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Quality of life Related to Oral Health for School Age Children with Dental Caries

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Abstract: Background: Oral health among children usually is an indicator of their overall health, well-being and quality of life. Dental caries represents a major public health problem in children making them more liable for poor quality of life. **Purpose of the study**: Was to assess the quality of life related to oral health for school-age children with dental caries. **Design:** A descriptive cross-sectional design was utilized. **Setting**: The study was conducted in primary schools in Menoufia governorate, there were Al Shohadaa and Tala urban and rural schools. **Sampling**: Multi-stage random sample of 500 children primary school was obtained from the previously mentioned settings. **Instruments**: Three instruments were utilized for data collection: structured interview questionnaire, quality of life related to oral health Likert scale, and observational dental examination sheet. **Results:** There were a statistically significant differences between children's total oral health knowledge and there were statistically significant differences between quality of life related to oral health among studied school children. **Conclusion**: The quality of life related to oral health of school-age children was significantly affected by dental decay in all quality of life related to oral health domains (oral symptoms, functional limitation, psychological status, and social status). **Recommendations:** Integrating oral health education in the scholastic regular curriculum should be applied for raising the awareness and enhancing the related habits at all education levels.

Key words: *Dental Caries, Oral Health, Quality of Life, School Age Children*

Introduction

There is no health without oral health. The health of our mouth is more important than many of us may realize. It is a key indicator of overall health which is essential to our well-being and quality of life. Oral health is an integral part and core component of general health and well-being that should be maintained throughout life, as the mouth is considered the mirror of the body and the gateway to health (Hurry et al., 2023).

School-age children can experience a range of dental problems. The most

common dental problems in this stage are dental caries, gum disease, malocclusion, dental trauma and tooth sensitivity. This is occurred due to several factors, including the consumption of sugary drinks and foods, snacking habits and poor oral hygiene. Children at this age may also be more likely to forget to brush their teeth or may not be brushing properly. It can increase their risk of dental problems. If left untreated, dental caries could progress to involve the pulp of the tooth leading to infection and pain (Bassa et al., 2023).

Quality of life related to Oral health (QOLROH) is a concept that describes the impact of the oral health status on general health and everyday life. Poor oral health and dental caries have significant impact on a child's quality of life. The pain and discomfort associated with untreated cavities can make it difficult for children to eat, sleep and focus in school. They may experience difficulty chewing, which can lead to poor nutrition and weight loss (Mathew et al., 2023).

Additionally, the appearance of decayed teeth can cause embarrassment and social anxiety, leading to a decrease in self-esteem. In severe cases dental caries can also lead to infections and abscesses which can be life-threatening if left untreated. Children may miss school or other activities due to dental pain or appointments for treatment. Therefore, it is crucial to prevent and treat dental caries in children to maintain their oral health and well-being (Alanzi et al., 2023).

Maintaining good oral health during this period is crucial to ensure healthy teeth, gums and preventing dental problems. It is important to promote healthy eating habits such as limiting sugary drinks and foods, and encouraging children to eat a balanced diet rich in calcium and other nutrients that support healthy teeth and bones (Amir et al., 2023).

School health nurses play an important role in assessing the oral health, dental caries risk of children by working with children, parents, and the broader school community. School health nurses can help in preventing dental caries and promote good oral health practices among children. She can conduct oral health assessments of children to identify any dental problems or early signs of dental caries. This can include checking for tooth decay, gum diseases and other oral health issues. Referring children to a dentist or dental clinic for further evaluation and treatment if they identify any dental problems or signs of dental caries during an oral health assessment (Ilgaz, 2022).

Significance of the Study

Dental Caries are the most important global oral health problems. Worldwide, nearly 60-90% of school children suffer from dental caries. This means that six to nine children in every ten are affected by tooth decay. According to the National Institute of Dental and Craniofacial Research about 42% of children ages 2 to 11 years have dental caries in their primary teeth and 23% of children have untreated dental caries (Wen et

al., 2022). The prevalence of dental caries in preparatory schools among children in Shebin El-Kom District, Menoufia Governorate was 62.8 % (Abdel- Rasoul et al., 2019). Hence, this study was conducted to assess the quality of life related to oral health for school-age children with dental caries.

Purpose of the study

The purpose of the current study was to assess the quality of life related to oral health for school-age children with dental caries.

Research Questions

1) What is the quality of life related to oral health for school-age children with dental caries?
2) Is there a statistical significance difference in the quality of life related to oral health between children in urban and rural schools?

Methods

Research Design:

A descriptive cross-sectional research design was utilized to achieve the purpose of the study.

Research Settings:

This study was conducted in primary schools in Menoufia governorate that was be chosen by multistage random selection according to the following steps:

1) Two districts from all districts of the Menoufia governorate (ten districts) was selected using a simple random sample. These districts were Al Shohadaa and Tala.
2) In Al Shohadaa city, one primary school was chosen by simple random sample as an urban area (Al Shohadaa New primary school) and in Al Shohadaa village, one primary school as a rural area (Martyr Amr Abu Hajar Primary School in Sarsana).
3) In Tala city, one primary school was chosen by simple random sample as an urban area (Al-Zahraa primary school) and Tala village, one primary school as a rural area (Munshat Aslam primary school).

Sample size:

Multi-stage random sampling was used to calculate the required sample size for this study, two districts out of the ten districts of Menoufia Governorate (first stage sampling) was chosen. They were El Shohadaa and Tala districts. El-Shohadaa district has 51 basic education schools (6 Urban and 45 Rural). Tala district has 68 basic education schools (7 Urban and 61 Rural). Two schools (one Urban and the other rural schools were selected randomly from each district (second stage sampling). To select the school's students who were participated in the current study (third stage sampling), the researcher used the Epi website.

The sample size ' Equation was:

$$n = [DEFF*Np(1-p)]/ [(d2/Z21-\alpha/2*(N-1) +p*(1-p)]$$

Where:

n= Sample size

N= Population size is 4000 (from school records of chosen 4 schools, the sum of the number of students who registered to classes: 4th, 5th, and 6th, during this academic year 2021-2022.

DEFF is Design effect =1.

P =Frequency of dental caries among school students' population is 62.8% (Abdel Rasoul at al., 2019) = 62.8% +/- 5%.

d = Confidence limits = 5%.

And 1- β = a power (% chance of detecting) of 80%.

Z= 1.96

α = Alpha error =0.05

The calculated sample size was 484 school students, which was approximated to 500 students in the 4th, 5th, and 6th classes. Accordingly, the sample size from Urban Tala school was 130 students, Rural Tala school: 120 students, Urban El Shohadaa school was 130 students, and Rural El Shohadaa school: 120 students, selected student from urban more than rural because number of students in urban school is more than rural school (Total 500).

Sampling:

Multi-stage random sample of 500 children primary school was obtained from the previously mentioned settings. They met the following criteria

Inclusion criteria:

1) Children in the 4th, 5th, and 6th classes who had dental caries as they comprehend more, were able to understand and fulfill questionnaire.
2) Children who were free from chronic illness as registered in their school medical records to exclude other causes of pain.
3) Children who were free from any psychological/mental problems.

Instruments of data collection:

three instruments were utilized for data collection:

Instrument One: A Structured Interviewing Questionnaire:

Structured interview questionnaire was developed by the researcher after reviewing the related literature (Thirunavukkarasu et al., 2022), nursing Journals, and magazines to assess characteristics of studied children and their parents as well as children's knowledge regarding oral health, dental caries and oral health behaviors. It was consisted of two parts:

- **Part One: Characteristics of Studied Children and their Parents:**
  a) Characteristics of studied children: It included 8 items such as school name, class, age, gender, child's ranking order among siblings, place of residence, number of family members, and dental problems the child suffering from it.
  b) Parent's characteristics: It included 3 items such as age, level of education and occupation.
- **Part Two: Children's Knowledge about Oral Health:**

It was developed by the researcher guided by Mohamed et al., (2021) to assess Child's knowledge regarding oral health. It included questions (multiple choice) that concerned with items related to four aspects divided into the following:

- **Children's knowledge about the teeth**: It included 3 questions such as importance of having teeth inside the mouth, types of teeth and number of deciduous and permanent teeth.
- **Children's knowledge about Dental caries**: it consisted of 7 questions such as definition of dental caries, causes of dental caries, foods that help in the occurrence of dental caries, problems that may be occurred as a result of dental caries, foods that may cause pain in the decayed teeth, types of foods are necessary to maintain teeth and methods for protection and maintenance of the integrity of the teeth from decay.
- **Children's knowledge about care of their teeth**: it consisted of 10 questions such as going to dentist in case of teeth problems, knowing dentist procedures, importance of brushing teeth, each person must have his own brush, knowing frequency of brushing the teeth/day, time of brushing the teeth, correct method of using toothbrush for cleaning mouth and teeth, brush must be changed periodically, toothpaste must be changed periodically and fluoride rich toothpaste must be used.
- **Children's knowledge about periodic follow-up for dental care:** it included 5 questions such as "is there a dentist in the school?", the school health nurse makes a referral if the problem existed, feeling afraid about visiting the dentist, visiting the dentists is necessary and it is necessary to visit the dentist periodically.
- **Scoring system for child's knowledge about oral health**: Scoring system was followed to
- Assess children's knowledge about oral health. The questionnaire contains 25 questions. Each question was answered on three points scale (0 – 2) as

Items	Score
Correct and Complete answer	2
Correct and in complete answer	1
Incorrect and/or unknowing answer	0

Total score:

Regarding assessing the school children grand total knowledge about oral health, it was evaluated giving a total score of 0- 50.

Levels of knowledge	Score percentages
Good knowledge	≥ 70% (35 - 50)
Average	50% - <70% (25 - 34)
Poor	< 50% (0 – 24)

Reliability of Instrument one:

Reliability was estimated among 10% (50) student by using test-retest method with two weeks apart between them. Then Cronbach alpha was calculated between the two scores using SPSS computer package. It was 0.86 which indicates that the instrument is reliable to detect the objectives of the study.

Instrument Two: Quality of life related to oral health Likert scale (QOLROH):

It was adapted from Brown & AlKhayal, (2006); Azab & Yousry, (2021) and modified by the researcher to be suitable for children

developmental stage and unclear words were replaced with alternatives that would be easier to understand to assess the impact of dental caries on quality of life related to oral health. QOLROH. Likert scale contains 36 questions and divided into four health domains:

1) Oral symptoms included 6 items such as pain in teeth, lips, jaw or mouth, gum bleeding, sores and pain in the mouth, dislocation or loss of primary or permanent teeth as a result of caries, food stuck between the teeth and unpleasant smell of breath

2) Functional limitations included 9 items such as taking longer time to eat, difficulty biting or chewing foods such as apples, pears, or pieces of meat, difficulty in swallowing food comfortably, difficulty in eating the foods you love, difficulty in drinking with a straw, difficulty in drinking or eating hot or cold foods, difficulty in opening the mouth wide, difficulty in pronouncing words and difficulty in sleeping due to toothache.

3) Emotional well-being included 9 items such worrying about others seeing the direction of your teeth, concern that you have good looking or acceptable, feel shame and embarrassment, lack of self-confidence, irritable or frustrated, stress and fear, worrying that you are different from others, annoyance and concern that you are not as healthy as others.

4) Social well-being included 12 items such as missing school because of pain or visiting the dentist, difficulty in paying attention at school, difficulty in doing homework, don't wanting (refusing) to speak or read out loud in class, avoid participating in school activities such as sports, acting, and music, avoid talking to other children, avoid smiling or laughing when you are with other children, not spending time with others, you fight with other children or with your family ,bullying or making fun of you by other children, other children made you feel isolated or lonely and other children brought you to ask about your teeth.

Scoring system for QOLROH:

Scoring system was followed to assess QOLROH**.** The questions in the four health domains were asked to children about the frequency of events in the previous three months and were scored on:

Items	Score
Always and overall	4
A lot and very much	3
Some time	2
very little	1
Rarely	0

Total score:

The sum of the children's responses to the 36 questions provides an overall evaluation of the extent to which each child's oral condition affected her or his Quality of life. Since there were 36 questions. The total score was 144 and classified as the following levels:

Levels of QOL scale	Score
Poor	109-144
Acceptable	73-108
Good	37-72
Very good	1-36
Excellent	0

Reliability of Instrument Two:

Reliability was estimated among 10% (50) student by using test-retest method with two weeks apart between them. Then Cronbach alpha was calculated between the two scores. It was 0.80 which indicates that the instrument was reliable to meet the objectives of the study.

Instrument Three: Observational

Dental Examination Sheet:

It was adopted from Alwattban et al., (2021) to assess dental caries in children. Dental conditions of school age children were assessed by researcher under good natural day light with the help of tongue depressor. Dental caries was measured using the decayed (d), extracted (e), and filled (f) teeth (deft) index for deciduous teeth and the Decayed (D), Missing (M), and Filled (F) teeth (DMFT) index for permanent teeth according to criteria of WHO, 2013.

Scoring system:

Both deft/DMFT scores were recorded separately and combined when applicable. After sum of both d +e + f + D + M + F, the scores and severity of dental caries were calculated according to

Items	Score
deft+DMFT = 0	caries free
deft+DMFT> 0	presence of caries

Total score:

To assess severity of dental caries, the total score of each school children was categorized into

Items	Score
Mild	1
Moderate	2-3
Severe	≥4

Validity of Instruments:

Instruments were submitted to a jury of five specialists, two professors and one assistant professor in Pediatric nursing. One professor in Pediatric Medicine and another professor in the Pediatric Dentist. All required modifications were done.

Ethical considerations:

- Ethical approval was obtained from the ethical and research committee of the Faculty of Nursing, Menoufia University.
- All participants were informed about the purpose, procedure and benefits of the study. The researcher explained that participation in the study was voluntary and they could withdraw from the study at any time without penalty.
- Confidentiality and anonymity of information waere assured through coding all data and putting all paper in a closed cabint.
- Informed consent was obtained from school students to participate in the study.
- Participants were assured that the questionnaire was fulfilled by participants themselves or by the researcher during personal interview. Also, they were informed that the nature of questionnaire wasn't cause any physical or emotional harm to them.

Pilot study:

Prior to actual study, a pilot study was conducted on 10 % (50 children) of the sample from different schools to assess the constructed instruments for

feasibility, clarity, applicability of instruments and necessary modification was carried out before conducting the main study. The time needed to fill questionnaire was determined. Oral and dental examination of the students by a researcher was conducted to gauge its duration. The pilot study revealed that the average length of time needed to complete the structured interview schedule and dental examination was 20 – 25 min with each student. Children who participated in the pilot study were excluded from the main study sample

Procedure:

1) Written permission

- An official permission for conducting the present study was obtained from the Faculty of Nursing, Menoufia University to the education administration in Shebin El Kom city to obtain the agreement of the educational sector to conduct the study after explaining the purpose of the study.
- The researcher met the director manager, the purpose of the study was explained and the agreement for conducting the study was obtained.
- The director manager was sending letters to education administration in Al Shohadaa and Tala city.
- The director manager was sending letters to the manager of selected schools to facilitate the task of collection data.
- The researcher met the school manager and school nurse, the purpose of the study was explained and the agreement for conducting the study was obtained.

2) Researcher preparation

A review of past and current literature including books and articles was done to develop data collection instruments before conducting the study. This review helped the researcher to be acquainted with the actual dimensions and magnitude of the problem.

3) Data collection

- The researcher collected data from each school. by visiting the primary school from 8:30 AM to 1:00 PM four days per week (Sunday, Monday, Tuesday, and Wednesday) for four months from the beginning of October 2022 to the end of January 2023. Each school took about three weeks.
- The researcher met the classroom teacher and the school nurse to gain their cooperation. The purpose of the study was explained.
- At the start of the interview the researcher introduced herself to the students. The researcher explained purpose of the study and obtaining oral consent from each student for filling questionnaire and clinical examination. The researcher did a survey for all student in the class for determining children who will be included in the study. she examined oral cavity of children to elect who have dental caries and exclude children with other dental problems.
- The researcher assessed the child's caries experience following the WHO, 2013 and the criteria for diagnosis of deft/DMFT indices. It was conducted in the school while

the child sat on an ordinary chair under good natural day light with the help of torch, tongue depressor, disposable gloves and disposable masks to prevent infection.

- After selecting the students who met the inclusion criteria, the researcher collected children from each grade alone during free time in the class in waiting area. She introduced herself to the students, purpose and importance of the study were explained.
- The researcher collected data by distributing questionnaire to each student, mainly during break, each question was explained to every student to clear any vague question and allowed them to answer questionnaire about knowledge of oral health (instrument 1) it took about 10 minutes for each student.
- The researcher assessed children's quality of life related to oral health Likert scale and filled out four health domains (oral symptoms, functional limitation, social well-being, and emotional well-being) by using (instrument two) and took about 5 minutes.
- The researcher assessed severity of dental caries, by recording both deft/DMFT scores of each child and sum of them ($d + e + f + D + M + F$). The severity of dental caries was calculated according to: if $deft + DMFT = 0$, this meant that school child is "caries free" and if it's more than zero, this meant "presence of caries". The total score of each child was categorized into "Mild" when he/she had a score of 1 of the total score, "Moderate" when he/she had a score 2-3 points of the total score, and "severe" when he/she had ≥ 4 points of the total score by using (instrument three). The researcher registered the number of carious teeth, missed and the number of filled teeth for each student in dental examination sheet of each student and took about 5 minutes.
- The children who needed dental treatment with assistance of school health nurse and school manager were referred to health insurance clinic related to their residence area.

Statistical Analysis:

Data was entered and analyzed by using SPSS (Statistical Package for Social Science) statistical package version 22. Graphics were done using Excel program. Quantitative data were presented by mean (X) and standard deviation (SD). It was analyzed using student t- test for comparison between two means, and ANOVA (F) test for comparison between more than two means. Qualitative data were presented in the form of frequency distribution tables, number and percentage. It was analyzed by chi-square ($\chi 2$) test. However, if an expected value of any cell in the table was less than 5, Fisher Exact test was used (if the table was 4 cells), or Likelihood Ratio (LR) test (if the table was more than 4 cells). Level of significance was set as P value <0.05 for all significant tests.

Results

Table (1): showed distribution of the studied school children according to their characteristics. It was obvious that the majority of the studied school children aged between 9 to < 11 years among both urban and rural schools (55.5% and 75% respectively) . Also, more than half of studied children were females in urban and rural schools (51.6% and 58.6% respectively) . According to their class, there were 34.4% of children in 5th grade primary school. In relation to child's rank, the same table showed that 34% of studied children were in the first child. The majority of studied children (86.8%)had family size less than five individuals in the urban versus 57.8% in the rural schools. Therefore, there were statistically significant differences between children in urban and rural regarding to their age, arrangement of child in the family, and no. of family members.

Table (2): displayed distribution of studied children according to the history of dental problems between urban and rural schools. The findings revealed that all studied children had dental problems (100%). According to type of dental problems, 47% of studied children suffered from tooth decay, 28.4% suffered from tooth decay & gum inflammation, while 10% suffered from tooth decay & broken tooth, 7% suffered from tooth decay, dislocation, or missing tooth and 7.6% suffered from tooth decay & tooth discoloration. Also, this table showed that there were highly statistically significant differences between urban and rural studied children regarding types of dental problems at $P < 0.0001$.

Table (3): showed distribution of children's total knowledge levels about teeth, dental caries, method of dental care and follow up for dental care between urban and rural schools. The findings revealed that near half (47.7%) of school children had fair knowledge and 2.3% of them had good knowledge about teething, dental caries, dental care, and periodic follow-up for dental care in urban schools compared to 35.7% of children had fair knowledge and 1.6% of them had good knowledge in rural schools. Also, the mean grand total knowledge score was 23.3 ± 5.6. However, there were statistically significant differences between children's total knowledge among urban and rural school at $P < 0.02$.

Table (4): clarified distribution of the level s of QoLROH among studied school children in urban and rural schools. As illustrated in the table, statistically significant differences were found between all domains of QoLROH among studied school children in urban and rural schools except for the effect on social status domain. Also, the mean grand total QoLROH OH score was 63.1 ± 34.5.

Fig. (1): displayed that 39.1% of children in urban schools had good QoLROH compared to 29.5% of children in rural schools while 20.1% of children in rural school had poor QoLROH compared to 10.2% of children in urban schools

Table (5): showed relationship between studied school children characteristics and their levels of

knowledge about oral health. these findings revealed that there were statistically significant differences between the studied school children characteristics and levels of knowledge related to oral health in most items relating to age, primary school class, gender & residence at p <0.0001, <0.0001, <0.04, & <0.01 respectively. While, there was no statistically significant difference related to arrangement of child in family and number of family member at p< 0.21, 0.88 respectively.

Table (6): Illustrated relationship between studied school children characteristics and their levels of the QOLROH. It represented that there were statistically significant differences between the studied school children characteristics and QoLROH levels related to all items at p <0.0001, <0.003, <0.0001, <0.006& <0.0001 respectively except for arrangement of child in the family at p>0.17.

Fig (2): Showed relationship between total Knowledge levels about oral health and Quality of life among studied children. It presented that school children with poor knowledge had the highest percentage of poor QoLROH (22.4%) while school children with good knowledge had the highest percentage of very good QOLOH 80%.

Table (1): Characteristics of the studied school children (N = 500)

Items		Place of residence				Total		Chi Square	P-value
		Urban		Rural					
		No.	%	No.	%	No.	%		
Age (Years)	9 < 11 Y	142	55.5	183	75	325	65	20.9	< 0.0001 HS
	11 ≤ 12 Y	114	44.5	61	25	175	35		
	Mean ± SD	10.4 ± 1.3 Years		10.9 ± 2.7 Years		10.5 ± 2.2 Years		t test = 0.95, p = 0.21 NS	
Gender	Males	124	48.4	101	41.4	225	45	2.5	0.11 NS
	Females	132	51.6	143	58.6	275	55		
Class	4th grade primary school	82	32	78	32	160	32	0.76	0.68 NS
	5th grade primary school	84	32.8	88	36	172	34.4		
	6th grade primary school	90	35.2	78	32	168	33.6		
Child's Rank in the Family	First	88	34.4	82	33.6	170	34	9.3	< 0.03 Significant
	Middle	90	35.2	63	25.8	153	30.6		
	Youngest	70	27.3	81	33.2	15	30.2		
	The only one	8	3.1	18	7.4	26	5.2		
No. of Family Members	< 5 individuals	176	86.8	113	46.3	289	57.8	26.7	< 0.0001 HS
	5 - 6 individuals	70	27.3	120	49.2	190	38		
	7 - 9 individuals	10	3.9	11	4.5	21	4.2		
Total		**256**	**100**	**244**	**100**	**500**	**100**		

NS = Not significant, HS = High significant, X^2= Chi Square test. t= t test.

Table (2): Distribution of studied school children according to the history of dental problems between urban and rural schools (N = 500)

History of Dental problems		Place of residence				Total		Chi Square	P-value
		Urban (256)		Rural (244)					
		N0.	%	N0.	%	N0.	%		
Had dental problems	Yes	256	100	244	100	500	100	NA*	NA
Types of dental problems	Tooth decay	106	41.4	129	52.9	235	47	37.3	<0.0001 HS
	Tooth decay & gum inflammation	66	25.8	76	31.1	142	28.4		
	Tooth decay, & broken tooth	32	12.5	18	7.4	50	10		
	Tooth decay, dislocation, or missing tooth	16	6.3	19	7.8	35	7		
	Tooth decay & tooth discoloration	36	14.1	2	0.8	38	7.6		
Total		**256**	**100**	**244**	**100**	**500**	**100**		

NA= Not Applicable. No statistics are computed because the values within a variable are constant

Table (3): Distribution of children's total knowledge levels about teeth, dental caries, method of dental care and follow up for dental care between urban and rural schools (N=500).

Residence	Levels of Knowledge						Chi Square	P-value
	Poor knowledge N0.	(%)	Fair Knowledge N0.	(%)	Good Knowledge N0.	(%)		
I. knowledge about teething:							15.3	<0.001 HS
Urban (N=256)	128	50	122	47.7	6	2.3		
Rural (N=244)	153	62.7	87	35.7	4	1.6		
Subtotal1	281	56.2	209	41.8	10	2		
Subtotal1 X± SD	**2.4±1.8 (Range:0- 7)**							
II. knowledge about Dental caries:							9.8	<0.008 HS
Urban (N=256)	60	23.4	132	51.6	64	25		
Rural (N=244)	34	13.9	156	63.9	54	22.1		
Subtotal 2	94	18.8	288	57.6	118	23.6		
Subtotal2 X± SD	**8.1 ± 2.1 (Range:1- 14)**							
III. knowledge about dental care: -							15.2	<0.0001 HS
Urban (N=256)	162	63.3	94	36.7	0	0		
Rural (N=244)	193	79.1	51	20.9	0	0		
Subtotal3	355	71	145	29	0	0		
Subtotal3 X± SD	**1.6 ±0.7 (Range:0- 3)**							
IV. knowledge about periodic follow-up for dental care: -							2.1	0.15 NS
Urban (N=256)	216	84.4	40	15.6	0	0		
Rural (N=244)	194	79.5	50	20.5	0	0		
Subtotal 4	410	82	90	18	0	0		
Subtotal4 X± SD	**3.3 ±1.2 (Range:1- 6)**							
Grand total Knowledge							8.2	<0.02 Sig.
Urban (N=256)	128	50	122	47.7	6	2.3		
Rural (N=244)	153	62.7	87	35.7	4	1.6		
Grand total knowledge	281	56.2	209	41.8	10	2		
Grand total Kn. X± SD	**23.3 ± 5.6 (Range: 5- 37)**							

NS = Not significant, HS = High significant, X^2= Chi Square test.

Table (4): - Distribution of the levels of QOLROH among studied children in urban and rural schools (N=500)

Residence	Levels of QoLROH										χ^2	P- value
	Poor		Accepted		Good		Very good		Excellent			
	N0.	%	N0.	%	N0.	%	N0.	%	N0.	%		
First domain: Suffering from oral symptoms (problems)											12.5	<0.01 Sig.
Urban (N=256)	20	7.8	50	19.5	112	43.8	74	28.9	0	0		
Rural (N=244)	40	16.4	49	20.1	92	37.3	61	25	2	0.8		
Subtotal 1	60	12	99	19.8	204	40.8	135	27	2	0.4		
Subtotal1 X± SD	**10.7 ± 6.0 (Range=0 – 48)**											
Second domain: the Effect on dental function											8.9	<0.03 Sig.
Urban (N=256)	46	18	50	19.5	102	39.8	58	22.7	0	0		
Rural (N=244)	53	21.7	62	25.4	67	27.5	62	25.4	0	0		
Subtotal 2	99	19.8	112	22.4	169	33.8	120	24	0	0		
Subtotal 2 X ± SD	**17.4 ± 9.1 (1 – 36)**											
Third domain: the Effect on Psychological status:											10.1	<0.04 Sig.
Urban (N=256)	23	9	57	22.3	78	30.5	92	35.9	6	2.3		
Rural (N=244)	40	16.4	49	20.1	58	23.8	95	38.4	2	0.8		
Subtotal 3	63	12.6	106	21.2	136	27.2	187	37.4	8	1.6		
Subtotal3 X± SD	**14.4 ± 9.2 (0 – 34)**											
Fourth domain: the Effect on social status:											6.7	=0.15 NS
Urban (N=256)	35	13.7	46	18	85	33.2	90	33.2	0	0		
Rural (N=244)	48	19.7	45	18.4	74	30.3	75	30.7	2	0.8		
Subtotal 4	83	16.6	91	18.2	159	31.8	165	33	2	0.4		
Subtotal 4 X± SD	**20.6 ± 12.8 (0 – 66)**											
Grand total QoLROH											12.4	<0.006 HS
Urban (N=256)	26	10.2	56	21.9	100	39.1	74	28.9	0	0		
Rural (N=244)	49	20.1	46	18.9	72	29.5	77	31.6	0	0		
Total	75	15	102	20.4	172	34.4	151	30.2	0	0		
Grand total QoLROH X± SD	**63.1 ± 34.5 (9 – 138)**											

Sig = significant, NS = Not significant, HS = High significant, X^2= Chi Square test..

Fig (1): Distribution of the levels of QoLROH grand total among studied children in urban and rural schools (N=500)

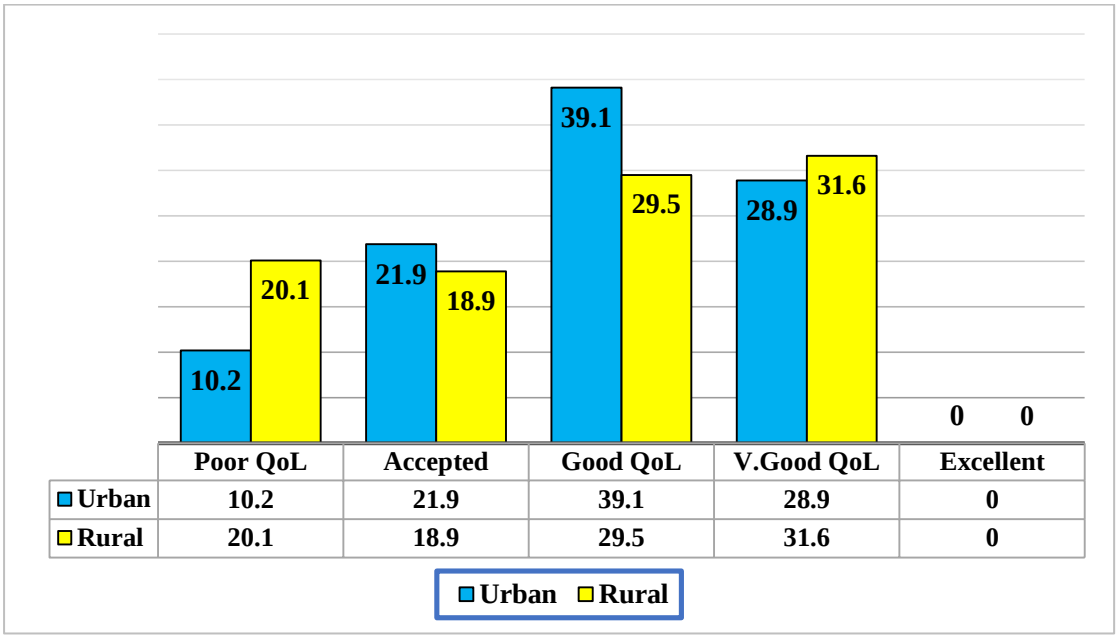


Table (5): Relationship between characteristics of studied school children and their levels of knowledge about Oral Health (N= 500)

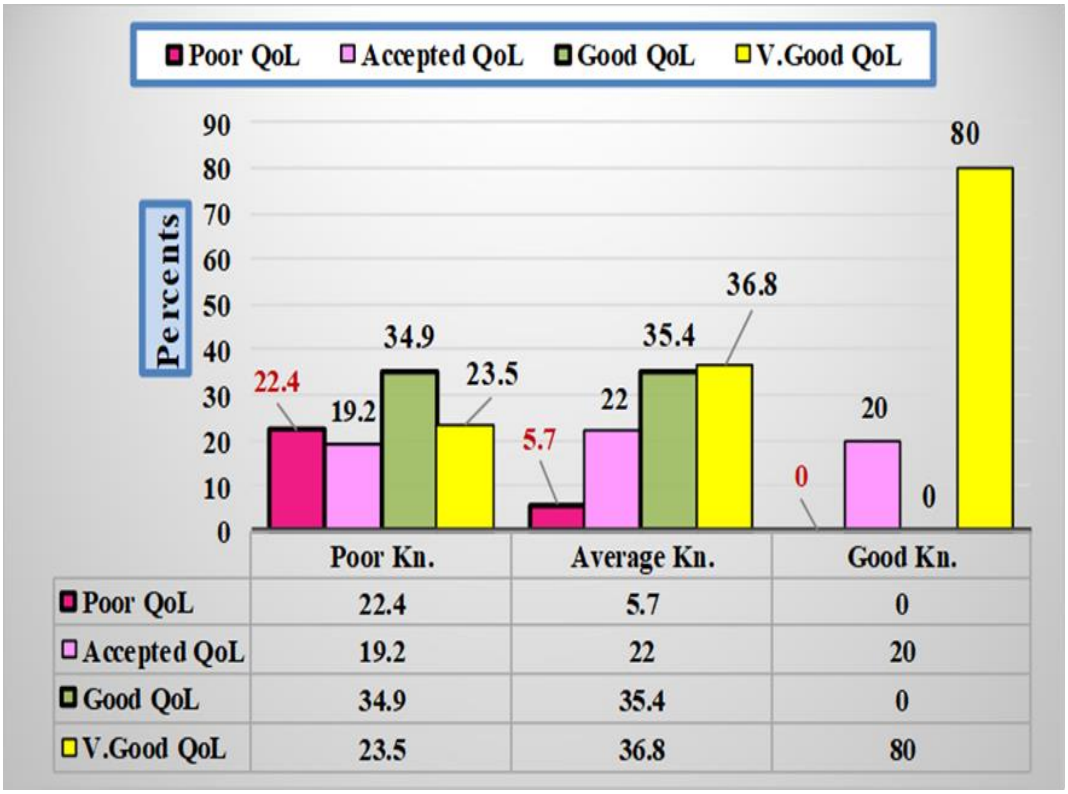
Items		Levels of Oral Health Knowledge							
		Poor Kn.		Average Kn.		Good Kn.		Chi-Square	
		N	%	N	%	N	%	X2	P-value
Age (Years)	9 < 11years (n = 325)	225	69.2	100	30.8	0	0	77.4	< 0.0001 HS
	11 ≥ 12 years (n = 175)	56	32	109	62.3	10	5.7		
Class	4th grade (n = 160)	138	86.3	22	13.8	0	0	155.3	< 0.0001 HS
	5th grade (n = 172)	104	60.5	68	39.5	0	0		
	6th grade (n = 168)	39	32.2	119	70.8	10	6		
Child's Rank in Family	First (n = 170)	86	50.6	80	47.1	4	2.4	8.3	0.21 NS
	Middle (n = 153)	83	54.2	68	44.4	2	1.3		
	Youngest (n = 151)	96	63.6	51	33.8	4	2.6		
	The only one (n = 26)	16	61.5	10	38.5	0	0		
Residence	Urban (n = 256)	128	50	122	47.7	6	2.3	8.2	< 0.01 Sig.
	Rural (n = 244)	153	62.7	87	35.7	4	1.6		
Gender	Male (n = 225)	129	57.3	88	39.1	8	3.6	6.9	< 0.04 Sig
	Female (n = 275)	152	55.3	121	44	2	0.7		
No. of Family Members	< 5 persons (n = 289)	160	55.3	123	42.6	6	2.1	1.2	0.88 NS
	5-6 persons (n = 190)	108	56.8	78	41.1	4	2.1		
	7-9persons (n = 21)	13	61.9	8	38.1	0	0		
Total	**N = 500 (100%)**	**281**	**56.2**	**209**	**41.8**	**10**	**2**		

Sig. = Significant HS= High significant NS= Not significant

Table (6): Relationship between studied school children characteristics and their levels of the Quality of life related to oral health among studied school children (N= 500)

Items		QoLROH levels					Chi-square	
		Poor	Accepted	Good	V. good	Excellent		
		%	%	%	%	%	X^2	P-value
Age (years)	9 < 11years(n=325)	20	18.5	34.5	27	0	20.2	
	11 ≥ 12 years(n=175)	5.7	24	34.3	36	0		
Class, 1ry school	4th grade(n=160)	23.8	17.5	32.5	26.3	0	27.1	<0.003 HS
	5th grade (n=172)	16.3	18.6	38.4	26.7	0		
	6th grade(n=168)	5.4	25	32.1	37.5	0		
Arrangement of child in family	First(n=170)	11.8	21.2	32.9	34.1	0	7.1	0.17 NS
	Middle(n=153)	20.3	17	35.3	27.5	0		
	Youngest(n=151)	11.9	25.2	34.4	28.5	0		
	The only one(n=26)	23.1	7.7	38.5	30.8	0		
Residence	Urban(n=256)	10.2	21.9	39.1	28.9	0	12.4	<0.006 HS
	Rural(n=244)	20.1	18.9	29.5	31.6	0		
Gender	Male(n=225)	12.9	20.4	32	34.7	0	11.8	<0.0001 HS
	Female(n=275)	16.7	20.4	36.4	26.5	0		
N0. Of family members	<5 persons(n=289)	11.6	13.7	32.6	42.1	0	25.3	<0.0001 HS
	5-6 persons (n=190)	16.6	24.9	36	22.5	0		
	7 – 9persons (n=21)	23.8	19	28.6	28.6	0		
Total	N=500 (100%)	15	20.4	34.4	30.2	0		

Fig. (2): Correlation of studied children total Knowledge levels about oral health and Quality of life among studied children (N=500)



Discussion:

Oral health is an integral part and core component of general health and well-being that should be maintained throughout life. A healthy mouth enables individual to speak, eat and deal without having diseases or confusion (Karamehmedovic et al., 2023). Poor oral health among school age children lead to numerous negative consequences including low self-esteem, depression, decreased performance in daily activities, lack of social interaction and an increased burden on the overall healthcare system (Kim et al.,2023). Accordingly, the current study aims to assess the quality of life related to oral health for school-age children with dental caries.

Regarding age, the current study revealed that the majority of the studied school children aged between 9 to <11 years among both urban and rural schools and the mean age of children was 10.5 ±2.2 Years. This result was consistent with Alkalash et al., (2020) who conducted study about " Oral and Dental Hygiene of Primary School Children" they found that the mean age of students was 10.01 ± 0.85. Also, this result was agreed with Ouda et al., (2019) who conducted study entitled " Oral Hygiene Knowledge and Practices among School Age Children" they revealed that one third of the studied children were at the age group of 11 years and the mean age of studied children was 10.94 ±0.80 Years. From the researcher's point of view, it can be interpreted as young children are more susceptible to tooth decay than older children because they tend to have low knowledge and practice care about oral health and poor oral health habits.

Regarding gender, the current study found that more than half of the studied sample was females, this comes in accordance with Riad et al., (2022), who performed study about " Oral health knowledge, attitudes, and behaviors of German dental students: descriptive cross-sectional study " they found that approximately three quarter of the students were females. In addition, Thirunavukkarasu et al., (2022) who studied " Assessment of Oral Health-Related Quality of Life and Its Associated Factors among the Young Adults of Saudi Arabia" they reported that more than half of the studied population were females. From the researcher's point of view, females are more susceptible to tooth decay than males because females sometimes follow dietary habits that have a greater impact on their teeth, such as consuming more sweets, soft drink and little milk products than males.

Concerning types of dental problems in children, the current study revealed that there were high statistically significant differences between urban and rural studied school children regarding types of dental problems, this result was in agreement with Vélez-León et al., (2022) who conducted a study about " Caries Experience and Treatment Needs in Urban and Rural Environments in School-Age Children from Three Provinces of Ecuador" they found that rural schools children had dental caries

, dental problems and need for dental treatment more than urban children.

More ever, this result was consistent with Ha et al., (2021) who conducted a study about " Impact of different determinants on the dental caries experience of children living in Australia rural and urban areas' ' they reported that dental caries prevalence was higher in rural than urban areas. Also, the current study supported by Probst et al., (2018) who conducted a study about "current State of Child Health in Rural America" they illustrated that rural children in Louisiana were found to be at increased risk of having untreated cavities than their urban counterparts.

On the other hand , this result contracted with Dalla Nora et al., (2020) who studied " Oral health status of schoolchildren living in rural and urban areas in southern Brazil" they revealed that higher caries prevalence and extent were found among urban schoolchildren than rural. From the researcher's perspective, caries rate was higher in rural areas than urban may be interpreted as rural areas do not give priority to dental care and oral health and have fewer healthcare providers such as availability of dentists that have impact on oral health.

Concerning children's knowledge about oral health, the current study showed that the largest percentage of studied children in rural schools have poor knowledge compared to children in urban schools. This finding supported by Prihastuti et al., (2023) who conducted a study about "The correlation of oral health knowledge with caries rate in rural community " and they revealed that more than half of children in the village had poor oral health knowledge and attitude. Also, Crouch et al., (2021) who conducted a study about " The oral health status of America's rural children: An opportunity for policy change" they found children residing in rural areas were more likely to have a fair or poor oral health condition and knowledge than children residing in urban areas. Moreover, this finding was consistent with a study conducted by Pathania et al., (2019) who conducted a study entitled "Oral Health Related Knowledge, Attitude and Practices amongst School Children in Himachal Pradesh, India" they reported that there was a statistically significance differences between the children from urban and rural areas regarding oral health knowledge. From the researcher point of view, the reasons for poor oral health knowledge among rural studied children may be due to rural areas often have limited access to dental care. Children in rural areas may not have regular access to dental check-ups, which can limit their exposure to information about maintaining and rural communities may have different cultural believes and attitudes towards oral health, which can impact the knowledge of school-age children.

Concerning quality of life related to oral health (QOLROH) of studied school children, the current study showed that there were statistically significant differences was found between all domains of OHRQOL among studied school children in urban and rural schools. This result is

supported by Gaber et al., (2018) who studied "Rural-urban disparity in oral health-related quality of life" they reported that the prevalence of poor oral health-related quality life (OHRQoL) was statistically higher in rural areas than in urban areas. Rural residents reported a significantly higher prevalence of negative daily-life impacts in pain, psychological discomfort and social disability Oral Health Impact Profile domains.

Also, Subramaniam& Surendran, (2020) studied " Oral Health Related Quality of Life and its Association with Dental Caries of Preschool Children in Urban and Rural Areas of India" and they found that the mean scored of OHRQoL of urban preschool children was significantly different from the mean OHRQoL of rural preschool children of Bangalore. Additionally, this result comes in line with Husain & Tatengkeng, (2021). who conducted a study about " Oral health-related quality of life appraised by OHIP-14 between urban and rural areas in Kutai Kartanegara Regency, Indonesia" they illustrated that oral health-related quality of life in urban area is better than in rural area, the overall OHIP-14 score showed a statistically significant differences between rural and urban areas.

There for, this result of the current study answered the second question of my study which is" Is there a statistical significance difference in the quality of life related to oral health between children in urban and rural schools? From researcher point view, it can be interpreted as decrease level of QOL in rural school children than urban school children were due to children in rural areas had more untreated dental problems reflecting difficulty accessing dental care in this area, health illiteracy and low parental socioeconomic status. That reflected direct correlation with daily living activities that may affect their quality of life.

The current study showed that there was a statistically significant difference between the studied children's age and oral health knowledge. This findings on the same line with Tadin et al., (2022) who conducted a study about" Oral Hygiene Practices and Oral Health Knowledge among Students in Split, Croatia " the study showed that there were statistically significant differences between children's age and their knowledge. While this result contradicted with a study entitled "Effect of an oral care educational program on the knowledge, practice and self-efficacy among school age children" conducted by Abu-Elenen et al., (2015) the study found that there were no statistically significant differences between total knowledge with age of children. In addition to El Nasr, (2017) who conducted a study about" Oral health intervention program among primary school children at El-Qalyubia Governorate" the study revealed that there was 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 were statistically significant differences between the studied

children's gender and their oral health knowledge. This result was consistent with Abd El -Kareem et al., (2022) who revealed that the majority of the studied subjects who have unsatisfactory level of knowledge were males under age of 10 years. While this finding was in contrast with Baloch et al., (2021) who conducted a study about " Knowledge, Attitude and Practice of Oral Health among School Students in Balochistan, Pakistan" the study stated that male students had higher level of knowledge about oral health than female students and female students need regular oral health education and dental checkup. From researcher perspective, there was association between the studied school children age & gender and their levels of knowledge because children age can effect on their knowledge where younger children have poor knowledge than older and male children tend to be more interested with playing more than learning oral health knowledge and practice.

More ever, the current study revealed that there were statistically significant differences between the studied school children's age and their QoLROH levels. These results agreed with the finding of Abu El Soud & Fathy, (2023) who revealed that there was a statistically significant difference between the studied children's age and their oral health related quality of life.

Concerning the gender of studied children and their QoLROH levels, the current study showed that there was a statistically significant difference between the studied school children's gender and their QoL levels. this finding come in accordance with Kim et al., (2021) who conducted study about " Association between oral health-related quality of life and socio demographic factors among Korean children and adolescents" the study found that oral health-related quality of life among children and adolescents was significantly associated with their gender while females had higher oral health-related quality of life compared to males. However, the finding of the current study contradicted with, a study titled “Impact of malocclusion on oral health-related quality of life among schoolchildren” conducted by Guimarães et al., (2018), who revealed that there was no association found between sex and OHRQoL. From researcher point of view, there was association between the studied school children's age, gender and their levels of QOLROH because children knowledge of oral health has a great influence on their QOL. Also, young children with low knowledge tend to have low QOL.

Moreover, the current study illustrated that there was a highly statistically significant association between children's knowledge about oral health and Quality of life related to oral health among studied school children .This finding is consistent with Zhao et al., (2022) who studied" Association of oral health knowledge, self-efficacy and behaviors with oral health-related quality of life in Chinese primary school children" the study found that Oral health knowledge, practice, and self-rated oral health affect OHRQoL directly and positively. Additionally, these findings supported by the results

of Kumari et al., (2022) who studied "Determination of Oral Health related Quality of Life in Secondary School Going Children using OIDP index-A Cross Sectional study" they found that knowledge about oral health was significantly associated with the number of decayed teeth that can affect the overall OHRQoL measure. From researcher point of view, it can be concluded that studied children who have a higher level of knowledge about oral health, have good quality of life and tooth decay affect negatively on their quality of life related to oral health.

Conclusion

The quality of life related to oral health (QoLROH) of school age children was significantly affected by dental decay in all domains (Oral symptoms, Functional Limitation, Psychological status and social status). There were high statistically significant differences between urban and rural studied children regarding types of dental problems. In addition, there were statistically significant differences between children total knowledge among urban and rural school. Also, there were statistically significant differences were found between QOLROH among studied school children in urban and rural schools.

Recommendations

Recommendations for school health nurse education:

1) Integrating oral health education in the scholastic regular curriculum should be applied for raising the awareness and enhancing the related habits at all education levels.

2) Health education sessions should be provided for teachers and students about oral hygiene and prevention of dental caries by using different methods of learning such as Posters and booklets should be displayed to show the importance of the correct technique of brushing and flossing teeth.

3) Periodic training of school nurses and other primary care workers who have regular contact with young children on the early identification of dental caries among preschool and school age children.

Recommendations for research:

1) Further studied should be conducted about the implementation of school-based health education programs for children to promote dental health practices.

2) Replication of the current study with large sample and different schools to ensure generalization of the study findings.

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