



Assessment of Oral Health Knowledge, Attitude and Practice for Public Primary School Teachers in the City of Madinah, Saudi Arabia

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Author's contribution

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Background: School teachers can play an important role in helping to instill good health habits in their students. Consequently, teachers need to have an adequate knowledge and a proper attitude regarding oral health.

Method and Materials: This is a cross sectional study conducted among public primary school teachers in Al-Madinah city. A questionnaire was distributed in 10 randomly selected schools. All teachers were asked to participate. Data was analyzed using SPSS software.

Results: 200 teachers were asked to participate all of them responded. 81% of the teachers were aware that caries are caused by bacteria in the oral cavity. 69.5% of teachers thinks that fluorides strength teeth. 44.5 % of the teachers brushed their teeth twice a day. Only 15% of the teachers regularly discuss oral health topics with their students. 74.5% of them think that it is necessary to treat tooth caries in primary teeth. 70.5% think that dental health education should be included in the primary school curriculum. 64% of them believed that schools should restrict the consumption of caries causing snacks during school hours.

Conclusion: Teachers' knowledge regarding oral health needs improvement. Their own oral health practices are fair; however, their attitude towards oral health is very positive.

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1. INTRODUCTION

Many consider good health to be a most precious blessing. Oral health is now recognized to have an important relationship to general health [1]. According to the American Dental Association: Oral health is defined as a functional, structural, aesthetic, physiologic, and psychosocial state of well-being and is essential to an individual's general health and quality of life [2].

Oral diseases are now considered to be major public health issues due to their high prevalence and significant social impact [3]. This is due to a general ignorance of or unawareness about the importance of oral health [4].

One of the most critical factors to improve oral health is to enhance societal knowledge about the importance of oral health and its impact on an individual's general health. Studies have shown that there is a direct relationship between an increased knowledge of oral hygiene and better oral health. Good oral hygiene is considered to be the most important factor in the prevention of oral diseases [5].

Oral health habits are formed during the early stages of life [6]. Therefore, early childhood is a highly appropriate time in child development to educate them in the basic concepts of good oral hygiene and sustain their development and maintenance throughout life [7]. Moreover, school age is the most influential period of a child's life and it is this period during which children develop skills, beliefs, and attitudes that they will practice throughout their lives [8].

A school health program should include the following eight components: (1) parent/community involvement; (2) healthy school environment; (3) health services; (4) health education; (5) physical education; (6) nutrition services; (7) counseling, psychological, and social services; and (8) health promotion for school staff [9].

Children spend substantial periods of their life at school in close association with their teachers [10]. Similarly, the knowledge and life-skills needed are acquired and developed during this time period. Shaping ways of life and personality development of school children is a key responsibility of teachers and parents alike [11]. In order to instill the practice of proper preventive

oral health habits, teachers themselves need to have a good knowledge and attitude towards oral health [12]. Therefore, their knowledge about oral health is important for their own oral health and the students they are teaching [13].

It was found that teachers traditionally have participated in school based oral health programs. Teachers often have a better opportunity to teach good dental health practice than dental health professionals. They have daily contact with the children and can influence and instruct all children rather than only those who seek dental care. Also the close relationship between the students and their teachers allows them to individualize information to suit each child. Moreover, teachers are more skilled in educational methods than dentists [14].

However, schoolteachers themselves should practice proper oral hygiene; as well as have a thorough and in-depth knowledge of the more common oral diseases and their modes of prevention [15].

Teachers could increase their knowledge through school-based dental education as it is internationally recognized and plays a potential role in increasing the knowledge.

In a study by Khan et al. [10] from Riyadh City, KSA, it was found that 34% of teachers practiced good oral hygiene, while 50.2% were rated as fair, and 15.8% were rated as poor. Regarding their knowledge, 65% of schoolteachers had a knowledge regarding tooth decay while 45% of schoolteachers were aware of gum diseases.

There is only one published study of oral health knowledge, attitude, and practices of primary school teachers in Al-Madinah, Therefore, there is a need for a study to determine the level of awareness of oral health among teachers and help develop school based oral health promotion programs in our educational system.

2. METHODS

2.1 Study Design

This was cross sectional questionnaire based survey. Public primary schools were randomly selected from a list of all primary schools in Al-Madinah city. All teachers in the selected schools were included in the study.

2.2 Sampling Techniques and Size

The sample size was determined from a sample size equation based on a pilot study. Each primary school in Madinah represents a cluster and 10 schools were randomly selected. Since it was a one-stage cluster sampling all teachers of these selected schools participated. A total of 200 teachers were included in the study.

2.3 Techniques, Instrument and Equipment Needed

The targets of this study were female teachers of public primary schools in Al-Madinah. Letters were sent to Schools' Heads to obtain their permission. The study subject and the informed consent were explained to the participants before they start filling the questionnaires. Those questionnaires (including the consent form) were handed directly to the participants and collected on the same day.

2.3.1 Questionnaire

The study instrument was comprised of a questionnaire constructed from two different tested (published) questionnaires [11,16] translated to Arabic language, then distributed among participants. This questionnaire consisted of 2 parts. The first part included demographic information regarding age, educational category and years of teaching. The second part was designed to evaluate oral health knowledge, practice, and attitudes of teachers. Included were: items on the causes of decay and their prevention, causes of gum disease and their prevention, causes of malocclusion, effects of brushing and using fluoride on the dentition, the meaning of bleeding gums and how to protect against it, the meaning of dental plaque and its effects, and the effects of refined sugar and soft drinks on the dentition.

Assessment of participants' oral health behavior included brushing activity (such as frequency, duration, time, and brushing aids) and dental visits (such as regularity, reason behind the visit and sought treatments).

Items that assessed participants' dental attitudes included attitudes towards regular dental visits, attitude towards restricting consumption of sweets and snacks during school hours, and attitude toward inspecting lunch boxes to make sure students are eating healthy diet. In addition, common complaints of the teachers and the type of oral health education provided at school as

well as ways to improve the same were also included.

2.4 Statistical Analysis

Data from the questionnaire will be entered and analyzed using SPSS.

2.5 Ethical Consideration

This study submitted to the Ethics committee for Ethical review.

Permission requested from the Heads of primary Schools. Informed consent was explained to all participants before start filling the Questionnaire.

3. RESULTS

Data was analyzed using the Statistical Package for Social Science 22.0 (SPSS 22.0).

In this study 200 female teachers in public primary schools in Al-Madinah were surveyed and all of them responded. 76% had a graduate degree, 19.5% had a diploma and 9 participants (4.5%) had a post-graduate degree [Table 1].

Table 1. Socioeconomic characteristics of the study population

Socioeconomic characteristics	Frequency	%
Age		
22-32	63	31.5
33-43	111	55.5
44-54	26	13
55 or older	0	0
Educational category		
Graduate degree	152	76
Post-graduate degree	9	4.5
Diploma	39	19.5
Years of experience		
0-5	76	38
6-10	36	18
11-15	24	12
>= 15	64	32

3.1 Knowledge of Oral Health and Diseases

81% of the teachers agreed that caries are caused by bacteria in the oral cavity. 88% believe that there is a relationship between general body health and oral health and dental diseases. 69.5% of the teachers think using fluoride strengths tooth structure [Table 2].

3.2 Practices of School Teachers Regarding Their Personal Oral Health

44.5 % of teachers brushed their teeth twice daily. 42% brushed for duration of 1 minute [Table3]. 180 teacher used toothpaste and

toothbrush [Table 4]. While 60.5% used a medium bristled brush, 29% used soft bristled brush. 41.5% of them changed their brush every 3 months. Only 15% of the teachers regularly discuss oral health topics with their students [Table 3].

Table 2. Knowledge of oral health and diseases among the study population

Knowledge	Yes		No		Don't Know	
	F	%	F	%	F	%
1 Consuming too much sweet food causes tooth decay/dental caries	192	96	6	3	2	1
2 Caries caused by bacteria in the oral cavity	162	81	14	7	24	12
3 Bacteria are normally in the saliva and on the teeth and gums.	141	70.5	14	7	45	22.5
4 Gum bleeding means inflamed gum	176	88	11	5.5	13	6.5
5 Regular brushing of teeth can protect oneself from gum bleeding	153	76.5	23	11.5	24	12
6 Dental plaque means soft debris on teeth	137	68.5	25	12.5	38	19
7 Dental plaque can lead to dental caries	119	59.5	31	15.5	50	25
8 Dental plaque can lead to gingivitis	127	63.5	16	8	57	28.5
9 Carious or decayed teeth can affect teeth appearance	196	98	2	1	2	1
10 Sweets affect the teeth adversely	193	96.5	5	2.5	2	1
11 Fizzy drinks affect the teeth adversely.	190	95	5	2.5	5	2.5
12 Using fluoride strengthens the teeth	139	69.5	19	9.5	42	21
13 General body health has a relationship to oral health and dental diseases	176	88	9	4.5	15	9.5
14 There is link between periodontal (gum) disease and many medical conditions (e.g. diabetes or heart disease)	116	85	21	10.5	63	31.5
15 Candy or pastries eaten between meals cause more decay than candy or pastries eaten as dessert at a meal	134	67	23	11.5	43	21.5

Table 3. Oral health practices among the study population

Oral health practices	F	%
1 Frequency of tooth brushing		
Once daily	22	11
Twice daily	89	44.5
Three times daily	78	39
More than 3 times	11	5.5
Total	200	100
2 Brushing duration		
Less than a minute	35	17.5
1 minute	84	42
2 minutes	59	29.5
More than 2 minutes	22	11
Total	200	100
3 Brushing time		
At morning	28	14
Before bed	9	4.5
At morning and before bed	136	68
Other	27	13.5
Total	200	100

Oral health practices		F	%
5	Type of tooth brush		
	Soft	58	29
	Medium	121	60.5
	Hard	11	5.5
	Don't know	10	5
	Total	200	100
6	Frequency of changing tooth brush		
	Monthly	48	24
	Every 3 months	83	41.5
	Every 6 months	57	28.5
	Yearly	12	6
	Total	200	100
7	Method of teeth brushing		
	Vertical	79	39.5
	Horizontal	29	14.5
	Circular	53	26.5
	Randomly	39	19.5
	Total	200	100
8	Using fluoridated tooth paste		
	Yes I do	160	80
	No, I don't	9	4.5
	I don't know	31	15.5
	Total	200	100
9	Frequency of dentist visit		
	When I have pain	162	81
	Every 6 months	14	7
	Yearly	21	10.5
	Never	3	1.5
	Total	200	100
10	Last dental visit	93	47.2
	Less than 6 months	49	24.9
	6-12 months	55	27.9
	More than 1 year	197	100
	Total		
11	Reason of the last dental visit		21.3
	It's time for a check-up	42	75.1
	Toothache	148	2
	Advice by dentist	4	5
	Advice by family/friends	1	1
	Other	2	100
	Total	197	
12	Treatment in the last dental visits:		
	Examination and check up	32	16.2
	Scaling and gum treatment	37	18.8
	Filling	81	41.1
	Crown or bridge	7	3.6
	Orthodontic treatment	9	4.6
	Extraction	26	13.2
	Fluoride application	2	1
	Other	3	1.5
	Total	197	100
13	Reason for not visiting the dentist:		
	Afraid of the hand piece	51	25.5
	Afraid of the dental needle	31	15.5

Oral health practices		F	%
Afraid of sitting in the waiting room		5	2.57
Afraid even from thinking of tomorrow's appointment		14	7
Treatment cost is high		17	8.5
No dental clinics nearby		8	4
No time		30	15
No pain to go to dentist		43	21.5
Other		1	0.5
Total		200	100
14	Candy/chocolate/sweet consumption:		
Never / once in a while		15	7.5
1 time/ week		17	8.5
2 times / week		39	19.5
3-5 times / week		35	17.5
Everyday		64	32
Several times per day		30	15
Total		200	100
15	Soft drinks consumption:		
Never / once in a while		80	40
1 time/ week		48	24
2 times / week		36	18
3-5 times / week		12	6
Everyday		20	10
Several times per day		4	2
Total		200	100
16	Discuss oral health topics with your student:		
Yes regularly		30	15
Once in a while		133	66.5
Never		37	18.5
Total		200	100

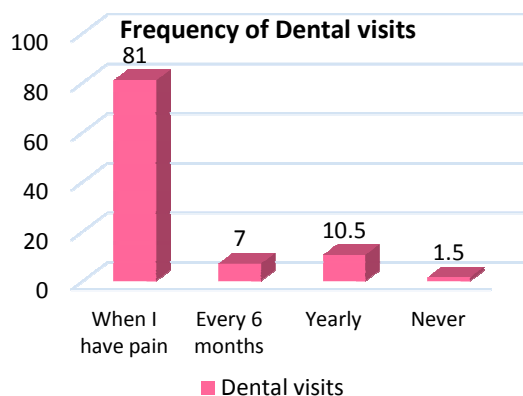


Fig. 1. Frequency of dental visits

3.3 Attitudes toward Oral Health and Oral Health Education

70.5% of teachers think that dental health education should be included in primary schools curricula. 64% felt it is necessary for the schools

to restrict consumption of sweets and snacks during its hours. 70.5% believe that teachers should regularly encourage children to brush their teeth. There is a general belief among all teachers that it is as important to treat tooth caries in baby teeth as it is in the permanent teeth. 50.5% strongly believes that they are responsible for preventing the loss of their teeth. Almost all teachers think that schools should restrict consumption of sweets and snacks during school hours and serve healthy food in their canteen (Table 5).

Table 4. Materials used to clean teeth

Materials used to clean teeth	F
Brush + tooth paste	180
Brush + tooth powder	11
Mouthwash	44
Miswak*	46
Dental Floss	42
Fingers	4
Total	327

*Miswak It is a teeth cleaning twig made from the *Salvadora persica* tree (known as arak in Arabic).

Table 5. Attitudes toward oral health and oral health education among study population

Attitude	Strongly agree		Agree		Uncertain		Disagree		Strongly disagree	
	F	%	F	%	F	%	F	%	F	%
1 only the dentist can prevent dental caries and teeth cavities	29	14.5	27	13.5	35	17.4	87	43.5	22	11
2 If my parents have bad teeth, brushing and flossing will not help my teeth.	18	9	17	8.5	34	17	83	41	48	24
3 By brushing and flossing my teeth I am less susceptible to tooth decay	94	47	69	34.5	24	12	11	5.5	2	1
4 Tooth loss is a normal part of growing old	31	15.5	38	19	71	35.5	53	26.5	7	3.5
5 I am likely to have gingivitis or gum disease in the next year or two	22	11	40	20	100	50	36	18	2	1
6 I am responsible for preventing the loss of my teeth	101	50.5	79	39.5	14	7	6	3	0	0
7 I can prevent gingivitis by flossing my teeth	53	26.5	65	32.5	51	25.5	23	11.5	8	4
8 I believe dentures are less trouble than taking care of my natural teeth.	17	8.5	6	3	20	10	56	28	101	50.5
9 I believe I know how to brush my teeth correctly	33	16.5	44	22	22	11	86	43	15	7.5
10 If my gums bleed when I floss this usually means that I am hurting my gums and I should stop flossing my teeth.	46	23	80	40	36	18	33	16.5	5	2.5
11 If I knew the facts about dental health I could help prevent the loss of my teeth	53	26.5	95	47.5	45	22.5	5	2.5	2	1
12 I believe visiting the dentist is only necessary when I am experiencing pain	121	60.5	70	35.5	7	3	1	.5	1	.5
13 It is important to visit dentist every 6 months for check up	106	53	70	35	18	9	4	2	2	1
14 General health is more important than oral health	36	18	23	11.5	39	19.5	86	43	16	8
15 Treatment of toothache as important as any organ in the body	123	61.5	63	31.5	7	3.5	6	3	1	.5
16 It is necessary to treat tooth caries in baby teeth	149	74.5	47	23.5	4	2	0	0	0	0
17 Dental health education should be included in primary schools curricula.	141	70.5	51	25.5	8	4	0	0	0	0
18 All teachers should have training in dental health education	116	58	60	30	17	8.5	6	3	1	.5
19 It is the duty of school teachers to impart oral health education to the student	122	61	63	31.5	9	4.5	5	2.5	1	.5
20 School teachers must inspect children's lunch boxes	84	42	61	30.5	33	16.5	20	10	2	1
21 Teachers should encourage children to brush their teeth regularly	141	70.5	52	26	6	3	1	.5	0	0
22 Schools should restrict consumption of sweets and snacks during its hours	128	64	55	27.5	16	8	1	5	0	0

4. DISCUSSION

This study presented a comprehensive view of the oral health knowledge, attitude and practices of primary school teachers' representative of the city of Al-Madinah, KSA. According to the best of our knowledge it represents the 2nd study of its kind among primary school teachers in Al-Madinah.

In this study the high response rate (100%) indicates that there is an interest in oral health practices among primary school teachers. However, the results of such questionnaire surveys should be viewed with caution. There is the possibility of bias created by a tendency to provide favorable responses to the questions, especially, if respondents are aware that the survey is being conducted by a specialist from an institution they respect.

In addition, the questionnaire approach has the inherent limitation that the investigator cannot observe the actual behaviors of the subjects in the study. Direct behavioral observations will differentiate between knowing and using information.

A majority of school teachers possess basic knowledge about the relationship between dental caries and oral bacteria. In our study, 81% of the teachers knew that dental caries are caused by bacteria in the oral cavity. These finding are encouraging when compared to the study of teachers in Riyadh were only 48.6% were aware of the relationship between the two [9].

Almost all the teachers recognized sugar consumption as major risk factor in causing dental caries. However, in practice, 32% of them consume sweets and chocolate daily and 15% several times a day. 69.5% of the teachers know the role of fluoride in helping to prevent tooth decay and 80% report using a fluoridated tooth paste.

A study by Sekhar et al. [11], showed that school teachers have a poor knowledge of gum disease. In our study, 25% of the study population did not know the role of dental plaque in causing dental caries and gum diseases. Also 31.5% did not know that there is considered to be a link between periodontal disease and some systemic diseases.

Almost all of those surveyed knew that proper brushing is necessary to maintain oral health.

However, there was a discrepancy regarding the optimum brushing frequency and practice. In our study, all teachers brushed their teeth daily. 44.5% of teachers brushed their teeth twice daily and similar to other studies[11][14], 90.5% used a brush and toothpaste. Also, as similarly reported by others, 41.5% of the teachers changed their brush every 3 months.

41% of school teachers afraid from dental hand piece and needle, this can explain their limited visits to dentist regularly. The use of a soft bristled tooth brush has been recommended [17]. In our study 60.5% used a medium bristle brush and 29% used a soft bristled brush.

The recommended length of time to brush is for 2 minutes [18]. In our study 42% brushed for 1 minute and only 29.5% brushed for 2 minutes.

The majority of teachers (92.5%) agreed that It is the duty of school teachers to impart oral health education to their students but only 15% regularly discussed oral health topics. Also, 88% thought that the frequency of routine dental check-up visits should be every 6 months but only 14% actually practiced the 6-month routine dental check-up visits. Wyne et al in another study from Riyadh, KSA [6] reported similar results. This indicates a discrepancy between belief and actual practice. These findings indicate that dental health professionals need to continuously reinforce and teach good oral health practices to their patients.

In our study school teachers show an overall positive attitude toward oral health and active participation in oral health education for their students. 96% think that dental health education should be included in primary school curriculum. The majority of schoolteachers agreed that they should receive training in dental health education. All these result reflect a positive attitude towards the concept of oral health promotion and how it can be effectively employed in the school curriculum.

7. CONCLUSION AND RECOMMENDATIONS

Hygiene is embedded in our Muslim society and it is a way of life. Schools provide a supportive environment for promoting health to children as well as the entire community. According to our data there is lack of knowledge concerning the importance of dental and oral health among teachers. Teachers need more education in the

area of oral health so that, in collaboration with dental health professionals, they can take an active role in promoting the oral health of their students. Dental caries in children has been always a major health issue in Saudi Arabia and studies showed high carries prevalence among young children. According to recent study by Mahrous et al. [19], shows that the prevalence of caries amongst 6-year-old children in Madinah was reported to be 86% and that for 12-year-old was 68%. Keeping in view the seriousness of the caries problem among our students, Schools and teachers need to take an active role in helping with dental caries prevention. An oral health education curriculum that includes prevention and control of oral and dental diseases should be included in the preschool and primary school programs as a part of National Oral Health Care program.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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