

Original Article

Parental Perception of Oral Health-Related Quality of Life in A Group of Children and Adolescents with Down Syndrome: A Cross-Sectional Study

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Abstract

Aim: To evaluate the parental perception of the oral health-related quality of life (OHRQoL) of children and adolescents with Down syndrome (DS), and oral hygiene measures and practices that are provided for children and adolescents with Down syndrome at home.

Subjects and methods: A total of 194 parents of 4-14 years old children and adolescents with DS attending the Genetic Disease Department, Abou El Reesh Hospital, Faculty of Medicine, Cairo University were recruited to participate in the study after confirming adherence to eligibility criteria. The principal investigator distributed the questionnaire which consisted of three parts including demographic data of both parent and child, the parental perception of their children's OHRQoL, and oral hygiene measures and practices that are provided for their children and adolescents at home.

Results: About 53.6% of the parents evaluated their children's oral health as good, and 80.9% had positive parental perceptions regarding their children's OHRQoL. Besides, 79.4% of the parents were responsible for cleaning their children's teeth, 43.8% washed their children's teeth three times per day mostly using water only, and 72.7% of parents hadn't received any dental information regarding tooth brushing for their children.

Conclusions: Most parents stated that their children had good oral health and had a positive parental perception of their children's OHRQoL. The majority of parents were responsible for cleaning their children's teeth three times per day using only water as they hadn't received any information regarding tooth brushing for their children.

Keywords: Down syndrome, Oral health-related quality of life, Oral hygiene measures, Parental perception

Introduction

Down syndrome (DS) is the most common genetically induced neurodevelopmental impairment, caused by a chromosome 21 extra copy which was diagnosed for the first time by John Langdon Down in 1866 (**Karmiloff-Smith et al., 2016**).

The global prevalence of DS is estimated to be one in 600 to 1,000 live births while Egypt

has one in 700 live births. Individuals with DS are more likely to develop congenital heart problems, recurrent respiratory infections, leukemia, thyroid gland dysfunction, and behavioral problems and difficulties (**Amin et al., 2021**).

Furthermore, they have unique oro-facial characteristics that may put them at risk for oro-dental problems, such as microdontia, delayed

eruption, hypodontia, malocclusion, and soft tissue abnormalities such as the protruded tongue. Besides, oral symptoms such as pain, discomfort, or difficulty chewing cause systemic effects on nutrition and digestion in addition to difficulty in speech which have a broader effect on the quality of life (QoL) including emotional status and interactions with others (AlJameel *et al.*, 2020).

Oral health has been proven in studies of large population samples to influence emotional and psychological well-being as well as social connections (Omara, Stamm and Bekes, 2021). Oral health-related quality of life (OHRQoL) captures the goal of a new perspective and is defined as a multi-dimensional structure that reflects people's comfort level when eating, sleeping, and participating in social interactions, their self-respect, and satisfaction with oral health (Rockville, 2000).

Few studies have been performed to evaluate the impact of oral health issues on many aspects of QoL in children and adolescents with DS, and some evidence of negative impacts on QoL in terms of social acceptability and other parts of their life has been discovered (Scalioni *et al.*, 2018; AlJameel *et al.*, 2020) So, the present study aimed to evaluate the parental perception of the OHRQoL of children and adolescents with DS in addition to the evaluation of oral hygiene measures and practices that are provided for children and adolescents with DS at home.

Subjects and Methods

Study Design

The present study was a questionnaire-based cross-sectional study to evaluate the parental perception of the OHRQoL in children and adolescents with DS and evaluate oral hygiene measures and practices that are provided for children and adolescents with DS at home.

Sample Size Determination

A power analysis was designed to have adequate power to apply a statistical test of the research question of the parental perception of the OHRQoL in children and adolescents with DS. Sample size calculation was performed using Epi info for windows version 7.2 based

on the result of Scalioni *et al.*, (2018) who reported that the prevalence of parents with a positive perception regarding the oral health of their children and adolescents was (55.1%)- and adopting a confidence interval of (95%), a margin of error of (7%) with finite population correction; the predicted sample size (n) was a total of (194) cases.

Subject Selection

A total of 194 parents of 4-14 years old children and adolescents with DS attending the Genetic Disease Department, Abou El Reesh Hospital, Faculty of Medicine, Cairo University were recruited to participate in the study after confirming adherence to eligibility criteria.

Eligibility criteria

Inclusion criteria:

- Children attend the hospital with one of their parents.

Exclusion criteria:

- Children and adolescents with multiple disabilities.
- Parents who declined to take part in the research.

Ethical Considerations

Ethical approval was obtained from the ethical committee of the Faculty of Dentistry, Cairo University under number 7-6-20. A detailed description of the purpose and steps of the study were explained to the parents of the children and adolescents with DS in simple words and signed informed consent was obtained.

Data Source and Collection

The child and the parent's name and age in years, the number of children in the family, the educational and occupational levels of both parents, the number of DS children in the family, history of previous abortion, and consanguinity marriage were obtained from the parents.

Parental perception of the OHRQoL in children and adolescents with DS:

An English self-administered questionnaire was developed by Allison and Lawrence, (2005) and validated by Bonanato *et al.*, (2013) and was translated into the Arabic language to be easily comprehended by parents, as shown in table (1). It was distributed into five domains

including functional impairment on food, communication skills, oral parafunctions, oral symptoms, and parental evaluation of the oral health of their children.

Questions from one to seven scored as follows; not at all scored zero, a little scored one, quite a lot scored two and very much scored three. While questions eight to thirteen had a reverse score where not at all scored three, a little scored two, quite a lot scored one and very much scored zero. Finally, question 14 scored as follows; bad scored three, reasonable scored two, good scored one, and excellent scored zero. The scale's total score was computed as the sum of the scores of all the questions. Thus, the total scale score could range from 0 to 42 where the lower score corresponded to a more positive parental perception of the OHRQoL.

Oral hygiene measures and practices at home

This part was composed of five multiple-choice questions using an English questionnaire developed and validated by **Al-Hussyeen and Al-Sadhan, (2006)** and was translated into the Arabic language to be easily comprehended by parents, as shown in table (1).

Statistical Analysis

Categorical data represented as frequency (n) and percentage (%) and analyzed using the chi-square test. Numerical data were explored for normality by checking the data distribution and calculating the mean and median values using Kolmogorov-Smirnov and Shapiro-Wilk tests. Numerical data were presented as mean and standard deviation values, and an independent t-test would be used for the analysis. The significance level would be set at $P \leq 0.05$ for all tests.

Results

Demographic Data

Out of the 169 parents, who initially met the eligibility criteria, the age of parents ranged between 23 to 55 years with a mean age of 38.61 ± 7.25 while the children with DS aged between 4 to 14 years with a mean age of 6.46 ± 2.38 . Regarding the number of children in the family, 43.81% of the participants had 2 to 3 children, and 40.72% had 4 to 5 children. The majority of the participants with 95% had one child with DS in the family, 29.9% of the parents had a consanguinity relationship while only 31.4% of mothers had a previous history of abortion, as presented in table (2).

In terms of the parents' educational levels, only 8.8% of the fathers were illiterate and 49.5% had a high school education, while 36.6% of the moms had a secondary education, and 13.9% of the mothers were illiterate. Regarding the occupational status of the parents, 31.4% of the fathers were daily workers, and 9.8% weren't working, while 91.8% of mothers were housewives, and only 6.7% were employees, as presented in table (3).

Parental evaluation of children's oral health:

Concerning the parental evaluation of oral health, 53.6% (104) of the parents chose good oral health, 30.4% (59) chose reasonable oral health, 13.4% (26) chose poor oral health, and 2.6% (5) chose excellent oral health with a statistically significant difference between different answers ($p\text{-value} < 0.001$).

Table (1): Parental perception of the oral health-related quality of life and Oral hygiene measures and practices

Question	Not at all	A little	Quite a lot	Very much
1-Does your child have difficulty chewing pieces of meat?				
2-During the day has your child often protruded his/her tongue?				
3-Have your child bleeding gum easily?				
4-Has your child bad breath?				
5-Has your child grinding his/her teeth?				
6-During chewing, has food split from your child's mouth?				
7-Has your child had a strong gag reflex?				
8-Has your child been able to eat all the food he/she wants to?				
9-Has your child suffered any painful dental problems?				
10-Is your child able to talk?				
11-Is your child understood by people outside the immediate family when he/she talks?				
12-Have you been able to judge if your child has pain?				
13-Have you been able to judge where your child has pain?				
14-How would you describe the oral or dental health of your child?	Poor	Reasonable	Good	Excellent

Table (2): Number of children, number of down syndrome children in the family, consanguinity relationship between the parents, and previous history of abortion

Number of children in the family	Number	Percentage	
One	9	4.64%	
2-3	85	43.81%	
4-5	79	40.72%	
More than 5	21	10.82%	
Number of Down Syndrome Children in The Family	Number	Percentage	
One child	186	95.9%	
More than one child	8	4.1%	
Is there a consanguinity relationship between the father and the mother?	Number	Percentage	
	Yes	58	29.9%
	No	136	70.1%
Has the mother had an abortion before?	Yes	61	31.4%
	No	133	68.6%

Table (3): Educational and occupational levels of the parents

1-Who is responsible for washing the child's teeth?	Child himself	Nanny & nurse	Older sibling	Parents
2-How many times per day do you wash your child's teeth?	Never	Occasionally	Once/day	2times/day 3times/day
3- What do you use to clean your child's teeth?	Toothbrush		Water only	Piece of gauze
4-Do you use toothpaste to clean your child's mouth?	Yes			NO
5-Have you Ever received any information about children's tooth brushing?	Yes			NO

Parental perception of the OHRQoL in children with DS:

Based on the scoring of the parental perception of OHRQoL, 80.9% (157) of the parents had a positive perception and 19.1% (37) had a negative perception.

Oral hygiene measures and practices at home:

When it came to who was responsible for cleaning their child's teeth, 79.4% of parents were responsible for teeth brushing while 43.8% chose 3 times per day as the frequency of teeth brushing. In terms of the method used to brush children's teeth, 61.35% of the participants used water only, 38.14% used toothbrushes with only 35.1% of the parents' used toothpaste. Regarding whether the parents had ever received any information about children's tooth brushing, only 27.3% of the participants received previous information, as shown in table (4).

Associations Between parental perception of Oral Health-Related Quality of Life score and Demographic Data:

Multiple linear regression was performed to ascertain the effects of different demographic variables on the parental perception of OHRQoL score showed that an

increase in parent age was significantly associated with lower scores ($p=0.016$). Additionally, families with more than 5 children were associated with higher scores in comparison to families with 2-3 children ($p=0.016$). Finally, illiterate fathers were significantly associated with higher scores in comparison to those with secondary school degrees ($p=0.011$) while the other variables had no significant effect ($p>0.05$), as presented in table (5).

Association between parental perception of oral health-related quality of life score and oral hygiene measures and practices at home

Multiple linear regression was performed to ascertain the effects of oral hygiene measures and practices at home on the parental perception of OHRQoL scores showed that occasional and once/day teeth brushing were significantly associated with higher scores in comparison to brushing 3 times a day ($p<0.05$). Additionally, using a toothbrush for cleaning was significantly associated with lower scores in comparison to using water only ($p<0.001$) while the other variables had no significant effect ($p>0.05$), as presented in table (6).

Table (4): Oral hygiene measures and practices at home

Question	Answers	Number	Percentage	p-value
1-Who is responsible for brushing/washing the child's teeth?	Child Himself	37 ^B	19.1%	<0.001*
	Nanny & Nurse	0	0.00%	
	Older Sibling	3 ^C	1.5%	
	Parents	154 ^A	79.4%	
	Never	5 ^D	2.6%	
2-How many times per day do you brush your child's teeth?	Occasionally	42 ^B	21.65%	<0.001*
	Once/Day	42 ^B	21.65%	
	2 Times/Day	20 ^C	10.3%	
	3 Times/Day	85 ^A	43.8%	
3-What do you use to clean your child's teeth?	Toothbrush	74 ^B	38.14%	<0.001*
	Water only	119 ^A	61.35%	
	Piece of gauze	1 ^C	0.51%	
4-Do you use toothpaste to clean your child's mouth?	Yes	68 ^B	35.1%	<0.001*
	No	126 ^A	64.9%	
5-Have you ever received any information about children's tooth brushing?	Yes	53 ^B	27.3%	<0.001*
	No	141 ^A	72.7%	

Values with different superscript letters within the same question are significantly different*; significant ($p\leq 0.05$) ns; non-significant ($p>0.05$)

Table (5): Associations between parental perception of oral health-related quality of life score and demographic data, and Oral hygiene measures at home

Parameter	Regression coefficient	95% CI		SE	Statistic	p-value
		Lower	Upper			
(Intercept)	22.44	18.19	26.68	2.15	10.43	<0.001*
Child age	-0.23	-0.54	0.07	0.15	-1.52	0.131ns
Parent age	-0.15	-0.27	-0.04	0.06	-2.57	0.011*
Number of children (one child) [reference 2-3 children]	1.37	-1.93	4.67	1.67	0.82	0.414ns
Number of children (4 to 5 children) [reference 2-3 children]	1.65	-0.09	3.39	0.88	1.87	0.063ns
Number of children (More than 5) [reference 2-3 children]	3.16	0.6	5.72	1.3	2.44	0.016*
Father education (Illiterate) [reference high school graduate]	4.13	0.95	7.32	1.61	2.56	0.011*
Father education (Writing and reading) [reference high school graduate]	1.3	-1.05	3.64	1.19	1.09	0.276ns
Father education (Primary school) [reference high school graduate]	1.41	-2.66	5.48	2.06	0.68	0.494ns
Father education (Intermediate school) [reference high school graduate]	0.61	-2.96	4.18	1.81	0.34	0.736ns
Father's education (University) [reference high school graduate]	-1.13	-3.61	1.36	1.26	-0.89	0.373ns
Mother education (Illiterate) [reference high school graduate]	-0.97	-4.02	2.08	1.55	-0.63	0.531ns
Mother education (Writing and reading) [reference high school graduate]	-0.77	-3.33	1.79	1.3	-0.59	0.554ns
Mother education (Primary school)	-0.23	-4	3.54	1.91	-0.12	0.904ns
Mother education (Intermediate school)	-1.21	-3.56	1.13	1.19	-1.02	0.308ns
Mother education (University) [reference high school graduate]	-0.41	-2.88	2.05	1.25	-0.33	0.741ns
Father work (Not working) [reference daily worker]	-0.48	-2.96	2	1.26	-0.38	0.703ns
Father work (Specialist worker /farmer) [reference daily worker]	-0.15	-2.05	1.75	0.96	-0.15	0.878ns
Father work (Trader /Free business) [reference daily worker]	-1.88	-4.79	1.04	1.48	-1.27	0.206ns
Father work (Employee) [reference daily worker]	-0.4	-2.24	1.44	0.93	-0.43	0.669ns
Father work (Business owner) [reference daily worker]	-5.86	-12.49	0.77	3.36	-1.74	0.083ns
Mother work (Daily worker) [reference housewife]	0.24	-6.33	6.81	3.33	0.07	0.943ns
Mother work (Employee) [reference housewife]	-0.2	-3.04	2.63	1.44	-0.14	0.887ns
Mother work (Specialist worker /farmer) [reference housewife]	-2.8	-12.12	6.51	4.72	-0.59	0.553ns

*; significant ($p \leq 0.05$) ns; non-significant ($p > 0.05$)

Table (6): Associations between parental perception of oral health-related quality of life score and Oral hygiene measures at home

Parameter	Regression coefficient	95% CI		SE	Statistic	p-value
		Lower	Upper			
(Intercept)	16.35	15.35	17.35	0.51	32.35	<0.001*
Who is responsible for brushing the child's teeth? (Child Himself) [reference parents]	-1.59	-3.21	0.03	0.82	-1.93	0.055ns
Who is responsible for brushing the child's teeth? (Older Sibling) [reference parents]	0.13	-4.98	5.23	2.59	0.05	0.961ns
How many times per day do you brush your child's teeth? (Never) [reference 3 times/day]	0.45	-3.55	4.45	2.03	0.22	0.824ns
How many times per day do you brush your child's teeth? (Occasionally) [reference 3 times/day]	3.51	1.06	5.97	1.24	2.83	0.005*
How many times per day do you brush your child's teeth? (Once/Day) [reference 3 times/day]	2.81	0.27	5.34	1.29	2.18	0.030*
How many times per day do you brush your child's teeth? (2 Times/Day) [reference 3 times/day]	1.83	-0.38	4.05	1.12	1.63	0.104ns
What do you use to clean your child's teeth? (Toothbrush) [reference water only]	-5.02	-7.27	-2.76	1.14	-4.39	<0.001*
What do you use to clean your child's teeth? (Piece of gauze) [reference water only]	-0.35	-9.06	8.37	4.42	-0.08	0.937ns

*; significant ($p \leq 0.05$) ns; non-significant ($p > 0.05$)

Discussion

Children with special needs are faced with the daily burden of dealing with the negative effects of their disabilities, including the impact of these difficulties on oral health. Parental perceptions of children's OHRQoL are especially important for children with special needs since many of these patients are with limitations in their cognitive capacities and communication skills also Parents and caregivers usually face oral health care problems in children with DS (Jokovic et al., 2003; Norwood and Slayton, 2013; Al-Sufyani et al., 2014; Bull, 2020).

Additionally, evaluation of oral hygiene measures and practices that are provided for children and adolescents with DS. The oral health condition of children with DS relies heavily on the family's commitment and responsibility in supporting them in oral hygiene practices, considering their difficulties in developing autonomy and motor skills and also the lack of parental counseling (Goveo Andrango, 2015; Suárez Alejandro and Mora Sánchez, 2015).

The mean age of children and adolescents with DS was 6.46 ± 2.38 consistent with Stein Duker et al., (2020), Stensson et al., (2021) and can be justified by

the improvement of parental awareness regarding the importance of the proper medical care needed for their children (Antonarakis et al., 2020; Akhtar and Bokhari, 2022). On the contrary, Al-Sufyani et al., (2014), Descamps and Marks, (2015), Aljameel, (2016) reported different mean ages which can be linked to increasing survival rates beyond 10 years for children with DS and the improvement of pharmacological and medical treatment for children and adolescents with DS (De Graaf, Buckley and Skotko, 2017; Hart et al., 2017; Trucco et al., 2018; Bull et al., 2022).

The mean age of the parents was 38.61 ± 7.25 , which was in agreement with Descamps and Marks, (2015) and can be explained by the fact that low socioeconomic level, residency in rural areas, consanguinity marriage, and the increase in the pregnancy age of the mother increases the risk of having a child with DS (Diamandopoulos and Green, 2018; El-Attar, Issa and Mahrous, 2019).

Regarding the number of children in the family of the participants, 43.8% of the participants had 2 to 3 children, which was following Darla and Bhat, (2021) and can be justified by the high fertility rate of the Egyptian population, the high rate of unintended

pregnancy and the difficulty to abort the child due to religious beliefs, also some families use their children as labor to get out of the economic crises (**Khatab et al., 2019; Ibrahim et al., 2020; Khalifa et al., 2020; Krafft, 2020**).

In the present study, the majority of parents didn't have education beyond high school, which was consistent with **Aljameel, (2016)** and can be attributed to the socioeconomic level of families attending public hospitals (**Ahmed, Taha and El-Dokky, 2016; Fouad Abd Elkodoos, Badr-Eldein and Ismail, 2022**).

Regarding parental occupation, the majority of the mothers were housewives This finding was in line with **Aljameel, (2016)** and can be justified by mothers being the primary caregivers for their special needs children (**de Faria and Casotti, 2019; Freitag, Milbrath and Motta, 2020**). About 54.1% of the fathers worked in a medium-level occupation such as a daily worker, specialist worker, or farmer, Which was in agreement with **Tomris et al., (2022)** and can be attributed to the socioeconomic level of families as families with low or medium occupation levels families usually attend public hospitals (**Pavel, Chakrabarty and Gow, 2016**).

In terms of parental evaluation of their children's oral health, 53.6% of participants reported that their children had good oral health, and 13.4 % reported their children had poor oral health which following **Stein Duker et al., (2020)** and can be attributed to the low incidence of dental caries in children with DS which is an oral disease that causes dental pain (**Oliveira et al., 2010; Nora et al., 2018; Scalioni et al., 2018**). On the opposite side, **AlJameel and AlKawari, (2021), Stensson et al., (2021)** reported that a higher percentage of 25-40% of DS children had poor oral health which can be linked to difficulties and barriers facing DS children in maintaining proper oral health and receiving the dental care that affects their OHRQoL (**Stein Duker et al., 2020**).

Regarding the parental perception of the OHRQoL score, 80.9% of the parents of DS children had a positive parental perception which can be explained by the improvement of health surveillance for DS by providing a complete system examination, nutritional assessment, developmental evaluation, hearing assessment, lifestyle activity, as well as the assessment for detection of any associated health problems (**Abou El Ella, El Fotoh and Ibrahim, 2019; Hendrix et al., 2020; Mohammed, Eliwa and Zaki, 2020**). On the other side, **Scalioni et al., (2018)** stated that only

55.1% of the children had a positive parental perception which can be attributed to the negative impact of general, mental, and oral health conditions on the QoL, also many problems may face children and adolescent with intellectual disabilities can have a direct influence on their OHRQoL including the need for support with essential tasks and difficulties to getting adequate health care (**Haddad et al., 2018; Wilson et al., 2019**).

Regarding the association between the parental perception of OHRQoL score and the parent's age, there was a statistically significant association with a $p=0.016$ as with the increase of parent age lower scores of OHRQoL were reported, which was in agreement with **Carvalho, Rebelo and Vettore, (2013), Martins-Júnior et al., (2013)** which can be attributed to young parents may feel less secure and confident in caring for their special needs children in comparison to older parents (**Martins-Júnior et al., 2013; Pani et al., 2013**). On the opposite side **Abanto et al., (2011), Kramer et al., (2013)** reported no statistically significant association which can be explained by the fact that parents from different age groups are prepared to deal with the needs of their children (**Caples et al., 2018**).

Also, a statistically significant association between the parental perception of the OHRQoL score and the number of children or siblings in the family with a p -value =0.016, which was in line with **Liu et al., (2021)** reported a negative association between the OHRQL score and the number of children in the family this result can be attributed to the fact that parental attention and efforts are distributed among their children, especially in large families (**Whiteman et al., 2011; Weng et al., 2019**). On the opposite side, **Abanto et al., (2012), Martins-Júnior et al., (2013)** reported no statistically significant association which can be attributed to the fact that parents focus their attention on their children with special needs to address their children's health problems and functional abilities (**Ansari et al., 2016; Nygård and Clancy, 2018; Shields et al., 2018; de Graaf et al., 2019**).

Concerning the association between the parental perception of OHRQoL score and parental education, there was a statistically significant association with a p -value=0.011. This finding was consistent with **Pani et al., (2013)** which can be linked to higher awareness and knowledge regarding the importance of oral health care for their children (**Assari and Hani, 2018**). On the contrary, **Mashoto et al., (2009), Abanto et al.,**

(2012), Martins-Júnior *et al.*, (2013) reported no statistically significant association which can be justified by all parents with special needs children tend to strictly follow medical instructions for their children's health (Mas *et al.*, 2019; Wallis *et al.*, 2020). While the association between the parental perception of OHRQoL score and parental occupation, there was no statistically significant association with a p -value > 0.05 , which was in agreement with Papaioannou *et al.*, (2011) and can be justified by parental occupation and income may predict children and adolescents QoL, but usually couldn't be linked to symptoms, functional limitations, or general health perceptions which affects the OHRQoL (Baker, Mat and Robinson, 2010; Nqobco *et al.*, 2019).

There was no significant association between the parental perception of OHRQoL score and the person responsible for brushing/washing children's teeth with a $p > 0.05$, which was contrary to Winders *et al.*, (2019), Kayacı and Gezgin, (2022) who reported a statistical significant association. This can be attributed to the limited motor skills and delays in the development of motor functions of children and adolescents with DS and those children usually depend on their parents to clean their teeth, also the parents might have a lack of knowledge and information about the ideal way of tooth cleaning and brushing for their children (Zaihan *et al.*, 2015; Winders, Wolter-Warmerdam and Hickey, 2019; Aliakbari *et al.*, 2021; Kayacı and Gezgin, 2022).

Regarding frequency of tooth brushing/washing, the results of the model showed that occasional and once/day teeth brushing were significantly associated with higher scores in comparison to brushing/washing 3 times a day with a p value < 0.05 , which was in agreement with El-Meligy *et al.*, (2016) and can be justified by the importance of plaque control in preventing gingival inflammation, periodontal diseases, and enhancing oral health (Hayasaki *et al.*, 2014; Moreira *et al.*, 2015; Cruz, Chi and Huebner, 2016).

Concerning the way of cleaning children's teeth, there was a statistically significant association with a $p < 0.001$ which can be linked to the fact that a toothbrush is the most effective method of plaque control and improving oral health than oral rinsing or using a piece of gauze (Kalyoncu, Giray and Tanboga, 2018; Stein Duker *et al.*, 2020).

Conclusions

- Most parents stated that their children had good oral health and had a positive parental perception of their children's OHRQoL, in terms of oral hygiene measures,
- The majority of the parents were responsible for cleaning their children's teeth three times per day mostly using only water and they had not received any information regarding tooth brushing for their children.
- Parental age, the number of siblings, parental education, the frequency of teeth brushing/washing, and the method used to clean their children's teeth had a statistically significant association with parental perception of OHRQoL scores.

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Conflict of interest:

The authors declare no conflict of interest.

Ethics:

This study protocol was approved by the ethical committee of the faculty of dentistry- Cairo university on: 23/6/2020, approval number: 7-6-20.

Data Availability:

Data will be available upon request

Clinical trial registration:

The study was registered on Clinicaltrials.gov with ID number: **NCT04394221**.

Credit statement:

Author 1: Data curation, Writing original draft, Methodology, Conceptualization, Resources.

Author 2: Data curation, Conceptualization, Project administration, Supervision, Methodology, Writing review & editing.

Author 3: Methodology, Writing - review & editing, Investigation, Formal analysis, Supervision, Data curation.

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