



## Open Journal of Dentistry and Oral Health

Research Article

Open Access

### Periodontal health Knowledge and attitudes among primary school teachers in Benghazi city

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**Received Date:** Aug 06, 2022 / **Accepted Date:** Sep 06, 2022 / **Published Date:** Sep 08, 2022

#### Abstract

**Objectives:** To assess periodontal health Knowledge and attitudes among primary school teachers.

**Methods:** cross-sectional study of a random sample of one hundred and seventy seven primary school teachers (in 2022). The collected data were analyzed using SPSS for Windows, version 25. The alpha value was 0.05.

**Results:** A total of 177 primary school teachers filled in the questionnaires. 90% of the teachers were females. Overall, the majority of teachers knew that bad oral hygiene affects the gum health (99.4%). Only 22% knew that treatment of periodontal disease improves glycemic control. Teachers who have a higher level of education had better periodontal health knowledge 79.8% and positive attitude 43.4 %. A statistically significant gradient was observed in high knowledge score and age, also between positive attitudes with age and education level of teachers.

**Conclusion:** there is a need to improve periodontal health knowledge and attitude among school teachers and to learn proper preventive measures to decrease periodontal diseases through oral health education programs in schools.

**Keywords:** Primary Teachers; Cross-Sectional Studies; Periodontal Health; Periodontal Diseases; Schools

**Cite this article as:** Halima A Ayyad, Ghadah Elhassy, Salma mahfoud, et al. 2022. Periodontal health Knowledge and attitudes among primary school teachers in Benghazi city. Open J Dent Oral Health. 4: 01-10.

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#### Introduction

Periodontal disease is one of the most prevalent oral diseases all over the world. The disease affects subjects in all age groups, but it is more common in adult population [1].

Depending on the extent of inflammation, the destructive process may involve the soft tissue surrounding the teeth without loss of attachment (gingivitis), and /or the deep supporting tissue of the teeth; the periodontal ligament, cementum and bone. If gingivitis is

not properly treated, it often proceeds to periodontitis and finally results in tooth loss. Periodontitis is often preceded by gingivitis, which in the early stages of the disease causes inflammation and bleeding [2,3]. Microbial challenge is the primary initiating factor; there are many other variables that modify disease expression. These risk factors interfere with the way the body responds to bacterial invasion [3,4]. They include; age, ethnicity, genetic factors, diabetes mellitus (DM), smoking, alcohol consumption, stress, osteoporosis, and viral infection, which play an important role in the pathophysiology of periodontitis [4,5].

Literature suggests that, there is a link between periodontitis and systemic diseases. These diseases include cardiovascular disease, gastrointestinal, colorectal cancer, diabetes, Alzheimer's disease, respiratory tract infections and adverse pregnancy outcomes. The presence of periodontal pathogens and their metabolites in the mouth may in fact modulate the immune response beyond the oral cavity, thus promoting the development of systemic conditions [6]. The removal of plaque and plaque retentive factors which can be achieved by proper oral self-care and dental visit, are considered the most effective preventive measure [7]. The removal of microbial plaque from the oral cavity, is based on mechanical plaque control and chemical plaque control [7]. Dental health education programs and preventable measures are important for health promotion [8,9].

Education plays an important role in shaping the lives of children and young people and, because school is the second home for most children it has proven effective in helping children learn positive healthy attitude and practices [10,11] Furthermore, Teachers can contribute into this policy making by identifying important health problems caused by periodontal diseases, providing evidence for the effectiveness of specific interventions and suggesting appropriate good example for

implementing them [12]. The role of teachers in oral health education, which is a veritable tool in preventing oral disease, can only be harnessed if they are properly trained [12]. It has been reported that dentist-led, teacher-led, and peer-led strategies of oral health education are equally effective in improving the oral health knowledge and oral hygiene status of adolescents [13]. The outcome of school health programs depends on the teachers as active participants which contribute to the successful implementation of an oral health education program [13,14], while limited instructions on dental health education among teachers or non-motivated teachers result in unsuccessful oral health education programs [14,15].

## Subjects and Method

A cross-sectional study, a random sample of one hundred and seventy seven primary school teachers from the public and private schools in Benghazi City - Libya. The study took place over four months from December 2021 to March 2022.

## Questionnaire design

A structured interview using a close ended questionnaire used in this study. All participants were informed orally about the nature and purpose of the study. Participation in the study were voluntary. The structure of the questionnaire was based on research literature and adapted to the objectives of the study [16-30]. The questionnaire includes three Sections. Section (A); addressing the personal data. Section (B); includes questions testing the basic knowledge and awareness regarding periodontal disease and it is association with systemic health and preventable nature of periodontal disease. Section(C); Addresses the attitude related questions. (Index I).

**Statistical analysis**

The collected data were analyzed using SPSS for Windows, version 25.0 (SPSS Inc., Chicago, USA). Socio-demographic information and data from the questionnaire were summarized using numbers and percentages, Knowledge of periodontal health was assessed using twelve questions. Each correct response received a score of one point. The summed score, created an index for

knowledge of periodontal health, were the correct answers were about 70% from the questions. Similarly, teacher’s attitude regarding periodontal health. For each (agree) choice, which reflects the apposite attitude, the respondent received a score of one point. These score were summed up to give attitude score. Chi-square test used to compare between genders, age, and education level and years of experience, the alpha value was 0.05.

**Result**

**Table 1: demographic characteristics of primary school teacher**

Variables	N <sup>a</sup>	% <sup>b</sup>
<b>Age</b>		
≥30	43	24.3
<30	134	75.7
<b>Gender</b>		
Male	17	9.6
Female	160	90.4
<b>Years of experience</b>		
Less than 5 years	40	22.6
5- 10 years	134	75.7
> 10 years	3	1.7
<b>Education Level</b>		
Mid Institute	50	28.2
High institute	28	15.8
University	99	55.9

<sup>a</sup>N = Number, (%) = percentage.

**Table 2: Percentage distribution of primary school teachers regarding their knowledge about periodontal health.**

Knowledge questionnaires	correct Answer (yes) N <sup>a</sup>	% <sup>b</sup>
Is good oral hygiene necessary for healthy gum?	122	68.9
Is bad oral hygiene affects the gum health?	176	99.4
Is there any association between P.D and general health?	165	93.2
What is dental plaque?	141	79.7
What is calculus?	153	86.4
Do you know the most common signs / symptoms of P.D?	156	88.1
Dose smoking affect periodontal tissues?	142	80.2
Does P.D more common in diabetic patients?	90	50.8
Is the treatment of P.D improves glycemc control?	39	22.0

Do you know that P.D have an implication on certain systemic diseases/conditions?	90	50.8
Do you think P.D are preventable?	158	89.3

<sup>a</sup>N = Number, (%) = percentage.

**Table 3: Causes of P.D**

Cause answer	N <sup>a</sup>	% <sup>b</sup>
Plaque	91	51.4
hereditary factors	9	5.1
Both	41	23.2
Do not know	36	20.3

<sup>a</sup>N = Number, (%) = percentage.

**Table 4: Distribution of primary school teachers regarding their attitude towards periodontal health**

Statement	Agree N(%)	Disagree N(%)	Neutral N(%)
Important to know about P.D and oral hygiene	64 (36.2)	6(3.4)	107(60.5)
Treatment of gum disease is included as a part of general health assessment of the patient to improve overall health	66(37.3)	4(2.3)	107(60.5)

**Table 5: History of P.D among primary school teachers.**

Questionnaires	N	%
Have you ever complained of gum lesions or other conditions?	111	62.7
Did you seek help from your dentist?	108	61.0

**Table 6: The methods by which primary school teachers gained their knowledge about periodontal health.**

Questionnaires	Answer	N	%
Methods by which primary school teachers gained knowledge*	Media	167	74.6
	formal education at university	5	2.8
	Dentist	74	41.8
Do you agree to gain more knowledge regarding PD and wished to receive information about it to involve in the maintenance of periodontal health to school children	Yes	159	89.9

\*= Responses more than one answer.

**Table 7:** The association between Knowledge and studied variables.

Variables	Knowledge		X <sup>2</sup>	P-value
	High N(%) <sup>a</sup>	Low N(%) <sup>a</sup>		
<b>Gender</b>				
Male	12(70.6)	5(29.4)	0.268	0.605
Female	122(76.3)	38(23.8)		
<b>Age</b>				
≥30	38(88.4)	5(11.6)	4.954	0.026 <sup>c</sup>
<30	96(71.6)	38(28.4)		
<b>Years of experience</b>				
Less than 5 years	28(70.0)	12(30.0)	1.769	0.413
5- 10 years	103(76.9)	31(23.1)		
> 10 years	3(100)	0(0.0)		
<b>Education Level</b>				
mid institute	38(76.0)	12(24.0)	4.325	0.115
High institute	17(60.7)	11(39.3)		
University	79(79.8)	20(20.2)		

<sup>a</sup>N = Number, (%) = percentage; <sup>c</sup>P < 0.05, Obtained from chi-square test.

**Table 8:** Comparison of attitude score towards periodontal health according to studied variables.

Variables	Attitude		X <sup>2</sup>	P-value
	Good N(%) <sup>a</sup>	Bad N(%)		
<b>Gender</b>				
Male	8(47.1)	9(52.9)	1.901	0.168
Female	49(30.6)	111(69.4)		
<b>Age</b>				
≥30	6(14.0)	37(86.0)	8.665	0.003 <sup>c</sup>
<30	51(38.1)	83(61.9)		
<b>Years of experience</b>				
Less than 5 years	16(40.0)	24(60.0)	2.697	0.260
5- 10 years	41(30.6)	93(69.4)		
> 10 years	0(0.0)	3(100)		
<b>Education Level</b>				
Mid institute	6(12.0)	44(88.0)	15.23	0.001 <sup>c</sup>
High institute	8(28.6)	20(71.4)		
university	43(43.4)	56(56.6)		

<sup>a</sup>N = Number, (%) = percentage; <sup>c</sup>P < 0.05, Obtained from chi-square test.

A total of 177 primary school teachers filled in the questionnaires. Of these, 9.6 % were males and 90% were females. The age of the teachers in the study ranged from 30-60 years, the majority were over thirty years 75.7%. Concerning the years of experience, 75.7% were teaching from 5-10years, while 22.6%

had an experience less than five years. More than half of the participants 55.9% were University graduates (Table 1). The majority of teachers knew that good oral hygiene is necessary for healthy gum and bad oral hygiene has an adverse effect on the gum health 68.9% and 99.4% respectively. In addition, 93.2% knew there were an

association between periodontal disease and general health. Others knew dental plaque, calculus and the most common signs and symptoms of periodontal disease (79.7%, 86.4% and 88.1% respectively). Fewer participants knew that periodontal disease is more common in diabetic patients (50.8%) and treatment of periodontal disease improves glycemic control 22%. While 89.3% knew that periodontitis can be preventable (Table 2).

About the half of the participants (51.4%) reported that periodontal disease is caused by plaque and just 5.1% by hereditary factors, whereas 23.2% by both factors (Table 3). Out of all participants only 36.2% agreed that it is very important to know about periodontal diseases and oral hygiene and around one third of the participants 37.3% agreed that treatment of gum disease is included as a part of general health assessment of the patient to improve overall health (Table 4). More than half of participants suffered from P.D and were seeking help from your dentist (62.7% and 61% respectively) (Table 5). The majority (89.8%) of teachers stated that they need more knowledge. The main source by which they gained knowledge were the media (74.6%) followed by dentists (41.8 %), while formal education at university was less frequently reported 2.8% (Table 6). Regarding the association of knowledge and studied variables. A clear, but not statistically significant, gradient was observed in high knowledge score and years of experience, the participants who were teaching for more than five years had high knowledge score 76.9%. Also, there were no statistically significant differences in knowledge score among teachers according to gender and education level (0.605 and 0.215 respectively). However, statistically significant was found for age, only (Table 7).

Around one third of female teachers (30.6%) reported they have good attitude score towards periodontal health. There was positive and statistically significant correlation with age

and score of attitude  $p = 0.003$ . With regard to participants education, teachers who's completed University showed higher score attitude score than others (43.4 %, 28.6% and 12 % respectively) with statistically significant difference (Table 8).

## Discussion

The primary objective of this study was to evaluate the elementary schoolteachers' level of oral health knowledge and attitudes towards oral health education. A total of 177 participants were in the study, the majority were females (90%). These findings are consistent with a previous study which found that there were more female teachers than male teachers [16,17]. The age of the teachers ranged from 30 to 60 years with about 75.7% of the population's study aged less than 30 years old which also corresponded with the percentage of instructor who have only 5-10 years of experience (75%). Therefore, we can assume that the teachers in our study have a less experience than Vidya Sekhar's study where the mean age of the teachers was 47 years [18]. Based on their level of education the school teachers were divided into three groups: mid institute 28%. High institute 15% and university 55.9%. More than the half of the participant in our study were university graduate and this may explain the high percentage of the right answers to the most of the questions. About 80% of school teachers know dental plaque and 86% know about calculus. These findings inconsistent with findings from other studies where most adults misunderstood what tooth plaque was and its negative effects, as well as its role in the etiology of gingival disease [16,19-21].

Despite of good knowledge of the instructors about dental plaque and calculus, we found their knowledge to their role in the pathology of periodontal disease was poor. Just half of the participants 51.4% reported that periodontal disease is caused by plaque and only 5.1% by genetic factors, whereas 23.2%

by both factors. This outcome concurs with a cross-sectional survey conducted on the city of Pondicherry. Less than half of the study's participants define plaque and calculus as the primary factors causing periodontitis [18]. Regarding the implications of periodontal disease in certain systemic diseases including diabetes mellitus, Poor knowledge among the school teachers is prevalent and thus has to be corrected by health education. Furthermore, just 22% of people had a general understanding of how periodontal treatment affects diabetic patients' ability to control their blood sugar. One explanation for this might be that dentists in our society don't recognize or promote the positive effects of periodontal treatment on glycemic control and the two-way relationship between diabetes and periodontitis.

The most typical indicator of periodontal disease worldwide is gingival bleeding [22]. 88% of the precipitants know the most common signs and symptoms of periodontal disease. The same outcome was observed in two Jordanian studies as 60.8% and 88 % were aware of gingival bleeding as a sign of periodontal. Disease [19-21]. In the other hand a report among Nigerians led them to mistakenly believe that gingival bleeding was normal [23]. Another Indian study reported that only 54% of school instructors believe gum bleeding indicates inflamed gums [16]. It demonstrates the inadequacy of oral health literacy among those school teachers. It has proven that maintaining good oral health through self-care routines is a component of general health. In our study almost all the participants (93%) agreed that there is an association between periodontitis and general health. This is similar to another survey done by Zhu et al. 2005, as 76% of respondents believe that maintaining good oral and dental health enhances overall health [24]. However, only 37.3% of participants agreed that treatment of gum disease is included as a part of general health assessment of the patient to improve overall health which is lower than

another study conducted by Singh et al in 2021 as about eighty of participants agree that oral and dental health improves overall health [25]. The explanation for this could be a lack of understanding about periodontal health and oral health education programs in schools, as opposed to other developed countries.

Periodontal disease can affect any individual irrespective of age, gender and race to a variable extent and severity. More than half of the sample in the current study 62.7% complained of gum lesions or other conditions and 61.0% seek help from dentist. Compared to other countries, these reported the prevalence Benghazi primary school teacher for visit the dentist when they are in pain are substantially high compared to Nepal and Turkey teachers 48% and 40% of them seek dentist when they have pain [17,25]. The explanation for this higher prevalence in the current study might be due to the fact that in developing nations, pain is primary motivator for dentist visit and lack of dental follow up. The present study revealed the main source of the participant's information about periodontal disease was the media. The media is essential in the planning, development and implementation of any intervention programs designed to assess periodontal health and to reduce P.D [26]. This is in variance with previous studies [17,27] reported that the top sources of oral health knowledge were dentists, this can be explained by that dentist who are health care professionals more focused on treatment than play important role in providing formal education about periodontal health and how to prevent P.D. In addition, the majority of teachers (89.9%) in the present study needed more knowledge and wished to receive information about periodontal health to involve in the maintenance it to school children, which is consistent with previous findings [26]. Also, a cross sectional study among Indian school teachers observed that school teachers, need to improve their awareness and knowledge about oral diseases [28]. While assessing the

knowledge about periodontal health on age basis, findings revealed that participants with age group of over 30 years showed the highest percentage (88.4%) regarding having high periodontal health knowledge. On the other hand, below 30 years age group respondents obtained the low scores of levels of knowledge with statistically significant. These findings were in agreement with the study of Abdulaziz-Alward and Shetty, in 2017 [29]. However in variance with previous studies [28,30]. Explained this by the fact that knowledge and awareness improve with age.

Another interesting finding was that the majority of the teachers who has an experience from 5-10 years (76.9%) had high score of knowledge about periodontal health. However, no statistically significant relation between knowledge score and teaching experience was observed. These findings disagree with previous findings which reported the teachers with more than 10 years of work experience had the highest level of knowledge about oral health [17,26]. It might be assumed that the education about oral health gained from media. Educational level is a strong influence on oral health. In the present study it was observed that the highest level for having good knowledge was among participants who were graduated from university with no statistically significant relation. These findings were in disagreement with previous studies where significant difference was found regarding knowledge about oral health on the basis of qualification [25,30]. As the majority of the participants (86.0%) with over thirty had reported poor periodontal health attitude, and statistically significant was proved between age groups. The negative attitude was increased by age. These findings were in agreement with the study of Abu Alhaija et al in 2018 [31]. Also, a statistically significant relation was reported in the present study between participant's education levels and their attitude. The poor attitude score was among mid institute graduated teachers. This is supported by previous findings where there

was a proved relation between teachers' qualification and their attitude scores related to oral health education attitudes [17,25]. A probable explanation of the present findings may be attributed to higher knowledge among university graduated participants in the current study.

The sample, which was not equally stratified across gender, is the study's first drawback. However, this can be excused because the sample was intended to be as representative as possible of the demographics of Libyan school teachers, who are predominately female.

## Conclusion

The knowledge regarding periodontal health among school teachers was fair. Oral Health promotion programmers must be imparted to primary school teachers training. In return they should intend to help children adopt lifelong healthy behaviors and to improve knowledge and healthy attitudes towards the practice of proper oral health care. Further studies must be done to assess their awareness levels and make the necessary changes in further education.

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