



Designing and Evaluation of an Elective Oral Health Course for Fifth-Year Medical Students of Tehran University of Medical Sciences

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ABSTRACT

Objectives: This study aimed to evaluate the effect of an educational intervention on oral health-related knowledge, attitude, and practice of medical students.

Materials and Methods: This study was performed on the fifth-year medical students attending an elective oral health course at the Faculty of Dentistry of Tehran University (intervention group) and 25 other students attending another elective course (control group) in 2018. A 2-week internship program including 6 sessions of a workshop program plus 2 days of school field and 2 days of attending dental departments was designed for the intervention group. Before and after the intervention, students completed a questionnaire and their simplified debris index was calculated. Statistical analysis was performed using SPSS version 24 by paired-sample t-test and general linear regression.

Results: The mean age of the participants was 24.84 ± 1.31 years in the intervention group and 23.64 ± 1.28 years in the control group. There were 14 (56%) males in the intervention group and 16 (64%) males in the control group. At baseline, the mean knowledge, attitude and practice scores of the control and intervention groups were 26.28, 14.20 and 10.88, and 27.84, 15.80, and 9.36, respectively. After the intervention, the knowledge, attitude, debris index and willingness to adhere to oral health measures significantly improved ($P < 0.05$).

Conclusion: Oral health-related knowledge, attitude and practice of medical students were not desirable at baseline. The present study showed that even a short-term intervention in this field was effective to improve the oral health concepts in this group.

Keywords: Program Evaluation; Oral Health; Students, Medical

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INTRODUCTION

Oral health is an integral part of general health affecting the quality of life, social relationship, and self-confidence of individuals. Although oral diseases are preventable, quite a lot of people suffer from them [1]. In addition to dentists, other healthcare providers also play a pivotal

role in oral and dental care. They are involved in activities such as screening of oral diseases, emergency care, pain management, and referring of patients to dentists for preventive services [2]. The knowledge of healthcare providers as well as patients is extremely inadequate about dentistry; therefore, most

patients requiring dental services do not receive them due to lack of knowledge [3-5]. In a study carried out in Iran, the initial oral health knowledge score of midwifery students was 26.7 ± 9.4 out of 100 revealing a very low level of oral health knowledge in this group of medical professionals [5]. Similar studies in Nigeria [2] and the United States [6] showed unsatisfying results about oral health knowledge of other healthcare workers. In addition, Cooper et al. [7] showed that the mean score of initial knowledge of the pediatric healthcare providers in California University was 15.10 ± 2.09 out of 30. Physicians are not adequately instructed on oral diseases, and lack the necessary knowledge related to oral health [8,9]. It has been shown that they do not have an appropriate performance in promoting the oral health of their patients [10,11]. Enhancing the oral health knowledge of physicians can help their patients seek appropriate dental healthcare services [12]. Educational programs on dental care services can be useful for all healthcare providers, other than dentists, because they may be the only source of education and care for patients who do not have access to dentists [13]. Educational programs on oral health may provide opportunities to achieve this goal, and create a positive attitude in physicians and other non-dentist primary healthcare providers, especially those working in health centers visiting quite a lot of patients [14]. Therefore, this study aimed to assess the knowledge, attitude, and practice of medical students of Tehran University of Medical Sciences after passing an elective course on oral health.

MATERIALS AND METHODS

This interventional study was approved by the Medical Research Committee of Tehran University of Medical Sciences (IR.TUMS.DENTISTRY.REC.1396.4745). The study population included the fifth-year medical students of Tehran University of Medical Sciences. A group of 25 students who had taken an elective course on oral health were recruited as the intervention group. The control group members were selected from the fifth-year medical students who had taken other elective courses.

Each member of the control group underwent clinical oral examination to measure their simplified debris index [15] twice with a two-week interval and then they filled out the questionnaire. During the first session, the control group members were not informed that they will be examined and have to fill out the questionnaire the next week. At the end, when all the questionnaires related to the control group were collected, the answer to the questionnaire was sent to them electronically. A 2-week internship program was designed for the intervention group which included 6 days of workshop program with topics about dental caries and oral disease prevention, head and neck examination, the role of nutrition in oral health, oral health in children and during pregnancy, and dental emergencies, 2 days of attending a primary school for oral health examination and health education to children, and 2 days of attending the different departments of dental school to become acquainted with different dental fields. All the students in the intervention group filled out the questionnaire (as pre-test) prior to the intervention and their simplified debris index was measured. After a 2-week intervention, they were re-examined and filled out the questionnaire (as post-test), and their satisfaction about this course was evaluated qualitatively. They were ensured that taking part in the study was voluntary and they could quit whenever they wished to do so. The questionnaire of the study had been previously validated [16] and included 20 questions related to knowledge, 5 questions related to attitude, 4 questions assessing the self-reported practice, 1 question about the sources of oral health information, 1 question about the tendency to receive further information regarding oral health, 2 questions about self-confidence, 1 question about the barriers against provision of preventive programs such as health education and fluoride therapy, 1 question about willingness to perform preventive measures, 6 questions about oral self-care, and finally, 3 demographic questions about gender, date of birth, and having a family member who is a dentist [16].

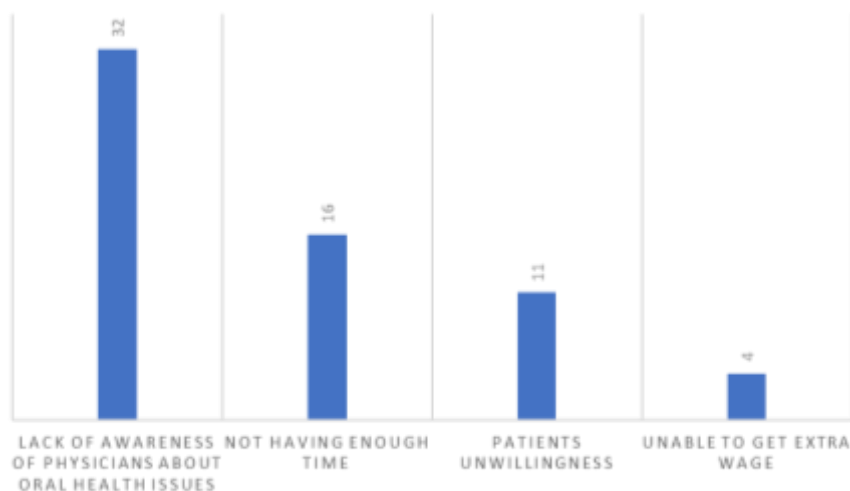


Fig. 1: Obstacles against provision of preventive measures such as health education and fluoride therapy

Sample Size and sampling:

The minimum required sample size for each study group was equal to 25 according to a previous study [6] considering $\alpha=0.05$, $\beta=0.2$, allocation ratio=1, standard deviation of 4.8, and mean difference of 4, using two sample t-test in PASS 11 software.

Statistical analysis:

Data were analyzed using SPSS version 24, and the mean difference of pre- and post-intervention data was calculated and analyzed with paired sample t-test. A general linear model was employed to compare the effect of intervention in the two groups considering the effect of demographic factors.

RESULTS

Demographic characteristics:

The mean age of the participants was 24.84 ± 1.31 years in the intervention group, and 23.64 ± 1.28 years in the control group. There were 14 (56%) males in the intervention group and 16 (64%) males in the control group.

Four of the participants (16%) in the intervention group and 4 (16%) in the control group had a family member who was a dentist.

Information of physicians about oral health:

In the intervention group, 3 participants (12%) agreed, 19 (76%) disagreed, and 3

(12%) had no idea about the statement “the information of physicians about oral health is adequate”. However, in the control group, 3 participants (12%) agreed, 17 (68%) disagreed and 5 (20%) had no idea in this respect.

Barriers against provision of preventive oral healthcare services:

According to the pretest answers given by the control and intervention groups, the main barrier against taking preventive actions according to the medical students’ point of view was “lack of general practitioners’ knowledge about oral health” followed by “time limitation” and “patients’ unwillingness” (Fig. 1).

Results of intervention:

The changes in knowledge, attitude, self-confidence, debris index, and willingness to take preventive oral healthcare measures were statistically significant in the intervention group ($P < 0.05$); while, the changes in self-reported practice and personal oral self-care were not statistically significant ($P > 0.05$, Table 1).

Demographics:

The general linear model demonstrated a change in the knowledge of female medical students ($P = 0.001$) and those who had a dentist family member ($P < 0.001$). Change in the attitude of students was evident only in female participants ($P = 0.031$).

Table 1. Comparison of medical students' knowledge, attitude, self-reported practice, self-confidence, personal oral health behavior, and debris index between the control and intervention groups before and after the intervention

| | | | Minimum | Maximum | Mean | Standard deviation | P |
|--------------------------------------|--------------------|--------|---------|---------|-------|--------------------|--------|
| Knowledge | Intervention group | Before | 12 | 46 | 27.84 | 8.22 | <0.001 |
| | | After | 11 | 49 | 39.88 | 8.54 | |
| | Control group | Before | 19 | 36 | 26.28 | 4.41 | 0.045 |
| | | After | 19 | 39 | 27.88 | 4.45 | |
| Attitude | Intervention group | Before | 3 | 14 | 9.36 | 2.58 | 0.343 |
| | | After | 3 | 15 | 9.56 | 3.37 | |
| | Control group | Before | 7 | 15 | 10.88 | 2.08 | 0.371 |
| | | After | 4 | 16 | 10.44 | 2.69 | |
| Self-reported practice | Intervention group | Before | 9 | 20 | 15.80 | 3.12 | 0.001 |
| | | After | 15 | 20 | 18.40 | 2.14 | |
| | Control group | Before | 9 | 19 | 14.20 | 2.14 | 0.196 |
| | | After | 11 | 20 | 14.76 | 1.80 | |
| Self-confidence | Intervention group | Before | 0 | 8 | 2.44 | 2.04 | <0.001 |
| | | After | 3 | 8 | 5.80 | 1.22 | |
| | Control group | Before | 1 | 7 | 3.24 | 1.58 | 0.403 |
| | | After | 1 | 6 | 2.96 | 1.36 | |
| Personal oral health behavior | Intervention group | Before | 4 | 12 | 8 | 2.12 | 0.096 |
| | | After | 3 | 12 | 8.6 | 2.14 | |
| | Control group | Before | 4 | 12 | 7.12 | 2.24 | 0.882 |
| | | After | 3 | 12 | 7.16 | 1.95 | |
| Debris index | Intervention group | Before | 1 | 10 | 4.5 | 2.14 | 0.008 |
| | | After | 0 | 8 | 3.42 | 2.32 | |
| | Control group | Before | 0 | 9 | 4.40 | 2.48 | 0.065 |
| | | After | 2 | 9 | 4.96 | 2.22 | |

None of the demographic factors was associated with change in self-confidence, self-reported practice, oral self-care, willingness to take preventive measures, or debris index.

Participants' satisfaction with the elective oral health course:

All the participants expressed their opinion in a form they received at the end of each session. The main codes were extracted from the forms by the authors. The main strength points of the course reported by the students were their presence and activity at school. They also suggested that the time allocated to practical parts of the course should be extended. However, they believed that the theoretical part of the course was intensive and quite a lot of contents were offered in a

short time, which was considered as a limitation. They also suggested that the contents of the course should be provided in a booklet.

DISCUSSION

The mean score of knowledge in the intervention group before the intervention was at the average level. Findings of a similar study on physicians showed the same knowledge level [17]. Moreover, in this study, the mean score of attitude of the intervention group before the intervention was moderate. A study conducted by Alshunaiber et al. [18] revealed that 65% of the participants had good knowledge and 86% had a positive attitude towards infants' oral health and prevention of early childhood caries. The

reason for higher level of knowledge in comparison with our study can be the fact that their study population included pediatricians and family physicians, while the participants in our study included medical students. In a study conducted in the United States, the mean score of correctly answered knowledge questions before the intervention was 6.83 ± 1.68 out of 13, and the mean score of attitude questions was 3.20 ± 0.94 out of 8 [14]. The initial knowledge level in their study was similar to that in our study, but their initial attitude level was lower. Oyetola et al. [2] displayed the low knowledge and attitude level of medical students as well as the physicians in Nigeria in comparison with dentists.

Park et al. [19] conducted a study revealing that 135 participants (93%) answered “very much” or “to some extent” to the attitude question of “how important is oral health in comparison to general health?”. This result was similar to the finding of our study (96%) [19]. In another study which was carried out in Iran, the initial knowledge level of midwifery students was 26.7 ± 9.4 out of 100, being a very low score. The low mean score of knowledge level in this study in comparison with our study may be due to the reason that our participants had chosen an elective course of oral health and might have been more interested in it and had more knowledge about it [5]. Cooper et al. [7] showed that the mean score of initial knowledge of the participants in California University was 15.10 ± 2.09 out of 30, which was similar to our study result (average level). The mean score of initial attitude of the participants was 11.10 ± 1.45 out of 12, which was higher than that in our study [7]. In a study conducted by Nicely [6], it was revealed that the mean score of initial knowledge was equal to 6.48 out of 15, and the initial attitude score was 40.33; both were rather low. According to a study done by Chandiwal and Yoon [20] in the Medical Center of Colombia University, New York, the initial knowledge score was 10.7 ± 1.6 (77%), a rather high score.

The mean score for the initial self-stated

practice of the students was low in the present study. Cooper et al. [7] demonstrated that the mean score of the initial self-reported performance of the participants in California University was 7.87 ± 7.39 out of 30, which was even lower than that in our study. In a study done by Alshunaiber et al, [18] only 43% of the participants had a good self-reported performance, which was somewhat low. Sabbagah et al. [21] demonstrated a higher level of performance in their study in which most of the pediatricians did routine examinations on children’s teeth.

In contrast to the study by Cooper et al, [7] in which the initial self-confidence of the participants was 13.13 ± 5.89 out of 20, which was a rather high score, in our study, only 16% of the participants were certain about their diagnosis of caries and the ability to give consultation to the parents, a rather low self-confidence. Also, Prakash et al. [22] found that about half of the participants were sure of themselves about caries detection and giving consultation to parents. Moreover, Skeie et al. [23] conducted a study in Norway on primary healthcare providers showing that they had a great self-confidence about their high level of knowledge and giving consultation to parents. However, there were studies showing low initial self-confidence such as the one conducted by Golinveaux et al, [24] in which the mean score of self-confidence was 7.8 out of 20.

As it was mentioned in several studies, lack of knowledge and self-confidence may act as a barrier for primary healthcare providers against providing dental care services to children [7,25,26]. Sabbagah et al. [21] demonstrated that low self-confidence was due to lack of oral health knowledge; therefore, the higher the knowledge level, the higher the self-confidence of dental clinicians would be. Similar to our study, Nicely [27] revealed a high score of oral self-care in the participants. However, Ghasemi et al. [28] conducted a study on oral self-care of dentists and found lower than expected results.

The mean score of debris index of students was moderate to low in the present study.

Findings of a similar study on midwifery students showed lower mean baseline plaque index [5]. After the intervention, there was a significant change in the knowledge score of the intervention group, and the difference in knowledge between the control and intervention groups was significant. Park et al. [19] conducted a study in the United States and showed an increase in the knowledge of students after oral health education. Similarly, Berkowits et al. [29] demonstrated that in addition to the fact that knowledge level increased (26% more than the baseline), knowledge retention was optimal over time (14% more than the baseline). Likewise, Forbes et al. [14] mentioned a significant increase in the knowledge of participants with regard to oral health. Some other studies also came to similar conclusion [6,7]. It appears that enhanced knowledge after the intervention is a common outcome.

Regarding the attitude, it was revealed that the change at the follow-up compared with baseline was statistically significant in the intervention group. Similarly, Graham et al. [30] concluded that after an educational program held for primary healthcare providers for children, the physicians had a more positive attitude towards oral health and its importance. Some other studies came to similar conclusion [6,14].

In contrast, in the study conducted by Cooper et al, [8] despite a positive change in attitude (from 11.10 ± 1.45 to 11.32 ± 1.30), it was not statistically significant. Review of the literature revealed that schools can be the best place to educate students about oral health and increase their knowledge and create a positive attitude towards it. To be precise, after medical students graduate and get busy doing job-related activities, they have less motivation and free time for updating their knowledge [7,31,32].

In our study, it was found that changes in self-confidence were statistically significant in both groups. The results of our study were similar to those of Schaff-Blass and Rozier [25] in which physicians stated that after receiving education on oral health, they had more self-confidence to take preventive actions. Two other studies reported similar findings [7,24].

Changes in self-reported performance between the two groups were not statistically different. Similarly, in a systematic review done by Kay and Locker [33], it was found that education was directly associated with enhanced knowledge and improved attitude, although it was not effective for behavior change. However, it was in contrast to the results of a study done by Prakash et al [22]. They showed that the likelihood of referring the children to dentists was four times higher by the participants who participated in relevant courses compared with those who did not. The changes in oral self-care of the participants in the two groups were not significantly different. This was in line with the findings of Nicely [6], who found no significant difference in oral self-care of the participants. The reason might be due to the presumably good oral health of medical students. In fact, the initial oral health of the participants was good and the intervention could not affect it.

The change in debris index, as an ultimate outcome of oral self-care, in the intervention group was significant in the present study. It is believed that health education can appropriately decrease the debris index [34]. A study done on midwifery students revealed that after a 3-month intervention, the dental plaque index decreased [35]. Two other studies conducted on primary and junior high school students approved the effect of educational intervention on improvement of this index [36,37].

The educational intervention also changed the willingness of the participants to take preventive measures. Cooper et al, [7] and Berkowitz et al, [29] in two different studies came to similar conclusion that after educational interventions, most students were willing to take preventive health measures. This finding has a great importance because medical staff can take care of oral health of disadvantaged groups in the society by taking preventive actions [19].

Being a female and having a dentist as an immediate family member were shown to be associated with knowledge changes among the students. A study done on physicians also revealed that the oral health knowledge of female physicians about children was higher

than that of male physicians [17]. Nonetheless, studies conducted in Saudi Arabia and Italy observed no difference between male and female medical professionals other than dentists regarding their oral health knowledge [17,38, 39]. In our study, being a female had a relationship with attitude change among the students. Another study conducted in Palestine revealed that having a higher knowledge level and more positive attitude in females can be due to the fact that females pay more attention to their health and appearance; therefore, they are more willing to visit a dentist and are eager to gain some information before participating in an educational course on dentistry [40]. Age, sex and having a dentist as immediate family member were the cofounding factors in this study; thus, we used multivariate analysis to control for their effects. Also, the control group did not cooperate well in the post-test; however, we resolved the problem by explaining that they would receive a health package after the examination and training.

CONCLUSION

Based on the acquired total scores, the level of medical students' knowledge, attitude, and practice with respect to oral health was insufficient. This study showed that a short-term intervention could bring about positive changes in their knowledge and attitude. It highlights the importance of adding a course on oral health to the curriculum as well as the in-service learning courses for physicians.

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CONFLICT OF INTEREST STATEMENT

None declared.

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