



## Oral health-related Knowledge, Attitude and Practices Among 9-11-Year-Old Schoolchildren of Government School of Zliten – Libya

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### المعرفة والمواقف والممارسات المتعلقة بصحة الفم والأسنان بين تلاميذ المدارس الحكومية في زليتن - ليبيا الذين تتراوح أعمارهم بين 9 و 11 عامًا

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#### Abstract:

Oral health is critical component of overall health, which reflects to quality of life and wellbeing. However, oral disease remains the most prevalent issues that effect on globally population public health. Objectives: The aims from current study to assess oral hygiene knowledge, attitude and practice among (9-11-Yrs) schoolchildren. This is a cross sectional study was conducted on 210 school students of age group (9-11-Yrs) from government primary schools of Zliten - Libya at 2024. The school and the students were selected by random sampling method. A pre-tested close- ended questionnaire was used for the study, the data was analyzed on using Microsoft Excel to assess oral and dental health knowledge and Attitude and practice in school-age children. Consent was obtained from the school administration. 50.54% of male reported changing their toothbrushes when they became worn out while 55.56% of female did it same. Majority of participants 67.74% of male schoolchildren brushed once a day compared to 58.12% of female schoolchildren. Only 11.32% participant of male schoolchildren reported the reason for dental visit was general dental check- up while 67.74% visited dentist only when sever pain and only 16.12% participant of female schoolchildren reported the reason for dental visit was general dental check-up while 58.12% visited dentist only when sever pain and 25.64% of them had never visited a dentist. 92.47% of male had the never rinsing their mouth while 84.62% of female did it same. The participants had sufficient knowledge, limited oral health behavior, gaps in practice and attitudes remain regarding oral health especially use interdental cleaning aids. Initiate the integration of a comprehensive oral health education program at school and home to enhancing oral health.

**Keywords:** Oral Health, Knowledge, Attitude, Schoolchildren, Toothbrush.

## الملخص

تُعدّ صحة الفم عنصرًا أساسيًا في الصحة العامة، مما ينعكس إيجابًا على جودة الحياة والرفاهية. ومع ذلك، لا تزال أمراض الفم من أكثر المشاكل انتشارًا وتأثيرًا على الصحة العامة للسكان محليًا وعالميًا. الأهداف: تهدف هذه الدراسة الحالية إلى تقييم معارف وسلوكيات وممارسات نظافة الفم لدى أطفال المدارس (من 9 إلى 11 عامًا). المنهجية: أجريت هذه الدراسة المقطعية على 210 طالب وطالبة من الفئة العمرية (من 9 إلى 11 عامًا) من المدارس الابتدائية الحكومية في زليتن -ليبيا، عام 2024. تم اختيار المدرسة والطلاب بطريقة العينة العشوائية. استُخدم استبيان مغلق مُختبر مسبقًا للدراسة، وحُللت البيانات باستخدام برنامج مايكروسوفت إكسل لتقييم معارف ومواقف وممارسات صحة الفم والأسنان لدى أطفال المدارس. تم الحصول على موافقة إدارة المدرسة. النتائج: أفاد 50.54% من الذكور بتغيير فرشاة أسنانهم عند تناولها، بينما 55.56% من الإناث فعلت ذلك. أغلبية المشاركين 67.74% من تلاميذ المدارس الذكور ينظفون أسنانهم مرة واحدة يوميًا مقارنة بـ 58.12% من تلميذات المدارس. أفاد فقط 11.32% من تلاميذ المدارس الذكور أن سبب زيارة طبيب الأسنان هو الفحص الدوري العام للأسنان بينما زار 67.74% طبيب الأسنان عندما كان هناك ألم شديد وأفادت فقط 16.12% من تلميذات المدارس أن سبب زيارة طبيب الأسنان هو الفحص الدوري العام للأسنان بينما زار 58.12% طبيب الأسنان عندما كان هناك ألم شديد ولم يزر 25.64% منهم طبيب الأسنان أبدًا. لم يغسل 92.47% من الذكور أفواههم أبدًا بينما 84.62% من الإناث فعلت الشيء نفسه. الخلاصة: كان لدى المشاركين معرفة كافية ومواقف محدود في صحة الفم ولا تزال هناك قصور فيما يتعلق بصحة الفم وخاصة استخدام الأدوات المساعدة في تنظيف الفم وما بين الاسنان. البدء في دمج برنامج صحي توعوي شامل للحفاظ على صحة الفم والأسنان في المدارس والمنازل لتعزيز الصحة العامة.

**الكلمات المفتاحية:** صحة الفم، المعرفة، المواقف، أطفال المدارس، فرشاة الأسنان.

## Introduction

Oral health is critical component of overall health, which reflects to quality of life and wellbeing, However oral disease remain the most prevalent issues which effect on globally population public health[1, 2], proper oral hygiene during childhood can promote awareness of maintain oral health that contribute in prevent all common oral diseases in later age[3, 4], However, self-care by regular tooth brushing and diet control keeping the mouth healthy and clean and improve the effectiveness of oral hygiene [5], Although Poor oral health behaviors lead to oral problems such as dental caries, periodontal disease that may lead the risk of several systemic conditions [6].

On the other hand socioeconomic factors and limited access to professional dental care and lack of awareness are the most prevalent oral health problem in children[7]. Therefore a correlation between inadequate oral health knowledge and poor oral health behavior has been reported [8], Increase the knowledge and education about risks like neglecting regular dental visits and limited fluoride exposure, high sugars consumption, others help to change attitude and behavior of schoolchildren [9], Several previous studies show an association between dental decay and brushing practices [10], When toothbrush use and dental flossing are performed correctly, including proper brushing techniques, appropriate frequency, and sufficient time spent, they help prevent dental issues and maintain a healthy oral cavity [11, 12], this study confirmed low rates of tooth brushing and dental attendance among children schools in different ages [13], also analyzes the correlation between knowledge and attitude toward oral and dental hygiene, tooth brushing behavior in school-aged children (9-11-years).

## Materials and Methods

### Study design

Participants of this cross-sectional study were children enrolled in one of government primary schools and the study is was carried out to assess oral hygiene practice, knowledge and attitude among (9-11-Yrs) school children of government primary school, Zliten-Libya. using random sampling technique from September - December 2024. The questionnaire was divided into three sections. The initial segment of the study involved the collection of data pertaining to the age as well as gender. The subsequent section included information about to oral hygiene knowldeg of oral hygiene procedures. The final section consisted of items designed to assess students' Attitude and practise of oral hygiene procedures and elaborated on the specifics of dental visits.

### Study population

The research population consists of students studying in the 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> grades in government primary schools aged (9- 10 and 11Yrs )in Zliten city of Libya in the 2024. The sample group consists of 210 students (117 Female, 93Male) volunteered students studying in the 3rd and 4th and 5th grades in the government primary schools in Zliten city of Libya.

### Study area

This was a cross-sectional descriptive study conducted in Zliten municipality,Libya. Zliten City is the fifth largest city in Libya. The study population included children enrolled in one of the primary schools.

### Data analysis

A questionnaire included 18 closed-ended questions, which they had to answer without any external help, The data collected was analyzed on using Microsoft Excel to assess oral and dental health knowldeg, Attitude and practise in school-age children. Consent was obtained from the school administration.

## Results

The examination of Table 1 showed that the research group consisted of 117 (55.7%) females and 93 (44.3%) males: 29 male school children (43.9%) while 37 female school children (56.1%) were 9 years old, 33 male school children (43.4%) while 43 female school children (56.6%) were 10 years old, 31 male school children (45.6%) while 37 female school children (54.4%) were 11 years old. It was determined that 66 students were in the 3rd grade, 76 students were in the 4th grade, and finally 68 students were in the 5th grade. Various questions were asked in relation to the knowledge on oral health, like visit a dentist, brushing techniques, and brushing frequency etc.

**Table1:** Students' demographic characteristics.

| Variables       | Frequency | Percentage |
|-----------------|-----------|------------|
| Age             | -         | -          |
| 9               | -         | -          |
| Male            | 29        | 43.9%      |
| Female          | 37        | 56.1%      |
| 10              | -         | -          |
| Male            | 33        | 43.4%      |
| Female          | 43        | 56.6%      |
| 11              | -         | -          |
| Male            | 31        | 45.6%      |
| Female          | 37        | 54.4%      |
| Total of Gender | -         | -          |
| Male            | 93        | 44.3%      |
| Female          | 117       | 55.7%      |

Table 2 shows revealed that most of participants 67.74% of male schoolchildren brushed once a day and 27.96% brushed twice a day compared to 58.12% of female schoolchildren brushed once a day while 25.64% reported brushing twice daily and 16.24% brushed three times. Approximately 91.08% of male schoolchildren acknowledged that the sugar can cause teeth decay, while 93.55% of female schoolchildren were acknowledged of this as well. Approximately 83.90% of male schoolchildren reported acknowledged that lack of brushing can lead to bad breath and oral disease, while 87.20% of female schoolchildren were aware of the same issue. Unfortunately, when participants were asked about the availability of preventive programs (oral hygiene-related educational initiatives) designed to enhance knowledge and attitudes in their country, all of them (100%) indicated that such programs were absent.

**Table 2:** Oral health knowledge.

| Parameter                                            | Evaluation Index | Total male [n (%)] | Total female [n (%)] |
|------------------------------------------------------|------------------|--------------------|----------------------|
| Frequency brushing                                   | Once a day       | 67.74%             | 58.12%               |
|                                                      | Twice a day      | 27.96%             | 25.64%               |
|                                                      | Three times      | 4.30%              | 16.24%               |
|                                                      | Rarely           | 00.00%             | 0.00%                |
|                                                      | When I need      | 5.38%              | 0.00%                |
| know dental caries is related to sugar intake        | Yes              | 91.08%             | 93.55%               |
|                                                      | No               | 8.92%              | 6.45%                |
| know the lack of brushing and care can cause Malodor | Yes              | 83.90%             | 87.20%               |
|                                                      | No               | 16.10%             | 12.80%               |
| oral hygiene-related educational programs available  | Yes              | 0.0%               | 0.00%                |
|                                                      | No               | 100.00%            | 100.00%              |

When asked about the reasons for not attending early checkup at the dental clinic, approximately 45.16% of male schoolchildren had economic difficulties and 20.43% mentioned that their parents always busy in their works, for this reason the issue was they do not have a time to go to dental clinic whereas a 18.28% reported a fear of dental needles while around 45.30% of female schoolchildren had economic issues and 17.95% had time constraints, and another 17.95% mentioned a fear of dental needles as illustrated Table 3. Only 11.32% participant of male schoolchildren mentioned that their dental visits were for routine check-ups, while 16.12% of female schoolchildren had the same reason and

25.64% of them had never visited a dentist. On the other hand, 67.74% of male schoolchildren went to the dentist only when they had dental pain, and 58.12% of female schoolchildren did the same. The findings of the current study revealed that approximately 67.74% of male schoolchildren reported visiting the dentist only when experiencing dental pain, 27.96% reported regular dental visits every 6 months to a year, and 4.30% reported never having visited a dentist. On the other hand, 58.12% of female schoolchildren reported visiting the dentist only when they had dental pain, 16.12% reported regular dental visits every 6 months to a year, and 25.64% stated they had never visited a dentist.

**Table 3: Oral health attitude.**

| Parameter                                      | Evaluation Index             | Total Male [n (%)] | Total Female [n (%)] |
|------------------------------------------------|------------------------------|--------------------|----------------------|
| schedule an early checkup at the dental clinic | Afraid from a dentist        | 16.13%             | 14.53%               |
|                                                | Afraid from infection        | 0.00%              | 0.00%                |
|                                                | Economic problems            | 45.16%             | 45.30%               |
|                                                | Time problem                 | 20.43%             | 17.95%               |
|                                                | Limited access dental clinic | 0.00%              | 4.27%                |
|                                                | Afraid from dental needle    | 18.28%             | 17.95%               |
| visit a dentist                                | When I have dental pain      | 67.74%             | 58.12%               |
|                                                | Regularly every 6-12 months  | 11.32%             | 16.24%               |
|                                                | Never visited a dentist      | 4.30%              | 25.64%               |
|                                                | Between 1-2 years            | 0.00%              | 0.00%                |
|                                                | Occasionally                 | 16.64%             | 0.00%                |
| Reason for visiting dental clinic              | Check my teeth               | 0.90%              | 3.24%                |
|                                                | Take X-rays                  | 0.00%              | 0.00%                |
|                                                | Have scaling                 | 0.00%              | 2.10%                |
|                                                | Have fluoride                | 0.00%              | 0.00%                |
|                                                | Treat gums                   | 2.64%              | 4.77%                |
|                                                | Have filling                 | 22.17%             | 28.22%               |
|                                                | Sever pain                   | 61.13%             | 53.05%               |
|                                                | Have orthodontic Rx          | 00.00%             | 0.00%                |
|                                                | Have tooth extraction        | 13.16%             | 8.62%                |

Table 4 shows around 45.95% of male schoolchildren reported using a combined method for brushing their teeth, while 29.73% used the horizontal strokes for brushing, and approximately 24.32% used the vertical strokes for brushing. Similarly, 33.33% of female schoolchildren used a combined brushing method, 41.94% used the horizontal strokes for brushing, and about 12.90% used the vertical strokes for brushing. When asked about the duration of their brushing, 39.78% of male schoolchildren indicated they brushed for 2 minutes, while 26.88% brushed for 1 minute. Additionally, 25.80% were uncertain about the time spent. In comparison, 41.88% of female schoolchildren reported brushing for 2 minutes, 24.79% for 1 minute, and 26.50% were unsure of the duration. The majority of male schoolchildren 95.70% clean their teeth daily, while 97.44% of female schoolchildren clean their teeth daily.

The findings demonstrated that approximately 52.70% of male schoolchildren performed tongue cleaning, while 47.30% did not. In contrast, 59.10% of female schoolchildren reported practicing tongue cleaning, whereas 40.90% did not. Approximately 81.72% of male schoolchildren using a toothbrush whereas 82.91% of female schoolchildren reported using a toothbrush. Additionally, 9.68% of male schoolchildren indicated using dental floss, compared to 11.96% of female schoolchildren. Mouthwash was used by 6.45% of males and 5.13% of females. The use of a toothbrush and toothpaste was the predominant method, practiced by 97.85% of male and 99.15% of female schoolchildren. However, small proportion of male schoolchildren (2.15%) and female schoolchildren (0.85%) used alternative methods for cleaning their teeth. The findings revealed that approximately 67.74% of male schoolchildren brushed their teeth in morning while about 27.96% were brushed at evening. wherease, 58.12% of female schoolchildren brushed their teeth in morning , 16.24% were brushed at evening and 25.64% brushed morning and evening.

The findings revealed that approximately 63.44% of male schoolchildren brushed their teeth independently with parental advice but without direct supervision, while about 25.81% were rarely monitored. Similarly, 52.99% of female schoolchildren brushed their teeth without parental monitoring but with guidance, and around 15.39% were occasionally watched a round 7.53% of male schoolchildren reported rinsing their mouth when they felt the need. Furthermore, 92.47% reported never rinsing their mouth. In comparison, 15.38% of female schoolchildren rinsed their mouth when needed, and 84.62% never did. The majority of schoolchildren 96.77% applied a toothpaste to the

length their toothbrush, while 98.29% of them used the same amount. Approximately 50.54% of male schoolchildren reported changing their toothbrushes when they became worn out, 25.81% were unsure about when to replace them, and 19.35% replaced them every 6 months. while, 55.56% of female schoolchildren changed their toothbrushes when they became worn out, 11.11% were uncertain, and 18.80% replaced them every 6 months.

**Table 4:** Oral health practise.

| Parameter                                 | Evaluation Index                 | Total Male [n (%)] | Total female [n (%)] |
|-------------------------------------------|----------------------------------|--------------------|----------------------|
| Brushing method                           | Vertical method                  | 12.90%             | 11.97%               |
|                                           | Horizontal method                | 41.94%             | 38.46%               |
|                                           | Combined method                  | 33.33%             | 41.02%               |
|                                           | Others                           | 11.83%             | 8.55%                |
| Duration of brushing                      | Less than 1 min                  | 7.53%              | 6.84%                |
|                                           | 1 min                            | 26.88%             | 24.79%               |
|                                           | 2 min                            | 39.78%             | 41.88%               |
|                                           | Uncertain                        | 25.80%             | 26.50%               |
| clean teeth daily                         | Yes                              | 95.70%             | 97.44%               |
|                                           | No                               | 4.30%              | 2.56%                |
| cleaning Tongue                           | Yes                              | 52.70%             | 59.10%               |
|                                           | No                               | 47.30%             | 40.90%               |
| Material used for brushing your teeth     | Brush + toothpaste               | 81.72%             | 82.91%               |
|                                           | Dental floss                     | 9.68%              | 11.96%               |
|                                           | Mouthwash                        | 6.45%              | 5.13%                |
|                                           | Toothpicks                       | 0.00%              | 0.00%                |
|                                           | Miswak                           | 0.00%              | 0.00%                |
|                                           | Others                           | 2.15%              | 0.00%                |
| How do you clean your teeth               | Toothbrush                       | 97.85%             | 99.15%               |
|                                           | Others                           | 2.15%              | 0.85%                |
| How often do you brush your teeth         | Morning                          | 67.74%             | 58.12%               |
|                                           | Evening                          | 27.96%             | 16.12%               |
|                                           | Morning + Evening                | 4.30%              | 25.64%               |
|                                           | Others                           | 0.00%              | 0.00%                |
| supervised by your parents while brushing | Watch me while brushing my teeth | 3.22%              | 04.27%               |
|                                           | Do not watch but advise me       | 63.44%             | 52.99%               |
|                                           | Never cared                      | 25.81%             | 27.35%               |
|                                           | Rarely                           | 7.53%              | 15.39%               |
| When do you use mouthwash                 | When I needed                    | 7.53%              | 15.38                |
|                                           | Never rinsing                    | 92.47%             | 84.62%               |
|                                           | Rarely                           | 0.00%              | 0.00%                |
| Amount toothpaste applied on toothbrush   | Length of brush                  | 96.77%             | 98.29%               |
|                                           | Pea size                         | 3.23%              | 1.71%                |
|                                           | Less than a pea                  | 0.00%              | 0.00%                |
|                                           | Others                           | 0.00%              | 0.00%                |
| change toothbrush                         | When it becomes worn out         | 50.54%             | 55.56%               |
|                                           | Every 6 months                   | 19.35%             | 18.80%               |
|                                           | Every 3 months                   | 04.30%             | 14.53%               |
|                                           | Uncertain                        | 25.81%             | 11.11%               |

## Discussion

Oral health is critical component of overall health. several studies conducted globally have utilized surveys to assess the knowledge, attitudes, and behaviors related to oral health across various schoolchildren groups [14-17]. This cross-sectional study was aimed to analyzes the correlation between knowledge and attitude and practice toward oral and dental hygiene, tooth brushing behavior in schoolchildren both genders, aged 9-11studying in public sector schools of Zliten – Libya. The schools included in this study were characterized by a balanced gender distribution, allowing comparative analysis between the genders, Furthermore, it was expected that the students had a limited



understanding of basic oral hygiene concepts, for instance, toothbrush method, interdental cleaning aids, which were in agreement with other studies [18]. The current study revealed that most of participants had simple understanding for cleaning teeth routine especially related to interdental cleaning aids. Majority of participants 67.74% of male schoolchildren brushed once a day compared to 58.12% of female schoolchildren. Furthermore, 25.64% of all participants reported brushing twice daily similar findings to [19].

Approximately 91.08% of male schoolchildren acknowledged that the sugar can cause teeth decay, while 93.55% of female schoolchildren were acknowledged of this as well, also Approximately 83.90% of male schoolchildren acknowledged that inadequate brushing can cause bad breath and oral diseases, while 87.20% of female schoolchildren were aware of this as well. The same aspect has been highlighted in other studies [4,20]. Unfortunately, preventive programs regards to oral health education to improve oral hygiene status in their countries were absent, all of them (100%) indicated that such programs unavailable compare with other studies that reported to increase knowledge, attitude and practice done by [21-23].

Approximately 45.16% of male schoolchildren had economic difficulties and 20.43% mentioned lack of time, whereas 18.28% reported a fear of dental needles while around 45.30% of female schoolchildren had economic issues and 17.95% had time constraints, and another 17.95% mentioned a fear of dental needles, this finding less than study done by [24]. The findings of the current study revealed that approximately 67.74% of male schoolchildren reported visiting the dentist only when experiencing dental pain, 27.96% reported regular dental visits every 6 months to a year, and 4.30% reported never having visited a dentist. On the other hand, 58.12% of female schoolchildren reported visiting the dentist only when they had dental pain, 16.12% reported regular dental visits every 6 months to a year, and 25.64% stated they had never visited a dentist which agree with other study [25-27].

Lack of awareness among children may be a direct outcome of parental awareness and attitude about regular dental visit to maintain oral health and prevent oral disease, so, the finding of participants toward reason for visiting dental clinic were tooth pain, restoration and dental extraction 61.13%, 22.17%, 13.16% of schoolchildren male and 53.05%, 28.22%, 8.62% of schoolchildren female respectively, unfortunately just 0.90% of male and 3.24% of female reported who did not visit for check up, this coincides with the results of another study done by [28]. Around 45.95% of male schoolchildren reported using a combined method for brushing their teeth, while 29.73% used the horizontal strokes for brushing, and approximately 24.32% used the vertical strokes for brushing. Similarly, 33.33% of female schoolchildren used a combined brushing method, 41.94% used the horizontal strokes for brushing, and about 12.90% used the vertical strokes for brushing similar to done by [18].

Only 39.78% of male schoolchildren indicated they brushed for 2 minutes, while 26.88% brushed for 1 minute. Additionally, 25.80% were uncertain about the time spent. In comparison, 41.88% of female schoolchildren reported brushing for 2 minutes, 24.79% for 1 minute, and 26.50% were unsure of the duration [29]. Approximately 81.72% of male schoolchildren using a toothbrush whereas 82.91% of female schoolchildren reported using a toothbrush. Additionally, 9.68% of male schoolchildren indicated using dental floss, compared to 11.96% of female schoolchildren, the finding less than study by [28, 30]. The findings demonstrated that approximately 52.70% of male schoolchildren performed tongue cleaning, while 47.30% did not. In contrast, 59.10% of female schoolchildren reported practicing tongue cleaning, whereas 40.90% did not, this finding is similar to that in the study by [9, 31]. The use of a toothbrush and toothpaste was the predominant method, practiced by 97.85% of male and 99.15% of female schoolchildren. However, small proportion of male schoolchildren (2.15%) and female schoolchildren (0.85%) used alternative methods for cleaning their teeth this finding similar to study done by [20, 32-34].

The findings revealed that approximately 67.74% of male schoolchildren brushed their teeth in morning while about 27.96% were brushed at evening. whereas, 58.12% of female schoolchildren brushed their teeth in morning, 16.24% were brushed at evening and 25.64% brushed morning and evening this finding more than study done by [16]. The findings revealed that approximately 63.44% of male schoolchildren brushed their teeth independently with parental advice but without direct supervision, while about 25.81% were rarely monitored. Similarly, 52.99% of female schoolchildren brushed their teeth without parental monitoring but with guidance, and around 15.39% were occasionally watched [35]. Around 7.53% of male schoolchildren reported rinsing their mouth when they felt the need, Furthermore, 92.47% reported never rinsing their mouth. In comparison, 15.38% of female schoolchildren rinsed their mouth when needed, and 84.62% never did, the finding similar to [36]. The majority of schoolchildren 96.77% applied a toothpaste to the length their toothbrush, while 98.29% of them used the same amount more than done by [37]. Approximately 50.54% of male schoolchildren reported changing their toothbrushes when they became worn out, 25.81% were unsure about when to replace them, and 19.35% replaced them every 6 months. while, 55.56% of female schoolchildren

changed their toothbrushes when they became worn out, 11.11% were uncertain, and 18.80% replaced them every 6 months, this finding nearly to study done by [38].

## Conclusion

This participant -based study among 9-11-year-olds found that girls had slight better knowledge about dental health, but attitudes toward dental health were not significantly different between genders that were limited oral health behavior, gaps in practice and attitudes remain regarding oral health especially use Interdental cleaning aids. We recommended that initiate the integration of a comprehensive oral health education program at school and home to enhancing oral health and evaluation of ongoing campaigns in schools is needed that can facilitate translating improved knowledge and attitudes into changing practice.

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