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International Journal of Current Research
Vol. 9, Issue, 04, pp.48953-48960, April, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

THE INFLUENCE OF ORAL HEALTH AWARENESS ON PERIODONTAL DISEASE STATUS AMONG SOME UNIVERSITY NON DENTAL STUDENTS IN KING KHALID UNIVERSITY

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ARTICLE INFO

Article History:
Received 23rd January, 2017
Received in revised form
14th February, 2017
Accepted 16th March, 2017
Published online 20th April, 2017

Key words:

King Khalid University,
Oral health awareness,
Periodontal diseases.

ABSTRACT

Background: Oral and dental health are a fundamental part of public health and the proper health behaviors and attitudes are necessary for health correlated workings. It depends on the person recognition and his behavior. Attitudes usually reveal his experiences, familial beliefs, culture and other life conditions that have an effect on oral health behavior.

Aim of the study: The present study was designed for evaluating the influence of oral health awareness on periodontal disease status among university non dental students in King Khalid University.

Methodology: Three hundred university, non dental students were selected in this study and they were divided according to their selected colleges into three equal groups Humanities, Engineering and Sciences. They completed the questionnaire of the present study during a personal interview. Plaque index (PLI), gingival index (GI), periodontal pocket depth (PPD), and clinical attachment loss (CAL) were recorded. The data were collected and analyzed by means of computerized SPSS statistical package.

Results: All the patients completed the study uneventfully. Participants showed poor knowledge of causes, signs, symptoms, and preventive measures of gum disease; there were significance differences between our study groups (p 0.05) and there were significance differences between the first level and final level an almost of the participants of our study groups (p 0.05). In periodontal examination there was statistically significant differences in all the periodontal parameters in the comparison between all groups of the present study and harmonious with their oral hygiene knowledge.

Conclusion: There were significant differences in oral health awareness related periodontal disease and status among non dental students in King Khalid University in different levels of studies and different specialist.

Citation: Mohammed M.A. Abdullah Al-Abdaly, Mohammed Salman J. Almalki, Hussein Mohammed A. Alhelaly, Majed Ali H. Almajdoa and Bandar Hassan Mohammad Alfifi, 2017. "The influence of oral health awareness on periodontal disease status among some university non dental students in King Khalid University", *International Journal of Current Research*, 9, (04), 48953-48960.

INTRODUCTION

Periodontal diseases and dental caries are the most common oral diseases (Akpata, 2004) and bacterial plaque is considered as the main etiologic factors of periodontal diseases, whereas numerous other factors as diabetes, poor nutrition, stress, smoking and hormonal changes may influence on the formation and development of periodontal diseases (Scannapieco, 1998) this depends on personal attitude and control of these etiologic factors (Levine, 1989) and regardless of the race, gender, residence, socioeconomic status and education and according to Epidemiological studies there were different forms of gingivitis and periodontitis may be detected in all age groups (Oliver *et al.,* 1991) but in other studies, there were a positive correlation between periodontal health and level of education (Sanders *et al.,* 2006; Dye *et al.,* 2005). Recently, there are many studies interest in the young adults behaviors and attitudes and the relation of that with oral hygiene status (Kawamura *et al.,* 1993; Honkala, 1995) the students in universities are considered the main population group to assess oral hygiene status, awareness and exercise among educated groups and young adult the dental students are the most important group of university students who are supposed to have ideal oral hygiene status and oral hygiene behavior (Kumar *et al.,* 2010; Kumar Tadakamadla *et al.,* 2010). But some studies among dental students revealed that the oral hygiene, attitude was varied in countries, according to health education systems of students and community cultures (Kawamura *et al.,* 2000 & 2002). In Arabic countries, there were many studies for evaluating the prevalence of periodontal diseases (Quteish Taani, 2004) also to assess knowledge and awareness of periodontal diseases among adults and children

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(Taani *et al.,* 2003) but these studies were few among university students (Al-Wahadni *et al.,* 2004; Al-Omari *et al.,* 2005; Barrieshi-Nusair *et al.,* 2006). During the revising the available literature of university students oral health awareness on periodontal disease status, there were little data regarding to impact of a student's level in the humanities or science or engineering faculties on oral hygiene knowledge although the level of students might have distinguished effect on student's oral hygiene knowledge and oral hygiene instructions for them or other students in different colleges at the university and there is little information about oral hygiene knowledge among university students in developing countries like Saudi Arabia in comparison with students from developing countries. Knowledge of oral hygiene relative to periodontal diseases plays important role in the prevention and management of periodontal diseases among children, adolescents, adults and the students in university (Hugoson *et al.,* 2007; Al-Ansari *er al.,* 2007). So, the present study was designed for evaluating the influence of oral health awareness on periodontal disease status among university non dental students in King Khalid University.

MATERIALS AND METHODS

Cross sectional study was used to collect our study data from king Khalid University, Abha, Saudi Arabia during the academic year 2016-2017, by a close-ended questionnaire, the study was approved by the Research and Ethics Committee, Faculty of Dentistry, King Khalid University, Abha, Saudi Arabia, and informed consent was taken from the participants.

A. Patients samples

Three hundred above of 18 years non dental students were included in the current study.

The objective groups were students of the first (n=50) and final (n=50) educational levels, including faculties of Humanities (n=100), Engineering (n=100) and Sciences (n=100). The participants were gained the study questionnaire explanation regarding to medical, dental terms and periodontal diseases during the study, then, all questionnaires were checked and all the items were answered and participants were required to complement any missing data (table 1).

B. Clinical examinations

Plaque index (PLI) of Silness and Loe, 1964 Gingival index (GI) of Loe and Silness, 1963 periodontal pocket depth (PPD) and clinical attachment loss (CAL) were recorded (figure 1and 2).

C. Statistical Analysis

All collected data were entered into Excel spreadsheets and exported to SPSS for statistical package. Frequency tables, percentages, and cross-tables were generated. Statistical significance was based on probability values of less than 0.05 .

RESULTS

The samples of our study were selected to be equally distributed according faculties and educational levels. The overall mean age (SD) of the students was 21.4± 2.1 years, with significant differences between different groups *($p<0.05$)*. Table 2 summarizes the distribution of the study sample and knowledge of the causes, signs, and preventive measures of periodontal disease, according to faculties (humanities, engineering and sciences).

Table 1. Created questionnaire questions and answers followed in this study.

1)	**What is the main factor of periodontal disease?**	**Yes**	**No**	**I don't know.**
	• Soft deposit (Microbial plaque)			
	• Hard deposits (calculus)			
	• Undernourishment			
	• Genetic			
	• diabetes mellitus			
	• Contagion			
2)	**What is the main clinical mark of periodontal disease?**	**Yes**	**No**	**I don't know.**
	• Gingival redness			
	• Bad breath			
	• Gingival swelling			
	• Gingival bleeding			
3)	**What is the main measure to prevent periodontal disease?**	**Yes**	**No**	**I don't know.**
	• Regular visits to the dentist			
	• Use toothbrush and dental floss			
	• Good nourishment			
4)	**Is there any correlation between gum disease and systemic diseases?**			
	• Diabetes?			
	• Heart diseases?			
5)	**Do you have gum problems?**			
	• Red gum or			
	• Gum swelling or			
	• Gum ulceration?			
6)	**Do you have periodontal problems?**			
	• Teeth movement or			
	• Gum recession or			
	• Food impaction or			
	• Itching gum?			

Table 2. Distribution of responses to periodontal health knowledge questions by faculty

Questions :	Humanities faculty (n = 100)			Engineering faculty (n=100)			Sciences faculty (n = 100)			P value
	Yes %	No %	I don't know %	Yes %	No %	I don't know %	Yes %	No %	I don't know %	
1)What is the main factor of periodontal disease?										
• Soft deposit (Microbial plaque) *	15	0	85	13	0	87	15	0	85	
• Hard deposits (calculus)	11	0	89	11	0	89	17	0	83	
• Undernourishment	2	0	98	5	0	95	14	0	86	.006
• Genetic	0	0	100	0	0	100	0	0	100	
• diabetes mellitus	0	0	100	0	0	100	1	0	99	
• Contagion	0	0	100	0	0	100	1	0	99	
2) What is the main clinical mark of periodontal disease?										
• Gingival redness	2	0	98	1	0	99	4	0	96	.012
• Bad breath	10	0	90	8	0	92	9	0	91	
• Gingival swelling	12	0	88	11	0	89	20	0	80	
• Gingival bleeding*	7	1	92	17	0	83	18	0	82	
3) What is the main measure to prevent periodontal disease?										
• Regular visits to the dentist*	10	0	90	12	0	88	14	0	86	.000
• Use toothbrush and dental floss	16	0	84	26	0	74	29	0	71	
• Good nourishment	2	1	97	1	0	99	9	0	91	
4) Is there any correlation between gum disease and systemic diseases?	41*	30	29	48*	26	26	58*	21	21	.236
- Diabetes?										
- Heart diseases?										
5). Do you have gum problems?	32*	60	8	36*	59	5	42*	53	5	.438
- Red gum or										
- Gum swelling or										
- Gum ulceration?										
6). Do you have periodontal problems?	25*	62	13	25*	63	12	25*	67	8	.172
- Teeth movement or										
- Gum recession or										
- Food impaction or										
- Itching gum?										

*The correct answer.

Table 3. Distribution of responses to periodontal health knowledge questions of faculty of Humanities

Questions :	First level (n = 50)			Final level (n=50)			P value
	Yes %	No %	I don't Know %	Yes %	No %	I don't Know %	
1)What is the main factor of periodontal disease?							
• Soft deposit (Microbial plaque)*	7	0	43	8	0	42	
• Hard deposits (calculus)	4	0	46	7	0	43	
• Undernourishment	1	0	49	1	0	49	.074
• Genetic	0	0	50	0	0	50	
• diabetes mellitus	0	0	50	0	0	50	
• Contagion	0	0	50	0	0	50	
2) What is the main clinical mark of periodontal disease?							
• Gingival redness	2	0	48	0	0	50	
• Bad breath	3	0	47	7	0	43	.026
• Gingival swelling	7	0	43	5	0	45	
• Gingival bleeding*	2	0	48	5	1	44	
3) What is the main measure to prevent periodontal disease?							
• Regular visits to the dentist*	5	0	45	5	0	45	.062
• Use toothbrush and dental floss	6	0	44	10	0	40	
• Good nourishment	1	1	48	1	0	49	
4) Is there any correlation between gum disease and systemic disease?	22	15	13	19	15	16	.767
- Diabetes?							
- Heart diseases?							
5). Do you have gum problems?	19	29	2	13	31	6	.203
- Red gum or							
- Gum swelling or							
- Gum ulceration?							
6). Do you have periodontal problems?	28	17	5	28	14	8	.612
- Teeth movement or							
- Gum recession or							
- Food impaction or							
- Itching gum?							

*The correct answer.

Table 4. Distribution of responses to periodontal health knowledge questions of faculty of Engineering

Questions :	First level (n = 50)			Final level (n=50)			P value
	Yes %	No %	I don't know %	Yes %	No %	I don't know %	
1) What is the main factor of periodontal disease?							
• Soft deposit (Microbial plaque)	3	0	47	10	0	40	
• Hard deposits (calculus)	0	0	50	11	0	39	.000
• Undernourishment	0	0	50	5	0	45	
• Genetic	0	0	50	0	0	50	
• diabetes mellitus	0	0	50	0	0	50	
• Contagion	0	0	50	0	0	50	
2) What is the main clinical mark of periodontal disease?							.000
• Gingival redness	0	0	50	1	0	49	
• Bad breath	2	0	48	6	0	44	
• Gingival swelling	1	0	49	10	0	40	
• Gingival bleeding	3	0	47	14	0	36	
3) What is the main measure to prevent periodontal disease?							.000
• Regular visits to the dentist	0	0	50	12	0	38	
• Use toothbrush and dental floss	5	0	45	21	0	29	
• Good nourishment	0	0	50	1	0	49	
4) Is there any correlation between gum disease and systemic diseases?	25	9	16	23	17	10	.140
- Diabetes?							
- Heart diseases?							
5) Is there any correlation between gum disease and heart diseases?	4	24	22	4	23	23	.978
6). Do you have gum problems?	12	35	3	24	24	2	.044
- Red gum or							
- Gum swelling or							
- Gum ulceration?							
7) Do you have periodontal problems?	31	16	3	29	15	6	.577
- Teeth movement or							
- Gum recession or							
- Food impaction or							
- Itching gum?							

*The correct answer.

Table 5. Distribution of responses to periodontal health knowledge questions of faculty of Sciences

Questions :	First level (n = 50)			Final level (n=50)			P value
	Yes %	No %	I don't know %	Yes %	No %	I don't know %	
1) What is the main factor of periodontal disease?							
• Soft deposit (Microbial plaque)	8	0	42	7	0	43	
• Hard deposits (calculus)	14	0	36	3	0	47	.585
• Undernourishment	9	0	41	5	0	45	
• Genetic	0	0	50	0	0	50	
• diabetes mellitus	0	0	50	1	0	49	
• Contagion	0	0	50	1	0	49	
2) What is the main clinical mark of periodontal disease?							1.000
• Gingival redness	3	0	43	1	0	49	
• Bad breath	6	0	44	3	0	47	
• Gingival swelling	15	0	35	5	0	45	
• Gingival bleeding	9	0	41	9	0	41	
3) What is the main measure to prevent periodontal disease?							
• Regular visits to the dentist	10	0	40	4	0	46	
• Use toothbrush and dental floss	18	0	32	11	0	39	.052
• Good nourishment	6	0	44	3	0	47	
4) Is there any correlation between gum disease and systemic diseases? e.g	33	12	5	25	9	16	.026
- Diabetes?							
- Heart diseases?							
5) Do you have gum problems?	19	27	4	23	26	1	.333
- Red gum or							
- Gum swelling or							
- Gum ulceration?							
6) Do you have periodontal problems?	29	16	5	36	13	2	.340
- Teeth movement or							
- Gum recession or							
- Food impaction or							
- Itching gum?							

*The correct answer.

Half of the samples were in the first level and half in the final level. There were significance differences in knowledge of causes, signs, preventive measures of periodontal disease and correlation between periodontal disease and systemic diseases between the groups study ($p > 0.001$), and there were significant differences in the knowledge of the correlation between periodontal disease and systemic diseases ($p = 0.236$) but almost of students know the correlation between periodontal disease and systemic diseases on the other hand there were significant differences in the knowledge of their current periodontal problems ($p > 0.5$) and almost of students were not having periodontal problems. In the comparison between the first level and final level of students in current study groups there were significance differences in knowledge of causes, signs, preventive measures of periodontal disease and knowledge of the correlation between periodontal disease and systemic diseases ($p > 0.001$) but there were highly significance differences in knowledge of causes, signs and preventive measures of periodontal disease between the first level and final level in college of engineering ($p = 0.000$) furthermore, there were significant differences in the knowledge of their current periodontal problems between first levels and final levels of students in all current study groups ($p > 0.05$) Tables 3,4 and 5).

Table 6. Mean and SD of clinical parameters according to faculties

	PLI	GI	PPD	CAL
Humanities faculty (HF)	1.8±0.2	2.1±0.7	4.6±0.4	3.4±0.4
Engineering faculty (EF)	1.6±0.5	1.1±0.4	5.6±0.5	4.1±0.3
Sciences faculty (SF)	1.3±0.7	1.5±0.1	5.7±0.5	2.9±0.5

Table 7. Mean and SD of clinical parameters according to students level

		PLI	GI	PPD	CAL
Humanities faculty (HF)	First level	2.2±0.4	2.3±0.1	5.2±0.6	3.5±0.2
	Final level	1.6±0.15	1.9±0.3	5.8±0.2	3.3±0.4
Engineering faculty (EF)	First level	1.7±0.5	1.5±0.6	5.1±0.6	3.1±0.6
	Final level	1.7±0.2	1.3±0.6	5.9±0.1	4.5±0.6
Sciences faculty (SF)	First level	1.6±0.8	1.25±0.5	4.6±0.75	2.7±0.75
	Final level	1.8±0.2	1.6±0.5	5.7±0.4	3.4±0.2

Table 6 and Figure 3 summarize the clinical findings, according to the faculties and the comparison between the patients of current study groups there were significant differences in the PLI, GI, PPD and CAL values. The students in the Humanities faculty (HF) had a PLI and GI scores more than PLI and GI scores of Engineering faculty (EF) students and Sciences faculty (SF) students, whereas the students in Sciences faculty (SF) and Engineering faculty (EF) had PPD value more than PPD value of Humanities faculty (HF) students, but the CAL value was more in the Engineering faculty (EF) students than the CAL value of Humanities faculty (HF) Students and Sciences faculty (SF) students. On the other hand, there were significance differences in the PLI, GI, PPD and CAL values In the comparison between the first level and the final level except PLI score of the first level and the final level in the EF. The first level students of HF had PLI and GI scores more than the final level, whereas the first level of EF had GI score more than the final level, whereas the final level of SF had PLI, GI, PPD and CAL values are more than the first level and furthermore the final level of EF had PPD and CAL values more than the first level also the final level of HF had PPD and CAL values more than first level (Table 7 and Figure 4).

Fig.1. Clinical examination of anterior teeth

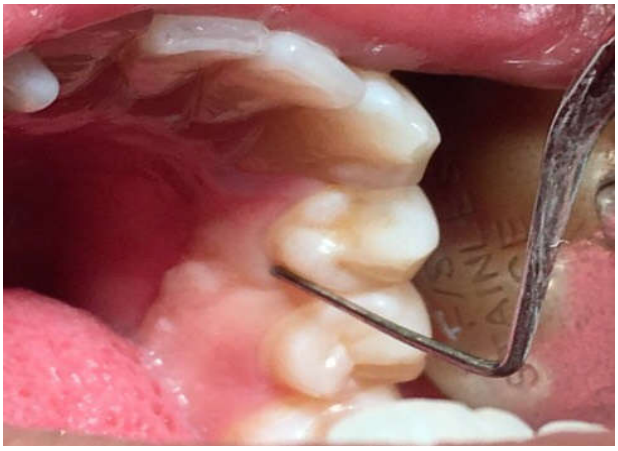

Fig.2. Clinical examination of posterior teeth

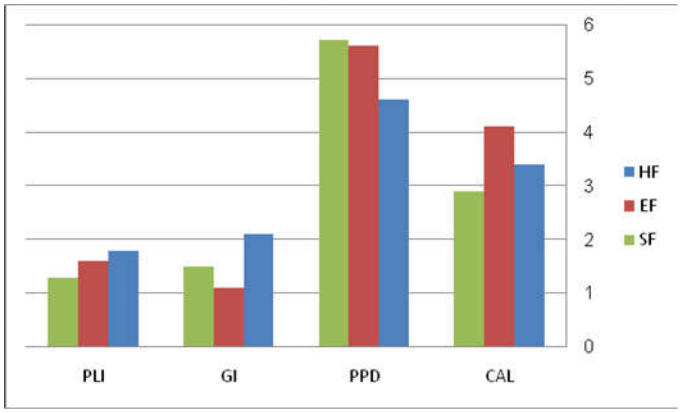

Fig.3. Clinical parameters of faculties

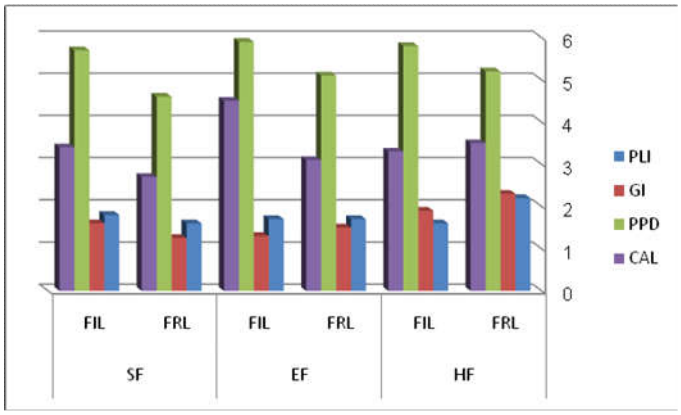

Fig.4. Clinical parameters of levels

DISCUSSION

The current study is the first study that was performed to assess oral health awareness on periodontal disease status among university non dental students in King Khalid University. The knowledge of oral health is leading to improvement in the exercise of self oral hygiene that it does not mean the personal oral health will be better (Freeman *et al.,* 1993) but the personal oral health relies to his behavior and attention furthermore the patients' family, faiths, expertise, environment and other life conditions usually impact on their behavior on oral health (Locker, 1998). There are reduced in the researches of oral health knowledge regarding periodontal disease among non-dental Saudi university, so the aim of this study was to evaluate the influence of oral health awareness on periodontal disease status among university, non dental students in King Khalid University and this study is considered as primary importance in this scope to assessment this field within Saudi university non dental students. The students in university are ideal samples of the population due to they reveal psychological stress, education, culture and socioeconomic conditions which able to effect on the status of oral hygiene. In the previous studies there were relation between improved oral hygiene and increased knowledge (Woodgroove *et al.,* 1987; Hamilton *et al.,* 1991). In Indian study the oral hygiene, behavior and attitude between medical and para-medical students were detected to be more than non-medical students due to the professional of medical student education (Sharda, 2010).

In the other studies that were revealed the reason of knowledge of periodontal disease signs, preventive measures, and relations to general health among medical students may be due to they know more about periodontal disease and they have more dental health care than non medical students, but regarding to non medical students the knowledge of periodontal disease signs, preventive measures, and relations to general health increased in the advanced levels of education (Kawamura *et al.,* 2007 & 2002). On the other hand and according to the findings of the current study there are only a very few of non dental students know the causes, signs, and preventive measures of periodontal disease according to faculties (humanities, engineering and sciences) approximately less than 15%. In agreement with the results of previous studies that were carried out by Usman *et al*., Doshi *et al*., and Baser *et al*., where there were poor oral hygiene among engineering students compared to medical and paramedical students due to reduced exposure of medical students to oral hygiene problems and oral hygiene measures are included within their regular activities (Usman *et al.,* 2007; Doshi *et al.,* 2007; Baseer *et al.,* 2012). In Jordanian study regarding to the knowledge of clinical signs of gingival diseases and gingival bleeding there were low in knowledge of gingival clinical signs among students' schools compared to medical and dental students (El-Qaderi *et al.,* 2004). In the current study most of the non dental students are aware about the correlation between periodontal disease and systemic diseases between the group study and almost of students were not having periodontal problems, but in the comparison between first levels and final levels of students in all current study groups there was no relation between increased the education level and the knowledge of causes, signs, preventive measures of periodontal disease.

In the study that was done by Baseer *et al*, there were increases in oral hygiene awareness in final level compared to other levels among undergraduate medical students due to increased students experience and knowledge of final level compared to other levels. and there were relation between their knowledge of the correlation between periodontal disease and systemic diseases with increased the student education level (Baseer *et al.,* 2012) but there was no relation between their knowledge of current periodontal problems between first levels and final levels in our study. On the other hand, most of the students of our study had PLI score ranging from 1.3±0.7 among SF students to 1.8±0.2 among HF students and GI score ranging from 1.1±0.4 among EF students to 2.1±0.7 among HF students and PPD value ranging from 4.6±0.4 among HF students to 5.7±0.5 among SF students and the CAL value ranging from 2.9±0.5 among SF students to 4.1±0.3 among EF students. This was despite the fact that significant student's knowledge of the causes, signs, and preventive measures of periodontal disease. Moderate plaque accumulations induced moderate gingivitis and moderate of chronic periodontitis was found among almost of students in the present study except among HF students where Moderate plaque accumulations induced severe gingivitis.

In the previous study that was carried out among dental students, there were increases in periodontal clinical parameters with progression of education levels (Cavaillon *et al.,* 1982). Furthermore, their awareness of periodontal disease was increased in the final education level (Hikiji *et al.,* 2005). In the current study the relationship between the education level of students the first level of HF students had PLI score in the more than the first level of the EF and SF students but they had severe gingivitis and moderate chronic periodontitis compared to moderate gingivitis and moderate chronic periodontitis of the first level of EF and SF students whereas all students in final levels of the present study had moderate plaque accumulations, moderate gingivitis and moderate chronic periodontitis. This could be attributed to poor of students' knowledge of the causes, signs, and preventive measures of periodontal disease.

Conclusion

This study revealed that there were relation between the students' college and their knowledge and awareness of periodontal disease this may be due to their experience, attitudes, behavior, and education where knowledge and awareness of periodontal disease among EF students and SF students were better than HF students, but according to the education level there were no significant differences between the first level and final levels among all students in the present study. So we recommended that the university curriculums of non dental colleges should include the oral health education course**.**

Acknowledgment

The authors would like to thank, Dr. Mohammad Mahtab Alam, Assistant professor of Biostatics, College of Applied Medical science, King Khalid University, Abha, Kingdom of Saudi Arabia and the students who participated in this study.

Conflicts of interest: There are no conflicts of interest.

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