

Oral Hygiene, Periodontal Condition and Their Treatment Need of Teaching Faculty in Higher Schools

Sunitha.S¹, Aruna.G^{2*}, Vidya Doddawad³, Arunpriya Srinivasan⁴

1. Department of Public Health Dentistry, JSS Dental College and Hospital, JSS Academy of Higher Education and Research, Mysuru, Karnataka, India
2. Department of Periodontology, JSS Academy of Higher Education and Research, Mysuru, Karnataka, India
3. JSS Dental College and Hospital. JSS Academy of Higher Education and Research, Mysuru, Karnataka, India.
4. Dept of Oral and Maxillofacial Surgery and Diagnostic Sciences, College of Dentistry, Jouf University, Al Jouf, KSA.

Abstract

A teaching faculty in the school (school teacher) hold influential, community gatekeeper, The assessment of the oral hygiene status and periodontal experience of teachers will definitely reflect upon their efforts in educating the others which include the students, their parents or guardians and community at large.

The objective of this study is to assess oral hygiene, periodontal condition and their treatment need of teachers in schools. Methodology: With stratified random sampling, 300 teachers, Personal data was collected by questionnaire and oral health examination conducted by WHO Criteria of 1997. (OHI-S), (CPI) recorded and analysed.

The results based on age groups, area of location, education, gender and type of schools. The mean OHI-S score was 2.3 ± 1.2 . OHI-S ($P < 0.001$, HS) and CPI ($P < 0.001$, HS) 95% needed health education and 38.6% needed complex periodontal therapy.

There is need for oral health education to the teachers to make them help themselves, their students.

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Introduction

Good health supports successful learning. Successful learning supports health. Education and Health are inseparable. Worldwide, as we promote health, we can see our significant investment in education yield the greatest benefits.-Dr. Desmond O'Byrne (Health Promotion, Non communicable Disease, Prevention and Surveillance, WHO) School is a location, which helps to promote the health of staff, families and community members along with that of the students¹.

A teaching faculty in the school (school teacher) hold influential, community gatekeeper, decision making roles that may affect not only

student / family knowledge, but also their opinion and decision about the health are worth, and thus lead implementation of dental public health programs². It is through them that, children can be reached at the time the health habits are forming^{3,4}.

Teaching faculties' preparedness to teach about the link between personal habits and health outcomes reflect their beliefs about the oral health benefits accruing from carrying out those activities. Strengthening health beliefs in the presence of correct knowledge might successfully promote adoption and maintenance of oral health enhancing behaviours among teachers training, thereby improving their status as role models for the school children^{5,6,7}.

The assessment of the oral hygiene status and periodontal experience of teachers will definitely reflect upon their efforts in educating the others which include the students, their parents or guardians and community

Objectives: To assess the oral hygiene of school teachers of Davangere district and periodontal status and to identify periodontal treatment needs.

*Corresponding author:

Dr. Aruna.G, MDS
Assistant Professor, Department of Periodontology,
JSS Academy of Higher Education and Research,
Mysuru, Karnataka, India
E-mail: arunaperio@yahoo.co.in

Materials and methods

The present study is an descriptive cross sectional epidemiological survey. Davangere district lies in the centre of Karnataka state of India and hosts many educational institutions.

There are over 166 primary and middle schools in Davangere district. 86 are located in the urban area and 80 in the Semi urban area, which constitute of both Government and Private schools. This information was gathered from the officer at Deputy Director of Public Instruction Office, Davangere district.

Sample selection:

The stratified random sampling technique was followed. Based on which, the district was stratified as per the geographic distribution in to urban and semi urban areas.

The sample size was determined using the formula:

$$n = \frac{Z^2pq}{d^2}$$

Where, Z = 2 (As per the table of area under the normal curve for 95% CI)

To select the final sample size, a preliminary visit to some of these schools were held and information regarding the staff infrastructure were gathered, which indicated that on an average each of these schools employed 16-20 teachers, who were of both sex between the age group of 20-58 years. Thus, the final sample based on this information, which necessitated 10% of the total schools for the study, 16 schools were picked up using simple random sampling (through random number table) to make 300teaching faculty. These 16 schools were proportionately allocated to urban, semi urban areas randomly.

From each of the selected schools all the teachers were selected with the following inclusion and exclusion criteria's.

Inclusion Criteria: A total number of 300 school teachers, 150 from urban and 150 from semi urban areas belonging to both genders available on the day of examination who taught for primary and middle schools were considered.

Exclusion Criteria: The female teachers who were pregnant and those were on treatment for diabetes and cardiac problems or any other systemic long standing diseases were excluded. Prior to the commencement of the study,

permission was obtained from the officer of Deputy Director of Public Instructions (DDPI), Davangere district. The verbal and the written consent were obtained from the concerned school authorities. Schedule was allotted to the school teachers to undergo screening which did not interfere with their normal routine functioning. A pilot study was conducted in two schools. One urban school and one semi urban school with 15 teachers each, to check the feasibility of the survey and to note any difficulties encountered during the examination. This pilot study would also help in exacting the pre-designed Performa and to make modifications wherever necessary to design the final performa. All examinations were conducted by single examiner. The 30 teachers examined in the pilot study were not included in the final sample size so as to eliminate bias. Sufficient sets of instruments were taken during the study to avoid the need to interrupt examination while, used once were being sterilized. Chemical sterilization was followed at the examination site using gloves, one part of Korsolex was diluted to nine parts of potable tap water to obtain 10% solution into which, instruments were immersed for 30 minutes before being rinsed, when necessary. Used instruments were placed in the disinfectant solution, then washed and drained well before re-sterilization. For the collection of data, a specially designed pre tested performa was used. The performa consisted of two sections, the first section was pertaining the questions that included demographic information, which was retrieved through personal interview with the teachers. The demographic variables considered were age, sex, place of working, type of the school, oral hygiene habits and practices, and the aids used for that purpose. The second section of the perform consisted of the indices-Simplified Oral Hygiene Index (OHI-S), Community Periodontal Index (CPI)^{8,9}

The general information was collected based on personal interview of the subject. The questions were well explained in Kannada, the local language. The collected data was entered in the first section of the Performa. The clinical examination performed with the teacher seated upright on a chair in a well-ventilated room making sure there were uniform and enough natural light throughout the procedure. The examiner stood to the right side of the participant, and assistant was seated next to her. A single

examiner conducted all the examination. A trained assistant entered the data into the prior perform.

The data collected was arranged systemically, and were transferred to the computerized excel sheet which was later analysed using Statistical Package for Social Sciences (SPSS) and MINITAB software's and was subjected to statistical analysis.

Continuous data is presented as mean and standard deviation, and categorical data as numbers and percentages. One-way ANOVA (Analysis of variance) was used for quantitative analysis when three or more groups were compared Chi-square test^{10,11} was used to test association $p < 0.05$ was set to be statistically significant (S) and $p < 0.01$ was set to be highly significant (HS).

Results

It was found that the teachers were in between the age group of 18-58 years with mean age being 34.5 years. 47 (15.7%) teachers were males and 253 (84.3%) were females. The observations of the study showed the following results that are displayed in the form of tables and graphs.

Demographic Representation of Study Population: Table I shows the sample population based on age groups and the locations of the schools. The maximum number of teachers belonged to age group of 21-30 years (40.7%), followed by 41-50 years (23.7%), 31-40 years (23.3%), 51-58 years (8.0%) and 18-21years (4.3%) respectively.

Age Group in years	Location		Total n (%)
	Urban n (%)	Semiurban n (%)	
18 – 20	-	13 (8.7)	13 (4.3)
21 – 30	64 (42.7)	58 (38.7)	122 (40.7)
31 – 40	37 (24.7)	33 (22.0)	70 (23.3)
41 – 50	30 (24.0)	35 (23.5)	71 (23.7)
51 – 58	13 (8.7)	11 (7.3)	24 (8.0)
Total	150 (100)	150 (100)	300 (100)

Table 1. Distribution of study population based on age groups and location.

Gender	Number	Percentage
Urban	150	50
Semiurban	150	50
Total	300	100%

Table 2. distribution of study population based on location.

Table II : Shows the of study population based on urban or semi urban location, which was equally distributed. The highest number of the sample are the females 84.3%(n=253) and only 15.7% (n=47) constituted males. 96 teachers were from government schools and 204 teachers were from the private schools.

Oral Hygiene Practices: All the teachers cleaned their teeth every day. Regarding the aids used to clean teeth, 92% (n=138) of the teachers in the urban areas, and 90% (n=135) in the semi-urban area used tooth brush and dentifrice. 12 (8%) of the teachers in the urban area and 10% (n=15) of the teachers in the semi-urban area used finger with dentifrice to clean their teeth as depicted in Table III.

Aids Used to Clean Teeth	Location		Total n (%)
	Urban n (%)	Semiurban n (%)	
Tooth Brush with Dentifrice	38 (46)	135 (45)	273 (91)
Finger with Dentifrice	12 (4)	15 (5)	27 (9)
Others	-	-	-

Table 3. Distribution of study population with respect to aids used to clean teeth.

Age Group (in Years)	N	DI-S	CI-S	OHI-S
18 – 20	13	0.7 ± 0.5	0.5 ± 0.7	1.3 ± 1.2
21 – 30	122	1.1 ± 0.6	0.8 ± 0.6	1.9 ± 1.1
31 – 40	70	1.3 ± 0.8	1.1 ± 0.6	2.4 ± 1.1
41 – 50	71	1.4 ± 0.6	1.3 ± 0.7	2.7 ± 1.2
51 – 58	21	1.6 ± 0.6	1.5 ± 0.8	3.1 ± 1.4
Total	300	1.2 ± 0.7	1.1 ± 0.7	2.3 ± 1.2

Table 4. Ohi-Scores According to Age Groups. Anova, F = 11.7, P= 0.001 (Hs).

Oral Hygiene Status according to age: The mean OHI-S scores of the study population based on the age groups is displayed in Table IV. The mean OHI-S score of the total sample population was found to be 2.3 ± 1.2 . The DI-S, CI-S and the OHI-S scores increased progressively with age and found to be highly significant (ANOVA, $F = 11.7$, $P = 0.001$). The poor OHI-S score was recorded in the teachers belonging to 51-58 years age group.

Age Groups in Years	n	Percentage of Participants Coded					
		Healthy Gingival 0 n (%)	Bleeding 1 n (%)	Calculus 2 n (%)	Shallow Pockets 3 n (%)	Deep Pocket 4 n (%)	Excluded X n (%)
18 – 20	13	4 (30.8)	4 (30.8)	5 (38.5)	-	-	-
31 – 30	122	7 (5.7)	35 (28.7)	69 (56.6)	10 (8.2)	1 (0.8)	-
31 – 40	70	1 (1.4)	8 (11.4)	33 (47.1)	25 (35.7)	3 (4.3)	-
41 – 50	71	2 (2.8)	-	13 (18.3)	43 (60.6)	13 (18.3)	-
51 – 58	24	1 (4.2)	-	2 (8.3)	10 (41.7)	11 (45.8)	-
Total	300 (100)	15 (5.0)	47 (15.7)	122 (40.7)	88 (29.3)	28 (9.3)	-

Table 5(a). Number, percentage of participants coded with cpi. $X^2 = 175.1$, $p < 0.001$, HS.

Age Groups in Years	Mean Number of Sextant Coded With					
	0	1+2+3+4	2+3+4	3+4	4	x
18 – 20	3.53	2.15	0.61	-	-	-
31 – 30	2.14	3.42	1.66	0.09	-	-
31 – 40	0.78	4.94	2.81	0.65	0.57	-
41 – 50	0.29	5.32	2.04	1.74	0.25	-
51 – 58	0.52	6.71	5.6	2.85	0.95	-
Total	1.46	4.50	2.54	1.06	0.35	-

Table 5(B). Mean number of sextants affected by periodontal conditions.

Table 5(A,B). Periodontal conditions measured by cpi among teaching faculty based on age group.

Periodontal Status according to Age: The results of CPI were found to be as tabulated in Table V(A) and V(B). Where it is presented as percentage of persons coded with CPI and the mean number of sextants affected. Very few participants 15 (5%) recorded healthy gingiva whereas majority 122 (40.6%) showed the presence of calculus, bleeding on probing was observed in 47 participants (15.7%), shallow

pockets were observed in 88 participants (29.3%) and 28 (9.3%) participants showed deep pockets. The sextant based depiction showed the most common condition was the presence of calculus. The periodontal condition worsened with older age group than the younger age group ($\chi^2 = 175.1$, $P < 0.001$ HS). Table VI depicts correlation between OHI-S and CPI which shows, as the OHI-S scores increases with poor status the CPI scores also is higher.

Oral Hygiene Status Simplified		No. of Teachers	PERSONS CODED WITH CPI				
Score	Status		0	1	2	3	4
0.0 – 1.2	Good	64	10	16	22	13	3
1.3 – 3	Fair	165	4	26	76	44	15
3.1 – 6	Poor	71	1	5	24	31	10
ANOVA $F = 8.92$ $P < 0.01(S)$ $X^2 = 38.4$, $p < 0.001(HS)$							

Table 6. Analysis Of Cpi in Relation To Ohi-S.

Discussion

Oral diseases are one of the most commonly and extensively effecting disease of mankind, regardless of age, sex, location or employment of an individual. An attempt is being made since years in regards to reduce the dental problems affecting the human kind. In that row, to get the data regarding health status many surveys have been made. School teachers are being used as one of the best health personnel available worldwide to instruct their students about health and be unfamiliar with the current oral health concept.^{3,5,6,11} The overall mean oral hygiene status was 2.3 ± 1.2 , which was near to findings by De la Maza FJ, (1989)¹³, Sendilkumar S, (2003)¹⁴

There was gradual decline in oral hygiene status of the olders when compared to the younger age group. i.e. from 1.3 ± 1.2 to 3.1 ± 1.4 respectively this was in accordance with the findings of Vigild M, et al (1993)¹⁵ and also in the study held at Srilanka by Ekanayake.I, Perera I (2005)¹⁶ The gender differences showed no significance with regards to oral hygiene status, which was not similar to findings by Alvarez-Arenal A, et al (1996)¹⁷ Ettinger RL, Beck JD,

Jakobsen (1984)¹⁸, Fuad Husain Akbar (2017)⁵⁰ where they found that oral hygiene status was better in women.

As mentioned earlier with the raise in OHI-S scores, the scores of DMFT also increased as found by Frentzen M, Schuler N, Nolden R (1990)¹⁹, Athanassouli T, (1990)²⁰. As mentioned earlier, there was significant CPI with poorer the OHI-S scores as the oral health is found to be inter related to each of them similar to the study conducted by Athanassouli T, et al (1990)²⁰.

Periodontal Status: The periodontal condition of different age groups was measured by the CPI index with four different indicators bleeding, calculus, shallow pockets and deep pockets.

There was gradual increase in the CPI scores with age and almost doubled when it came to older age group as recorded by Gaengler P, Goebel G, Kurbad A, Kosa W (1988)¹³, Songpaisan Y, Davies GN (1989)²³, Frentzen M, Schuler N, Nolden R (1990)¹⁹, Slade GD, et al (1993)²². The occurrence of pockets also increased with increase in age. Similar to Songpaisan Y, Davies GN (1986)²³, Blerta Latifi-Xhemajli (2018)⁵¹, Slade GD, et al (1993)²⁴, Mosha HJ, et al (1994)²⁵, Adegbebo AO, el-Nadeef MA (1998)²⁶, Gamonal JA, Lopez NJ, Aranda W (1998)²⁷, Brindle R, et al (2000)²⁸, El-Qaderi SS, Quteish Ta'ani D (2004)²⁹, Hugoson A, et al (2005)³⁰, Burt BA³¹, Papapanou PN³² this relationship is explained due to the prolonged exposure to risk factors over a person's life, creating a cumulative effect with time span.³³

Calculus was found to be the periodontal disorder of all age groups as also found by Vrbic V, et al (1988)³⁴, Songpaisan Y, Davies GN (1989)²³, Ismail AI, Szpunar SM (1990)³⁵, Loh T, Chan J, Low CN (1996)³⁶, Lin HC, Schwarz E (2001)³⁷, Hugoson A, et al (2006)³⁰

Overall bleeding on probing was recorded in 157% (n=47) of total sample. It was higher in younger age groups when compared with the older age group. Calculus was recorded in 40.7% (n=122) of total sample. Which was highest in the age group of 21-30 years with 56.6% (n=69). The overall calculus recorded was similar as recorded by Savage KO (1992)³⁸ and Songpaisan Y, Davies GN. (1989)¹⁸, Behbehani JM, Shah NM (2002)³⁹.

Shallow pocket was recorded in 29.3% of overall population and deep pocket in 9.3% with

greater percentage contributed by the older age group. The overall shallow or deep pockets were 29.3% and 9.3% respectively, which was 41.7% and 45.8% in 50-58 years age group and 60.6% and 18.3% in 45-50 years age group which was similar to that of the findings from oral health survey and fluoride mapping (2002)^{40,41} Hardwick KS, Jones DB, Phipps KR (1993)⁴² and Vrbic V, Homan D, Završnic B (1987)³⁴.

The teachers who were placed in Government schools had poorer periodontal status as compared with the teachers from Private schools (P<0.001 S) there is no available data regarding this criteria, a comparison is not been possible to be made.

Gender showed no significant difference. Teachers from urban areas had better periodontal status when compared to teachers of semi urban areas. This could be because of better dental health awareness, environmental factors, living conditions and nearer placement to dental clinics and the Dental Colleges.

There was a high level of treatment necessary for periodontal health which was 95% required oral health education, 79% required oral prophylaxis as similar to Bergman JD, Wright FA, Hammond RH (1991)⁴³, Loh T, Chan J, Low CN (1996)³⁶, Brindle R, et al (2000)²⁸. 38.66% required complex periodontal therapy which was in similarity with the findings of van Palenstein et al (1998)⁴⁴, Madden IM, et al (2000)⁴⁵, Pearson N, et al (2001)⁴⁶, Muhammad Ruslin (2019)⁴⁸.

Conclusions

Oral health holds the key to general health in many aspects. However, it is one component about which there is very little awareness and little clear understanding of the implications, and their consequences of the ill health. In view of the adverse effects of poor oral health, it is important to take preventive measures and create the required services. To achieve this purpose a baseline data is necessary to be created so that such data will help us plan and formulate programs and implement them to improve oral health of the community.

Indian sub-continent having 970 million population with substantial proportion of children⁴⁷, should concentrate to improve the dental health of the future generation in younger age, with the help of the most resourceful health-

man power, the school teachers.

In this study, the teaching faculty demonstrated poor oral hygiene due to lack adequate of knowledge on proper brushing technique. There is an imperative need for oral health education to the school teaching faculty to make them help themselves, their students and the community.

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Declaration of Interest

The authors report no conflict of interest.

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