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Effectiveness of an oral health training program for school teachers in India: An interventional study

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Abstract:

INTRODUCTION: Schools are a valuable platform for promoting oral health through oral health education as the children spend most of their active time in schools. Training school teachers on oral health promotion will help to inculcate healthy oral habits in children during their formative years of life.

OBJECTIVES: The objective of this study was to assess the knowledge, attitude, approach, and action change of school teachers toward oral health and the impact of this training intervention in improving their knowledge.

MATERIALS AND METHODS: An interventional study was conducted among 50 primary school teachers across the country selected by the Ministry of Human Resource Development. A self-administered, 28-item questionnaire in Google document format was developed to evaluate the knowledge and practice of teachers toward oral hygiene before and after the teachers' training program. The training was done using a validated training manual on oral health promotion for school teachers developed by the Ministry of Health and Family Welfare. Needs assessment for training was conducted 1 week before this training program.

STATISTICAL ANALYSIS: Wilcoxon signed-rank test and Mc Nemar tests were used to assess the difference between the scores before and after oral health education.

RESULTS: The needs assessment revealed that majority of the teachers felt the need to participate in oral health promotion training. A significant increase ($P < 0.001$) in mean knowledge scores of school teachers was seen after a 1-day training program.

CONCLUSION: The training improved the knowledge of school teachers on oral health which indicates that the adopted method of oral health education was well received by the participants from all over the country.

Keywords:

Oral health promotion, school teachers, training

Introduction

Oral health is a vital component of overall health, which contributes to each individual's well-being and quality of life by positively affecting physical, social, and mental health, appearance, and interpersonal relations.^[1] Education of schoolchildren on oral health is most important because healthy oral habits are developed early in life. The importance of

imparting knowledge on oral hygiene to children (infants or preschool children or schoolchildren) had been recognized as early as 1878.^[2]

The school-going age is the most influential period of a child's life, and it is this period during which the children develop skills, beliefs, and attitudes which they practice throughout their lives.^[3] According to the WHO's Global School Health Initiative launched in 1995, schools have constantly

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strengthening capacity as a healthy setting for living, learning, and working. This is because students can be accessed during their formative years, from childhood to adolescence, thus providing a supportive environment for promoting oral health.^[4]

School teachers play a pivotal role in the overall development of a child as children spend a considerable amount of time in schools. Teachers can utilize the time spent by the children in schools in promoting dental health-care activities on a daily basis.^[5] The role of teachers is important for the success of oral health promotion since school is often the only environment that is equipped with the resources to expose children to healthy practices. School is the second home for all children, and training school teachers is a widely tested way to implement school-level interventions. They can provide the necessary skills about oral health care to children and can also help with early detection of oral diseases with a subsequent prompt referral, thus translating into better oral health when these children grow up. School teachers are not always able to adequately inform the children and society about oral health. This may be due to their poor knowledge of oral health.^[6-9] It is, therefore, important that teachers' oral health knowledge is good and their oral health behavior conforms to an expectation of the population.

The Ministry of Health and Family Welfare (MoHFW), Government of India, launched the National Oral Health Program (NOHP) in the year of 2014–2015 to prevent, control, and manage effectively the burden of oral diseases in India. NOHP aims to strengthen the public health facilities of the country for an accessible, affordable, and quality oral health-care delivery. One of the key objectives of the program is to train the personnel from various sectors such as health workers, AYUSH professionals, nursing staff, and school teachers for the promotion of oral health.^[10]

In order to maintain the sustainability of this maiden initiative, the “training for school teachers” was done with an attempt to create a pool of master trainers who would train other teachers and act as a master dental teacher of the school. It is expected from them to refer the children with dental diseases to the nearest allied dentist/dental colleges/district hospital/primary or community health center.^[9]

Few trainings for teachers at regional level conducted before have reported improvement in knowledge level on oral health education.^[11,12] Hence, a training of nationwide school teachers under NOHP was undertaken to assess the knowledge change in teachers after attending the training session. The motive was to equip the participants with information on healthy oral structures and common dental problems that occur

in childhood and to provide them skills required to educate their fellow teachers and school children for the prevention of oral diseases.

This study is the first part of a yearlong follow-up study which will assess the long-term impact of training on the enhancement of the skill set of these professionals in training others about oral health at the interval of 6 months and 1 year.

Materials and Methods

Study design, study setting, and study population

An interventional study was conducted among primary school teachers at the Centre for Dental Education and Research (CDER), All India Institute of Medical Sciences (AIIMS), in New Delhi to assess the knowledge of participants on oral health promotion. The training program was conducted for 1 day after successfully receiving the needs assessment responses for training from all the participants, which was conducted 1 week before the training program.

Purposive sampling was employed wherein the selection of school teachers was done by the Ministry of Human Resource Development (MHRD). The Kendriya Vidyalaya Sangathan (KVS) board from the Department of School Education and Literacy of MHRD was chosen which further nominated two teachers each from different 25 KVS regions in all over India. All the selected teachers attended the training on oral health promotion under the mandate of NOHP.

Study questionnaire

A self-administered, 28-item questionnaire was designed in the English language and made in the form of Google documents. The test–retest reliability was performed to test the reliability of the questionnaire, and reliability analysis revealed an intra class correlation of 0.85 indicating good reliability. The comprehensiveness of the questionnaire was optimized using content and face validity with the help of a team of experts from the department of public health dentistry before the main study.

The questionnaire consisted of three sections: the first section included demographic details such as gender, age, marital status, school location, and teaching experience; the second section included 13 questions on oral health knowledge and attitude; and the third section contained seven questions to evaluate the practice of teachers toward oral hygiene. All the questions were in a digital format, uploaded on Google forms.

A pilot study was carried out among 22 primary school teachers who were not included in the training program

to check the feasibility and practicability of procedures of data collection before the commencement of the main study. Any difficulties that were encountered during the filling of the pro forma were corrected.

Study procedure

The training program was carried out in four phases:

Phase 1: Needs assessment

A week before the training program needs assessment was conducted using a Google document questionnaire which was sent through E-mail to all the teachers. The questionnaire assessed the needs of participants regarding a training program on oral health promotion.

Phase 2: Pre training assessment

Before training program, all the participants were administered a pretest questionnaire consisting of 28 questions in the form of an online semi-structured self-administered questionnaire (English) in Google document format.

Phase 3: Oral health education program Training module

All the participants received oral health education using a validated training manual^[13] on oral health promotion for school teachers developed under NOHP, MoHFW. The training included four sessions on healthy mouth and healthy teeth; common oral diseases such as dental caries, gum problems, malocclusion, oral cancer, dental trauma, and dental fluorosis; prevention of oral diseases; and prevailing myths and facts in Indian population. Individual sessions of 45 min to 1 h were taken during the training program.

Learning activities

After completing each session, adult education was imparted with the help of various learning activities such as quiz, role play, demonstration of brushing technique, crossword puzzle, matching the pictures of different dental diseases, and discussion on frequently asked questions. The teachers were provided with training manuals, facilitator guide and information, education, and communication material to facilitate further training programs to trainers and students as master trainers.

Phase 4: Post training assessment and feedback

Post training assessment of the oral health knowledge scores was done using the same online semi-structured self-administered questionnaire (English) in Google document format following which the feedback about the training program was obtained.

Ethical considerations

Ethical approval was obtained from the Institutional Review Board of AIIMS, New Delhi (IEC-333/03.05.2019). Official permission to conduct the study was obtained

from the MoHFW, MHRD, and KVS and informed consent from all the participants before the start of the study.

Statistical analysis

The collected data were entered into Microsoft Excel 2007 and subjected to statistical analysis using SPSS version 20.0 (IBM Statistics Inc., Chicago, Illinois, USA). The statistical test used was Mc Nemar and Wilcoxon signed-rank tests to assess the difference between the scores before and after oral health education. $P \leq 0.05$ was considered to be statistically significant.

Results

A total of 50 primary school teachers participated in the study. Of the 50 participants in the training program, 13 (26%) were males with majority (37, 74%) being females. The mean age of the participants was found to be 42.60 ± 11.43 years, wherein the teachers with age group of <50 years represented a slightly larger proportion of the study population. Majority of the teachers who took part in the study were married (78%) with teaching experience of more than 10 years (62%) [Table 1].

Table 2 shows the needs assessment findings of the school teachers which was conducted to a week before

Table 1: Demographic details of study participants (n=50)

Variable	n (%)
Gender	
Male	13 (26)
Female	37 (74)
Age (years)	
≤50	32 (64)
>50	18 (36)
Marital status	
Married	39 (78)
Single (unmarried/divorced/widow)	11 (22)
Teaching experience (years)	
≤10	19 (38)
>10	31 (62)

Table 2: Needs assessment findings among the school teachers (n=50)

Question	Yes, n (%)	No, n (%)
Have you participated in any oral health promotion training/workshop previously?	0	50 (100)
Have you conducted any oral health promotion training previously?	0	50 (100)
Do you feel the need to participate in any oral health promotion training?	47 (94)	3 (6)
Do you advise school children to visit a dentist in case of any oral health issues	48 (96)	2 (4)
Were you aware of the NOHP before the initiation of the training program?	30 (60)	20 (40)
Do you get funds to organize any training program in your school	10 (20)	40 (80)

NOHP=National Oral Health Program

the day of the training program. The questionnaire assessed the perception and needs of participants towards a training program on oral health promotion. None of the participants had previously attended or conducted any such training in their professional career. The majority (95.6%) felt the need to participate in an oral health promotion training program. Less than half (26.08%) of the participants were unaware of the NOHP before the training.

The comparative assessment of the before and after training oral health knowledge of school teachers in Table 3 shows that only 48% were aware of the split in the lip or roof of child at birth, post training evaluation suggested that it increased up to 96%, and this difference was found to be highly statistically significant ($P = 0.001$). Before training, only 36% of the participants were vigilant about the correct placement of knocked out tooth during fall or injury while oral health education made 100% of the teachers aware of keeping the broken tooth in milk or coconut water and visit dentist within 1 h, and this difference was found to be statistically significant ($P = 0.001$). Only 4% of the teachers gave the correct responses to the question enquiring the frequency of changing toothbrush, post training results showed a statistically significant ($P = 0.001$) rise in response by teachers up to 76% that to change their toothbrushes every 3 months or when bristles get frayed.

Table 4 unveils the comparative assessment of the before and after training mean oral health knowledge scores of school teachers, and it was found that the increase in knowledge of teachers was highly significant ($P = 0.001$). A significant increase in knowledge was observed in all the participants irrespective of gender, age groups, and teaching experience ($P = 0.001$).

Discussion

Primary schools have a great potential for influencing the health behavior of the child. During this period, the child goes through active developmental stages.^[14] The role of teachers during these developmental stages of the child is very important. Hence, school teachers can play a major role in oral health education programs at school levels.

This study was carried out to assess the knowledge, attitude, approach, and action change of school teachers on oral health before and after training. A one-day training program was conducted for oral health promotion of school teachers at CDER, AIIMS, which is the National Centre of Excellence for Implementation of NOHP.

This training program was the first-ever collaboration of the MHRD and MoHFW for oral health promotion

Table 3: Comparative assessment of knowledge of teachers on oral health before and after training program

Question	Knowledge and Attitude Variables		P
	Before training Correct responses n=50 n(%)	After training Correct responses n=50 n(%)	
How many sets of teeth do we get in our lifetime?	44 (88)	50 (100)	0.03*
Children teeth are also known as?	50 (100)	50 (100)	1.00
Teeth which help in cutting and biting are known as?	37 (74)	45 (90)	0.008*
First milk tooth erupts in the mouth at around?	44 (88)	47 (94)	0.25
Color of healthy gums is?	44 (88)	50 (100)	0.03*
Accumulation of plaque (sticky food deposits) and calculus (tartar) causes gum problems?	47 (94)	50 (100)	0.25
Small hole (cavity) formation on the tooth surface by the action of sweetened sticky foods in called?	44 (88)	48 (96)	0.12
A split in the lip or the roof of the mouth seen at birth is called?	24 (48)	48 (96)	0.001*
Daily tooth brushing prevents tooth decay?	49 (98)	50 (100)	1.00
Consumption of soft drinks is good for teeth?	49 (98)	50 (100)	1.00
Sealant placement on chewing surfaces of teeth helps to prevent decay?	24 (48)	49 (98)	0.001*
Regular dental visits are important for maintaining good oral health?	50 (100)	50 (100)	1.00
Does oral health affect general health?	49 (98)	50 (100)	1.00
Approach and Actions Change Variables			
Frequency of brushing daily should be?	47 (94)	50 (100)	0.25
Time taken for tooth brushing?	42 (84)	50 (100)	0.008*
Tooth brushing should be done with?	50 (100)	50 (100)	1.00
How often shall toothbrush be changed?	2 (4)	38 (76)	0.001*
Knocked out tooth/broken tooth fragment due to fall/injury can be saved by placing it in?	18 (36)	50 (100)	0.001*
Measure to reduce tobacco craving?	28 (56)	50 (100)	0.001*
When shall you visit a dentist?	46 (92)	50 (100)	0.12

* $P \leq 0.05$. Mc Nemar test.

Table 4: Comparative assessment of mean scores of knowledge of teachers on oral health before and after training program

Variable	Mean±SD		P
	Before training score	After training score	
Gender			
Males	12.75±2.71	17.69±2.33	0.001*
Females	13.83±2.69	18.08±1.91	0.001*
Age (years)			
≤50	13.10±1.93	18.44±1.32	0.001*
>50	13.83±2.44	17.28±1.88	0.001*
Teaching experience (years)			
≤10	13.75±2.91	18.08±2.02	0.001*
>10	12.43±2.18	17.62±1.81	0.001*
Total	13.20±2.73	17.89±2.10	0.001*

* $P \leq 0.05$. Wilcoxon signed-rank test. SD=Standard deviation

and education. This distinctive training program was an amalgamation of school teachers from various parts of the country with faculty members and research staff from CDER, AIIMS, New Delhi.

The study included 50 school teachers from different parts of the country, of which 74% were females and 26% were males where the majority of the participants had teaching experience of more than 10 years. The demographic distribution was nearly similar to the study done by Dedeker *et al.*^[11] where 40 teachers were given training on oral health promotion.

The needs assessment revealed that majority of the school teachers (94%) felt the need to participate in oral health promotion training. The findings of this study were in line with the study done by Aljanakh *et al.*^[15] who also reported that 83.9% of the teachers were keen to expand their oral health knowledge and felt definitive interest and willingness toward training in oral health education.

A statistically significant improvement in teachers' knowledge regarding correct duration for cleaning teeth was observed. This was in line with Nyandindi *et al.*,^[8] Sekhar *et al.*,^[16] and Petersen *et al.*^[17] who also suggested a significant increase in frequency and correct duration for toothbrushing post training. After health education, all the teachers believed that proper brushing prevents tooth decay, which is in close association with findings of few studies, wherein around 97% and 50% of the subjects, respectively, believed that regular brushing could reduce the incidence of dental caries and gum diseases and hence can preserve tooth longer^[16,18]

A significant increase in the knowledge scores was seen after the training program ($P < 0.001$), which is in accordance with a study conducted by Jain *et al.*^[3] and Ramroop *et al.*^[19] An increase in the knowledge scores of

school teachers was seen for the majority of the questions after the training program. This study result was found to be different from the study done by Suwargiani *et al.*^[20] which reported no difference between knowledge, attitude, and practice before and after training.

Few gaps in knowledge were identified during the pretest. Irrespective of the teaching experience, the misconceptions and myths regarding oral health and causes of oral diseases were commonly found. The identified knowledge gaps were discussed in detail and explained during the training program.

As the present study was carried out in a closed setting with all the participants in proximity to each other, the contamination in answering questions during knowledge assessment could not be fully controlled; however, measures through strict invigilation were undertaken.

Although all possible efforts were made to standardize the presentations and participants included in the study, another possible limitation is environmental factors such as barriers of communication and grasping power of participants, which could have modifying effects on the effectiveness of educational intervention.

Despite the limitations mentioned, this is one of the first studies which take into consideration the training of school teachers on oral health promotion at such a wide scale. The evaluation of knowledge on oral health and the impact of training school teachers will be subsequently assessed after a 6-month and 1-year time interval, thus answering whether the training of teaching professionals can be translated into positive practice or not.

The findings of the present study highlight the need for scientific meetings on oral health, basic management of dental emergencies, and understanding the role of oral health for overall health.

Conclusion

The results of this study revealed a statistically significant increase in mean scores of school teachers after the training on oral health promotion which indicates that the adopted method of oral health education was well received by the participants. The utilization of teaching professionals for oral health promotion and education can aid as a valuable tool for population-based oral health promotion approaches and the ultimate objective of achieving oral health for all.

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Conflicts of interest

There are no conflicts of interest.

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