FACULTY OF DENTISTRY, KUWAIT UNIVERSITY

Knowledge and opinions of preventive methods of periodontal disease and dental caries among primary school teachers and students in the Faculty of Education

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Elective Study Project – Course no. 703

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Content

Abstract

Objectives: The aim of this study was to assess knowledge and opinions of preventing caries and periodontal disease among the primary school teachers and students at the Faculty of Education.

Methods: The study was a cross-sectional one. The data were gathered by a structured Arabic questionnaire, which included questions about socio-demographic factors, and knowledge (level and source) of preventing dental caries and periodontal disease. The target populations were teachers from primary schools representing all governorates and students at different study year at the Faculty of Education in Kuwait University. Data were collected over a three months period and analyzed using Pearson's chi-squared test and ANOVA.

Results: Dental knowledge of dental caries and periodontal diseases were similar among primary school teachers and students in the Faculty of Education. Knowledge of periodontal disease was lower than knowledge about dental caries. Both study groups had limited knowledge about xylitol. Despite the recognition of both study groups of the importance of oral health education, most of the teachers admitted that they are not involved in oral health education. Half of the students considered that oral health education should be included in their curriculum. Currently it was almost non-existent.

Conclusions: Even though the knowledge about dental caries among both primary school teachers and students in the Faculty of Education was at an acceptable level, more knowledge is needed with regard to the newest caries prevention methods and concerning periodontal health.

Key words: Oral health knowledge, Teachers, Teacher trainees, Kuwait

Introduction

Awareness of any problem is the first step in the path of managing it properly and preventing it in the future. Despite the presence of school oral health program in Kuwait, it seems that there's a need for another program that emphasizes on education, and that can readily be accessible at all times and by all the students. Schools have an enormous impact on children's attitude and health knowledge among many other aspects of life [1]. Thus, school health programs have huge potential to improve children's health. Children in their first stages of their learning experience are thought to be the ideal target as they are starting to develop both their knowledge and skills. It is also expected that whatever knowledge child gains during the very early years in life it will affect his/her skills and attitude on the long run. Teachers who are constantly in direct contact with children are among the most important persons as they are the direct provider of knowledge in schools. [1]

In USA only, more than 50 million school hours are lost annually because of oral health problems which affect children's performance at school and success in later life [2]. It has been shown that dentist- and teacher-led school-based oral health education strategies are equally effective in improving oral health knowledge and oral hygiene status of adolescents [3]. In Tanzania, oral health-related knowledge improved among students who received a atraumatic restorative treatment given by oral health care staff, as well as among those receiving oral hygiene education from primary school teachers [4]. This suggests that improving the knowledge and changing attitude of teachers can affect the health knowledge and oral hygiene status of their students.

In Kuwait, the most common oral disease, dental caries, is prevalent among children. Among 5- and 6-year-old children, only 12.6% and 14.4 %, respectively, have sound primary dentition with a dft (decayed and filled teeth) score of 0 [5]. In the permanent

dentition, the mean DMFT (decayed, missing and filled teeth) increased from 0.3 at the age of 5 to 3.9 at the age of 14 [5]. More than 2/3 of schoolchildren have fair oral hygiene [6]. In the permanent dentition, caries risk is significantly associated with increasing age and poor oral hygiene [6]. Oral hygiene practices are far-off the international recommendation [7] and daily consumption of sugar-rich products is very high among intermediate school children [8].

In 1990, dental knowledge, attitudes and behavior were studied among Kuwaiti mothers and school teachers [9]. It was concluded that the level of dental knowledge was higher among teachers than mothers and that teachers responded positively to prevention of dental diseases [9]. More recently, the knowledge and practices of oral hygiene methods were assessed among school teachers in Riyadh, Saudi Arabia [10]. Both knowledge and practice of habits were quite similar among male and female school teachers, but there is a need to improve their knowledge regarding oral health and diseases [10].

Similar studies about knowledge and opinions of preventive methods of oral diseases have been conducted in the Health Science College, Public Authority of Applied Sciences and Training and in the Health Science Center, Kuwait University, among students who will be the primary health care providers. Among Health Science College male students, knowledge on some oral health topics – such as the role of fluoride in caries prevention and the role of sugar in caries etiology – seemed to be appropriate. However, they had limited knowledge on other issues, like meaning of calculus [11]. Oral health knowledge was significantly higher among female students than among male students [12]. A study among Health Sciences Centre students in Kuwait University revealed that students did not have correct knowledge about the causes and prevention methods of dental caries and periodontal diseases [13]. In

general, female students were more aware and concerned about oral health issues and more engaged in oral health behavior than male students [13].

For evaluating impact of school environment on oral health and oral health habits in Kuwait, current information is needed from focused group of people working in the schools as teachers and from students, the future teachers.

Aim

The aim of this study was to compare knowledge and opinions of preventing caries and periodontal disease between primary school teachers and (the) students at the Faculty of Education.

Specific objectives were to find out

1) if the curricula of the schools and the Faculty of Education includes any information concerning oral health education (OHE) and whether the school teachers are involved in teaching it.
2) if the schools have dental clinics with preventive services (including OHE) and what are teachers' opinions about it.

Subjects and Methods

Study design & study population

This cross-sectional study using structures questionnaires was conducted from April to July 2013 among teachers in public primary schools and students in the Faculty of Education (FoE) in Kuwait. The study included all 6 governorates, Capital, Hawally, Al-Jahra, Al-Ahmadi, Mubarak Al-Kabeer and Al-Farwaniya. From each governorate, 2-3 areas were randomly selected by using computerized random numbers, and from each area, one boys' and one girls' school were selected from the list of the schools provided by the Ministry of Education. A total of 24 schools (10% of primary schools in Kuwait) were approached. All teachers (N=566) in the selected schools were invited to participate in this study. (Representing 10% of the primary school teachers in the public schools in Kuwait.) Five hundred fifty four teachers answered the questionnaire; response rate being 99.6% (Table 1).

Table 1. The number of teachers in primary schools in Kuwait and the sample of teachers in this study, according to the governorate.

	Primary school teachers in Kuwait (N)			**Sample of teachers (n)**	
Governorate	Boys' schools	Girls' schools	Total	Aimed	Completed
Capital	388	399	787	79	74
Hawally	406	398	804	80	76
Al-Jahra	484	520	1004	100	102
Al-Ahmadi	656	656	1312	131	128
Mubarak Al-Kabeer	287	308	595	60	56
Al-Farwaniya	551	605	1156	116	118
Total	2772	2886	5658	566	554

Total number of the students in the Faculty of Education in 2012/2013 was 5698. Altogether 505 questionnaires were distributed in classes by FoE teachers without a pre-specified percentage of participants per study year.

The studies in the Faculty of Education are based on a course system; no specific courses or subjects are specifically taken by the first, second or third year students. There were fewer participants from year 4 than from the years 1-3 while most of the students in year 4 were doing their rotations in schools and could not be reached. Four hundred eighty two students answered the questionnaire; response rate was 95.4%. Number of students participating was 201 in the first study year, 113 in the second year, 110 in the third year, and 32 in the fourth year, respectively. Twenty six students did not report their study year.

Study instrument

Two partly different Arabic questionnaires were used, one for primary school teachers (Appendix 1) and the other one for students in the Faculty of Education (Appendix 2). The questionnaires contained 3 sections. The first section included the socio-demographic background information (age, gender, nationality, and marital status). Level of education, place of work (governorate) and years of working experience were included in the teachers' questionnaire while study year was included in the students' questionnaire. Section 2 assessed oral health knowledge of periodontal disease and dental caries with 16 questions (answer options: yes, no, I don't know) Section 3 concerned oral health education with 7 questions in the teachers' questionnaire and 6 questions in the students' questionnaire (answer options: yes, no, no opinion; or: yes/no).

The questionnaire was piloted among teachers and retired school teachers who worked or at the time of the piloting used to work in different schools in Kuwait and among some students in the Faculty of Education as well. No changes were made either one of the questionnaires after piloting, as all questions were clear and understood similarly between participants.

Ethical considerations

The Ethical Committee of the Health Sciences Centre, Kuwait University approved the study (Appendix 3). Permission to conduct the study was obtained from the Ministry of Education and the Dean of the Faculty of Education (Appendices 4-5). Participants were asked to fill in the written informed consent and return it together with the questionnaire.

Statistical analysis

The data were entered and analyzed by SPSS version 21.0. Frequency distributions were created to all study variables. Cross tabulations with Pearson's chi-squared test were used to determine the associations between knowledge and opinion questions and different categorized variables. Associations between knowledge and opinion questions and age (continuous variable) were analyzed by analysis of variance (ANOVA). Differences at the p-value smaller than 0.05 were accepted as significant. Summary variable for knowledge of periodontal disease was formed from 5 questions (i.e. questions about gum bleeding when brushing, dental plaque as a cause of gum disease, bone destruction connected to gum disease, and prevention by toothbrushing

and flossing). Summary variable for knowledge of dental caries was also formed from 5 questions (bacteria causing caries, snacking increasing the risk of tooth decay, fluoride in toothpaste and xylitol preventing caries, and if prevention of caries is possible). These questions were first dichotomized by giving “1” to a correct answer and “0” to incorrect or don't know answers. Then these five variables were counted together. Association between knowledge sum and other study variables were analyzed by ANOVA.

Results

Demographic background

Females represented the majority of the teachers and students (Table 2). Clearly more teachers were expatriates than students ($p<0.0001$). The mean age of teachers was 32.58 years (SD ± 6.345; range 20-58) and of students 19.99 years (± 2.702; range 18-40). Thus, the marital status also differed greatly between the teachers and students. Half of the teachers had worked between 6 and 15 years, over one-third five years or fewer. The majority of the teachers (94.2%) had a bachelor degree. Only 2.7% (n = 15) had a master or PhD degree.

Table 2. Proportions of teachers and students based on their socio-demographic backgrounds.

Background variable	**Teachers n (%)**	**Students n (%)**
Gender		
- Female	521 (94.2)	457 (94.8)
- Male	32 (5.8)	25 (5.2)
Nationality		
- Kuwaiti	363 (67.1)	456 (95.4)
- Non-Kuwaiti	178 (32.9)	22 (4.6)
Marital status		
- Single	87 (15.8)	380 (79.2)
- Married	460 (83.5)	100 (20.8)
- Widowed	4 (0.7)	-
Years of working experience		
- Less or equal to 5	197 (35.8)	-
- 6–15	275 (49.9)	-
- 16–25	59 (10.7)	-
- More or equal to 26	20 (3.6)	-

Teachers' socio-demographic background varied considerably between the governorates where the school they work in is located (Table 3). Only age did not differ.

Table 3. Proportions (%) of teachers working in different governorates according to their socio-demographic background.

Background variable	**Capital**	**Hawally**	**Al-Jahra**	**Al-Ahmadi**	**Mubarak Al-Kabeer**	**Al-Farwaniya**	***p-value**
Nationality							
- Kuwaiti	75.3	59.5	55.4	76.4	74.5	63.1	
- Non-Kuwaiti	24.7	40.5	44.6	23.6	25.5	23.6	0.004
Marital status							
- Single	23.0	18.9	12.7	10.9	25.0	12.8	
- Married	75.7	87.2	87.3	89.1	73.2	87.2	
- Widowed	1.4	0	0	0	1.8	0	0.039
Working experience							
- ≤ 5 years	39.2	44.7	27.5	29.9	41.8	38.5	
- 6–15	37.8	40.8	64.7	56.7	38.2	48.7	
- ≥ 16	23.0	14.5	7.8	13.4	20.0	12.8	0.006

*Pearson's Chi-squared test

Knowledge of periodontal disease

Almost half of both teachers and students thought that slight bleeding on brushing is normal (Table 4). However, almost 2/3 replied that slight bleeding on brushing is a sign of gingival disease; teachers more often that the students. Dental plaque as one of the causes of gingival disease was identified statistically significantly more often by the teachers than students. About half of the teachers knew that gingival disease can lead to bone destruction; proportion being significantly higher than among the

students. Most of the teachers and students reported that brushing and flossing can prevent gingival disease.

Table 4. Proportion of teachers and students who replied correctly to the questions concerning periodontal diseases.

Knowledge statements (and correct answer)	**Teachers n (%)**	**Students n (%)**	**p-value***
Periodontal diseases			
1. Slight bleeding on brushing is normal (no)	275 (49.8)	247 (51.2)	0.838
2. Slight bleeding on brushing is a sign of gum/gingival disease (yes)	379 (69.0)	320 (66.5)	0.020
3. One cause of gum diseases is dental plaque (yes)	418 (77.4)	307 (63.8)	<0.0001
4. Gum disease can lead to bone destruction (yes)	271 (51.0)	214 (45.1)	0.002
5. Gum disease can be prevented by brushing and flossing (yes)	447 (81.6)	385 (80.2)	0.493

*Pearson's Chi-squared test

Among teachers, in-group differences in knowledge questions of periodontal diseases, evolved between background variables and "slight bleeding on brushing" and between background variables and "bone destruction". Non-Kuwaiti teachers were significantly more often aware that bleeding on brushing is not a normal sign than their Kuwaiti colleagues (60.1% vs. 44.3%; p=0.001). The correct knowledge concerning bone destruction (Table 5) was more common among Kuwaiti teachers (p=0.030), among those with longer working experience (p=0.013), and among teachers working in Al-Ahmadi and Mubarak Al-Kabeer (p<0.0001).

Table 5. Proportion of teachers (%) who replied correctly to a question concerning periodontal disease and bone destruction, according to background factors.

	Gum disease can lead to bone destruction		
	Yes	**No/Don't know**	**p-value***
Nationality			
- Kuwaiti	54.0	11.9/34.1	
- Non-Kuwaiti	46.1	20.4/33.5	0.032
Years of working experience			
- Less or equal to 5	45.4	15.9/38.6	
- 6–15	50.0	16.0/34.0	
- 16 or more	68.8	7.8/23.4	0.013
Governorate (working place)			
- Capital	48.6	12.5/38.9	
- Hawally	49.3	9.9/40.8	
- Al-Jahra	42.7	31.3/26.0	
- Al-Ahmadi	59.7	12.1/28.2	
- Mubarak Al-Kabeer	57.4	5.6/37.0	
- Al-Farwaniya	48.2	12.3/39.5	<0.0001

*Pearson's Chi-squared test

The lowest level of knowledge of bone destruction was found among teachers working in Al-Jahra. Almost 1/3 or more of teachers in all areas didn't know whether gum disease can cause bone destruction. The lowest proportion of teachers in Al-Jahra (72.5%) knew that gum disease can be prevented by brushing and flossing while the proportion in Mubarak Al-Kabeer was 90.9%, in Capital 89.0%, in Hawally 86.7%, in Al-Ahmadi 81.3%, and in Farwaniya 77.4% (p=0.001), respectively. Mean age of teachers was statistically significantly (p=0.015) associated with the knowledge of gum disease and bone destruction. The mean age for teachers who knew that gum disease can lead to bone destruction was higher (33.4 years; SD 6.88) than among those who didn't know it (31.6; 4.94) or replied "don't know" (31.7; 6.01).

Amongst students, a significant difference was found between the study year and "bleeding on brushing" question. Students in the study years 1 and 2 had significantly more often correct knowledge than the senior students (50.7%/62.8% vs. 39.1%/46.9%; p=0.020). The younger students reported more often that gum disease can be prevented by brushing and flossing (p=0.034).

Only 18.1% of the teachers and 16.6% of the students answered correctly to all questions concerning periodontal disease. Almost one third (28.5%) of teachers and 35.3% of students had 0-2 correct replies. There was a statistically significant difference between teachers and students in the mean sum of periodontal knowledge. The mean sum score was 3.2 (SD 1.29) among teachers and 3.0 (1.35) among students (p=0.032). Among teachers, only statistically significant difference was found according to the governorates where they work (p=0.035). The highest mean score was found among teachers in the schools in Mubarak Al-Kabeer (3.7; 1.17) and the lowest one in Farwaniya (3.0; 1.19). Female students had a higher knowledge sum (mean=3.1; SD 1.27) than males (2.8; 1.25) (p=0.003). Periodontal knowledge sum also varied significantly according to the year of study (p=0.030); the students in the beginning of their studies had higher mean sum scores than students more close to their graduation.

Knowledge of dental caries

Identifying bacteria as a cause of tooth decay was known by less than 2/3 of the participants (Table 6). More than 90% of the participants believed that tooth decay can be prevented. Majority of the participants identified the role of using fluoridated tooth paste in prevention of tooth decay; teachers significantly more often than

students (p<0.0001). Majority believed that dental decay can be prevented, and that snacking of potentially cariogenic food products (chips, chocolate and candies etc.) several times per day increases the risk of tooth decay. Xylitol was not recognized as a caries preventive sweetener, and most of the participants didn't know whether xylitol is a natural sweetener or an artificial one.

Table 6. Proportion of teachers and students who replied correctly to the questions concerning dental caries.

Knowledge statements (and correct answer)	**Teachers n (%)**	**Students n (%)**	**p-value***
Dental caries			
1. The cause of tooth decay is bacteria (yes)	339 (63.5)	310 (64.3)	0.063
2. Fluoride in tooth paste is important in preventing tooth decay (yes)	490 (89.9)	303 (79.8)	<0.0001
3. Xylitol can be beneficial in preventing tooth decay (yes)	76 (13.9)	70 (14.6)	0.913
4. Increased risk of tooth decay can be due to snaking too many times a day (yes)	470 (85.8)	418 (86.7)	0.551
5. Tooth decay cannot be prevented (no)	515 (95.9)	461 (95.8)	0.294

*Pearson's Chi-squared test

Among teachers, in-group differences in knowledge questions of caries were found between working area (governorate) and "bacteria causing caries" and "xylitol preventing dental caries" (p=0.011). In Hawally governorate 77.8% of the teachers identified bacteria as a cause for tooth decay in comparison to 55.7% in Al-Jahra (p=0.006). Xylitol was recognized beneficial in preventing dental decay by 24.8% of the teachers in Al-Jahra but by less than 10% in Al-Ahmadi and Mubarak Al-Kabeer (p=0.011).

Only gender was strongly associated with most of the caries knowledge statements amongst students (Table 7); females having more knowledge in the majority of the statements. However, total number of male respondents was quite small. Younger female students had more knowledge about the use of fluoridated tooth paste in caries prevention compared to older and male students ($p<0.05$). Older students reported clearly more often that snacking is not a risk for caries ($p=0.020$).

Table 7. Proportion of students who replied correctly to the questions concerning dental caries, according to gender.

Knowledge statements (and correct answer)	**Boys n (%)**	**Girls n (%)**	**p-value***
Dental caries			
1. The cause of tooth decay is bacteria (yes)	9 (36.0)	301 (65.9)	0.009
2. Fluoride in tooth paste is important in preventing tooth decay (yes)	15 (60.0)	368 (80.9)	0.041
3. Xylitol can be beneficial in preventing tooth decay (yes)	6 (24.0)	64 (14.0)	0.226
4. Increased risk of tooth decay can be due to snaking too many times a day (yes)	15 (60.0)	403 (88.2)	<0.0001
5. Tooth decay cannot be prevented (no)	23 (93.0)	438 (96.1)	0.029

*Pearson's Chi-squared test

Less than 6% of both teachers and students replied correctly to all caries questions. Around 18% had 0-2 correct replies. There was no difference between teachers and students in the mean sum of caries knowledge. The mean sum score was 3.4 for both groups. Among students, only statistically significant difference was found between females (mean 3.4; SD 0.91) and males (2.7; 0.98) ($p<0.0001$).

Oral health education

Over 90% of teachers and students, especially Kuwaiti females ($p<0.05$) thought that oral health education is an important subject to be taught in schools. However, less than half of the teachers considered that it's the role of the teachers to educate their students about the matter (Table 8).

Table 8. Opinions of teachers and students concerning oral health education.

Questions	**Teachers n (%)**	**Students n (%)**	**p-value***
Do you think that Oral Health Education is an important subject to be taught in schools?			
- Yes	509 (92.7)	451 (94.0)	
- No	25 (4.6)	20 (4.2)	
- No opinion	15 (2.7)	9 (1.9)	0.626
Do you think it is the role of teachers to educate their students about this matter?			
- Yes	259 (47.2)	287 (59.8)	
- No	246 (44.7)	149 (31.0)	
- No opinion	44 (8)	44 (9.2)	<0.0001
Do you think enough effort have been put by the School Oral Health Program with regards to this matter?			
- Yes	269 (49.2)	188 (39.2)	
- No	209 (38.2)	243 (50.7)	<0.0001
- No opinion			
Do you agree that every school should have a dental clinic in it that can provide student with oral health education and prevention?			
- Yes	503 (92.3)	444 (92.5)	
- No	25 (4.6)	21 (4.4)	
- No opinion	17 (3.1)	15 (3.1)	0.987

*Pearson's Chi-squared test

A statistically larger proportion ($p<0.0001$) of the students of the Faculty of Education than the teachers thought that it's part of the teacher's job. Teachers differed in their opinion regarding their role in oral health education according to the governorate they work ($p=0.012$). In Al-Ahmadi 54.7% and in Mubarak Al-Kabeer 52.7% of the teachers believed that they have no role in teaching oral health education. Nearly 2/3 of teachers in all governorates were not involved in teaching their students about their oral health.

Almost 50% of teachers thought that not enough efforts have been put by the school oral health program with regards to OHE. Most of the teachers and students emphasized the importance of having dental clinics in schools that can provide students with oral health education and prevention. Even though 70% of the teachers participated in the study had dental clinic in their schools, almost ¼ of them did not know whether oral health education is provided to the students by the dental clinic or not. This proportion was especially big (43.2%) in Mubarak Al-Kabeer, and significantly higher than in other governorates ($p=0.020$). The lowest proportion (18.8%) was found in Capital.

Fifty eight percent of students agreed on that oral health education is an important subject to be included in their curriculum; 62% of females compared to 48% of males ($p<0.009$). The majority (82%) denied having a module that contain information about oral health education in their curriculum.

Discussion

This is the first study conducted to compare knowledge and opinions of preventive methods of dental caries and periodontal disease among primary school teachers and students in the Faculty of Education in Kuwait. The results regarding knowledge of periodontal disease and toothbrushing were similar between the two groups. Most knew that brushing and flossing can prevent gingival disease and half of both groups wrongly believed that bleeding on brushing is normal. Teachers had better knowledge about the role of dental plaque as a possible cause of gingival disease and that gum disease can lead to bone destruction. This might be because teachers were older than students and might have experienced periodontal problems themselves. The highest knowledge level of bone destruction was among teachers working in Al-Ahmadi and Mubarak Al-Kabeer. Kuwaiti teachers were more aware of bone loss and more Kuwaiti teachers were working in these areas than non-Kuwaiti ones. However, also in Capital the majority of teachers were Kuwaitis but had one of the lowest levels of knowledge of bone destruction. Diffuse knowledge of periodontal disease has been found among schoolteachers in Kuwait also earlier [9]. Among students, young female students had the best knowledge level of periodontal disease.

The knowledge concerning dental caries was similar between teachers and students; majority of both groups giving correct answers to the different statements. The knowledge and prevention of the gingival disease was less known subject compared to the knowledge and prevention of dental caries. These results are similar to the results of the study conducted in 1990 among Kuwaiti mothers and school teachers [9] in which more than 2/3 of the teachers acknowledged the role of sugar and bacteria as a cause of dental caries. And almost all teachers acknowledged the preventive role of fluoride. In addition, dental knowledge was higher among school

teachers compared to mothers, which has been confirmed also in China. [14]. While teachers are constantly in direct contact with children it is extremely important that their knowledge level of health issues is high.

In the Arabian Gulf region, particularly in KSA (Kingdom of Saudi Arabia), both knowledge and practice of oral hygiene habits were quite similar among male and female school teachers [10], while in Kuwait, female teachers' knowledge was higher. In general, the knowledge level of teachers in Kuwait was higher than in Saudi Arabia.

Among students in the Faculty of Education oral health knowledge was significantly higher among female students than among male students. Similar results were reported among the students in the Health Science College and Health Science Centre, Kuwait University [11-13]. In general, it seems that female students are more aware and concerned about oral health issues than male students in spite of where they study. However, in our study, the proportion of male students was very low and generalization is not very well justified.

Even though primary schools teachers were aware of the importance of the oral health education and the importance of having dental clinic in their schools, unfortunately, they were less interested in educating their students about the matter. Especially Kuwaiti teachers in Mubarak Al-Kabeer and Al-Ahmadi had this attitude. A study among Arab schoolteachers in northern Israel revealed, that teachers had positive attitudes toward enlightening the parents about the importance of oral hygiene and tutoring the children about preventive dentistry, while that they were less motivated about being involved in dental health school programs [15]. Students in the Faculty of Education showed more interest about oral health education than teachers. These results are similar to a study conducted in Tanzania, East Africa [16]. However, dental

knowledge was to some extent as low as in our study. In Tanzania, in-service teachers and teacher trainees were regarded as moderately informed about oral health is some aspects and poorly informed in others, thus affecting their attitude, oral health status and behaviors related to oral health [16]. Nevertheless, both groups had positive attitudes toward school oral health education [16]. In another study, Tanzanian students (teacher trainees) were more prepared to teach about the importance of personal habits for oral health, and had higher levels of oral health knowledge than Ugandan students [17]. In Nigeria, West Africa, primary school teachers lacked the knowledge of oral health, but had positive oral health attitude [18]. While another study conducted in the Nigerian state of Lagos concluded that primary school teachers have a poor attitude to oral health issues [19]. In Trinidad and Tobago, South America, the majority of teachers demonstrated positive attitude in the regard of their own involvement in the school-based dental health education [20], compared to low interest of teachers in Kuwait.

A study conducted in Kuwait about school teachers' knowledge of tooth avulsion and dental first aid before and after receiving information about avulsed teeth and replantation revealed that a lecture followed by discussion is an effective and efficient method of intervention [21]. This approach is likely to be successful in tackling the problem of poor knowledge in certain areas of oral health, for example xylitol as preventing dental caries. The level of knowledge of which was very low in our study populations. Training school teachers using a manual covering health education, promotion and incorporation of oral health-friendly activities in the school curriculum has been shown to be a successful approach and thus can be considered as a probable method of increasing awareness among teachers [22]. Health Promoting Schools concepts (HPSc), which has been implemented by many countries, is another idea that

could be implemented and has been proven to have a positive impact on health related attitudes and practices, However, oral health is often viewed as a distinct, separate entity to general health [23, 24]. In China, the HPS program had a positive effect on oral health knowledge and attitudes of mothers and teachers [25]. In Brazil, schools with health promoting policies have had a higher percentage of caries free children [26]. It's important to note, however, that no sufficient evidence for the efficacy of primary school-based behavioral interventions for reducing caries currently exists, according to a Cochrane review [27].

This topic has not been studied very much and new information was gained especially from the knowledge and attitude of the teacher students. The response rate of the teachers was very high and the sample represented the whole country which gives more strength for generalization of the results. However, the data were collected by self-administered questionnaires, when biases might be caused while self-reported information might not always be reliable. Thus, some caution has to be taken when interpreting the results. Another limitation of the study was that the sample of the students in the Faculty of Education was not based on equal proportion of participants from each study year. Also the number of male teachers and students was low which needs to take into account when generalizing the results between genders. For further studies a bigger sample of male students would be needed.

Conclusions

In conclusion, knowledge of dental caries and periodontal disease and the prevention methods are similar between teachers and students even though students are younger, suggesting that there is an improvement in general awareness of the population. The knowledge about periodontal diseases is still lower than that of dental caries. Unfortunately, information about new prevention method, xylitol, was not well known by either of study groups. Even though both study groups emphasized the importance of having dental clinic in schools and educating pupils about oral health, unfortunately a high percentage of teachers are not involved in educating their pupils and do not thinks that it's part of their job to do so. However there is hope as students in the Faculty of Education are enthusiastic about this matter and high percentage of them wants oral health education to be a subject in their curriculum.

Recommendations

Based on the literature and the findings of our study we would recommend the following methods and techniques for improving the knowledge and changing the attitude of primary school teachers and teacher students regarding oral health:

1- Lectures about periodontal health for school teachers followed by discussion.
2- Providing teachers with supplies, materials, and printed information (manual) about oral health to facilitate passing the information to their students and to make their participation in oral health education more desirable.
3- Incorporating teachers in the oral health education provided by clinics located in schools and enlightening them about the type of services provided by the clinic, especially in Mubarak Al-Kabeer and Al-Ahmadi.

4- Implementing Health Promoting Schools concepts (HPSc), i.e. health promoting policies at schools.
5- Including oral health education to the curriculum of the Faculty of Education.

Acknowledgments

We would like to thank our mother, Suad Ismael who was of great help and assistance to us while implementing this study. We also extend our appreciation to Mrs. Anisha for preparing the data entry and basic analysis, and for Dr. Sisko Honkala for supervision and guidance. We also would like to extend our gratitude to the teachers and students who participated in this study, the administrative staff in the schools and Faculty of Education, and the dean's secretary in the Faculty of Education, Kuwait University for their vital role in the implementation of this study.

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Appendix 1

استبيان للمدرسين\ مدرسات

✓ القسم الأول (البيانات الديموغرافية)

1- العمر(بالسنوات) : .....

2- الجنس:
- ذكر
- أنثى

3- الجنسية:
- كويتي
- غير كويتي

4- الحالة الاجتماعية:
- أعزب
- متزوج
- أرمل

5- المستوى التعليمي:
- دبلوم
- بكالوريوس
- ماجستير
- دكتوراه

6- المحافظة التي يقع فيها مقر عملك:
- العاصمة
- حولي
- الفروانية
- الجهراء
- مبارك الكبير
- الأحمدي

7- سنوات الخبرة :
- 5≥ (5 سنوات أو أقل)
- 6-15
- 16-25
- 26≤ (26 سنة أو أكثر)

✓ القسم الثاني (المعرفة عن صحة الفم)

الرجاء اختيار الإجابة التي تظن بأنها صحيحة لكل سؤال في هذا القسم بوضع علامة (x). الرجاء اختيار إجابة واحدة فقط لكل سؤال.

السؤال / الإجابة	نعم	لا	لا أعرف
1- وجود القليل من الدم أثناء تفريش الاسنان شيء طبيعي.			
2- وجود قليل من الدم أثناء تفريش الاسنان دليل على أمراض اللثة			
3- من الممكن ان يسبب الجير أمراض اللثة.			
4- أمراض اللثة ممكن أن تؤدي إلى تدمير العظم.			
5- الوقاية من أمراض اللثة ممكنه عن طريق تفريش الأسنان و استخدام خيط الأسنان بانتظام.			
6- تسوس الأسنان شيء طبيعي.			
7- سبب تسوس الأسنان هو البكتيريا			
8- تناول الوجبات الخفيفة (رقائق البطاطس, الشوكولاتة و الحلويات , إلخ) أكثر من مرة في اليوم يزيد من احتمالية تسوس الأسنان.			
9- تناول الوجبات الخفيفة (رقائق البطاطس, الشوكولاتة و الحلويات , إلخ) بكثرة مرة واحدة يزيد من احتمالية تسوس الأسنان.			
10- ممكن الوقاية من تسوس الأسنان			
11- ممكن الوقاية من تسوس الأسنان عن طريق تفريش الأسنان فقط.			
12- تفريش الأسنان و استخدام خيط الأسنان ضروري للوقاية من تسوس الأسنان.			
13- وجود مادة الفلورايد في معجون الأسنان مهمة للوقاية من تسوس الأسنان.			
14- مادة الزايليتول محلي طبيعي.			
15- مادة الزايليتول محلي صناعي .			
16- ممكن أن تكون مادة الزايليتول مفيدة للوقاية من تسوس الأسنان.			

17- كم مرة في اليوم تقوم بتفريش أسنانك؟

- مره واحده
- مرتان
- أكثر من مرتين
- لا أقوم بتفريش أسناني

✓ القسم الثالث (صحة الفم و الأسنان في مجال التعليم)

هذا الجزء من الاستبيان يتعلق بأهمية صحة الفم و الأسنان و تطبيقها في مجال التعليم. يرجى وضع علامة (x) بجانب الإجابة. الرجاء اختيار إجابة واحدة فقط لكل سؤال.

السؤال / الإجابة	نعم	لا	لا رأي
1- هل تعتقد/ تعتقدين أن التوعية بصحة الفم و طرق الوقاية			

موضوع مهم يجب أن يُدرس بالمدارس؟			
2- هل تعتقد/ تعتقدين أن تعليم الطلاب/الطالبات عن هذا الموضوع هو من مسؤولية المُدرس/ المُدرسة ؟			
3- هل تعتقد/ تعتقدين أن برنامج الصحة المدرسية قد بذل مجهود كافي فيما يتعلق بهذا الموضوع ؟(التوعية بصحة الفم و الأسنان و طرق الوقاية)			
4- هل توافق/ توافقين على وجوب احتواء كل مدرسة على عيادة أسنان تقوم بتوعية الطلبة/الطالبات عن صحة الفم و الأسنان و طرق الوقاية ؟			

5- هل أنت منخرط/ منخرطة في تعليم و توعية الطلاب/ الطالبات عن صحة الفم ؟
   - نعم
   - لا

6- هل لديكم عيادة أسنان في المدرسة ؟
   - نعم
   - لا

(إذا أجبت بنعم على السؤال السابق (السؤال السادس), الرجاء الإجابة على السؤال التالي أيضا)

7- هل يتم تقديم التوعية بصحة الفم و الأسنان للطلبة/للطالبات من قبل عيادة الأسنان في المدرسة؟
   - نعم
   - لا
   - لا أعرف

شكرًا على تعاونكم

Questionnaire for teachers

✓ Demographic Data

1- Age (in years): ……

2- Gender:
   - Male
   - Female

3- Nationality:
   - Kuwaiti
   - Non Kuwaiti

4- Marital status:
   - Single
   - Married
   - Widowed

5- Level of education:
   - Diploma
   - Bachelor
   - Masters Degree
   - PhD

6- Governorate where you work:
   - Asemah
   - Hawali
   - Farwaneyah
   - Jahrah
   - Mubarak Al-Kabeer
   - Al-Ahmedi

7- Years of experience:
   - ≤ 5
   - 6 – 15
   - 16 – 25
   - ≥ 26

✓ Oral Health Knowledge

In the following 16 questions, what do you think is the correct answer? Please tick (x) only one option for each question.

Answer / Question	Yes	No	I don't know
1. Slight bleeding on brushing is normal			
2. Slight bleeding on brushing is a sign of gum (gingival) diseases			
3. One of the causes of gum (gingival) diseases is dental plaque			
4. Gum disease can lead to the destruction of bones in the jaws			
5. Gum (gingival) disease can be prevented by regular tooth brushing and flossing			
6. It is normal to have tooth decay			
7. The cause of tooth decay is bacteria			
8. Snaking (chips, chocolate and candies etc.) too many times a day can increase the risk of tooth decay			
9. Snaking (chips, chocolate and candies etc.) too much at once can increase the risk of tooth decay			
10. Tooth decay can be prevented			
11. Tooth decay can be prevented just by brushing your teeth			
12. Regular tooth brushing and flossing is needed to prevent tooth decay			
13. Fluoride in tooth paste is important in preventing tooth decay			
14. Xylitol is a natural sweetener			
15. Xylitol is an artificial sweetener			
16. Xylitol can be beneficial in preventing tooth decay			

17. How many times do you brush your teeth?
    - Once
    - Twice
    - More than twice
    - I don't brush my teeth

✓ Oral Health Education

With the following 7 questions we want to ask about the importance and implementation of oral health education. Please tick (x) only one option for each question.

Question \ Answer	Yes	No	No opinion
1. Do you think that Oral Health Education is an important subject to be taught in the schools?			
2. Do you think it is the role of the teachers to educate their students about this matter?			
3. Do you think enough efforts have been put by the School Oral Health Program with regards to this matter?			
4. Do you agree that every school should have a dental clinic in it that can provide students with oral health education and prevention?			

5. Are you involved in teaching the student about their oral health?

- Yes
- No
-

6. Do you have a dental clinic in your school?

- Yes
- No

If you answered yes to the previous question, please answer the following question.

7. Is Oral Health Education provided to the student by the clinic?

- Yes
- No
- I don't know

8. How many times a day do you brush your teeth?

- 1 time
- 2 times
- >2 times

- I don't brush my teeth

Thank you for participating

Appendix 2

استبيان للطلبة

✓ القسم الأول (البيانات الديموغرافية)

8- العمر (بالسنوات) :

9- الجنس:
- ذكر
- أنثى

10- الجنسية:
- كويتي
- غير كويتي

11- الحالة الاجتماعية:
- أعزب
- متزوج
- أرمل

12- السنة الدراسية : .....

✓ القسم الثاني (المعرفة عن صحة الفم)

الرجاء اختيار الإجابة التي تظن بأنها صحيحة لكل سؤال في هذا القسم بوضع علامة (x). الرجاء اختيار اجابة واحدة فقط لكل سؤال.

السؤال / الإجابة	نعم	لا	لا أعرف
1- وجود القليل من الدم أثناء تفريش الاسنان شيء طبيعي.			
2- وجود قليل من الدم أثناء تفريش الاسنان دليل على أمراض اللثة			
3- من الممكن ان يسبب الجير أمراض اللثة.			
4- أمراض اللثة ممكن أن تؤدي إلى تدمير العظم.			
5- الوقاية من أمراض اللثة ممكنه عن طريق تفريش الأسنان و استخدام خيط الأسنان بانتظام.			
6- تسوس الأسنان شيء طبيعي.			
7- سبب تسوس الأسنان هو البكتيريا			
8- تناول الوجبات الخفيفة (رقائق البطاطس, الشوكولاتة و الحلويات , إلخ) أكثر من مرة في اليوم يزيد من احتمالية تسوس الأسنان.			
9- تناول الوجبات الخفيفة (رقائق البطاطس, الشوكولاتة و الحلويات ,			

إلخ) بكثرة مرة واحدة يزيد من احتمالية تسوس الأسنان.			
10- ممكن الوقاية من تسوس الأسنان			
11- ممكن الوقاية من تسوس الأسنان عن طريق تفريش الأسنان فقط.			
12- تفريش الأسنان و استخدام خيط الأسنان ضروري للوقاية من تسوس الأسنان.			
13- وجود مادة الفلورايد في معجون الأسنان مهمة للوقاية من تسوس الأسنان.			
14- مادة الزايليتول محلي طبيعي.			
15- مادة الزايليتول محلي صناعي .			
16- ممكن أن تكون مادة الزايليتول مفيدة للوقاية من تسوس الأسنان.			

17- كم مرة في اليوم تقوم بتفريش أسنانك؟

- مرة واحدة
- مرتان
- أكثر من مرتين
- لا أقوم بتفريش أسناني

✓ القسم الثالث (صحة الفم و الأسنان في مجال التعليم)

هذا الجزء من الاستبيان يتعلق بأهمية صحة الفم و الأسنان و تطبيقها في مجال التعليم. يرجى وضع علامة (x) بجانب الإجابة. الرجاء اختيار إجابة واحدة فقط لكل سؤال.

السؤال / الإجابة	نعم	لا	لا رأي
8- هل تعتقد/ تعتقدين أن التوعية بصحة الفم و طرق الوقاية موضوع مهم يجب أن يُدرس بالمدارس؟			
9- هل تعتقد/ تعتقدين أن تعليم الطلاب/الطالبات عن هذا الموضوع هو من مسؤولية المُدرس/ المُدرسة ؟			
10- هل تعتقد/ تعتقدين أن برنامج الصحة المدرسية قد بذل مجهود كافي فيما يتعلق بهذا الموضوع ؟(التوعية بصحة الفم و الأسنان و طرق الوقاية)			
11- هل توافق/ توافقين على وجوب احتواء كل مدرسة على عيادة أسنان تقوم بتوعية الطلبة/الطالبات عن صحة الفم و الأسنان ؟			
12- هل تعتقد/ تعتقدين ان موضوع صحة الفم و الأسنان و طرق الوقاية مهم لأن يضاف إلى مقررك الدراسي؟			

13- هل توجد لديك مادة في مقررك الدراسي تحتوي على معلومات عن صحة الفم و الأسنان؟

- نعم
- لا
- لا أعرف

شكراً على تعاونكم

Questionnaire for students

✓ Demographic Data

8- Age (in years): ……

9- Gender:
- Male
- Female

10- Nationality:
- Kuwaiti
- Non Kuwaiti

11- Marital status:
- Single
- Married
- Widowed

12- Study year: ……

✓ Oral Health Knowledge

In the following 16 questions, what do you think is the correct answer?

Please tick (x) only one option for each question.

Answer / Question	Yes	No	I don't know
1. Slight bleeding on brushing is normal			
2. Slight bleeding on brushing is a sign of gum (gingival) diseases			
3. One of the causes of gum (gingival) diseases is dental plaque			
4. Gum disease can lead to the destruction of bones in the jaws			
5. Gum (gingival) disease can be prevented by tooth brushing and flossing			
6. It is normal to have tooth decay			
7. The cause of tooth decay is bacteria			
8. Snaking (chips, chocolate and candies etc.) too many times a day can increase the risk of tooth decay			
9. Snaking (chips, chocolate and candies etc.) too much at once can			

increase the risk of tooth decay			
	Yes	No	I don't know
10. Tooth decay can be prevented			
11. Tooth decay can be prevented just by brushing your teeth			
12. Regular tooth brushing and flossing is needed to prevent tooth decay			
13. Fluoride in tooth paste is important in preventing tooth decay			
14. Xylitol is a natural sweetener			
15. Xylitol is an artificial sweetener			
16. Xylitol can be beneficial in preventing tooth decay			

17. How many times do you brush your teeth?
    - Once
    - Twice
    - More than twice
    - I don't brush my teeth

✓ Oral Health Education

With the following 6 questions we want to ask about the importance and implementation of oral health education. Please tick (x) only one option for each question.

Answer / Question	Yes	No	No opinion
1. Do you think that Oral Health Education is an important subject to be taught in the schools?			
2. Do you think it is the role of the teachers to educate their students about this matter?			
3. Do you think enough efforts have been put by the School Oral Health Program with regards to this matter?			
4. Do you agree that every school should have a dental clinic in it that can provide students with oral health education and prevention?			
5. Do you think Oral Health Education is an important subject to be included in your curriculum?			

6. Do you have any module in your curriculum which contains information about Oral Health Education?

- Yes
- No
- I don’t know

Thank you for participating

Appendix 3

Shuhub Supervisor

Hessa Hussain Sisko

Fatma Husain

جـامعـة الكـويت Kuwait University | كلية الطب Faculty of Medicine | مكتب العميد Dean's Office

التاريخ : 2013/2/12
الرقم / ع ك ط/ ٨١

السيد الدكتور / عميد كلية طب الأسنان المحترم

تحية طيبة وبعد ،،،

الموضوع : تسهيل مهمة الباحثة/ حصة حسين والباحثة فاطمة حسين
بإشراف د. سيسكو هونكالا
إجراء مقابلات مع طلبة كلية التربية

يرجى التفضل بالإحاطة بأن اللجنة الفرعية المفوضة من الدائمة لتنسيق البحوث الطبية والصحية المشكلة بموجب القرار الوزاري رقم 2012/207 قد أوصت اللجنة باجتماعها المنعقد يوم الأحد الموافق 2013/2/10 بالموافقة على إجراء البحث المقدم من الباحثة / حصة حسين والباحثة فاطمة حسين بإشراف د. سيسكو هونكالا (طلبة كلية التربية) تحت عنوان:
Knowledge and opinions of preventive methods of dental caries and periodontal disease.

ويتم البحث باستخدام استبيان لجمع البيانات من طلبة كلية التربية ومدرسي المرحلة الابتدائية بعد استيفاء الإقرار المستنير من المشاركين بالبحث Informed Consent.

لذلك يرجى الموافقة على توصية اللجنة الفرعية على تسهيل مهمة الباحثين مع التزامهما بالمحافظة على حقوق المشاركين بالخصوصية وسرية المعلومات وعدم تداولها خارج إطار البحث والحصول على الاقرار المستنير من المشاركين بالبحث حسب الضوابط المنظمة لذلك.
وتفضلوا بقبول فائق الاحترام ،،،،

الأستاذ الدكتور/ عادل خضر عايد
عـــميد كلية الطب

نسخة: د/ وليد الفلاح – وكيل وزارة الصحة المساعد للتخطيط والجودة
رئيس اللجنة الدائمة لتنسيق البحوث الطبية والصحية.
ع ع/ زف.

EXAMINED
كلية طب الأسنان
الوارد
التاريخ ١٣/ ٢/ ٢٠١٣
الإشارة ط س/ ١٦٦

Appendix 4

75/30/EA0026699/10/5000

دَوْلَةُ الكُوَيْت

(٩)

وزارة التربية

مكتب الوكيل المساعد للتعليم العام

Ministry of Education
Office Of Under Secretary

Ref : _____

Date : _____

المرجع: وت/ت/٩٠٧

التاريخ: ٢٠١٣/٣/٦

السادة / مديري عموم المناطق التعليمية ، المحترمين.

تحية طيبة ،، وبعد

الموضوع : دراسة استبيانيه في مدارس المرحلة الابتدائية

بالإشارة إلى كتاب السيد الدكتور / عميد كلية طب الأسنان – جامعة الكويت ، الوارد إلى السيدة / وكيل الوزارة ... المؤرخ 2013/2/18م ، بشأن طلب تسهيل مهمة الباحثتان (**حصة حسين / وفاطمة حسين**) في تنفيذ دراسة علمية ميدانية ، تم الموافقة عليها من قبل جامعة الكويت بتاريخ : 2013/2/10م

يرجى الإيعاز إلى من يلزم بالتعميم على إدارات مدارس المرحلة الابتدائية في منطقتكم التعليمية ؛ لتسهيل مهمة الباحثتان المشار إليهما ؛ خلال زيارتهم للمدارس.

للعلم واتخاذ اللازم.

مع خالص التحية

الوكيل المساعد للتعليم العام

الوكيل المساعد للتعليم العام

وزارة التربية

الوكيل المساعد للتعليم العام

نسخة لـ :- الوكيل المساعد للتعليم العام.
- الوكيل المساعد لقطاع البحوث والمناهج
- الملف (أ. بدرية السابح)

K877

ص.ب :٧ الصفاة 13001 الكويت - هاتف : ٢٤٨١٥٠١١ - ٢٤٨٣٥٧٤٣ - فاكس : ٢٤٨٣٥٧٣٣ - ٢٤٨٢٣٩٨٨ تلكس :٢٣١٦٦
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E-mail : pesector@moe.edu.kw

Appendix 5

Shudents Supervisor

Hessa Hussain Sisko

Fatma Hussain

جـامعة الكـويت | كلية الطب | مكتب العميد
Kuwait University | Faculty of Medicine | Dean's Office

التاريخ : 2013/2/12
الرقم / ع ك ط/ ٨١

السيد الدكتور / عميد كلية طب الأسنان المحترم

تحية طيبة وبعد ،،،

الموضوع : تسهيل مهمة الباحثة/ حصة حسين والباحثة فاطمة حسين
بإشراف د. سيسكو هونكالا
إجراء مقابلات مع طلبة كلية التربية

يرجى التفضل بالإحاطة بأن اللجنة الفرعية المفوضة من الدائمة لتنسيق البحوث الطبية والصحية المشكلة بموجب القرار الوزاري رقم 2012/207 قد أوصت اللجنة باجتماعها المنعقد يوم الأحد الموافق 2013/2/10 بالموافقة على إجراء البحث المقدم من الباحثة / حصة حسين والباحثة فاطمة حسين بإشراف د. سيسكو هونكالا (طلبة كلية التربية) تحت عنوان:

Knowledge and opinions of preventive methods of dental caries and periodontal disease.

ويتم البحث باستخدام استبيان لجمع البيانات من طلبة كلية التربية ومدرسي المرحلة الابتدائية بعد استيفاء الإقرار المستنير من المشاركين بالبحث Informed Consent.

لذلك يرجى الموافقة على توصية اللجنة الفرعية على تسهيل مهمة الباحثين مع التزامهما بالمحافظة على حقوق المشاركين بالخصوصية وسرية المعلومات وعدم تداولها خارج إطار البحث والحصول على الاقرار المستنير من المشاركين بالبحث حسب الضوابط المنظمة لذلك.

وتفضلوا بقبول فائق الاحترام ،،،،

الأستاذ الدكتور/ عادل خضر عايد
عـــميد كلية الطب

نسخة: د/ وليد الفلاح – وكيل وزارة الصحة المساعد للتخطيط والجودة
رئيس اللجنة الدائمة لتنسيق البحوث الطبية والصحية.
ع ع/ زف.

SCANNED

كلية طب الأسنان
الوارد
التاريخ ١٣/ ٢/ ٢٠١٣
الإشارة: ك.ط.س/ ١٦٦

السيد/ المدير المساعد للشؤون الأكاديمية
تحية طيبة وبعد،،،
☐ للحفظ
☐ الرجاء الإفادة
☑ لاتخاذ الإجراءات اللازمة
☐ الرجاء إعداد الرد للتوقيع عليه
☐ لإحاطتكم علما
عميد الكلية

١٣/٢/١٤

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