

ORIGINAL ARTICLE

Oral Health Knowledge and its Associated Factors Among Universiti Putra Malaysia Staff

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ABSTRACT

Introduction: Oral health knowledge ensures that the person has all the requisite information to find out which oral diseases are and how they occur and recognize the security measures that must be taken. This knowledge can lead to changes in attitude, which leads to changes in the person's everyday life. This study aims to evaluate oral health-related knowledge and determine its associated factors among Universiti Putra Malaysia staff. **Methods:** A cross-sectional study involving 207 UPM staff. The study included the UPM Malaysian staff (permanent, temporary, contract), and excluded foreigners and staff on leave. Stratified random sampling was used to select a representative sample with five selected faculties. Oral health knowledge was assessed with a validated and pretested questionnaire. **Results:** The total respondents were 162 from 207 subjects, giving a response rate of 78.3%. In this study, more than half of the participants have satisfactory knowledge (56.2%). The results show a significant association between oral health knowledge and each of: level of education, monthly income, faculty, type of staff, and smoking. It is observed that postgraduate staff are more knowledgeable towards oral health with 63.2% compared to graduate level and below with 39.6% only. In addition, the staff with higher incomes are more likely to have satisfactory knowledge compared to the working staff with lower incomes with percentage up to 20%. Regarding the source of information association, none of the factors is found to have a significant association. **Conclusion:** More than half of the participants have satisfactory knowledge on oral health. Despite this, a significant proportion of staff have unsatisfactory knowledge, which suggests initiating an awareness program for the staff members to increase their knowledge of oral health.

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INTRODUCTION

Oral health knowledge can lead to changes in attitude, which leads to changes in the person's everyday life. Therefore, proper oral health knowledge is essential for better practice (1). The use of effective oral hygienic practices relates to the degree of understanding and knowledge of oral health in the subject (2). Overall, knowledge is essential to maintain good oral health, and improved oral health-related knowledge is a requirement for promoting oral health in a population (3).

The studies conducted by (4, 5, 6), report that oral health knowledge is influenced by income. Low socioeconomic status has been found to be a risk factor for insufficient knowledge about oral health and thus inadequate oral hygiene practices. The study (7) found

that the employees at University Alexandria, Egypt, with postgraduate levels, had higher scores in oral health knowledge than participants with lower education levels. The authors in (8) conducted a study among non-teaching (administrative staff) at Taibah University, KSA, where periodontal health knowledge was found that does not significantly associate with the age group ($p = 0.604$). Thus, there is no significant association between oral health knowledge and the studied age groups in this study.

A study in the United Arab Emirates among adults on oral health knowledge and behavior showed significant differences in oral health knowledge between males and females ($p = 0.03$). Females are more knowledgeable and practice better oral health behavior than males (9). However, results from other studies done in Kelantan among adults in rural villages on oral health knowledge showed no significant association between knowledge (p .value = 0.262) and gender (10).

The literature lacks studies about the different levels of

knowledge on oral health between Malaysia’s three main races. A study was conducted in Melaka on gingival and periodontal disease awareness among dental clinic patients; this research compared the knowledge among the three races (Malay, Chinese, Indian) in Malaysia. Overall, the results showed significant differences between the three races’ understanding of periodontal and gingival disease (11).

Oral health information can be gained in different ways. For example, a television campaign as a dental knowledge source has shown significant effects on adults’ periodontal health and disease knowledge (12). According to a study made in Japan among university students in 2017, the results showed 1,266 (57%) participant students gained dental knowledge from dental clinics, followed by the school (39.2%) and television (29.1%). A study was conducted in Melaka on the awareness of periodontal diseases among dental clinic patients; most respondents (31.4%) knew about gingival and periodontal diseases from their dentists. Television was the second way of obtaining information (28.1%). About 26.9% of the respondents gained knowledge from the internet, followed by friends and relatives (16.2%). In the least, 13.9% of the respondents obtained information about the gingival and periodontal disease from school (11).

Various studies have indicated that there is a considerable percentage of non-communicable diseases that affect the academic sector, such as respiratory problems (13), gastroesophageal disease (14), hypertension (15-18), diabetes (19,20), and metabolic syndrome (21,22). However, there is a lack of studies investigating oral health problems among university staff. Therefore, this study was conducted to evaluate oral health knowledge and its associated factors among Universiti Putra Malaysia (UPM) staff and to predict the variables that influence the knowledge of oral health.

MATERIALS AND METHODS

Study design

A descriptive cross-sectional study was conducted from May to July 2020 on the staff at Universiti Putra Malaysia.

Study participants and sampling procedure

This study includes Malaysian staff (permanent, temporary, contract) who work at UPM university, both male and female, and excludes staff on leave or not available during data collection and foreign staff. The sample size was calculated using the two population proportions formula (23). The formula is as bellow:

$$n = \frac{\{ [z_{(1-a/2)} \times \sqrt{2\bar{P}(1-\bar{P})}] + [z_{(1-B)} \times \sqrt{P_1(1-P_1) + P_2(1-P_2)}] \}^2}{(P_1 - P_2)^2}$$

Where,

n=Calculated sample size

z (1-a/2) = Z statistics for 95% confidence level = 1.96

Z(1-B) = Z statistics for 80% power = 0.842

$\bar{P} = (P_1 + P_2) / 2$

P₁ = Prevalence of oral health knowledge among urban teachers = 0.77.

P₂ = Prevalence of oral health knowledge among rural teachers = 0.58.

n = 94x2 =188. Adding 10% non-response. The estimated sample size was 207 participants.

A stratified random sampling technique was used, with selected faculties each serving as strata. The proportion of samples for each faculty was calculated. After calculating the sample size, a table of random numbers was used to select the required staff. Five faculties are chosen randomly from a total of 16 faculties that the UPM university contains posted on its website. The faculties selected randomly are the Faculty of Environmental Studies, Engineering, Agriculture, Medicine and Health Sciences, Modern Languages and Communication.

Study instrument

A questionnaire was utilized to collect data. The questionnaire was adopted and modified from previous studies (24, 25); the questionnaire was made in English and then translated into Bahasa Melayu language. The questionnaire has the sections as follows:

Section A: Socio-demographic factors consisted of five questions, including age, gender, ethnicity, the highest level of education, and monthly income. Section B: Medical disorders and smoking status consisted of three questions. Section C: Employment factors consisted of five questions, including faculty, duration of work, job title, and employment status. Section D: Oral health knowledge consisted of 17 questions; respond told to select the correct response. Each correct answer was given a “one” score, while the wrong answer and don’t know the answer given a “zero” score. Section E: Sources of information, participants were asked to indicate the source from which they obtained the oral health information, for example, the Internet, dentist, healthcare worker, school, television, friends, and newspaper.

Face and content validation were taken place after approval from UPM Ethics Committee for Research Involving Human Subjects (JKEUPM-2020-052) and faculty approvals. Additionally, the content of the questionnaire was reviewed by the supervisory committee and revised by an expert in dentistry.

Another non-participating staff carried out a pre-test to ascertain the questionnaire’s reliability. The test of reliability analysis for the finding was employed using Cronbach’s alpha value. The total Cronbach’s alpha value of the questionnaire was 0.79.

Data collection

Ethical approval for the study was obtained from UPM Ethics Committee for Research Involving Human

Subjects. Also, approvals from faculties were taken.

The questionnaire was sent to a respondent via email; The faculty staff's emails were obtained from the university registrar's office. The staff from each faculty was communicated via e-mail, which explained the conducted study, accompanied by a link to the questionnaire in English and a second link to the questionnaire translated into Melayu Bahasa.

We used Gmail equipped with the MailTrack software to send the questionnaire, which allows us to follow up on the emails sent, whether they were opened and whether the questionnaire links were clicked and answered. The email was sent on working days with two reminders for those who did not answer the questionnaire on the first attempt. All participants had emailed an information sheet and informed consent form to provide them with sufficiently detailed information on the study to make an informed, voluntary decision to participate.

Data analysis

Data were analyzed using the Statistical Package of Social Sciences (SPSS) version 25. Descriptive analysis is used to illustrate the prevalence of oral health knowledge. For the association between study variables, the Chi-square test is used to illustrate the association between dependent and independent variables. The knowledge score is recorded as categorical data and has been categorized into satisfactory and unsatisfactory knowledge based on the median as the cut-off point. A multiple logistic regression test is performed to determine the main predicting variables that influence oral health knowledge.

RESULTS

Knowledge score and association with the socio-demographic factors

Out of a total of 207 (the sample size of the study), the number of respondents who completed the questionnaire was 162, giving a response rate of 78.3%. Table I shows the total knowledge score; more than half of the respondents, 91(56.2%), have satisfactory oral health knowledge. Table II shows the results of chi-square tests for the association between oral health knowledge and socio-demographic factors. It is observed that there is a significant association between level of education and oral health knowledge, with postgraduate staff being more knowledgeable about oral health compared to graduate and below level with $p=0.006$. Regarding monthly income, there is a significant association between knowledge and staff's income, with $p=0.011$. There is no significant association between age, gender, ethnicity, and oral health knowledge.

Association of OH knowledge with the employment, health-related factors and source of the information

Table III shows the results of chi-square tests for the

Table I: Distribution of oral health knowledge among respondents

Knowledge	Frequency (n)	Percentage (%)
Satisfactory	91	56.2
Not satisfactory	71	43.8

Table II: Oral health knowledge and socio-demographic factors

Variable	Knowledge		p-value
	Satisfactory	Not satisfactory	
Age (year)			
≤39	47(57.3%)	35(42.7%)	0.766
>39	44(55%)	36(45%)	
Gender			
Male	34(53.1%)	30(46.9%)	0.528
Female	57(58.2%)	41(41.8%)	
Ethnicity			
Malay	77(54.2%)	65(45.8%)	0.183
Non-Malay	14(70%)	6(30%)	
Level of education			
Graduate & below	19(39.6%)	29(60.4%)	0.006*
Postgraduate	72(63.2%)	42(36.8%)	
Monthly income (RM)			
≤7300	38(46.3%)	44(53.7%)	0.011*
>7300	53(66.2%)	27(33.8%)	

* Level of significance at $p < 0.05$

Table III: Oral health knowledge and employment factors

Variable	Knowledge		p-value
	Satisfactory	Not satisfactory	
Faculty			
Medical Faculty of Health Sciences	47 (66.2%)	24 (33.8%)	0.023*
Non-Medical Faculty of Health Sciences	44(48.4%)	47(51.6%)	
Type of staff			
Academic	69 (64.5%)	38 (35.5%)	0.003*
Non-Academic	22 (40.0%)	33 (60.0%)	
Professional type			
Clinical	16 (61.5%)	10 (38.5%)	0.621
Non-Clinical	25 (67.6%)	12 (32.4%)	
Years of experience			
≤10	48 (58.5%)	34 (41.5%)	0.539
>10	43 (53.8%)	37 (46.3%)	
Employment status			
Permanent	85 (57.0%)	64 (43.0%)	0.448
Contract	6 (46.2%)	7 (53.8%)	

* Level of significance at $p < 0.05$

association between oral health knowledge and employment factors. It is observed that there is a significant association between the types of faculties and oral health knowledge, with a staff of Medicine and Health Sciences, are more knowledgeable about oral health compared to staff in other faculties ($p = 0.023$). There is a significant association between the type of academic staff and knowledge of oral health. However, there is no significant association between other employment factors and oral health knowledge. Table IV presents the association between oral health knowledge and health-related factors. As we can notice from the table, 8% only form the participants are smokers, and another 6% have diabetes, and around 1% with heart disease, which is a very small percentage that makes the association not applicable.

Table IV: Oral health knowledge and health-related factors

Variable	Knowledge		p. value
	Satisfactory	Not satisfactory	
Diabetes			
Yes	3 (30.0%)	7 (70.0%)	0.082
No	85 (58.2%)	61 (41.8%)	
Heart diseases			
Yes	0 (0.0%)	2 (100%)	0.101
No	89 (57.8%)	65(42.2%)	
Smoking			
Yes	3 (25.0%)	9 (75.0%)	0.024*
No	88 (58.7%)	62 (41.3%)	

*Level of significance at p< 0.05

Table V presents the association results between the source of getting information on oral health and knowledge. None of the factors is found to have a significant association with oral health knowledge.

Predictors of oral health knowledge among respondents Table VI shows a significant association between oral health knowledge and faculty (p= 0.018), where non-medical Faculty of Health Sciences have 0.445 times less likely to have adequate knowledge than Medical Faculty of Health Sciences (OR=0.443, 95% CI: 0.226-0.868). Besides, there is a significant association between oral health knowledge and the type of staff (p= 0.01). The academic staff has 3.199 times more likely to have satisfactory knowledge than non-academic staff (OR= 3.199, 95% CI: 1.585- 6.460).

Table V: Oral health knowledge and source of the information

Variable	Knowledge		p. value
	Satisfactory	Not satisfactory	
Internet			
Yes	85 (57.8%)	62(42.2%)	0.185
No	6 (40.0%)	9 (60%)	
Dentist			
Yes	73 (59.8%)	49 (40.2%)	0.101
No	18 (45.0%)	22 (55%)	
Health care worker			
Yes	25 (65.8%)	13 (34.2%)	0.172
No	66 (53.2%)	58 (46.8%)	
Friends			
Yes	32 (57.1%)	24 (42.9%)	0.856
No	59 (55.7%)	47 (44.3%)	
Schools			
Yes	19 (59.4%)	13 (40.6%)	0.684
No	72 (55.4%)	58 (44.6%)	
Television			
Yes	35 (57.4%)	26 (42.6%)	0.810
No	56(55.4%)	45 (44.6%)	
Magazine & newspaper			
Yes	38 (56.7%)	29 (43.3%)	0.907
No	53 (55.8%)	42 (44.2%)	

Table VI: Predictors of oral health knowledge

Variable	Coeffi- cient B	Adjusted OR	p- value	95% CI	
				Lower bound	Upper bound
Faculty					
Medical Faculty (Ref)					
Non-Medical Faculties	-0.813	0.443	0.018*	0.226	0.868
Type of staff					
Non-Academic (Ref)					
Academic	1.163	3.199	0.01*	1.585	6.460
Internet					
No (Ref)					
Yes	1.012	2.751	0.081	0.882	8.580

*Level of significance p<0.05

DISCUSSION

Oral health is an area with great impact on the community and has been studied worldwide. Literature is still limited to certain segments of the population; the university population workers are poorly studied in general. For this reason, this study aimed to produce documented information on the university staff's oral health knowledge level. This work could also be a baseline study to expand further and develop adequate oral health education material and programs to improve oral health awareness among university staff in Malaysia.

This study shows that more than half of the respondents, 91(56.2%), have satisfactory knowledge. This finding is in line with study results among non-teaching staff at Taibah University, KSA, where the staff had good periodontal health knowledge (8). In contrast with the study (26), where most staff members had a poor level of knowledge regarding oral hygiene. This is because the sample in the study (26) comprised only administrative staff, where almost two-thirds (60%) had completed a post-graduate diploma or degree. Contrary to our study, most of the staff (70,4%) have master's and Ph.D., and it is known that the level of education is associated with oral health knowledge as found in the studies (4, 7).

Regarding the association between socio-demographic factors and oral health knowledge, this study's findings show no significant association between oral health knowledge and the current study's age groups. This agrees with Al-Ahmadi (8), who conducted a study among non-teaching staff at Taibah University, KSA, where periodontal health knowledge was not significantly associated with the age group. This may be because of the limited variety of study participants' age, with most of the participants were young and mid-aged adults (75.9% of participants are between 24 to 45 years old).

Contrary to some studies that found that there is a significant statistical association with age, a study conducted in Egypt among the employees of Alexandria University found that the age range (years) [20-29] scored 0.72 points lower than the age range [45-60], while the age range [30-44] scored 0.85 points lower than age range [45-60] years (7). The age variable is associated with knowledge; as found in the study conducted at the dental clinic at the University of Valencia among adults in Spain, the average oral health awareness scores of younger subjects (18-40 years) were significantly higher. The older have shown 2% lower oral health awareness (4).

Regarding gender, there is no significant association in this study. These results agree with other studies that found no significant difference in oral health literacy levels between genders (27-29). In contrast, many studies show a significant association; more women have been more knowledgeable than men (4,7,8). It may be due to females are more concerned about their esthetic and look (8). This observation coincides with other studies conducted among students at a private university in Malaysia (30) and another study conducted on adults at two university-based dental clinics in the United States (31). The chi-square tests show the association between oral health knowledge and level of education, with postgraduate staff more knowledgeable about oral health than graduates and below level. Similarly, the study (4,7) found that the postgraduate level employees, had higher mean oral health literacy scores than participants with secondary education.

The present study also showed that there is no significant association between oral health knowledge and three races: Malay, Chinese, and Indian. The study (11) observed the same findings among patients attending the dental clinic at Melaka-Manipal Medical College. However, there was a significant association in OHL scores between the three races, where Malays came out on top (54.5%), followed by Chinese (31.5%) and Indians (10.3%) (27). However, this finding could not be supported, as there was no data from other literature comparing OH and races in Malaysia (27).

Low socioeconomic status has been found to be a risk factor for insufficient knowledge about oral health (4). This study had a significant association between oral health knowledge and monthly income. These findings agree with many studies where participants whose household income was in the top 20% of the population (T20 (>RM8135)). Participants with household income within the top of the country's population (T20 (>RM8135)) had the highest score in oral health literacy (OHL) than those at the bottom (B40 (<RM3855)). These findings support results that others report where OHL was influenced by income (5,28,32).

Employment factors are poorly studied in relation to oral

health knowledge. The faculty and the knowledge score of respondents were shown to be significantly associated. This is because of the comparison between the Faculty of Medicine and Health Sciences staff, where medical doctors, nurses, and other professional staff have basic oral health knowledge. This result agrees with the study (7) among employees of the faculty of Engineering and faculty of Dentistry, Alexandria University in Egypt. There was a significant statistical difference in OHL between the two faculties.

There is no significant association in this present study regarding the association with the duration of working experience with oral health knowledge. This disagrees with the study (8), where they found that the number of staff whose work period has been under ten years is better known than the number of staff who have worked for more than ten years. Also, there is a significant association between oral health knowledge and type of staff, where the academic staff has better knowledge compared to non-academic staff. This is because the academic staff is highly skilled and more educated, which also corresponds to the results in (4, 7).

Smokers in this study have a lower level of knowledge; this information may help to focus on training and intervention programs to increase knowledge on oral health for smoker staff. There is no significant association between having medical diseases such as diabetes, heart disease, and oral health knowledge. These findings agree with the works in (33, 34); there were no significant differences in oral health knowledge.

The findings from this study showed that none of the sources of information is found to have a significant association with oral health knowledge. This disagrees with the (35) study, where there was an association between the use of dental floss, dental check-ups, and dental information obtained from dental clinics, television, and school. The dental clinic was the most popular source of dental information and was associated with better oral health behavior. The study in (12) also reported that TV showed important impacts on adult knowledge about periodontal health.

The main predictors of oral health knowledge in this study were the faculty and the type of staff, which coincide with the study (36), where the study found that students in non-medical faculties tend to have lower scores than those in medical faculties.

CONCLUSION

In conclusion, the results found that more than half of the participants have satisfactory knowledge, despite this remaining significant proportion of staff with insufficient knowledge of oral health. Level of education, monthly income, faculty, type of staff, and smoking are associated with oral health knowledge. This study suggests initiating an oral health awareness program for the staff members

to increase their knowledge of oral health.

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