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Oral Health related Knowledge, Practices and Quality of Life among School age Children

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Abstract
Background: Oral health among children usually is an indicator of their well-being, overall health and quality of life. Poor oral hygiene due to oral self-care deficit and dental visits infrequency is a main cause for the dental problems as dental caries, gingival disease, loose teeth, bad breath and oral trauma. **Aim:** The current study aimed to assess the oral health related knowledge, practices and quality of life among school age children. **Method:** Descriptive correlational design was utilized; the study was implemented in Dental Clinics in Comprehensive Health Insurance Primary Care Centers in Ismailia City (Hay-elsalam, El-shohda and Araieshiet Misr Family Medicine Centers). The study subjects comprised (308) children. Four tools of data collection were utilized namely; Oral Health Structured Interviewing Questionnaire, Oral Health related Habits Assessment Sheet, An Observational Checklist for Oral Hygiene Practice and Children Oral Health related to Quality of Life Scale Version 25. **Results:** most of the studied children and more than two thirds (92.9% and 68.8%) of them had good knowledge and had good oral health related quality of life (OHRQoL) respectively. While, most and the majority (89.9% and 83.4%) of them had poor oral health related habits and didn't brush their teeth correctly. **Conclusion:** Most of the studied children total levels of knowledge was good, while most of them had poor oral health related habits. The majority of them didn't brush their teeth correctly and more than two thirds of them had good OHRQoL. **Recommendations:** Promotion programs related to oral health are required for raising oral health knowledge, practices and quality of life among children.

Keywords: Oral health, Quality of life & School age children.

Introduction
Oral health among children usually is an indicator of their overall health, well-being and quality of life **(WHO, 2020)**. The oral health is a condition contributing positively to children's physical, mental and social well-being through allowing children's speech, eating and socialization without any sense of embarrassment, oral\facial pain, discomfort, gum disease, oral infection , tooth loss, dental caries, other oral-associated diseases and throat cancer **(Canadian Dental Association, 2015d & WHO, 2012)**.

Oral health is defined according to World Dental Federation as multi-faceted compromising the speech, smiling, smelling, tasting, touching, chewing, swallowing ability and having facial expression conveying emotions confidently and painless **(Glick et al., 2017)**. Poor oral hygiene resulting from oral self-care deficit and dental visits infrequency is a main cause for the dental problems including (dental caries, gingivitis, gingival disease, malocclusion (poor bite), loose teeth, bad breath and oral trauma) **(Nguyen et al., 2016; & Branden 2013)**.

Dental caries is a microbial, multi-factorial irreversible disease of the teeth calcified tissues which characterized by inorganic portion demineralization and organic substance destruction of the tooth, which often leading to cavitation. Dental caries has long been a global oral health burden. The World Health Organization (WHO) verified that 60–90% of children are suffering from dental caries **(WHO, 2018; & Seif El-Nasr, 2017)**, Dental caries has high prevalence across different countries ranging from 49 to 83% **(Frencken et al., 2017)**. A meta-analysis concluded that children (aged 5–15 years) dental caries prevalence is still a major problem in the Eastern Mediterranean Region, in nine countries namely; Egypt, Bahrain, Iraq, Jordan, Islamic Republic of Iran, Lebanon, Libya, United Arab Emirates and Yemen **(Kale et al., 2020)**.

School age children nearly one quarter of total population, so school children's health care contribute to the country overall health status. Dental caries is the leading childhood dental problem; 90% of all children (by 12 years of age) suffering from some tooth decay. The poor oral health of school age children is influenced by such factors as poor dietary habits as eating sugar inform of (ice-cream, candies and canned juice) which usually develop during early childhood, poor oral hygiene practices, minimal dental care education and poor parental oral health related knowledge **(Castilho et al., 2013; & Kaur, 2013)**.

The consequence of dental caries in the primary dentition may persist on permanent dentition. School-

age children suffering from dental caries are more liable for having poor quality of life (QoL) in relation to their physical, social, emotional, psychological well-being, social interactions and school accomplishment. As they suffer dental pain, discomfort, trouble eating, activity restriction (12 times more likely to restrict daily activities in comparisons with others having good oral health), sleepless nights, speech impairments, and days lost from school (50 million school hours and over were being loss annually), poor scholastic achievement, consequently may influence their accomplishments\success and self-esteem in the adult life **(WHO, 2018; & Maharani et al., 2017; & Oral Health Advisory Panel, 2015; & United Nations Intervention, Scientific, and Cultural Organization (UNESCO), 2009)**.

Pediatric nurses are on the first lines of children's dental care through oral health screening, assessment for risky children and providing the preventive services **(Sun et al., 2021)**. Also the pediatric nurse as health educator should enrich the school age children and their families with sufficient knowledge regarding the oral health as, proper oral health fluoride supplementation, mentioning the unhealthy dietary health habits causing dental decay and the referrals need for the pediatric dentists; as the more knowledgeable the children more highly satisfactory oral health related practices, habits and consequently positively impacting their quality of life. prevention, diagnoses and treatment of dental caries can be more effectively in case of the oral health related knowledge sufficiency. Also the pediatric nurse has a role regarding good oral health maintenance and preventing gum disease through focusing on the necessity of the frequent good oral hygiene through twice daily tooth brushing and following the good oral health related habits ranging from eating healthy food to frequent dental check-up **(Haque et al., 2016; Hassija & Sridhar, 2014)**.

Significance of the study:

An Egyptian epidemiological study on oral health status, revealed that utilization of dental services is not at optimal level and nearly 20% of participants had not visited a dentist for more than 2 years **(World Health Organization, Eastern Mediterranean Regional Office, (WHO, EMERO), 2019)**. Every child has the right to attain good oral health, according to the United Nations Convention on the Rights of the Child **(UNICEF, 1989)**.

Children as a precious gift having several potentialities, can be the best resource for nation in case of being healthy considered; healthy children will be healthy adults and citizens constituting a healthy nation. Despite the prognosis of preventive and interventional approaches, dental caries remain prevalent in children. Besides, the dental treatment high cost has significant economic impact on individuals, families and the community, although maintaining good oral hygiene practices is the key for the majority of dental diseases prevention **(Sami et al., 2016)**. So, the current study is aiming to assess the oral health related knowledge, practices and quality of life among school age children.

Aim of the study:

The current study aimed to assess the oral health related knowledge, practices and quality of life among school age children through the following specific objectives:

Specific objectives:

1. Assess the studied children's oral health related knowledge.
2. Assess the studied children's oral health related practices.
3. Assess the studied children's oral health related habits.
4. Assess the studied children's oral health related quality of life.
5. Explore the relationship between the studied children's oral health related knowledge, practices, habits and quality of life.

Research Questions:

1. What is the level of knowledge related to oral health among the studied children?
2. What is the level of practices related to oral health among the studied children?
3. What is the level of habits related to oral health among the studied children?
4. What is the level of quality of life the related to oral health among the studied children?
5. Is there a relationship between the studied children's oral health related knowledge, practices, habits and quality of life?

Subjects and Method

Study design: Descriptive correlational design was utilized in the current study.

Settings: Dental Clinics in Comprehensive Health Insurance Primary Care Centers in Ismailia City namely;

1. Hay-elsalam Family Medicine Center.
2. El-shohda Family Medicine Center.
3. Araieshiet Misr Family Medicine Center.

Sample: The study subjects comprised (308) children, whom were selected purposively from the previously mentioned study settings. The studied children were chosen according to the following

Inclusion criteria:

1. Aged between 6 to 12 years old.
2. From both gender.
3. Willing to participate in the study.

4. Suffering from untreated dental caries.
5. First time to visit the dental clinic.

Exclusion criteria:

1. Children suffering from any systemic diseases.
2. Children suffering from any apparent genetic disease.
3. Children suffering from dental abnormalities.

Sample size: Sample size was determined using the following equation:

$n = (Z\,\alpha/2)^2 * P(1-P)/d^2$ **(Dawson, 2004)**

Where

- n= sample size
- Z α/2 = Z is the statistic corresponding to level of confidence (1.96)
- d = is precision (corresponding to effect size) (0.05)
- P is expected prevalence (72.5%) **(Ouda et al., 2019)**

So, n= 308

Tools for data collection

Four tools were used to collect data in the current study, as the following:

Tool I: Oral Health Structured Interviewing Questionnaire: It was developed by the researchers after reviewing the literature mainly based on **(Ouda et al., 2019; Seif El-Nasr, 2017)**, which composed of two parts as the following:

Part I: The Studied Children's Socio-demographic Characteristics: It includes (age, sex, residence, sibling number and birth order).

Part II: The Studied Children's Oral Health related Knowledge: which composed of two parts namely;

Part II. A: Related to Oral Health: which assessed the studied children's knowledge about importance of teeth, methods of oral care, effect of sweetener & cola on the oral health and the useful diets for oral health.

Part II. B: Related to Dental Decay: which assessed the studied children's knowledge about dental decay as (causes, clinical manifestations, complications, the best treatment modality, it's effect on dental cosmetics and the importance of treating the dental decay).

Scoring system: for the studied children's knowledge for each question: complete correct answers were scored two, while incomplete correct answers were scored one and incorrect or unknown answers were scored zero. If the studied children's total obtained scores less than 50% were considered having poor knowledge, while from 50% to less than 70% were considered having fair knowledge and those obtained 70% and more were considered having good knowledge **(Abd Elgphar et al., 2019)**.

Tool II: The Studied Children's Oral Health related Habits Assessment Sheet: It was developed by the researchers after reviewing the literature mainly based on **(Abd Elgphar et al., 2019 ; & Ouda et al., 2019)** which composed of three parts as the following:

Part I: Studied children's general dental care habits: which assessed the frequency, preferred timing and duration of tooth brushing; frequency of replacing the used tooth brush; used equipment in tooth brushing and type of the used tooth paste

Part II: Studied children's general follow-up and dentist visit habits: which assessed the pattern of considering the concept of both follow-up and dentist visit, periodically, regardless of having a complaint.

Part III: Studied children's general nutritional habits: which assessed the frequency of sweeteners intake, drinks type and types of snacks per day

Scoring system: the total mean scores were estimated to give an interpretation for the studied children's over all dental habits expressing the habits either good or poor.

Tool III: An Observational Checklist for Oral Hygiene Practice: it was adapted from **(Seif El-Nasr, 2017)**. An observational Checklist composed of the following steps (applying toothpaste on the brush, contact of teeth and gums with the brush, brushing the upper teeth in from upward to downward and brushing the lower teeth in from downward to upward.

Scoring system, the studied children who performed the five steps completely, their overall practice was considered done, while studied children whom checklist missed any step, their overall practice was considered not done **(Seif El-Nasr, 2017)**.

Tool IV: Children Oral Health related to Quality of Life Scale Version 25 (COHRQoL-25): which was adopted from **(Molek et al., 2016)** and used for assessing the OHRQoL among school-age children, asking about the frequency of events in the last month in relation to the clinical consequences of untreated dental caries. COHRQoL-25 represented subjective perception and evaluation of oral conditions in relation to school-age children's functional limitation, physical, emotional, social well-being and scholastic achievement **(Da Fonseca et al., 2020)**.

The researchers translated the scale into simple Arabic version; the scale composed of five domains, namely (Functional limitation, Physical well-being, Emotional well-being, Social well-being and school). Each domain consisted of five questions; the functional limitation domain questions were (difficulty chewing or biting food, difficulty eating the preferred foods, food caught between teeth, difficulty pronouncing any words (especially f, s, t) and brushing the teeth avoidance). While, the physical well-being domain questions included (teeth, gums sensitivity to hot/cold things, pain in teeth, bad breath, headache and fever).

The emotional well-being domain questions included (feeling irritability per frustration, feeling embarrassment, less confidence, smiling avoidance per laughing and trouble in sleeping), and the social well-being domain such as (speaking avoidance with friends, meeting avoidance per playing with friends, been teased, bullied by other children, usual activity of daily living (room clean up) avoidance and outside the home avoidance) finally, the school domain questions represented (difficulty of paying attention in school, doing homework avoidance, speaking per reading out loud in class avoidance, doing extra-curricular activity (gym, art) avoidance and going to school avoidance).

Scoring system: the response options were never scored as one; sometimes (once or twice a month) and scored two and often (almost every week) scored as three; the total minimum score of the scale was 15 and the total maximum score was 45; the lower the total mean scores the better and the higher OHRQoL among the studied children and vice versa. The sensitivity test was done according to **(Thirunavukkarasu et al., 2022)**.

Content validity:

The study tools' modification was assured by a jury composed of five expertise from nursing staff whom specialized in pediatric and community health nursing, and reviewed the tools for relevance, clarity, understanding, comprehensiveness and applicability.

Reliability:

Cronbach's alpha coefficient was established for assessing the study tools' reliability; which were proved to be reliable as:

Tool No.	Tool Name	Cronbach's alpha
Tool I	Oral Health Structured Interviewing Questionnaire	.70
Tool II	The Studied Children's Oral Health related Habits Assessment Sheet	.71
Tool IV	Children Oral Health related to Quality of Life Scale Version 25 (COHRQoL-25)	.87

Pilot study:

A pilot study was carried out on ten percent of the studied children (No =31) who were chosen randomly, which was done to assure the used study tools' clarity, significance and practicability, and to estimate the time required for filling in the study tools. The studied children who were involved in the pilot study were excluded from the main study sample to assure the result stability.

Procedure:

The researchers sent an official letter to the directors of the study settings, demanding their acceptance and cooperation for implementing the study, afterwards verifying the study intention.

Ethical considerations: the Scientific Research Ethics Committee of the Faculty of Nursing, Suez Canal University approved the study protocol (Research Code 171. 9/2022). The researchers obtained an informed consent from the studied children's parents after complete verification for the study purpose and nature. The collected data confidentiality was assured and anonymity was strictly maintained through a code number affixed to each studied children's questionnaire. The studied children's voluntary participation was assured as the children were well-informed of having the freedom for withdrawal from study at any phase.

Statistical analysis: the collected data was coded and entered to the statistical package of social sciences (SPSS version 20). After complete entry, data was explored for detecting any error, then, it was analyzed by the same program for presenting frequency tables with percentages. The following statistical techniques were used percentage, Mean score degree, Standard deviation SD, Chi-square test, Mont Carlo Chi-square test, Pearson correlation (r test), Simple linear Regression and proportion probability of error (*P*-value). Significance of results was displayed as a statistically significant difference, when $P<0.05$, while there is a highly statistically significant difference, when $P<0.01$.

Results:

Table (1): Distribution of the studied children according to their socio-demographic characteristics (n=308).

Socio-demographic characteristics	No.	%
Age (Years):		
6 -< 8	40	13.0
8 -< 10	113	36.7
10-≤12	155	50.3
$\bar{x}$ ± SD **10.05 ± 1.89**		
Gender:		
Boy	108	35.1
Girl	200	64.9
Residence:		
Urban	81	26.3
Rural	227	73.7
Number of siblings:		
None	23	7.5
One	42	13.6
Two	111	36
Three or more	132	42.9
Birth order:		
First and alone	23	7.5
First	104	33.8
Second	86	27.9
Third or more	95	30.8

Table (2): Distribution of the studied children according to their knowledge regarding oral health (n=308).

# The studied children's knowledge regarding oral health	No.	%
Importance of teeth: #		
Chewing food	87	28.2
Giving a cosmetic appearance to the mouth	39	12.7
Enabling correct pronunciation of words	26	8.4
All the above	191	62.0
Methods of teeth care: #		
Using a toothbrush	205	66.6
Using a fluoride toothpaste	121	39.3
Using a toothbrush 2 or 3 times/day	54	17.5
Replacing the toothbrush every 3 months	105	34.1
Dental follow-up every 6 months	77	25.0
All the above	13	4.2
Sweets affect dental health: #		
Yes	211	68.5
No	45	14.6
Unknown	52	16.9
Soft drinks affect dental health: #		
Yes	191	62.0
No	54	17.5
Unknown	63	20.5
Oral and dental health affect the health of the body: #		
Yes	169	54.9
No	46	14.9
Unknown	169	54.9

# The studied children's knowledge regarding oral health	No.	%
Beneficial foods for dental health: #		
Eggs	23	7.5
Milk and dairy products (cheese, yogurt...)	192	62.3
Fish	92	29.9
Vegetables and fruits	133	43.2
Rice and bread	19	6.2
All the above	23	7.5
Unknown	32	10.4
Total correct Mean score: $\bar{x}$ ± SD	**8.05±3.11**	

Responses not mutually exclusive

Table (3): Distribution of the studied children according to their knowledge regarding dental decay (n=308).

The studied children's knowledge regarding dental decay	No.	%
Causes of dental decay: #		
The presence of food residues on the teeth	35	11.4
The presence of bacteria on unclean teeth	20	6.5
Sweeteners	93	30.2
All the above	175	56.8
Unknown	12	3.9
Symptoms of dental decay: #		
Teeth pain most of time	197	64.0
Pain when biting food	82	26.6
Slight pain when eating hot or cold foods or juices	88	28.6
Swelling	70	22.7
Bleeding gums	48	15.6
All the above	26	8.4
Unknown	33	10.7
Complications of dental decay: #		
Toothache	91	29.5
Tooth erosion	66	21.4
Difficulty eating and speaking	41	13.3
All the above	151	49.0
Unknown	10	3.2
Treatment of dental decay: #		
Extraction of the carious tooth	114	37.0
Filling the carious part	161	52.3
Use of medicines	43	14.0
All the above	12	3.9
Unknown	12	3.9
Dental decay give bad cosmetic effect:		
Yes	209	67.9
No	54	17.5
Unknown	45	14.6
Dental pain treatment is important as any body organs treatment:		
Yes	166	53.9
No	68	22.1
Unknown	74	24
Total correct Mean score : $\bar{x}$ ± SD	**8.27±3.05**	

is multiple response question

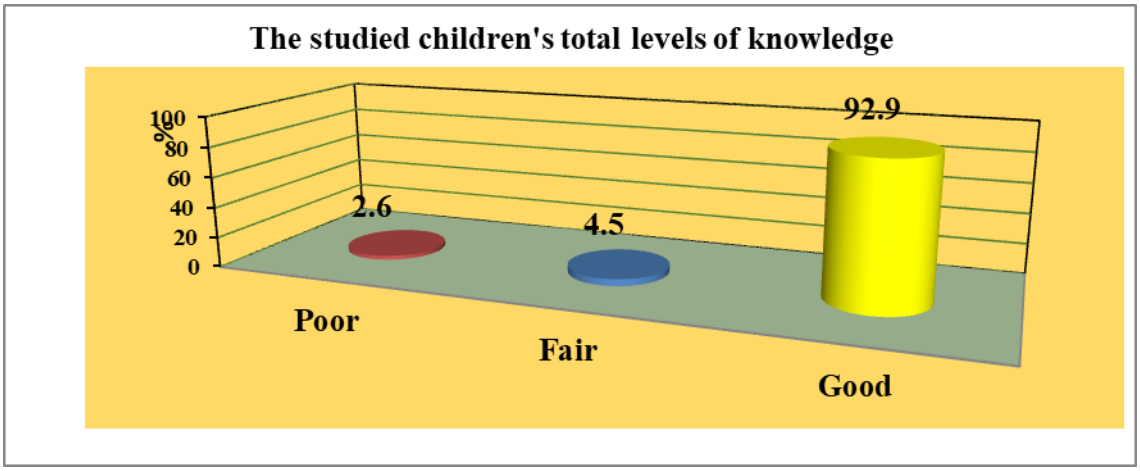

Figure (1): Distribution of the studied children according to their total mean score of knowledge (n=308).

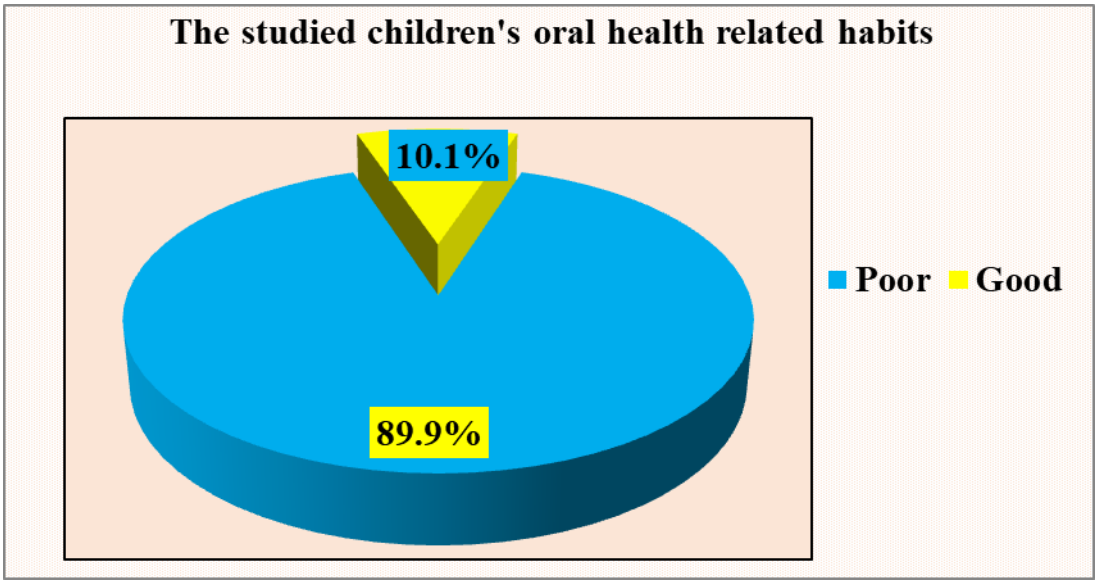

Figure (2): The studied children's oral health related habits (n=308).

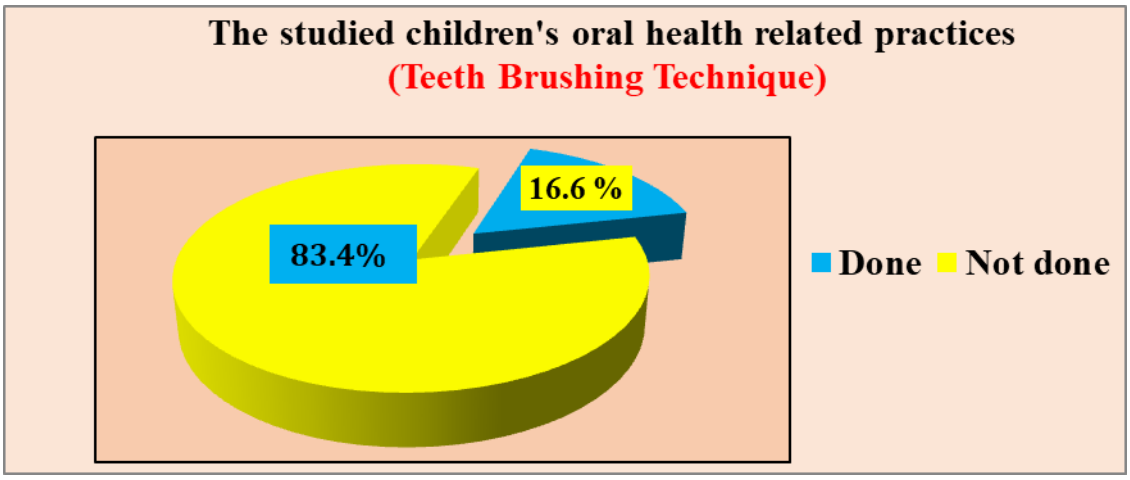

Figure (3): Studied children's oral health related practices (teeth brushing technique) (n=308).

Table (4): Distribution of the studied children's oral health related to their quality of life (functional limitation and physical well-being domains) (n=308).

The domains	Never		Sometimes		Often	
	No.	%	No.	%	No.	%
1) Functional limitation: #						
1. Difficulty chewing or biting food	114	37.0	151	49.0	43	14.0
2. Difficulty eating the preferred foods	166	53.9	102	33.1	40	13.0
3. Food found to be between teeth	47	15.3	172	55.8	89	28.9
4. Difficulty pronouncing any words (especially f, s, t)	233	75.6	59	19.2	16	5.2
5. Avoiding brushing the teeth	198	64.3	83	26.9	27	8.8
Mean ± SD	**8.27±1.96**					
2) Physical well-being: #						
1. Teeth, gums sensitive to hot/cold things	148	48.1	94	30.5	66	21.4
2. Had dental pain	83	26.9	184	59.7	41	13.3
3. Had bad breath	173	56.2	89	28.9	46	14.9
4. Had headache	129	41.9	108	35.1	71	23.1
5. Had fever	218	70.8	51	16.6	39	12.7
Mean ± SD	**8.45±2.35**					
3) Emotional well-being: #						
1. Felt irritable per frustrated	93	30.2	114	37.0	10	32.8
2. Felt embarrassed	109	35.4	140	45.5	1	19.2
3. Less confident	176	57.1	90	29.2	59	13.6
4. Avoided smiling per laughing	170	55.2	68	22.1	42	22.7
Trouble in sleeping	132	42.9	106	34.4	70	22.7
Mean ± SD	**8.91±2.56**					
4) Social well-being: #						
Avoided speaking with friends	202	65.6	61	19.8	45	14.6
Avoided meeting per playing with friends	216	70.1	57	18.5	35	11.4
Been bullied by other children	207	67.2	55	17.9	46	14.9
Avoided usual activity of daily living (room clean up)	149	48.4	86	27.9	73	23.7
Avoided outside the home	180	58.4	84	27.3	44	14.3
Mean ± SD	**8.10±2.56**					
5) School: #						
1. Difficulty of paying attention in school	212	68.8	72	23.4	24	7.8
2. Avoided doing homework	176	57.1	90	29.2	42	13.6
3. Avoided speaking per reading out loud in class	137	44.5	104	33.8	67	21.8
4. Avoided doing extra-curricular activity (gym, art)	187	60.7	75	24.4	46	14.9
Avoided going to school	117	38.0	143	46.4	48	15.6
Mean ± SD	**41.46±9.07**					

is multiple response question

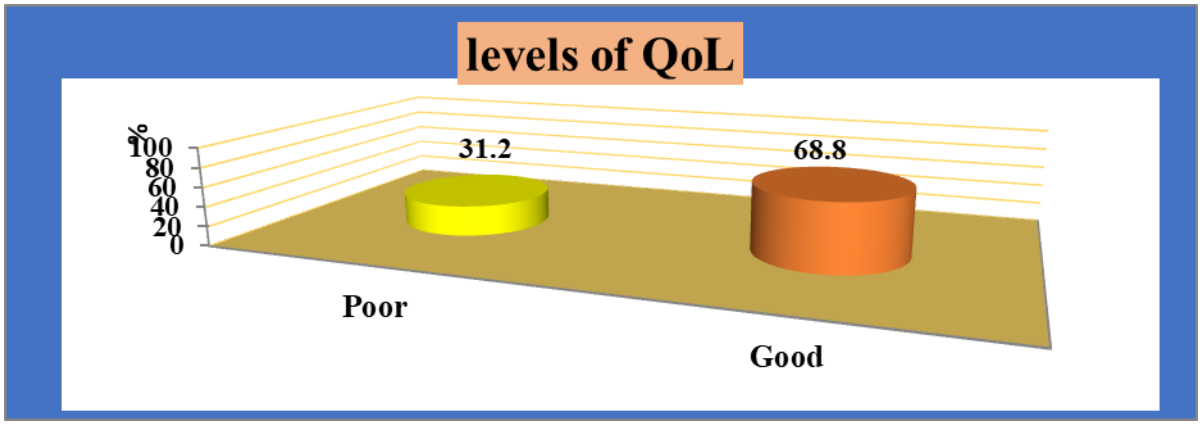

Figure (4): Studied children's oral health related quality of life total mean score (n=308).

Table (5): Relationship between the studied children's socio-demographic characteristics and their oral health related (knowledge & quality of life) (n =308).

Items	Oral health related knowledge			X^2 (*p* value)	Oral health related QoL		X^2 (*p* value)
	Poor	Fair	Good		Poor	Good	
	%	%	%		%	%	
Age (Years):							
6 -< 8	2.5	17.5	80.0	33.09 **(<.001*)**	25.0	75.0	3.16 (.213)
8 -< 10	1.8	3.5	94.7		37.2	62.8	
10-≥12	3.2	1.9	94.8		28.4	71.6	
Gender:							
Male	1.9	4.6	93.5	.366 (.833)	41.7	58.3	8.54 **(.003*)**
Female	3.0	4.5	92.5		25.5	74.5	
Residence:							
Urban	2.5	4.9	92.6	.045 (.978)	37.0	63.0	1.76 (.184)
Rural	2.6	4.4	93.0		29.1	70.9	
Number of siblings:							
None	0	0	100	6.94 (.311) ^{mc}	4.3	95.7	10.44 **(.016*)** ^{mc}
One	6.4	2.1	91.5		40.4	59.6	
Two	2.7	3.6	93.7		36.9	63.1	
Three or more	1.5	6.8	91.7		26.5	73.5	
The studied children's birth order:							
First and alone	0	4.3	95.7	20.39 **(.004*)** ^{mc}	21.7	78.3	6.20 (.102)
First	6.7	3.8	89.4		35.6	64.4	
Second	0	0	100		37.2	62.8	
Third or more	1.1	9.5	89.5		23.2	76.8	

*X^2 is Chi square test & ^{MC} is Monte Carlo for Chi square test & * Significant at p < 0.05*

Table (1): Revealed that about one half of the studied children (50.3%) aged between 11 to 12 years with a mean age 10.05±1.89 years. Less than two thirds of them (64.9%) were girls and less than three quarters of the studied children (73.7 %) reside in rural areas. Concerning the studied children's sibling number, more than two fifths of them (42.9%) had three sibling or more; regarding their birth order, around one third of them (33.8%) were ranked the first.

Table (2): Revealed that around two thirds of the studied children (62%, 68.5% and 62%) had responded completely regarding the importance of teeth and correctly regarding the effect of sweets and soft drinks on dental health, respectively. Also, table (2) declared the total means scores of the studied children's knowledge regarding oral health was 8.05±3.11.

Table (3): Clarified that around one half of the studied children (56.8% and 49%) had responded completely regarding the causes and complications of dental decay respectively and more than half of them (67.9% and 53.9%) responded correctly regarding the negative cosmetic effect of dental decay and importance of dental pain treatment. Also, it was declared the total means scores of the studied children's knowledge regarding dental decay was 8 8.27±3.05.

Figure (1): Showed that most of the studied children (92.9%) total mean score levels of knowledge was good, while the minority of them (2.6%) had poor knowledge total mean score.

Figure (2): Showed that most (89.9%) of the studied children had poor oral health related habits, while the minority (10.1%) of them had good oral health related habits.

Figure (3): Showed that the majority (83.4%) of the studied children didn't brush their teeth correctly, while less than one fifth (16.6%) of them brushed their teeth correctly (did the required five steps of teeth brushing).

Table (4): Verified that around half (49% and55.8%) of the studied children sometimes had difficulty chewing or biting food and food found to be between teeth respectively; the functional limitation total mean score was 8.27±1.96, while physical well-being total mean score was 8.45±2.35; more than one half (59.7%) of the studied children sometimes had dental pain and more than one third (35.1%) of them sometimes had headache.

Also, **Table (4):** Verified that around one third (37% and 34.4%) and less than one half (45.5%) of the studied children sometimes felt irritable, had trouble in sleeping and felt embarrassed respectively; the emotional well-being total mean score was 8.91±2.56, while the social well-being total mean score was

8.10±2.56; slightly above one third (33.8%) of the studied children sometimes avoided speaking per reading out loud in class and less than one half (46.4%) of the studied children sometimes avoided going to school; the scholastic domain total mean score was 41.46±9.07.

Figure (4): Showed that more than two thirds (68.8%) of the studied children had good oral health related quality of life, while less than one third (31.2%) of them had poor oral health related quality of life.

Table (5): Showed that there was a statistically significant difference *p* (<.001 and .004) between the studied children's age, birth order and their oral health related knowledge respectively. Also, it was shown that, there was a statistically significant difference *p* (.003 and .016) between the studied children's gender, number of siblings and their oral health related quality of life respectively.

Discussion

Oral cavity is a gateway of the body, so oral health is an integral influential part of general health. Poor oral hygiene due to oral self-care deficit and dental visits infrequency is a main cause for the dental problems as dental caries. Dental caries among school age children is a global oral health burden not only affecting the oral health but also overall health and quality of life. So, the current study is aiming to assess the oral health related knowledge, reported practices and quality of life among school age children. The current study revealed that about one half of the studied children with a mean age 10.05±1.89 years; less than two thirds of them were girls and less than three quarters of the studied children reside in rural areas. Concerning the studied children's sibling number, more than two fifths of them had three sibling or more; regarding their birth order, around one third of them were ranked the first.

The current study showed that total mean score levels of knowledge was good for most of the studied children, while the minority of them had poor knowledge total mean score. The finding of the current study was in an agreement with the study of **Shaheen et al., (2021)** titled "Self-reported basic oral health knowledge of primary school students and teachers in rural areas of Saudi Arabia" that revealed the adequacy of the basic oral health related knowledge among 3–6th grade government primary school students in rural areas of the Riyadh region. Also, a study results of **Siddaiah et al., (2021)** titled "Assessment of oral health awareness among residential and day school-going children in South Bengaluru: A Questionnaire-based survey" showed that general awareness related to oral health was rated as quite good, while limited knowledge exhibition was on the preventive dental practices. This finding was in an agreement with a study titled "Knowledge, attitudes and practices on oral hygiene among 12 years old school children in Luanshya, Zambia" of **Hamoonga et al., (2015)** who found high level of knowledge on dental caries among the participants.

In contrast, a study of **Abd Elgphar et al., (2019)** titled "Effect of educational program about dental problems on health-related quality of life for children" revealed that, preprogram most of the studied children attained poor level of knowledge in oral health all items. Likewise, a study of **Al-Darwish, (2016**) that titled "Oral health knowledge, behavior and practices among school children in Qatar" revealed that the oral health related knowledge is below the satisfactory level, as only around one quarter of children reported a high level of oral health knowledge. **From the researcher point of view,** the reason for the increase in children's knowledge regarding dental decay can be attributed to the increased focus on dental caries by most of the oral health promotion programs implemented by schools during school activities, toothpaste companies and in media advertisements on television and social media, thus attracting more attention to children.

Regarding dental care habits, follow-up & dentist visit habits and nutritional habits, the current study declared that most of the studied children had poor oral health related habits, while the minority of them had good oral health related habits. Similarly, the study of **Vishwanathaiah, (2016)** that titled "Knowledge, attitudes, and oral health practices of school children in Davangere" found that high percentage of children brushed their teeth once daily only. As well, a study titled "Effect of school oral health promotion programmed on dental health and health behavior in Vietnamese schoolchildren" of **Nguyen et al., (2016**) clarified that two-thirds of Vietnamese schoolchildren brushed their teeth twice a day, slightly more than half (53.6)% of the children were having sugary snacks and drinks daily; and around one quarter (25.9%) of them have never been examined in the school dental clinic.

Correspondingly, in one study of **Aslan Ceylan et al., (2022)** that named "The effects of socioeconomic status, oral and dental health practices, and nutritional status on dental health in 12-year-old school children" revealed that more than one third (39. %) of children exhibit harmful habits related to oral and dental health in which lip bite is the leading among less than two thirds (62.6%) of them. Around one half of the children (49.2%) reported that they first saw a dentist at the age of 6–10 years and 14.2% reported that they have never seen a dentist. Also, clarified that those consuming the unhealthy food and drinks as (energy drinks, dessert, candy\delight, pastry products, jam,

table sugar, jelly food, and sugary chewing gum) have higher mean decayed teeth values than those who weren't consuming such foods and drinks, but the differences are not statistically significant ($p > 0.05$).

Similarly, a study of **Saveanu et al., (2022)** named "Cross-Sectional study to evaluate knowledge and attitudes on oral hygiene of Romanian students" revealed that the tooth brushing duration ranging from two to or three minutes. The tooth brushing frequency was mainly twice per day among more than half of the students (428) after every meal. More than half of the students use mouthwash 421, and 228 after each brushing. Dental floss is used by about a third of students 240, and only 74 after each brushing.

This finding was in an agreement with a study titled "Knowledge, attitudes and practices on oral hygiene among 12 years old school children in Luanshya, Zambia" of **Hamoonga et al., (2015)** who found that only 10% of the participants reported regular dental visits in contrast of the recommended brushing frequency of twice per day, they found the minority (11.4%) of participants were adhering to the recommendation. Also, a study titled "Oral hygiene practices and oral health knowledge among students in Split, Croatia" of **Tadin et al., (2022)** who showed that only 26.7% and 15.3% of the participants use dental floss and interdental brushes daily, and only 20.9% use mouthwash daily. Most respondents change their toothbrushes every three months. About 70% of them brush their teeth for two to three minutes and only 2.5% do so for more than five minutes.

From the researcher point of view the reasons for the rise in poor oral health related habits among studied children may be due to low parental socioeconomic status, as they cannot buy toothpaste, dental floss, change brushes or visit the dentist on an ongoing basis. Dietary habits play an important role in oral health and overall health. Diet has been shown to be the dominant factor in caries risk profile. Where children eat fast food, as well as unhealthy food because it is easy to obtain from the school canteen or the street.

The current study showed that the majority of the studied children didn't brush their teeth correctly, while less than one fifth of them brushed their teeth correctly (did the required five steps of teeth brushing). On the same line, a study titled "Assessment performance of primary school students regarding oral hygiene and dental caries" of **Abd El - Kareem et al., (2022)** who illustrated that the majority (84.7%) of the students have poor practices scores, while the minority (15.3%) of the students have good practices scores. While, the study of Vishwanathaiah**, (2016)** verified that dental care practices still below the satisfactory level among the school students. On the same line the study titled "Effect of educational program about dental problems on health-related quality of life for children" of **Abd Elgphar et al., (2019)** who found that preprogram nearly two thirds (63.4%) of children had poor dental practice.

In contrast with the current study, a study of **Tadin et al., (2022)** who showed that 59.5% of the participants report daily tongue washing. Moreover, in this study titled "Knowledge attitude and practices regarding personal hygiene among the male primary school children in Abha, Kingdom of Saudi Arabia: A cross-sectional study" of **Hazazi et al., (2018)** who revealed that around 90% of the students apply teeth brush technique by using tooth brush and paste. The results of the study titled "Cross-Sectional study to evaluate knowledge and attitudes on oral hygiene of Romanian students" for **Saveanu et al., (2022)** who indicated that most of the subjects (292) apply a toothbrushing technique. From the researcher point of view the reason behind this may be the knowledge deficiency about the correct teeth brushing technique. **The researchers view that** the reason for not using floss may be lack of awareness of the tool, its availability and its cost.

Regarding oral health related quality of life, the current study showed that more than two thirds of the studied children had good oral health related quality of life, while less than one third of them had poor oral health related quality of life. On contrast, the study of **Abd Elgphar et al., (2019)** found that, preprogram nearly two thirds (65%) of children had poor quality of life. Also, the study of **Koposova et al., (2010)** reported that poor oral health related quality of life where dental problems affect children's oral health related their quality of life with a significant reduction problem reported with physical, mental, and social functioning. Likewise, a study titled "Oral health-related quality of life of children in relation to dental appearance and educational transition" for **Rodd et al., (2011)** who revealed that worse OHRQoL of studied sample at baseline and follow-up and it associated with visible dental differences and dissatisfaction with dental appearance.

The current study showed that there was a statistically significant difference p (<.001 and .004) between the studied children's age and their oral health related knowledge respectively. The finding of the current study Agreed with a study of **Tadin et al., (2022)** who showed that students significantly–difference between age and the children's knowledge ($p \leq 0.001$). While this is contradicted with a study titled "Effect of an oral care educational program on the knowledge, practice and self-efficacy among school age children" of **Abu-Elenen et al., (2015)**, who found that there were no significant differences

between total knowledge with age of children. As well, a study of **Abd El -Kareem et al., (2022)** who illustrated that there is not a statistically significant difference between total knowledge scores and age, while there is a statistically significant difference between total knowledge scores and sex.

In addition to, the study results titled "Mothers' knowledge, attitude, and practice regarding their primary school children's oral hygiene" for **Seif El-Nasr, (2017)** revealed that there is no statistically significant correlation between study participant's age with total knowledge and total practice before and after the oral health intervention program.

The current study showed that there was a statistically significant difference between the studied children's gender and their oral health related quality of life respectively. The finding of the current study contradicted with, a study titled "Impact of malocclusion on oral health-related quality of life among schoolchildren" for **Guimarães et al., (2018**), who revealed that no association was found between sex and a negative impact on OHRQoL.

Conclusion:

The current study concluded that total mean score level of knowledge was good among most of the studied children, most of the studied children had poor oral health related habits, the majority of the studied children didn't brush their teeth correctly (had poor dental practices) and more than two thirds of the studied children had good oral health related quality of life.

Recommendation:

- Oral health promotion programs are required for improving oral health related knowledge, practices and quality of life among children.
- Integrating oral health education in the scholastic regular curriculum is a crucial for raising the awareness and enhancing the related habits.
- Periodic screening for school students for early detection of dental decay and referred to health insurance services.

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