

ORIGINAL ARTICLE

An Assessment of Impact of Higher Education on Oral Health Knowledge, Practices and Lifestyle habits

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ABSTRACT

Aim: To assess impact of higher education on oral health related knowledge, practices, and lifestyle habits among faculty of King Faisal University, Saudi Arabia.

Methods: In this descriptive study, a self-administered questionnaire including socio-demographic, oral health awareness, practices, and oral health status questions was distributed among faculty. Descriptive statistics, linear correlation, ANOVA, Independent t-test and logistic regression analysis were used using SPSS. A two-sided significance level of $\leq 5\%$ was implied.

Results: Fifty eight percent were males and 91% married. Mean age was 42.8 ± 8.07 years. 66.5% had PhD, 42% were assistant professors. 22% had hypertension, 13.5% diabetes mellitus and elevated cholesterol (23%) and 10% were current smokers. 21% consumed soft drinks, 67% dairy products and 71% fruits daily. Most of the faculty ($\geq 81\%$) showed a robust oral health related knowledge and 75% practiced oral hygiene measures and 65.5% visited dentist regularly. Almost half (49%) reported dental caries, 66% fillings, 31% gum bleeding, 55% missing teeth, and 24% had artificial teeth. There was a statistically significant difference between females and males regarding lifestyle habits and oral hygiene practices with a mean difference of ($p < 0.001$). Logistic regression analysis showed a significant difference ($p < 0.001$) with respect to gender, income.

Conclusion: In this study, majority of the University faculty had an acceptable oral health related knowledge, and demonstrated good oral hygiene practices with a significant impact of gender on oral hygiene practice and life style.

Key words: higher education, oral health knowledge, practices, lifestyle, university faculty.

INTRODUCTION

Oral health is an important component of general health and overall quality of life.¹ Oral diseases cause infection, pain, tooth loss that result in difficulties of chewing, swallowing and speaking.² Social and behavioral factors such as urbanization, level of education, dental knowledge and attitude, oral hygiene habits, intake of sweets, use of sugary drinks and dental visits are associated with oral diseases.³ A shift in disease pattern is closely related to lifestyle that include changes in dietary habits, an increased consumption of sweetened food products and tobacco use, and this lifestyle has an impact on oral health.⁴

Education and literacy are important determinants of health and well-being.⁵ Knowledge is identified as a key component of health literacy.⁶ Lower levels of health literacy are associated with lower understanding of the importance of prevention and consequently inferior health.⁷ Oral health knowledge is considered as an essential prerequisite for health-related behavior and increased knowledge is associated with better oral health.⁸ Higher education² and socioeconomic status⁹ have been found to contribute to a better oral hygiene habits and utilization of oral health services. Lack of teacher's knowledge about oral health may be a substantial barrier to the success of health promoting activities.¹⁰ Regular oral hygiene practices help improve oral health and self-care practices are effective measures for maintaining good oral health.¹¹ In order to initiate a good positive approach to oral habits amongst students, the teachers themselves need to have good knowledge, attitudes and practices toward oral hygiene.¹²

Information on oral health status, common oral hygiene practices and lifestyle habits among highly educated adults, especially university teachers, is sparse. Therefore, this study was designed to assess self-reported oral health knowledge and practices, status of oral and systemic health and life-style habits among faculty of King Faisal University in Al-Ahsa, Saudi Arabia.

METHODOLOGY

This study was conducted as a cross-sectional survey during January and February 2019. Approval of study was obtained from the college ethical committee vide letter # CoD/R/003/2018. Faculty members of twelve colleges of the University were contacted in their offices through a team of internees of the KFU dental clinics complex.

A formal permission was obtained from dean of each college to contact the faculty. The purpose of study was explained to the faculty members before requesting them to respond to questionnaire. If agreed, a self-administered, anonymous, structured questionnaire was provided to be filled in. The study questionnaire was developed and validated by the authors. The questionnaire composed of five sections: first section comprised of eleven questions that were related to study participants' personal information; second section included seven questions about lifestyle habits; third section contained five questions about medical history; fourth section was related to oral health knowledge and included 18 questions; fifth section included eight questions about oral health practices. An overall oral health knowledge score (OHKS) was calculated by adding each correct score for all oral health knowledge related questions for each participant. Missing observations were excluded.

The total scores reflected the level of knowledge and was interpreted as follows: 0-3.99 (Very Low), 4-7.99 (Low), 8- 11.99 (Acceptable), 12-14.99 (Good), and 15-16.99 (Excellent), and 17 was the maximum score that indicated a perfect level of knowledge.⁷ The data were analyzed using SPSS version 23. Descriptive statistics such as mean and standard deviation for continuous variables, and frequency and percentage for categorical variables were calculated and tabulated. Linear correlation, and independent sample t test was used to assess sum of the scores of knowledge, health related dietary and other habits, oral health practices, and reported oral health status. We also used Stepwise multivariate logistic regression. A two-sided significance level of 5% and a Confidence Interval (CI) of 95% were implied for all analyses.

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RESULTS

Socio-demographic characteristics and Medical History: After a diligent data cleaning procedure, data pertaining to two hundred and twenty-five faculty members was analyzed. The mean age of the respondents was 42.85 ± 8.07 years, the mean height was 165.12 ± 23.9 cm and mean weight was 81.27 ± 17.7 kg. Mean BMI was calculated as 29.85 ± 3.15 (kg/m^2). More than half (58%) were males, and almost all (91%) respondents were married with a small proportion as single (7%) and divorced (2%). Most of them (78%) reported having less than six family members. Many of the participants (67%) owned a vehicle ($p < 0.001$ for males). Most (66.5%) held PhD qualification and 33.5% had Masters. The respondents comprised of lecturers (26%), assistant professors (42%), associate professors (21%) and professors (11%) ($p < 0.001$ for males). More than one-third (37%) had a salary (in Saudi Rial) of <10000, 45% had a salary of 10000-20000, while few (17.8%) had >20000 ($p < 0.001$ for PhD holders). The proportion of respondents with a teaching experience of <10 years, 11-20 years, and >20 years was 36.4%, 38.2% and 25% respectively, ($p = 0.006$ for males). Regarding medical history, 22% of the participants had hypertension, 5% had cardiac disease, 13.5% had diabetes mellitus, 1.8% had hepatitis and 23.8% reported elevated cholesterol levels (Figure 1).

Lifestyle Habits: The mean score of aggregated lifestyle construct was 10.64 ± 2.88 . Self-reported habits of faculty members showed that a few (9%) were current daily smokers and 8% were previous smokers ($p = 0.002$). Regarding the frequency of exercise, majority (40%) reported exercising less often, and 31% reported exercising 1-2 times a week ($p < 0.001$). Most of them (71%) consumed fruit two times a day, while some (25.5%) of the participants rarely consumed fruits. Most of the participants (67%) consumed dairy products two times daily, whereas few of them (25.5%) rarely consumed dairy products. More than half (64%) reported eating and drinking 4-6 times daily and 31% less than three times per day ($p < 0.001$) (Figure 2).

Oral Health Knowledge: Regarding oral health knowledge among faculty members, the mean score of aggregated knowledge construct was 9.24 ± 2.15 . Most of the participants (85.4%) correctly knew that rinsing of mouth after meals aids in oral disease prevention, and 73% knew that bacteria always present in our mouth. Most of the participants (81%) reported that bacteria is responsible for dental caries, and 92% agreed that excessive consumption of sugar and candy could cause dental caries. Almost all of them (91%) knew that brushing prevents dental caries and gum disease, while 87% agreed that visiting a dentist every 6 months is essential for maintaining a good oral health. Almost all participants (93%) mentioned that they should change toothbrush regularly. Most of the respondents agreed that quality of life is compromised by poor oral health, and poor oral health affects

eating, smiling and sleeping, (85.5% and 91%, respectively, $p = 0.046$). Many participants (79.5%) mentioned that self-assessment of the oral cavity is helpful in maintaining oral health, and (76%) felt that gum disease affects systemic health (Figure 3).

Oral Health Status: The results indicated that the mean score of aggregated reported oral health status was 2.39 ± 1.48 . Almost half (49%) of the participants reported having dental caries, and most of them (66%) reported having filled teeth. Few (19%) reported about gum disease and 31% with gum bleeding, most (78%) had gum bleeding with brushing ($p = 0.010$). More than half (55%) of them have lost some teeth and 24% of them have artificial teeth (Figure 4).

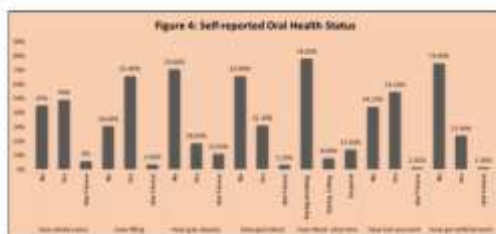
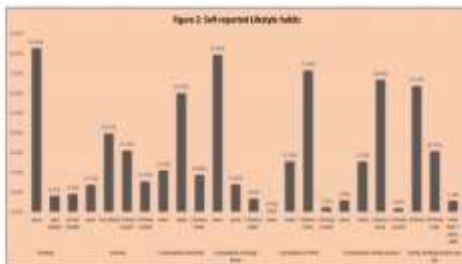
Oral Hygiene Practices: The results indicated that the mean score of aggregated oral health practices construct was 12.79 ± 1.99 . Most of the participants (75%) reported rinsing one time after meals and majority (81%) of the participants reported brushing once daily ($p < 0.001$) while only a few of them (9.5%) brush twice daily and 27.2% ($p < 0.001$) had the habit of using Miswak once a day. A few of the faculty (1.9%) reported using dental floss twice daily, and 37.5% reported using dental floss at least once daily ($p < 0.038$). Most of the participants (74%) reported use of fluoride toothpaste, while more than half (54%) of them used medium toothbrush and few of them (31%) used soft brush. Most of them (65.5%) visited the dentist regularly and (54.1%) visited one to two times in a year ($p < 0.001$) (Figure 5).

Association between socio-demographic characteristics, knowledge, Lifestyle habits, oral health and oral hygiene practices: The results showed that there was a statistically significant difference between females and males regarding lifestyle habits and oral hygiene practices with a mean difference of (-2.483, -1.791, respectively, $p < 0.001$). Level of education did not show any difference. In the logistic regression with oral hygiene practices as a dependent variable; in the first step gender and SES as independent variables explained 2% of the variation in the construct (Nagelkerke R^2 0.024). In the second step knowledge, oral health status and lifestyle habits were added to the model and it increased the explanation of the construct to 40% (Nagelkerke R^2 0.408). Lifestyle habits were found statistically significantly associated with the dependent variable (OR 26.5 CI 8.6 to 81.2, $p < 0.001$).

In the second model lifestyle habits were used as the dependent variable; in the first step gender and SES as the independent variables explained 23% of the variance (Nagelkerke R^2 0.235) in the dependent variable. In the second step knowledge, oral health status, and oral hygiene practice as independent variables explained 54% of the variance (Nagelkerke R^2 0.548). Gender was statistically significantly associated with the independent variable in the first step (OR 6.1, CI 3.0 - 12.6, $p < 0.001$) and remained in the second step together with oral hygiene practice as significantly associated with lifestyle habits (OR 8.4 CI 3.4 - 20.8, OR 26.9, CI 8.7-82.9 respectively, $p < 0.001$) (Table 1).

Table 1: Logistic Regression

| Variables | Oral Hygiene Practices | | | | | Lifestyle Habits | | | | |
|-------------------------|------------------------|------|--------------|------|-----------|------------------|------|--------------|-------|-----------|
| | B | S.E. | Sig. | OR | 95% C.I. | B | S.E. | Sig. | OR | 95% C.I. |
| Gender | | | | | | | | | | |
| Male | -.511 | 0.4 | 0.25 | 1 | | 2.1 | 0.5 | 0.000 | 1 | |
| Female | | | | 0.6 | 0.25, 2.4 | | | | 8.4 | 3.4, 20.8 |
| SES | | | | | | | | | | |
| Low | .287 | 0.4 | 0.48 | 1 | | -0.55 | 0.5 | 0.232 | 1 | |
| High | | | | 1.3 | 0.6, 2.9 | | | | 0.6 | 0.24, 1.4 |
| OH Status | | | | | | | | | | |
| Poor | -.035 | 0.4 | 0.90 | 1 | | 0.20 | 0.4 | 0.654 | 1 | |
| Good | | | | 0.96 | 0.5, 2.0 | | | | 1.2 | 0.51, 2.9 |
| Knowledge | | | | | | | | | | |
| Low | 0.544 | 0.4 | 0.20 | 1 | | -0.04 | 0.5 | 0.936 | 1 | |
| High | | | | 0.2 | 0.8, 3.7 | | | | 0.96 | 0.4, 2.4 |
| Lifestyle Habits | | | | | | | | | | |
| Poor | 3.277 | 0.6 | 0.000 | 1 | | | | | | |
| Good | | | | 26.5 | 8.6, 81.2 | | | | | |
| Oral Hygiene | | | | | | | | | | |
| Poor | | | | | | 3.3 | 0.6 | 0.000 | 1 | |
| Good | | | | | | | | | 26.9 | 8.7, 82.9 |
| Constant | -.813 | .41 | 0.1 | 0.06 | | -3.8 | 0.7 | .000 | 0.023 | |



DISCUSSION

Oral health behaviors are associated with several factors including knowledge, lifestyle, educational level and socioeconomic status.¹³ Self-rated health reflects a person's integrated perception of health, including its psychological, biological, and social dimensions.¹⁴ Several factors intervene in health literacy and oral health outcomes, and knowledge remains the key component of health literacy.⁶ Assessment of oral hygiene practices and understanding of oral health care needs are important to introduce preventive programs.³ Therefore, this may be the first study that explored the oral health knowledge (OHK), oral hygiene practices, oral health status and lifestyle of faculty members of a local University in Saudi Arabia.

Socio-economic status (SES) is another established determinant of health.¹⁵ Income, education, and occupation are supposed to define socioeconomic status¹⁶, while inequalities in SES causes health disparities that also include oral health¹⁷. There is an evidence that people with higher socioeconomic status have a lower prevalence of smoking, better oral health knowledge, attitudes, and practices¹⁸. This study showed similar results by reporting low level of smoking but an acceptable health level of related practices. In a previous study, OHK was significantly associated with SES and gender¹⁹ whereas in comparison with the current study findings, only gender showed significant association with OHK.

Demographic factors such as gender and educational level have been documented in the literature as significant factors for differences in health literacy^{9,19}. This study found significant differences in oral health knowledge (OHK) among genders, as females scored better in knowledge than males, while educational level was not associated with OHK. In this study, gender was significantly associated with lifestyle habits conforming to another study¹³.

In this study, mean oral health knowledge score (OHKS)⁷ was used to assess OHK and it was found to be at acceptable level (9.24 ± 2.15). The mean score for general health related knowledge was also found to be acceptable (10.64 ± 2.88), while the score for oral hygiene practices was found to be good (12.79 ± 1.99). However, the mean for oral health status was very low (2.39 ± 1.48). OHK mean score of this study was lower than reported among adults of UAE (10.50 ± 2.36)⁷ and also lower than the mean knowledge score (12.53 ± 3.38) of residents of Riyadh city¹⁹.

Al-Baghli et al.²⁰ conducted a study in the Eastern province of Saudi Arabia and reported that only 2.7% had awareness of CVD and it was higher in women and subjects with lower level of education. The authors also reported prevalence of 58.2% hypertensive, 48.6% diabetic, 45% with high cholesterol, 32.4% overweight and 51% obese. These findings reported from the general population of the Eastern region correspond with the

results of this study, where participants were aware of and reported cardiac diseases (5%), hypertension (22%), diabetes (13.5%) and elevated cholesterol levels (23.8%), however, these figures are lower in this study sample with higher education. Another study reporting NCDs in the same University employees, among the participants aged 24-63 years showed that 13.5% had hypertension, 9% diabetes, 1.9% cardiac diseases and 15.3% had high cholesterol²¹.

These results are comparable with that of our study. Amin et al.²¹ reported that 17% were current smokers as compared to our study reporting 9.1%, consumption of fruits and dairy products reported by Amin and group also correspond to our study. Their reported obesity among faculty was 64% as compared to this study (20.4%), and none of our study participants were obese. A study by Al-Shammari et al.¹, demonstrated SES, oral hygiene practices and self-perceived oral health status of Kuwaiti population with a mean age of 33.4±9.0 years. Differences in socio-demographic characteristics between males and females in that study are comparable with our study. Regarding self-reported oral hygiene practices, 62% were using toothbrush twice daily, 11.8% were using dental floss once daily, 33% were using Miswak daily or occasionally and 36.6% were rinsing mouth. These results are comparable to our study, where 81% of the faculty brush teeth one-time, 37.5% use dental floss one-time and 27% use Miswak daily¹.

Results of a recent study from Riyadh²² with respect to sweets, soft drinks, regular tooth brushing, regular visit to dentist, use of fluoride toothpaste, OHK of school teachers was found to be better than that of the cohort of this study. Results of a study by Al-Manasif et al.²³ on adults (20-60 years) with bachelor degree and above showed that participants' response towards dentist visit and use of floss was poor, and reported a higher prevalence of carious lesions as compared to the present study. In another study on university undergraduate women from Jeddah, more females were found to brush teeth 1-2 times daily, majority used medium toothbrush, a smaller number of women had gingivitis, majority did not visit dentist in the previous year. Majority of the women used less sugar products and soft drinks. In the current study, female faculty have shown better oral health practices as compared to these undergraduate women²⁴.

In contrast to this study sample, El Bcheraoui et al.⁴ concluded in their study that oral hygiene practices were not common and oral health care was limited in KSA. Other research work has shown that low SES and poor OHK are risk factors for periodontal disease, dental caries, and poor oral health¹⁸. This notion is supported by the present study as cohort with high SES and better OHK have reported good oral health.

CONCLUSION

Knowledge regarding oral health is an important driving component in forming and maintaining oral hygiene practices. It may be concluded that the majority of university faculty despite having a master or doctorate qualification have shown an acceptable level of oral health related knowledge, but have demonstrated good oral hygiene practices. Socio-demographic factors were reflected on the participants' knowledge and oral hygiene practices.

Limitations of Study: As a cross sectional in design, this study has some limitations such as voluntary participation that led to selection bias and self-reporting information bias. Although all faculty members of the university were approached and invited to participate, however response rate was low. That may be due to the non-availability of faculty in the office at the time of visit, lack of interest in study and low level of health awareness.

Conflict of Interest: Authors declare conflict of interest as none

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