

Knowledge, Attitude and Practice Regarding Oral Health Among the Rural Government Primary School Teachers of Mangalore, India

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Introduction

Children who suffer from poor oral health are 12 times more likely to have restricted-activity days, including missing school, than those who do not. Annually, more than 50 million hours are lost worldwide from schools due to oral diseases.¹ A school is not just a place for a student to receive education, but an institute which molds the behavior, attitude and perceptions towards life. The World Health Organization's Global School Health Initiative encourages "Health-Promoting Schools" to create a healthy setting for living, learning and working. This initiative is designed to improve the health of students, school personnel, families and other members of the community through schools.²

Oral disease can be considered a public health problem due to its high prevalence and significant social impact. Chronic oral disease typically leads to tooth loss, and in some cases has physical, emotional and economic impacts: physical appearance and diet are often worsened, and the patterns of daily life and social relations are often negatively affected.³⁻⁵ Because of the failure to incorporate oral health into general health promotion, millions suffer intractable toothache and poor quality of life, and end up with few teeth.⁶

Elementary schools are suitable for the presentation of oral health information. Children, the potential recipients, spend a considerable amount of time in this setting. They can be reached at a time when their health habits are forming. Oral health information can be made available to all children, including those who may not have access to other sources of health information.⁷

Abstract

Purpose: This study was conducted to assess the knowledge, attitude and practice regarding oral health among the Rural Government Primary school teachers of Mangalore, Karnataka, India.

Methods: A self-administered close ended questionnaire consisting of 16 items was distributed among the rural primary school teachers of Mangalore (n=165). Comparison of knowledge and attitude amongst the 3 age groups was done with Kruskal Wallis test. Comparison of mean scores between the genders was done using Mann-Whitney-U test. Comparison of mean scores across four educational qualification groups was done using Kruskal Wallis test.

Results: Out of 165 primary school teachers to whom the questionnaires were sent, 153 responded, yielding a 92.7% response rate. Results showed that significant difference ($p < 0.01$) was seen across the 3 age groups for the mean practice scores. There was significant difference between the genders with females scoring better for the mean knowledge, practice and the total scores. Educational qualification did not make any significant difference in the knowledge and practice on oral health.

Conclusion: The study concluded that oral health knowledge was lacking among the primary school teachers of rural Mangalore, although practices were satisfactory. Oral health education program targeting only the teachers is of utmost importance in the light of the present study results.

Keywords: attitude, knowledge, oral health, practice, rural, school teachers

This study supports the NDHRA priority area, **Health Promotion/Disease Prevention:** Validate and test assessment instruments/strategies/mechanisms that increase health promotion and disease prevention among diverse populations.

Teachers play a vital role in shaping the behavior and overall comprehensive development of school children. School teachers are known to exert considerable influence on their pupils and to an extent on the community at large. School teachers are more authoritative on children than parents in the Indian context. The instructions imparted by the teachers are generally followed more religiously by the pupils. The advantages of using school personnel are the potential for improved continuity of instruction and lowered cost of the service.⁷

Methods and Materials

Study Design and Study Population

In a developing country like India with a population of more than 1 billion, where more than 70% of the people reside in rural areas,⁸ schools can function like a bridge between the seekers and the providers of Oral health information. Studies that have investigated the oral health awareness among school children have revealed that they have a low level of oral health knowledge.⁹⁻¹¹ It is recommended that health education programs in the schools be conducted by adequately trained teachers.⁹⁻¹¹

Teachers need to have a sound knowledge regarding constructive oral health habits to train their students. Children enter Grade I of the primary school between the ages of 5 to 6, and continue until grade 7, approximately 13 years of age. This is a highly appropriate age group to inculcate good oral hygiene habits. Previous study conducted on elementary school teachers in Michigan has shown that teachers' knowledge about oral health and oral hygiene practices are incomplete and inappropriate.⁷ Very few studies assessing the oral health knowledge, attitude and practice of primary school teachers have been reported from this part of the country. A study conducted on primary school teachers in Dharwad, India have shown that school teachers have fair knowledge regarding oral health.¹² Such studies can be helpful to gather the baseline data on the existing knowledge of the school teachers and plan appropriate health education programs for them.

This study was conducted to assess the knowledge, attitude and practice regarding oral health among the Rural Government Primary school teachers of Mangalore, Karnataka, India.

Description of the Study Area

Mangalore is located in Karnataka state along the south western coast of Indian peninsula, and is the administrative headquarters of the Dakshina Kannada district. There are 3 kinds of schools in Karnataka: government (run by the government), aided (financial aid is provided by the government) and un-aided private (no financial aid is provided).¹³

The Dakshina Kannada district is further divided into 6 subdivisions for the purpose of school administration: Mangalore city, Mangalore Taluk, Bantwal, Belthangady, Moodbidri and Puttur. There are total of 420 schools in Mangalore (both rural and urban) of which 100 schools are rural schools run by the State Government (Department of Education).¹⁴

There are 107,974 school children enrolled for the year 2010 to 2011 and total of 3,363 school teachers of which 1,307 teachers are working in Government schools in Mangalore (both rural and urban).¹⁵

This was a cross-sectional questionnaire study to assess the knowledge, study design and study population. The study population was all the primary school teachers of Mangalore rural. Ethical approval to conduct the study was obtained from Institutional ethical committee, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Mangalore. Official permission was obtained from the Block Education Officer, Mangalore Taluk, before conducting the study. Informed consent was obtained from the school teachers participating in the study. Participants were assured that their responses would be kept confidential.

Survey Instrument

A self administered, pre-tested close ended questionnaire consisting of 16 items was distributed among the rural primary school teachers of Mangalore (n=165). The questionnaire was prepared in the local language "Kannada." The questionnaires were mailed to all the primary school teachers of Mangalore rural along with an informed consent form and a self addressed paid postage envelope, in the month of December 2010. The responses were gathered in 15 days from the date of dispatch of the questionnaires.

The questionnaire collected sociodemographic information and the educational qualification of the school teachers. Questions were framed to assess the knowledge (n=10), attitude (n=1) and practice (n=5) of the rural primary school teachers regarding oral health. Knowledge questions were based on the primary and the permanent dentition, oral hygiene measures, dietary habits, and common myths about extraction in rural India. Consumption of homemade jaggery containing sweets (ladoos, kheer, halwas, etc.) is common in rural India.

Questionnaire Reliability Analysis

The questionnaire was tested for reliability by test-retest method prior to conducting the study. The questionnaire was distributed to and collected back from 10 rural primary school teachers from 3 schools on 2 different days by the investigator. Reliability was assessed by split half reliability coefficient test ($\rho=0.84$, good reliability).

Data Management and Processing

The first 10 questions assessed the level of knowledge of the primary school teachers on oral

health. Knowledge score for each individual was calculated by assigning a score of 1 for each correct answer. Scores for questions 1 through 10 were added together to get a “knowledge score” for each individual. Mean knowledge score was calculated by dividing the total knowledge scores of all individuals by the number of individuals.

Questions 11 through 15 assessed the oral hygiene practice of the primary school teachers. The mean practice score was calculated similar to the method of calculation of the mean knowledge score. Question 16 was an attitude question to understand the participant’s receptivity towards further health education sessions. Participants who were willing to know more about oral health were considered to have a positive attitude. “Total score” was calculated by adding all the correct responses of questions 1 through 16.

Kolmogorov-Smirnov statistic was applied to analyze the type of data. The total scores, knowledge scores and practice scores were separately tested to know whether each one of them followed the normal distribution. Since all 3 scores significantly deviated from normal distribution ($p < 0.001$), data was deemed as non-normal and hence non-parametric tests were applied subsequently.

The participants were categorized into 3 categories based on their age as 34 years and below, 35 to 44 years and 45 years and above. Comparison of the knowledge and practice scores of the 3 age groups was done with Kruskal Wallis test. Individual’s age was further correlated with practice score using Spearman’s correlation. Comparison of mean scores between the genders was done using Mann-Whitney-U test. Comparison of mean scores across 4 qualification groups (Basic qualification, main education stream, Teacher’s Certificate Higher course and arts stream) was done using Kruskal Wallis test. Level of significance was set at 1% and probability value of < 0.01 was considered as statistically significant. The data was entered in Microsoft Excel 2007 and the statistical analysis was performed using SPSS Version 10.0 (SPSS Inc., Chicago, IL, USA).

Results

Table I summarizes the sociodemographic characteristics of the study participants. Out of the total 165 primary school teachers to whom the questionnaires were sent, 153 responded. The response rate was 92.7%. About half of the teachers were in the 45 years and above age group (54%). Most of the teach-

Table I: Sociodemographic Characteristics of Participants

		Number of individuals (%)
Age group (In years)	34 and below	28 (18%)
	35 to 44 years	43 (28%)
	45 and above	82 (54%)
	Total	153 (100%)
Gender	Female	108 (71%)
	Male	45 (29%)
	Total	153 (100%)
Highest level of Educational Qualification	Basic Education (10th and 12th grade)	22 (14%)
	Main stream Education*	15 (10%)
	Teacher’s Certificate Higher Course	98 (64%)
	Arts stream (BA, MA)	18 (12%)
	Total	153 (100%)

*Main stream education refers to Diploma in Education (DEd), Bachelor in Education (BEd), Certificate in Physical Education (CPEd), Diploma in Physical Education (DPEd)

ers were females (71%). The majority were qualified with a “Teachers certificate Higher” course (64%).

Table II shows the number and percentages of the participants who answered the knowledge questions correctly. Most of the subjects (92%) knew that the teeth should be cleaned using a tooth brush. Half of them did not know the importance of milk teeth. Only 54% answered correctly that milk teeth are required for eating, speaking and maintenance of space. Very few participants (28%) answered that early loss of milk teeth can cause irregularities in occlusion. Only 38% of the teachers answered that teeth are required for lifetime and losing a tooth would make a difference. Almost all the subjects (99%) knew that the mouth has to be rinsed after every meal. When asked whether in between meal snacking causes tooth decay, 58% answered no. For the last question on sequelae of extraction, 50% answered that it might lead to blurring of vision, affects the brain and weakens the nerves.

Table III depicts the oral health practices of the primary school teachers of rural Mangalore. To the question regarding previous visit to the dentist, 88% of the respondents had visited a dentist earlier. Of those, 31% visited for restorations, 26% for extraction, 30% due to dental pain, 6% for oral prophylaxis, 2% for

Table II: Correct Responses of Participants for Knowledge Questions

Sl. Number	Question	Correct/Expected Answer	Participants Who Answered Correctly	
			Number	%
1.	Total number of milk teeth present in a child's dentition	20	133	87%
2.	How should teeth be cleaned?	Using tooth brush	141	92%
3.	Milk teeth are required for	Eating, speaking and space maintenance	83	54%
4.	First permanent tooth normally erupts at the age of	6 years	58	38%
5.	Early loss of milk teeth can	Cause irregularities of teeth/dentition	43	28%
6.	When should you visit a dentist	once in 6 months	140	92%
7.	Teeth are important for lifetime. Losing a tooth does not make any difference.	Only first statement is true	58	38%
8.	It is necessary to rinse your mouth	After every meal	151	99%
9.	Consumption of snacks between meals	Causes tooth decay	65	42%
10.	Removal or extraction of teeth	None of the above complications	77	50%

Table III: Correct Responses of Participants for Practice Questions

Sl. Number	Question	Correct/Expected Answer	Participants Correctly Identifying Desired Answer	
			Number	%
11.	Have you visited a dentist in the past	Yes	134	88
12.	How do you clean your teeth?	Using tooth brush and paste	141	92
13.	How often do you brush your teeth?	Twice a day	139	91
14.	How often do you change your tooth brush?	Once in 3 months	128	84
15.	What measures do you take when you get pain in your teeth?	Visit a dentist	145	95

their children's treatment and 5% for a routine check-up. Most of the teachers (92%) used tooth brush and tooth paste to clean their teeth, and 91% said they brushed their teeth twice a day. Changing of tooth brush once in 3 months was practiced only by 84% of the respondents. A majority (95%) visited a dentist in case of toothache, whereas 5% either visited a doctor, took a pill from the nearby pharmacist or kept a clove in their mouth. Clove is a household product found in almost all kitchens in India and is a common spice used in cooking. It is considered a handy household remedy for a toothache. All the respondents (100%) wanted to know more about oral health.

Table IV shows the comparison of the knowledge and practice scores across the 3 age groups. Though there was no significant difference among the age groups for knowledge and total scores, the 47 years and above age group scored better compared to the other age groups, which was statistically significant.

Table V compares the knowledge and practice scores between genders using Mann-Whitney-U test. Females scored better than the males for knowledge, practice and total scores which was statistically significant.

Table VI shows the comparison of knowledge and practice scores across different educational qualification groups using the Kruskal Wallis test. It was noted that the categorization into different groups based on educational qualification did not make any significant difference in the knowledge and practice on oral health.

Discussion

The present study assessed the knowledge, attitude and practice regarding oral health among the primary school teachers of rural Mangalore.

Table IV: Knowledge and practice scores across different age groups

Age group	Number of individuals (%)	Knowledge score		Practice score		Total score	
		Mean (SD)	p-value*	Mean (SD)	p-value*	Mean (SD)	p-value*
34 and below	28 (18%)	6.5 (1.4)	0.42 (NS)	3.9 (1)	<0.001**	11.4 (2)	0.78 (NS)
35 to 44 years	43 (28%)	6.2 (1.2)		4.4 (0.5)		11.7 (1.3)	
45 and above	82 (54%)	6.1(1.3)		4.7 (0.5)		11.8 (1.5)	
Total	153 (100%)	6.2 (1.3)		4.5 (0.7)		11.7 (1.5)	

*Comparison of three age groups with Kruskal wallis test

** Individual's age was further correlated with practice score using Spearman's correlation that showed significant correlation (r=0.35,p<0.01, Significant)

NS - Not significant

Table V: Knowledge and practice scores compared between genders

Gender	Number of individuals (%)	Knowledge score		Practice score		Total score	
		Mean (SD)	p-value*	Mean (SD)	p-value*	Mean (SD)	p-value*
Female	108 (71%)	6.3 (1.3)	0.017**	4.6 (0.6)	0.0017**	11.9 (1.5)	0.003**
Male	45 (29%)	6.0 (1.3)		4.3 (0.8)		11.1 (1.6)	
Total	153 (100%)	6.2 (1.3)		4.5 (0.7)		11.7 (1.5)	

*Comparison of mean scores between the genders using Mann-Whitney-U test.

** p<0.01, significant

Table VI: Knowledge and practice scores across different Educational qualification groups

Highest Educational Qualification	Number of individuals (%)	Knowledge score		Practice score		Total score	
		Mean (SD)	p-value	Mean (SD)	p-value	Mean (SD)	p-value
Basic Education (10th and 12th grade)	22 (14%)	6.0 (1.2)	0.63 (NS)	4.5 (0.7)	0.13 (NS)	11.5 (1.4)	0.57 (NS)
Main stream Education*	15(10%)	6.4 (1.8)		4.1 (0.9)		11.5 (2.5)	
Teacher's certificate higher course	98 (64%)	6.2 (1.3)		4.6 (0.6)		11.8 (1.4)	
Arts stream (BA, MA)	18 (12%)	6.4 (1.2)		4.4 (0.5)		11.8 (1.3)	
Total	153(100%)	6.2 (1.3)		4.5 (0.7)		11.7 (1.5)	

*Main stream education refers to Diploma in Education (DEd), Bachelor in Education (BEEd), Certificate in Physical Education (CPEd), Diploma in Physical Education (DPEd)

NS - Not Significant

The questionnaires were mailed to all the teachers, with the intention of not disturbing the ongoing academic activities of schools. The questions were framed at a language level that was easy to comprehend and understand by the primary school teachers.

In India, a Bachelor of Education (BEEd) is a course offered for those interested in pursuing career in teaching. The BEEd degree is mandatory for teaching in higher primary schools (fifth through seventh grade) and high schools (eighth through tenth grade). The Diploma in Education (DEd) or TCH (Teachers Certificate Higher Course) is meant

for teaching in lower primary (first through fourth grade) and nursery (kindergarten) schools in India.

A search in the existing literature revealed very few reported studies assessing the knowledge, attitude and behavior of primary school teachers regarding oral health in India. The results of the present study show that the mean knowledge score across all age groups was 6.2±1.3, which is suggestive of an average knowledge regarding oral health among the teachers. The 34 years and below age group scored better than the other age groups with a mean score of 6.5±1.4, which indicates that the younger teachers had more knowl-

edge on oral health. This was in contrast to those reported in Dharwad, India where school teachers aged >50 years and those with postgraduate degrees had greater knowledge.¹² Females had a better score (6.3 ± 1.3) compared to males (6.0 ± 1.3). When the comparison of knowledge was made according to highest level of education, teachers in the main stream education (6.4 ± 1.8) and the arts stream (6.4 ± 1.3) performed better compared to their other counterparts.

With regard to the practice scores, the total mean score across all age groups was 4.5 ± 0.7 . The 45 years and above age group scored better than the other age groups with a mean score of 4.7 ± 0.5 . Though the younger teachers had better knowledge on oral health, they did not score well in the practice items. Females had a better score (4.6 ± 0.6) compared to males (4.3 ± 0.8). This finding is in accordance with previous studies which may be due to the fact that females are generally more hygiene conscious than males.⁹⁻¹¹ When the comparison of practice was made according to highest level of education, teachers qualified with Teachers' Certificate Higher Course (4.6 ± 0.6) fared better than others.

The attitude of the teachers was favorable, and all of them (100%) wished to have a dental health education program in the future. A study conducted on primary school teachers in Benin-City, Nigeria also demonstrated positive attitudes among the teachers.¹⁶ However, a majority of primary school teachers in Lagos state, Nigeria, had negative attitudes about oral health issues.¹⁷ The difference observed from the 2 different regions could be due to environmental and cultural factors, which can affect individual's attitude to health matters.¹⁶ Most of the teachers in the current study visited a dentist for a dental treatment to relieve pain in the form of either an extraction or a filling. Only 6 teachers out of 153 respondents had visited a dentist for a routine checkup, which indicates that the utilization of dental services was mainly for pain relief, rather than for prevention.

Oral diseases and conditions are often chronic, painful and disfiguring. Together, they represent a huge economic and social burden of illness. While rarely fatal, the costs of these oral diseases and conditions have a large economic impact. An estimated total of 40.36 million hours are spent each year on check-ups or problems with teeth.¹⁸ Some of the consequences of dental decay are acute and involve chronic pain, interference with eating, sleeping and proper growth, tooth loss, and

compromised general health. The competencies of dental hygienists focus on disease prevention and oral health promotion. Investing in public health dental hygienists who focus on oral disease prevention and oral health promotion will also decrease the need for costly oral disease treatment. It will build capacity within the public health system to improve oral health and not simply treating oral disease after it arises. Public health dental hygiene programs require a small investment with potentially large dividends. For example, a Canada-wide school based program would cost an estimated \$564 million — about 4.5% of the \$12.6 billion being spent on dental care today and 0.3% of total health spending.¹⁸ Many of the services that dental hygienists provide can prevent future oral diseases, for example applying fluoride varnish on new teeth can reduce the amount of dental caries, educating the school teachers and school children on importance of maintain oral health. Dental hygienists can serve as a vital link to emphasize the value of good oral hygiene. They can provide remedial home oral hygiene practice instructions, apart from the treatment provided at their clinics. Dental hygienists can encourage regular dental attendance of the teachers, which in turn would be passed on to their students.

Teachers, apart from just merely providing education to the pupils, also have a moral responsibility of ensuring their health and safety. To accomplish this task, teachers need to have sound knowledge regarding health and oral health. While teachers are crucial to the implementation of school oral health education, they do not necessarily possess adequate knowledge and skills to enable them to deliver the programmes effectively. Teachers in all disciplines should be encouraged to include oral health in their teaching programs and activities. They should be inspired to make the curriculum exciting and stimulating for students to acquire good oral health knowledge and behaviors and to make healthy decisions. When teaching a practical skill such as tooth brushing technique, it is necessary for the teachers to learn, and be competent on brushing their own teeth effectively first. This is particularly important as teachers are often considered as role models by students.^{1,19} The results of this study did not show favorable performance from the teachers. Most of the oral health promotion programs are targeting the school children only, sidelining this other most important group. In view of the present study results, there is an urgent need to take measures in this regard and conduct oral health awareness programs for the teachers as well.

Conclusion

The findings of the present study indicate that oral health knowledge was lacking among the primary school teachers of rural Mangalore, although practices were satisfactory. Teachers require training programs, in which a half day workshop/symposium on oral health aspects could be beneficial. Coordination between the school authorities, parents, dental care providers and funding agencies is required to implement a teacher's training program in between the school's academic schedule. Dental hygienists in India and elsewhere can exchange lobbying efforts towards this educational experience. A dental hygienist should always be a part of the team providing school dental health programs, so that the importance of oral hygiene is highlighted.

Recommendations

Based on the results of this study, the author recommend the following:

- To create awareness among teachers regarding oral hygiene so that they stimulate the development of resources to make dental care available to all children
- When conducting school dental health programs, dental professionals should also plan out a separate lecture/demonstration of oral hygiene measures to school teachers so as to increase their awareness about oral hygiene
- Guidelines for teachers in monitoring and supervising tooth brushing drills should be developed
- Incorporation of a chapter on oral hygiene in the school curriculum would be helpful, so that the children are taught about the importance of oral hygiene at an early age

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