of the caregivers were employed. Similar findings were presented by **Alqahtani et al., (2023),** who reported that more than fifty percent of the caregivers were employed.

Regarding the total level of knowledge toward oral health care among the subjects, the present study results showed that half of the caregivers had a poor level of knowledge regarding oral health care. This is in agreement with **Ngema, (2021),** who presented that nearly two-thirds of the caregivers were not knowledgeable about oral health. This also is in harmony with **Ibrahim et al., (2020),** who revealed that the majority of the studied sample had poor knowledge. The poor level of knowledge regarding oral health care among half of the caregivers can be explained by their negative attitude toward oral health, while nearly half of the studied subjects view dental problems are less important compared to other health problems which highlights the need for educational intervention to raise the awareness regarding the omportance of oral health care of autistic children and its effect on overall health.

Regarding the total level of attitudes toward oral health care among the subjects, the results of the current study found that more than two-thirds of the studied sample had a negative attitude towards oral care. This contradicted with **Krishnan et al., (2019),** who stated that more than half of the caregivers had a positive attitude regarding oral care. Also, **Alyafei et al., (2020)** reported that the majority of caregivers had positive attitudes toward oral care.

This disparity may be due to the majority of caregivers in the current study having low and middle levels of education, which could explain their low oral health literacy and their negative attitude toward the oral health of their autistic children. The degree of education of caregivers is significantly linked to their attitude and knowledge. It's possible that a person who has received more education will have a better understanding of the causes of dental diseases and the risk factors, which will enable them to act proactively by practicing regular, ideal oral hygiene and promptly seeking preventive care and treatment.

Concerning the total level of practices regarding oral healthcare among the subjects, the current study results demonstrated that nearly two-thirds of the caregivers had a poor practice level regarding oral health care of their children. This is congruent with **Ibrahim et al., (2020),** who found that the majority of the studied sample had an unsatisfactory practice level regarding oral care. Conversely, **Halim et al., (2020)** presented that three-quarters of the caregivers had a good practice level regarding oral care. This disagreement may be due to the majority of caregivers having poor awareness regarding oral care and their lower socioeconomic level, which is indicated by being treated in a governmental hospital.

Concerning the total level of knowledge, attitudes, and practices of the caregivers' and socio-demographic data, the results of the current study clarified that there were highly significant relations between caregivers' educational level and their knowledge, attitude, and practice. This is in harmony with **Krishnan et al., (2019),** who reported that there were highly significant relationships between caregivers' knowledge and their educational level, caregivers' attitudes and their educational level, caregivers' practices and their educational level.

Residence, working status, and consanguinity between parents of the autistic children were additional demographic factors significantly related to the level of knowledge, attitude, and practice of the caregivers regarding oral health, while residents in urban areas have significantly good knowledge, good practice, and a positive attitude regarding oral health compared to participants who live in rural areas. This urban/rural disparity may be due to the unequal distribution of oral health professionals, as well as inadequate access to oral health care services in rural and remote zones, highlighting the need for a strategy to promote oral health in rural areas.

Study Limitations:

The main limitation of the study was the small sample size due to the scarcity of ASD in addition to the substantial underdiagnosis of ASD cases in developing countries, especially in cases of children with mild forms of the disorder.

Conclusion:

The current study concluded that half of the caregivers had poor knowledge regarding oral health care, more than two-thirds of the caregivers had negative attitudes regarding oral care, and nearly two-thirds of the caregivers had poor practice toward oral care. Moreover, the current study concluded that certain sociodemographic characteristics, such as residence, educational qualification, and working status, are significantly related to the knowledge, attitude, and practice of caregivers regarding oral health care of their autistic children. Furthermore, there was a strong positive statistically significant correlation between the total score of knowledge, total attitude score, and the total score of practices of the studied sample toward oral healthcare of their autistic children.

Recommendations:

Based on the findings of the current study, the following recommendations are made:

1- The role of caregivers and parents is vital in promoting oral health. For caregivers to be effective, they need to have the right knowledge and positive attitude towards their child's oral hygiene and nutrition. This can be achieved through comprehensive educational programs focused on oral health. It's also important to stress how oral health contributes to overall well-being.
2- Establishing contact with parents shortly after a child's diagnosis of ASD is essential for encouraging good oral health practices.
3- Further studies should be employed to discover the challenges faced by the caregivers to provide the appropriate oral health care for their autistic children.
4- Dental health professionals should provide medical information to the caregivers, especially of the autistic children, about oral health.

References:

1. Ahmed, M. A., Khattab, N. M., & Elheeny, A. A. (2021). Oral hygiene status among a group of Egyptian autistics children: A cross-sectional survey. Minia Journal of Medical Research, 32(1), 82-85.
2. Ahmed, Y. T., Haleem, S., Alrusayyis, S. A., Almuhaidib, B. N., & Albawardi, W. A. (2022). Awareness Of Oral Hygiene Among Parents Of Autistic Children In The Kingdom Of Saudi Arabia. Journal of Pharmaceutical Negative Results, 431-445.
3. AlHammad, K. A. S., Hesham, A. M., Zakria, M., Alghazi, M., Jobeir, A., AlDhalaan, R. M., ... & Mosadomi, H. (2020). Challenges of autism spectrum disorders families towards oral health care in Kingdom of Saudi Arabia. Pesquisa Brasileira em Odontopediatria e Clínica Integrada, 20, e5178.
4. AlHumaid, J., Gaffar, B., AlYousef, Y., Alshuraim, F., Alhareky, M., & El Tantawi, M. (2020). Oral health of children with autism: The influence of parental attitudes and willingness in providing care. The Scientific World Journal, 2020(1), 8329426.
5. Al-Mendalawi, M. D. (2020). Re: Revisiting the prevalence of autism spectrum disorder among Omani children: A multicentre study. Sultan Qaboos University Medical Journal, 20(2), e236-e236.
6. Alqahtani, A. S., Gufran, K., Alsakr, A., Alnufaiy, B., Al Ghwainem, A., Bin Khames, Y. M., ... & Almuthaybiri, S. M. (2023). Oral Healthcare Practices and Awareness among the Parents of Autism Spectrum Disorder Children: A Multi-Center Study. Children, 10(6), 978.
7. Alvares, G. A., Mekertichian, K., Rose, F., Vidler, S., & Whitehouse, A. J. (2023). Dental care experiences and clinical phenotypes in children on the autism spectrum. Special Care in Dentistry, 43(1), 17-28.
8. Alyafei, N. A., Jaleel, B. N. F., & Mathew, T. (2020). Knowledge, Attitude and Behavior Towards Oral Health Care Among Parents/Caregivers of Children with Disabilities in Qatar. Medical & Clinical Research, 5(10), 251-257.
9. Como, D. H., Floríndez-Cox, L. I., Stein Duker, L. I., Polido, J. C., Jones, B. P., Lawlor, M., & Cermak, S. A. (2022). Oral care knowledge, attitudes, and practices of Black/African American caregivers of Autistic children and non-Autistic children. Children, 9(9), 1417.
10. Ferrazzano, G. F., Salerno, C., Bravaccio, C., Ingenito, A., Sangianantoni, G., & Cantile, T. (2020). Autism spectrum disorders and oral health status: review of the literature. European journal of pediatric dentistry, 21(1), 9-12.
11. Halim, N. A., Harun, N. A., Kenali, N. M., & Sopie, S. S. M. (2020). Oral Health Knowledge, Attitude and Practice of the Caregiver at the Special Needs Boarding School in Kuantan, Pahang. Age, 11(30), 26-8.
12. Ibrahim, S. E. M., Bahgat, R. S., & Elhendawy, F. A. (2020). Effect of health education for mothers about care of oral health problems on quality of life for their autistic children. American Journal of Nursing Research, 8(5), 524-533.
13. Jarling, A., Rydström, I., Ernsth-Bravell, M., Nyström, M., & Dalheim-Englund, A. C. (2020). A responsibility that never rests–the life situation of a family caregiver to an older person. Scandinavian Journal of Caring Sciences, 34(1), 44-51.
14. Krishnan, L., Prabha, G., & Madankumar, P. D. (2019). Knowledge, attitude, and practice about oral health among mothers of children with special needs–A cross-sectional study. Journal of Dental Research and Review, 6(2), 39-43.
15. Lu, G. A. O., & Liu, X. N. (2022). Status Quo and Advanced Progress in Oral Health Care and Treatment of Children with Autism Spectrum Disorder: A Literature Review. Chinese Journal of Dental Research, 25(4).
16. Mah, R. M. F., Rahman, N. A., Adnan, M. M., & Zakaria, N. (2023). Effectiveness of" Oral Health Care for Children with Autism Spectrum Disorder Module" in Improving Tooth-Brushing Practice among Children with Autism Spectrum Disorder in Hospital University Sains Malaysia. Malaysian Journal of Medicine & Health Sciences, 19(1):71-79.
17. Nagda, R. (2023). Oral Hygiene Practice and Home-Care Challenges in Children with Autism Spectrum Disorder in San Francisco (Doctoral dissertation, University of California, San Francisco).
18. Ngema, S. N. (2021). Knowledge, attitudes and practices of oral health care among caregivers, parents and teachers of autistic disorder children in Randburg Clinic School (Doctoral dissertation, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg).
19. Omer, R., Mohamed, N., & Peck, C. (2024). Oral health practices and challenges facing parents of autistic children in the Western Cape (2021). Pediatric Dental Journal.
20. Pi, X., Liu, C., Li, Z., Guo, H., Jiang, H., & Du, M. (2020). A meta-analysis of oral health status of children with autism. Journal of Clinical Pediatric Dentistry, 44(1), 1-7.
21. SAM, S. S., SHETTY, V., & AMMA, V. (2021). Oral Health of Autistic Children and Awareness of Care Providers towards their Oral Hygiene. Journal of Clinical & Diagnostic Research, 15(2), 19.
22. Sami, W., Ahmad, M. S., Shaik, R. A., Miraj, M., Ahmad, S., & Molla, M. H. (2023). Oral Health Statuses of Children and Young Adults with Autism Spectrum Disorder: An Umbrella Review. Journal of Clinical Medicine, 13(1), 59.
23. Sherriff, A., Stewart, R., Macpherson, L. M., Kidd, J. B., Henderson, A., Cairns, D., & Conway, D. I. (2023). Child oral health and preventive dental service access among children with intellectual disabilities, autism and other educational additional support needs: A population-based record linkage cohort study. Community Dentistry and Oral Epidemiology, 51(3), 494-502.
24. Stark, P., McKenna, G., Wilson, C. B., Tsakos, G., Brocklehurst, P., Lappin, C., ... & Mitchell, G. (2022). Interventions supporting community nurses in the provision of Oral healthcare to people living at home: a scoping review. BMC nursing, 21(1), 269.
25. Yousef, A. M., Roshdy, E. H., Abdel Fattah, N. R., Said, R. M., Atia, M. M., Hafez, E. M., & Mohamed, A. E. (2021). Prevalence and risk factors of autism spectrum disorders in preschool children in Sharkia, Egypt: a community-based study. Middle East Current Psychiatry, 28(1), 1-14