Oral Health perception among Schoolchildren in Municipality of Tripoli Center, Libya

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Abstract:

Objective: The purpose of this study is to assess the knowledge, attitude, and behavior of schoolchildren towards oral health and dental care, as well as to evaluate the factors that determine these variables. **Materials and methods:** A cross-sectional survey was performed on 511 students (219 girls, and 292 boys) attending public schools in Tripoli, aged 12-14 years, between October and November 2018, using a pre-structured questionnaire. The data was analyzed using IBM SPSS Statistics Version 26. **Results:** oral hygiene habits, such as tooth brushing, were found to be infrequent, and the role of parents in encouraging oral hygiene habits was limited. The study showed higher awareness of school-aged children about dental caries than periodontal conditions. In general, girls were more knowledgeable significantly than boys. Irregular visits to the dentist were found to be common, and toothache was the major driving factor for dental visits. **Conclusion:** children's and parents' attitudes toward oral health and dental care need to be improved. Comprehensive oral health educational programs for both children and their parents are required to achieve this goal. To the best of our knowledge, this study represents the first study that explored such issues among schoolchildren in Municipality of Tripoli Center.

Keywords: Oral health; attitude; behavior.

■ **ملخص:**

تهدف هذه الدراسة إلى تقييم ومعرفة مواقف وسلوك أطفال المدارس تجاه صحة الفم والعناية بالأسنان، وكذلك تقييم العوامل التي تحدد هذه المتغيرات.

المواد والأساليب: تم إجراء مسح مقطعي على 511 طالبًا (219 فتاة، و 292 فتى) يدرسون في المدارس

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العامة في طرابلس، تتراوح أعمارهم بين 12 و 14 عامًا، بين أكتوبر ونوفمبر 2018، باستخدام استبيان منظم مسبقًا. تم تحليل البيانات باستخدام IBM SPSS Statistics الإصدار 26.

النتائج: تبين أن عادات نظافة الفم، مثل تفريش الأسنان، غير متكررة، وكان دور الوالدين في تشجيع عادات نظافة الفم محدودًا. أظهرت الدراسة وعيًا أعلى للأطفال في سن المدرسة حول تسوس الأسنان أكثر من حالات امراض اللثة. بشكل عام، كانت الفتيات أكثر معرفة من الأولاد. وجد ان الزيارات غير المنتظمة لطبيب الأسنان كانت شائعة، وكان ألم الأسنان هو العامل الرئيسي الدافع لزيارات طبيب الأسنان.

■ **الخلاصة:**

يجب تحسين مواقف الأطفال والآباء تجاه صحة الفم والأسنان. مطلوب برامج تثقيفية شاملة عن صحة الفم لكل من الأطفال وأولياء أمورهم لتحقيق هذا الهدف.

Introduction:

"Oral health is multi-faceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex" (Glick et al., 2016). Oral health self-perception is a multidimensional assessment that includes psychological, psychosocial and functional aspects of oral health (Banu et al., 2018). Dental caries is the most prevalent oral disease, on a global basis, affecting 60-90% of school-aged children and most adults (Petersen, 2003). Thus, oral health perception can be perceived as a useful indicator of tooth decay treatment necessity in children with mixed dentition. This can impact the outcomes of oral health and reduce the risks of morbidity (Banu et al., 2018). Although the prevalence of dental caries has decreased among 5-12 year old in high-income countries (Frencken et al., 2017), there are still several factors associated with this global prevalence of dental caries, such as sugar consumption (Lagerweij and van Loveren, 2020), lack of oral health education (Al-Samadani et al., 2017) and deprivation (Hall-Scullin et al., 2017). In fact, the burden of oral disease, in general, was highly associated with deprivation in both developing and developed countries (Petersen et al., 2005). A remedy for this pending public health crisis 'tooth decay', can be summarized as follows: water fluoridation, topical fluoride application, using fluoride rinses, providing school oral health education programs, getting a proper diet and maintaining a regular visit to the dentist (Bagramian et al., 2009). Thus, evaluation of schoolchildren's health practice is required to improve knowledge, habits and attitudes (Al Subait et al., 2015). Therefore, a study was designed to present an overview of the oral health behavior, knowledge, and attitudes of schoolchildren, aged 12-14 years, attending Libyan public schools.

• **Materials and methods:**

A Cross sectional study has been carried out on students with a total number of 511, recruited from two public schools (One for males and one for females), located in a highly populated area of Municipality of Tripoli Center. The study targeted school pupils of an average age of 12-14 years old.

Ethical approval from the Ministry of Education (Department of social service and school health) was obtained, and an information letter was sent to the selected schools, explaining the purpose of the study and the procedures that would be performed during the study. The study was approved by the Research, Consulting and Training Center at the University of Tripoli. Parents' informed consent was obtained before recruiting the children into this study. The students' personal data was obtained from the school records for each individual pupil. The sample size was 511 students (219 girls, and 292 boys).

Students were asked to complete a comprehensive questionnaire adapted from Al-Omiri et al. (2006) in order to evaluate school children's perception of their oral health and dental treatment. The role of parents in oral health care motivation was also evaluated. The questionnaire included 30 closed-ended questions translated from English to Arabic. The final version was evaluated by dentists and epidemiologists. The questionnaire was also pre-tested to evaluate students' understanding of the questions and their ability to answer these questions.

A full explanation was given to the students about the questions and how they should respond to them. The questionnaires were then completed by the children at the schools under their teachers' supervision. The investigators were available for any clarifications. The questions were about brushing habits, the use of tooth paste and other tooth cleaning aids, what the meaning of bleeding gum is and how to prevent this, the number of deciduous and permanent teeth, any previous experience in the dental office and the frequency of dental attendance. In addition, the questionnaire evaluates the opinion about dental care, the effect of sweets and soft drinks on the dentitions and the role of their parents in oral health care.

Data were analyzed using IBM SPSS Statistics Version 26. Chi-square test of homogeneity (2x C)* was used when comparing a difference between two groups of an independent variables such gender on a dichotomous dependent variable such as yes/no questions. Chi-square test of homogeneity (R x2)*** was used to see whether there is a statistically significant difference in the probabilities between two independent groups if the dependent variable has three or more categories. Post hoc analysis was performed and involve pairwise comparisons using the z-test of two proportions with a Bonferroni correction. Mann-Whitney U Test** was used to determine if there are differences between two groups on ordinal dependent variable such as brushing duration.

• **Results:**

In total, there were 511 students surveyed. 292 (57.1%) students from the boy's school and 219 (42.9%) from the girl's school. Year distribution is demonstrated (Table 1).

Table 1: Number of students surveyed.

Year	Female	Male	Total	Percentage (%)
Year 7	76	101	177	34.6
Year 8	75	94	169	33.1
Year 9	65	97	162	31.7
Missing data	3	0	3	0.6
Total	219	292	511	

All students participated in the study reported using tooth paste and dental brush to clean their teeth, while only 5% using dental floss, approximately 17% using mouth wash and only 6% using dental pick as an extra aid for oral hygiene performance (Figure 1 A). 20.1% and 6.8% of girls use mouthwash and dental floss, respectively, compared to 15.4% and 3.4% of boys (Figure 1 B). However, the frequency of brushing varied from once per week in 5% of students to twice per day in about 45% of participants (Figure 2 A). More girls (24.7%) brush their teeth more than twice a day than boys (6.5%) (Figure 2 B). In addition, about 80% of the students brush their teeth in the morning, and 64% reported brushing before going to bed (Figure 3). Around 69% of students reported their brushing time was between one to two minutes, while only 17% of students brush their teeth for more than two minutes, and around 14% brush for less than one minute (Figure 4 A). In general, girls spend more time brushing than boys (Figure 4 B). Approximately 6% of students reported that their parents neglected care for their oral health practice (Figure 5).

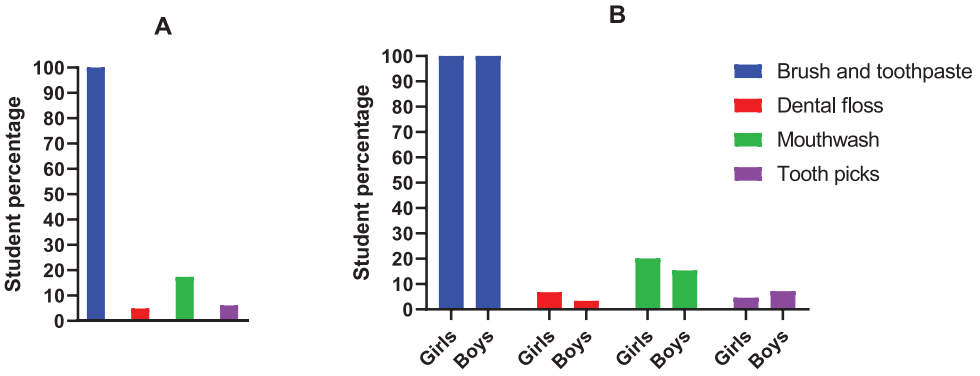

Figure 1. Oral hygiene methods. (A) In all students (B) In girls and boys.

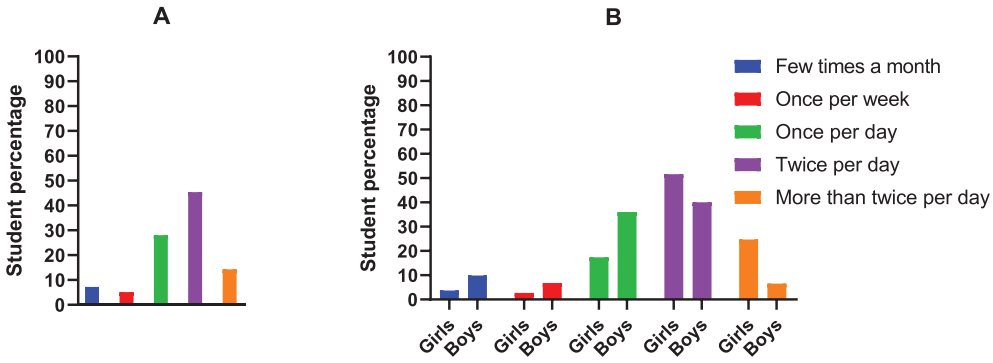

Figure 2. Brushing frequency. (A) In all students (B) In girls and boys.

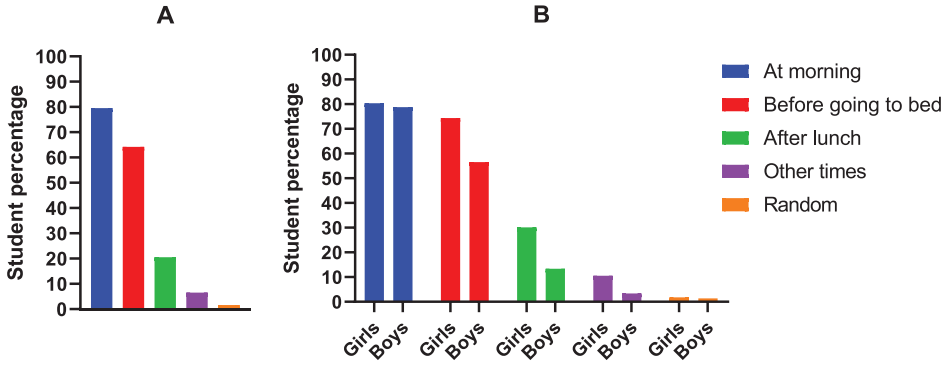

Figure 3: Brushing interval. (A) In all students (B) In girls and boys.

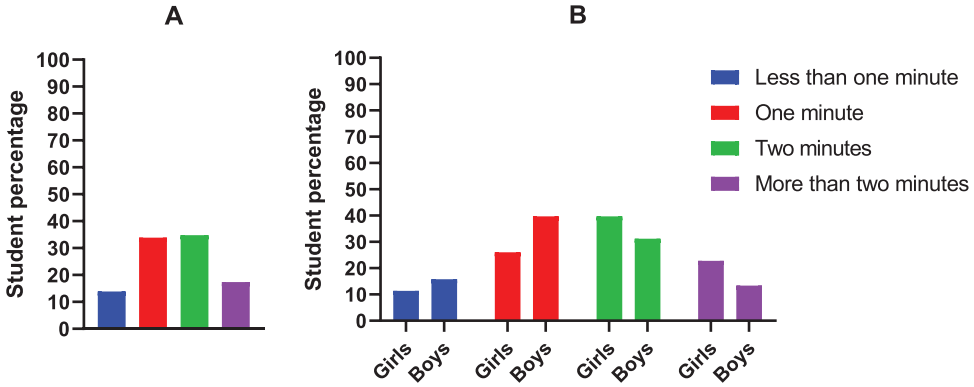

Figure 4: Brushing duration. (A) In all students (B) In girls and boys.

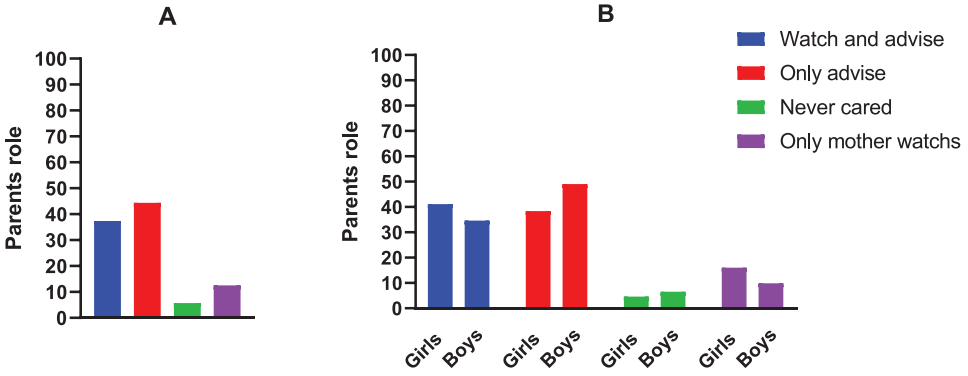

Figure 5: Parent role. (A) In all students (B) In girls and boys.

Approximately, 57% of students were aware that gingival bleeding means inflammation of the gingivae. Notably, girls were more knowledgeable significantly than boys (Figure 6). On the other hand, only around 44% express their knowledge that brushing, and flossing can prevent gingivitis (Figure 7).

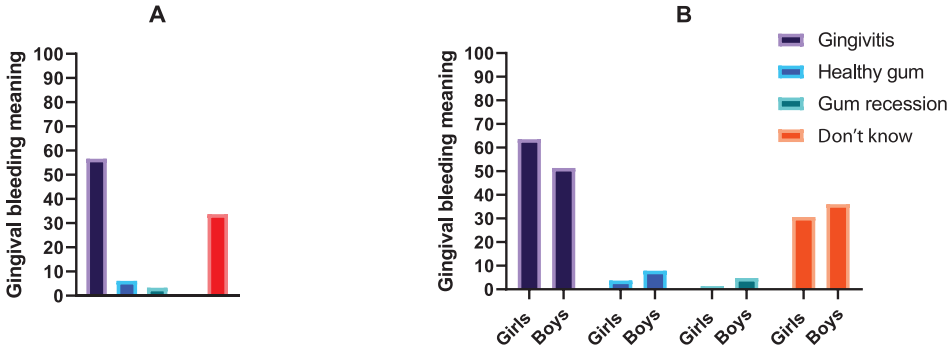

Figure 6: Meaning of gingival bleeding. (A) In all students (B) In girls and boys.

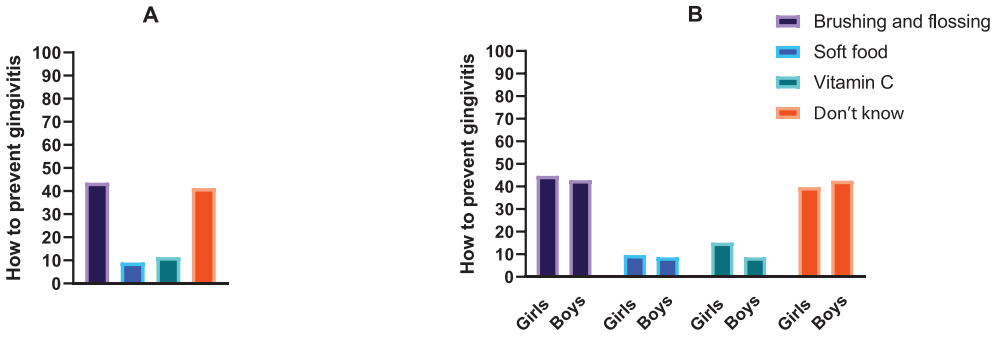

Figure 7: How to prevent gingivitis. (A) In all students (B) In girls and boys.

Approximately 65% of students reported that they haven't had any filled teeth (Figure 8), around 45% have had no decay (Figure 9) and around 40% have got misaligned or crowded teeth (Figure 10). About 22% of students avoid laughing because of their appearance. 24% of girls have this problem compared to 20% of boys (Figure 11).

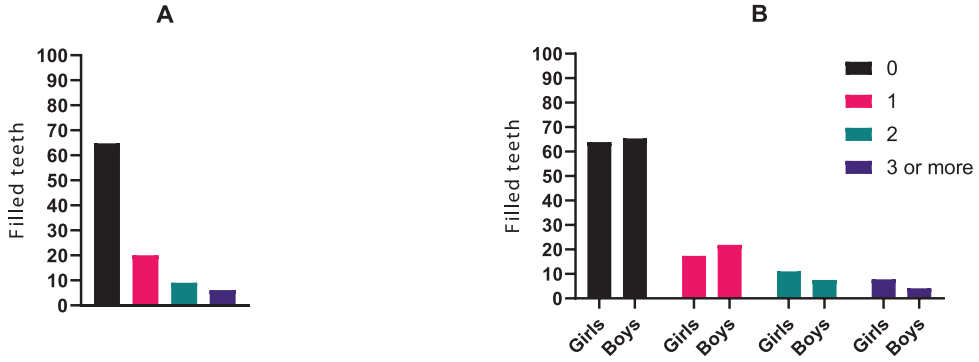

Figure 8: Filled teeth. (A) In all students (B) In girls and boys.

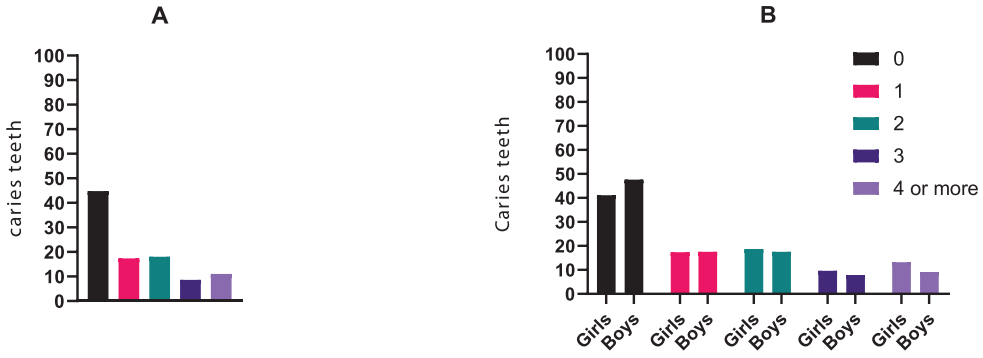

Figure 9: Caries teeth. (A) In all students (B) In girls and boys.

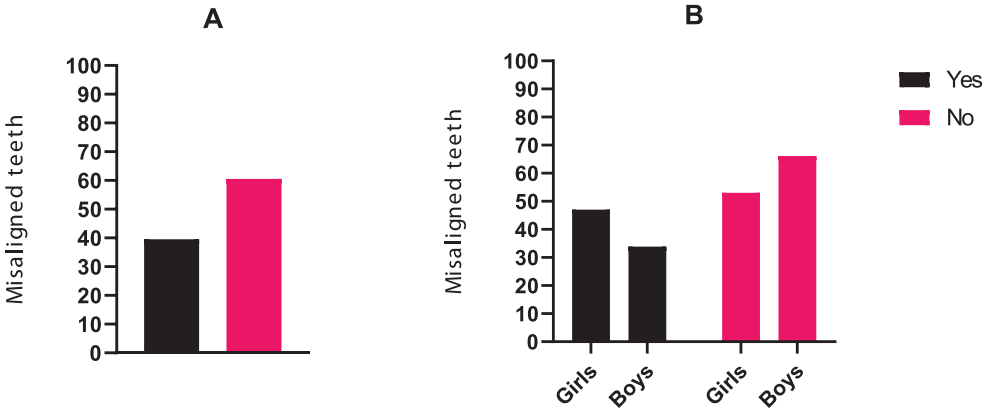

Figure 10: Misaligned teeth. (A) In all students (B) In girls and boys.

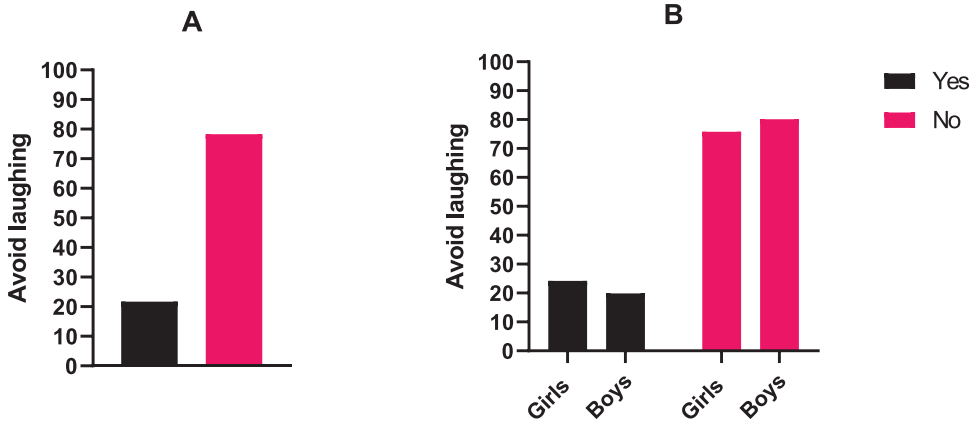

Figure 11: Avoid laughing because of teeth. (A) In all students (B) In girls and boys.

90% of the participants think that tooth decay can affect appearance. Most students (93%) think that sweets affect teeth negatively. In addition, around 83% of students recognize that soft drinks have an adverse effect on their teeth. While most students (93%) exhibit the knowledge that teeth brushing can prevent dental caries, only 43% of them are familiar with the positive effect of fluoride on their teeth. In general, girls were more knowledgeable than boys (Table 2 and 3).

Table 2: Knowledge and awareness of dental and general health among the study population (n=511)

	Frequency	Percentage (%)
Do you think the appearance of the teeth affects face appearance		
Yes	464	90.8
No	45	8.8
Carious teeth can affect teeth appearance		
Yes	456	89.2
No	55	10.8
Sweets affects the teeth adversely		
Yes	476	93.2
No	35	6.8
Fizzy drinks affect the teeth adversely		
Yes	423	82.8
No	88	17.2
Brushing teeth prevents dental decay		
Yes	476	93.2
No	35	6.8
Using Fluoride strengthens the teeth		
Yes	218	42.7
No	293	57.3
regular visits to the dentist are necessary		
Yes	417	81.6
No	94	18.4
General body health has a relationship to oral health		

	Frequency	Percentage (%)
Yes	334	65.4
No	177	34.6
You care about your teeth as much as any part of your body		
Yes	414	81.0
No	97	19.0

Table 3: Knowledge and awareness of dental and general health among girls and boys

	Female	Male	
	Frequency (%)	Frequency (%)	Significance
Do you think the appearance of the teeth affects face appearance			
Yes	208 (95%)	256 (88.3%)	0.008*
No	11 (5%)	34 (11.7%)	
Carious teeth can affect teeth appearance			
Yes	199 (90.9%)	257 (88%)	0.3*
No	20 (9.1%)	31.4 (12%)	
Sweets affects the teeth adversely			
Yes	210 (95.9%)	266 (91.1%)	0.034*
No	9 (4.1%)	26 (8.9%)	
Fizzy drinks affect the teeth adversely			
Yes	187 (85.4%)	236 (80.8%)	0.17*
No	32 (14.6%)	56 (19.2%)	
Brushing teeth prevents dental decay			
Yes	201 (91.8%)	275 (94.2%)	0.29*
No	18 (8.2%)	17 (5.8%)	
Using Fluoride strengthens the teeth			

	Female	Male	
	Frequency (%)	Frequency (%)	Significance
Yes	77 (35.2%)	141 (48.3%)	0.003*
No	142 (64.8%)	151 (51.7%)	
Regular visits to the dentist are necessary	(%)	(%)	
Yes	83.1 (81.6%)	235 (80.5%)	0.45*
No	37 (16.9%)	57 (19.5%)	
General body health has a relationship to oral health			
Yes	160 (73.1%)	174 (59.6%)	0.002*
No	59 (26.9%)	118 (40.4%)	
You care about your teeth as much as any part of your body			
Yes	193 (88.1%)	221 (75.7%)	<0.0001*
No	26 (11.9%)	71 (55.4%)	

Regarding the Attitudes towards the professional dental care, many subjects (58%) reported that they visit the dentist when they have a dental pain (Figure 12). Around 11% of the participants have never been to any dental office. Around 41 % of students reported that they have visited a dentist in the last six months and dental pain was the driving factor for the visit in approximately 65 % of the students. Furthermore, approximately 52% of students reported that they are scared of dental visit, their major source of fear was dental needle (around 25%) and handpiece drilling (around 23%) (Table 4).

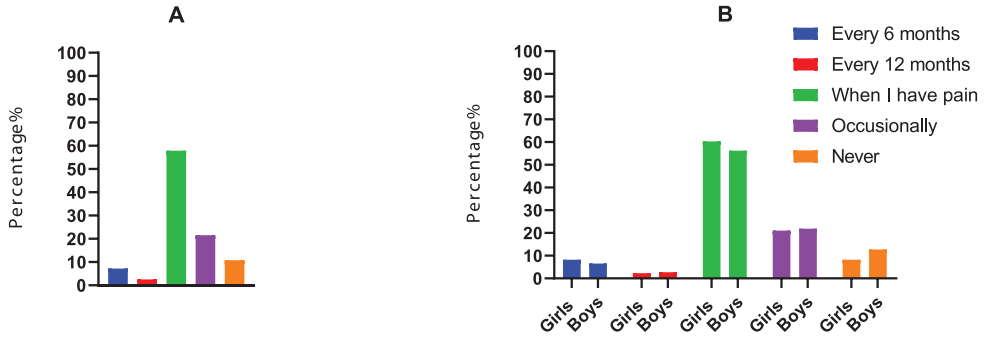

Figure 12: Visit to the dentist. (A) In all students (B) In girls and boys.

Table 4: Attitudes towards professional dental care among the study population (n=511)

	Frequency	Percentage (%)
How often do you visit your dentist		
Regularly every 6 months	37	7.2
Regularly every 12 months	13	2.5
When I have dental pain	296	57.9
Occasionally	110	21.5
I never visited a dentist	55	10.8
Last visit to the dentist was		
Six months ago	209	40.9
Around one year ago	126	24.7
Around two years ago	61	11.9
Around five years ago	33	6.5
More than five years ago	58	11.4
Not applicable	24	4.7
The reason for my last visit to the dentist was		
Not applicable	27	5.3
Dental pain	329	64.4
Family and friend advice	95	18.6
A dentist advised me	30	5.9
Other reasons	10	2.0
Gum bleeding	8	1.6
Orthodontic treatment	11	2.2
Are you scared of dentist visit		
Yes	263	51.5
No	248	48.5
Reasons behind not visiting/ dislike of visiting the dentist		
Not applicable	38	7.4
Fear		
Of Handpiece	116	22.7
Of dental needle	125	24.5

	Frequency	Percentage (%)
In waiting room	43	8.4
From thinking of tomorrow's appointment	43	8.4
High cost	19	3.7
No clinic nearby	15	2.9
No time	52	10.2
The dentist examines and takes care of his or her patients		
Yes	478	93.5
No	33	6.5
What the dentist cares about is treatment not prevention		
Yes	75	14.7
No	436	85.3

Table 5: Attitudes towards professional dental care among girls and boys (n=511)

	Female	Male	
	Frequency (%)	Frequency (%)	Significance
How often do you visit your dentist			***
Regularly every 6 months	18 (8.2%)	19 (6.5%)	>0.05
Regularly every 12 months	5 (2.3%)	8 (2.7%)	>0.05
When I have dental pain	132 (60.3%)	164 (56.2%)	>0.05
Occasionally	46 (21%)	64 (21.9%)	>0.05
I never visited a dentist	18 (8.2%)	37 (12.7%)	>0.05
Last visit to the dentist was			
Six months ago	96 (43.8%)	113 (38.7%)	0.2**
Around one year ago	58 (26.5%)	68 (23.3%)	
Around two years ago	23 (10.5%)	38 (13%)	
Around five years ago	12 (5.5%)	21 (7.2%)	
More than five years ago	21 (9.6%)	37 (12.7%)	
Not applicable	9 (4.1%)	15 (4.1%)	

	Female	Male	
	Frequency (%)	Frequency (%)	Significance
The Management sought in your last visit			
Routine check of my teeth	209 (95.4%)	276 (94.5%)	0.6*
Take X ray	9 (4.1%)	9 (3.1%)	0.53*
Scaling	34 (15.5%)	41 (14%)	0.64*
Gum treatment	12 (5.5%)	16 (5.5%)	1*
Filling	73 (33.3%)	76 (26%)	0.07*
Have crown/bridges	2 (0.9%)	5 (1.7%)	0.4*
Orthodontic treatment	12 (5.5%)	8 (2.7%)	0.11*
Tooth extraction	45 (20.5%)	65 (22.3%)	0.6*
Fluoride application	1 (0.5%)	2 (0.7%)	0.7*
The reason for my last visit to the dentist was			***
Dental pain	153 (69.9%)	176 (60.3%)	<0.05
Family and friend advice	29 (13.2%)	66 (22.6%)	<0.05
A dentist advised me	9 (4.1%)	21 (7.2%)	<0.05
Other reasons	8 (3.7%)	2 (0.7%)	>0.05
Gum bleeding	2 (0.9%)	6 (2.1%)	>0.05
Orthodontic treatment	8 (3.7%)	3 (1%)	<0.05
Symptoms that led to your last visit			***
There was no dental pain	67 (30.6%)	73 (25%)	>0.05
There was severe dental pain	59 (26.9%)	88 (30.1%)	>0.05
There was little dental pain	65 (29.7%)	89 (30.5%)	>0.05
I was feeling not comfortable	8 (3.7%)	10 (3.4%)	>0.05
There was not enough time for treatment	2 (0.9%)	1 (0.3%)	>0.05
There was enough time for treatment	6 (2.7%)	6 (2.7%)	>0.05

	Female	Male	
	Frequency (%)	Frequency (%)	Significance
On my first visit to the dentist			
I was not scared	56 (25.6%)	163 (55.8%)	<0.0001**
I was slightly scared	72 (32.9%)	80 (27.4%)	
I was very scared	82 (37.4%)	26 (8.9%)	
Are you scared of dentist visit			
Yes	164 (74.9%)	99 (33.9%)	<0.0001*
No	55 (25.1%)	193 (66.1%)	
Reasons behind not visiting/ dislike of visiting the dentist			
Fear			
Of Handpiece	67 (30.6%)	49 (16.8%)	<0.0001*
Of dental needle	91 (41.6%)	34 (11.6%)	<0.0001*
In waiting room	23 (10.5%)	20 (6.8%)	0.14*
From thinking of tomorrow's appointment	20 (9.1%)	23 (7.9%)	.227*
High cost	5 (2.3%)	14 (4.8%)	0.14*
No clinic nearby	2 (0.9%)	13 (4.5%)	0.019*
No time	18 (8.2%)	34 (11.6%)	0.21*
The dentist examines and takes care of his or her patients			
Yes	211 (96.3%)	267 (91.4%)	0.025*
No	8 (3.7%)	25 (8.6%)	
What the dentist cares about is treatment not prevention			
Yes	26 (11.9%)	49 (16.8%)	0.12*
No	193 (88.1%)	243 (83.2%)	

- **Discussion:**

The change towards a more Westernized diet in Libya in terms of frequent consumption of manufactured sugared dietary items contributed to the high

experience of dental caries in Libyan schoolchildren (Huew et al., 2012), and due to the lack of primary preventive measures, the increase in dental caries would burden its ailing health care system (Peeran et al., 2014).

In our study, all students were requested to complete the questionnaire designed to evaluate knowledge, attitude and behavior of schoolchildren and perception of their oral health and the dental treatment they received. Girls were more organized, trying to be more precise about each question compared to boys.

The results of this study indicate that the levels of knowledge and attitude were good, but the level of practice was not satisfactory. Students reveal good knowledge regarding how to maintain good oral health, most students recognize that sweets (93.2 %) and fizzy drinks (82.8 %) consumption affect teeth adversely and the majority of the students (93.2 %) aware that the practice of teeth brushing can prevent dental decay. On the other hand, 57.3% of students could not recognize that using fluoride strengthens teeth.

In the present study, 100% of the students brush their teeth with toothpaste. This is in contrary to the study conducted in Benghazi among Libyan pupils (6-12 years), between 1993 and 1994, which showed that majority of the students (42.1% of the sample) did not brush their teeth at all (al-Sharbati et al., 2000). The reason behind this improvement in oral hygiene practice could be accredit to the raise of awareness regarding the importance of oral health in the past 25 years. However, the results, in the previous study conducted in Benghazi, showed that even though tooth brushing practice was not satisfactory, dental caries prevalence among students was relatively low compared to other countries in the region, the study attributed that to the high fluoride content of the drinking-water (al-Sharbati et al., 2000).

In our study, the use of other recommended oral hygiene methods such as the dental floss and mouthwash was still found to be uncommon. These findings are comparable to Al-Samadani et al. (2017) which showed that more than 95% of schoolchildren reported using a toothbrush and toothpaste and more than two thirds of the students were not using any additional means of tooth cleaning. This could be attributed to the cost of such additional aids, and/or due to the lack of self-awareness to the importance of such aids in oral hygiene.

In our sample, although 81.6% of the students realize the importance of regular dental visits, only 40.9 % have visited a dentist during the last 6-12 months, 10.8% of students have never visited any dentist. These findings are in agreement with a study in India, in which 67.8% were aware of the importance of regular dental visits and 35.1% have visited a dentist during

the last 12 months (Harikiran et al., 2008). Similarly, 84.7% of the students were aware of the importance of regular visits to the dentists, but only 35.3% reported that they have visited a dentist during the last 6-12 months (Rad et al., 2015). In our study, most of the children visit the dentist only when they have dental pain. This also agrees with another study by Lian et al. (2010).

Most of the students in this study reported infrequent dental attendances, and this finding is consistent with the findings of other studies regardless of student understanding about the importance of regular dental attendance. Some findings in this study might explain the irregular dental attendance among the participants. A high proportion of the subjects (approximately 48%) reported that they have not attended because of anxiety about treatment or procedures, such as the dental needle and handpiece. This is in agreement with what other studies reported (Al-Omiri et al., 2006, Lian et al., 2010). There are other factors involved, such as high costs of dental care and lack of toothache. Lack of parental encouragement and advice to visit the dentist might also contribute to the irregular dental attendance. In addition, lack of parents' regular dental attendance might be reflected on their children.

For tooth brushing duration, around 13.9% of the students reported brushing for less than one minute, 33.9 % brushing for around one minute, while 35.9% brushing for two minutes. These findings are similar to the study in Ajman, which showed that 14.3% of participants brush their teeth for only 30 seconds, 27.4% brush for one minute, while (35.4%) brush their teeth for two minutes (Dakhili et al., 2014).

Furthermore, we found that 56.6 % of the student exhibit the knowledge that gingival bleeding means gum inflammation. 43.6 % reported that teeth brushing, and dental flossing are the best ways to prevent gingivitis. However, around 41% of the students do not have the knowledge about how to prevent bleeding gum. Similarly, 81.7% of the participants in another study reported that gum disease is not related to teeth cleaning (Dakhili et al., 2014).

However, it is important to highlight the subjectivity and limitation beyond the oral perception self-assessment. This survey is based upon self-reported data derived from schoolchildren with different levels of language ability, and varying levels of familiarity with such questionnaires. This might have affected their responses due to the possible misinterpretation and misunderstanding of the questionnaire items. However, the questionnaire was pre-tested to evaluate students' understanding. During answering the questionnaire, full explanations were given to the students about the questions format and how they should respond to them. Furthermore, investigators were always available during the completion of the questionnaire, and the students were encouraged to ask the investigators whenever they needed clarification of any point.

Conclusion:

In Libya, because of the political and economic changes, and due to the lack of preventive oral health programs, dental caries prevalence is expected to increase. This could burden Libya's already ailing health care system. This study implies the need of preventive strategies to be proceeded on society. The results of this study illustrate that parents' education must be included in any national program that promotes preventive oral care in schools as well as in other oral health educational programs aimed at the general public. These recommendations are based on the findings that children were aware of the importance of dental care, but their parents' perceptions and knowledge seemed to significantly affect their health practice and regular visits to the dentist.

- Appendix

Table 6: Oral hygiene habits among the study population (n=511)

	Frequency	Percentage (%)
Oral Hygiene methods used		
Brush and toothpaste	511	100
Dental floss	25	4.9
Mouthwash	89	17.4
Toothpicks	31	6.1
Brushing Frequency		
Few times a month	37	7.2
Once per week	26	5.1
Once per day	143	28.0
Twice per day	232	45.4
More than twice per day	73	14.3
Brushing intervals		
At morning	406	79.5
Before going to bed	328	64.2
Noon (after lunch)	105	20.5
Other times	33	6.5
Random	8	1.6
Brushing duration		
Less than one minute	71	13.9
One minute	173	33.9
Two minutes	178	34.8

More than two minutes	89	17.4
Role of parents in supervision of oral hygiene		
Watch and advise	191	37.4
Only advise	227	44.4
Never cared	29	5.7
Only my mother watches me	64	12.5

Table 7: Self-reported dental health of participants:

	Frequency	Percentage (%)
How many filled teeth do you have		
0	331	64.8
1	102	20.0
2	46	9.0
3 or more	31	6.1
How many carious teeth do you have		
0	229	44.8
1	89	17.4
2	92	18.0
3	44	8.6
4 or more	56	11
Do you have misaligned teeth		
Yes	202	39.5
No	309	60.5
I avoid laughing because of my teeth		
Yes	111	21.7
No	400	78.3

Table 8: Awareness of periodontal and gingival health among the study population (n=511)

	Frequency	Percentage (%)
Gingival bleeding means		
Gingivitis	289	56.6
Healthy gum	31	6.1
Gum recession	17	3.3
Gingivitis and Gum Recession	2	.4

Don't know	172	33.7
How to prevent gingivitis		
Brushing and flossing	223	43.6
Soft food	46	9.0
Vitamin C	58	11.4
Don't know	211	41.3

- **Difference between boys' and girls' schools:**

Table 9: Oral hygiene habits among the study population (n=511)

	Female	Male	
	Frequency (%)	Frequency Percentage (%)	Significance
Oral Hygiene methods used			
Brush and toothpaste	219 (100%)	292 (100%)	
Dental floss	15 (6.8%)	10 (3.4%)	0.076*
Mouthwash	44 (20.1%)	45 (15.4%)	0.16*
Toothpicks	10 (4.6%)	21 (7.2%)	0.22*
Brushing Frequency			
Few times a month	8 (3.7%)	29 (9.9%)	<0.0001**
Once per week	6 (2.7%)	20 (6.8%)	
Once per day	38 (17.4%)	105 (36%)	
Twice per day	113 (51.6%)	119 (40%)	
More than twice per day	54 (24.7%)	19 (6.5%)	
Brushing intervals			
At morning	176 (80.4%)	230 (78.8%)	0.196*
Before going to bed	163 (74.4%)	165 (56.5%)	<0.0001*
Noon (after lunch)	66 (30.1%)	39 (13.4%)	<0.0001*
Other times	23 (10.5%)	10 (3.4%)	0.001*
Random	4 (1.8%)	4 (1.4%)	0.68*
Brushing duration			

	Female	Male	
	Frequency (%)	Frequency Percentage (%)	Significance
Less than one minute	25 (11.4%)	46 (15.8%)	<0.0001**
One minute	57 (26%)	116 (39.7%)	
Two minutes	87 (39.7%)	91 (31.2%)	
More than two minutes	50 (22.8%)	39 (13.4%)	
Role of parents in supervision of oral hygiene			***
Watch and advise	90 (41.1%)	101 (34.6%)	>0.05
Only advise	84 (38.4%)	143 (49%)	<0.05
Never cared	10 (4.6%)	19 (6.5%)	>0.05
Only my mother watches me	35 (16%)	29 (9.9%)	<0.05

Table 10: Self-reported dental health of participants:

	Female	Male	
	Frequency (%)	Frequency Percentage (%)	Significance
How many filled teeth do you have			
0	140 (63.9%)	191 (65.4%)	0.39**
1	38 (17.4%)	64 (21.9%)	
2	24 (11%)	22 (7.5%)	
3 or more	18 (7.8%)	14 (4.1%)	
How many carious teeth do you have			
0	90 (41.1%)	139 (47.6%)	0.072**
1	38 (17.4%)	51 (17.5%)	
2	41 (18.7%)	51 (17.5%)	
3	21 (9.6%)	23 (7.9%)	
4 or more	29 (13.2%)	27 (9.1%)	

Do you have misaligned teeth			
Yes	103 (47%)	99 (33.9%)	0.003*
No	116 (53%)	193 (66.1%)	
I avoid laughing because of my teeth			
Yes	53 (24.2%)	58 (19.9%)	0.24*
No	166 (75.8%)	234 (80.1%)	

Table 11: Awareness of periodontal and gingival health among the study population (n=511)

	Female	**Male**	
	Frequency (%)	**Frequency (%)**	**Significance**
Gingival bleeding means			***
Gingivitis	139 (63.5%)	150 (51.4%)	<0.05
Healthy gum	8 (3.7%)	23 (7.9%)	<0.05
Gum recession	3 (1.4%)	14 (4.8%)	<0.05
Don't know	67 (30.6%)	105 (36%)	>0.05
How to prevent gingivitis			
Brushing and flossing	98 (44.7%)	125 (42.8%)	0.66*
Soft food	21 (9.6%)	25 (8.6%)	0.68*
Vitamin C	33 (15.1%)	25 (8.6%)	0.022*
Don't know	87 (39.7%)	124 (42.5%)	0.61*

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