Original Article

Effectiveness of video-assisted teaching program on dental hygiene among children

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ABSTRACT

Introduction: Worldwide, dental problems affect children's health, causing millions of school hours to be lost each year. An effective community prevention program as a planned procedure prevents the onset of a disease among a group of individuals and the most cost-effective method is health education. **Objectives:** Assess the effectiveness of video-assisted teaching program on dental hygiene among primary schoolchildren. **Methods and Materials:** An experimental study was carried out in 60 primary schoolchildren between the age group of 5 and 10 years by dividing them into experimental and waitlisted control group. Pre-test-post-test waitlisted control group design and simple random sampling were used. Standardized plaque index score and semi-structured knowledge questionnaire used as tool. **Results:** The experimental group pre-test means rank (30.23) was significantly lower than the overall post-test rank (44.00) according to Mann–Whitney U-test. The control group pre-test means rank (30.77) was significantly higher than the post-test means rank (17.00) U = 442 (Z = −0.118), p < 0.01. The difference between the experimental and waitlisted control group was large (μ = 0.906). **Conclusion:** The level of awareness among schoolchildren regarding correct dental hygiene practices is low. The video-assisted teaching program was found to be effective in improving the dental hygiene of the schoolchildren as measured by plaque index score. The knowledge regarding the importance of maintaining dental hygiene will help more and more schoolchildren to follow the correct dental hygiene practices.

Key words: *Effectiveness, Video-assisted teaching, Dental hygiene*

D ental hygiene is an important aspect of general health and well-being. A healthy mouth helps an individual to talk, eat, and socialize without experiencing discomfort and embarrassment [1]. Children with poor dental hygiene are 12 times more likely to suffer with dental caries [2]. Video-assisted teaching program improves dental hygiene of the participants [3]. Worldwide, dental problems disturb activities in schools, causing millions of school hours to be lost each year. Moreover, the psychosocial impact of these problems often significantly diminishes the quality of life. Prevention is the most cost-effective approach and has the greatest impact on a community. Many different approaches to prevent dental problems exist and the most cost-effective method is health education [2]. Dental problems are one of the most prevalent yet preventable conditions in the world [4]. Children are fond of more sugary foods compare to adults who will result in dental caries at an early age if dental hygiene is not taken care [5]. Treatments for all dental problems are available in developed countries but may be expensive and not always accessible. In less developed and poor countries, appropriate treatment is generally not available. Further, dental problems increase economic burden for individuals, families, and nation [2]. Dental hygiene education in the form of demonstration

and video-assisted teaching program will establish good dental health habits among children and also enhance the knowledge of their parents about good dental hygiene [2].

MATERIALS AND METHODS

The research design used in this study was experimental in nature. The study was conducted for duration of 14 days at a Primary School in Pune, India. Approval to conduct the study was obtained from the institutional ethical committee. The purpose of the study was outlined to the participants and explained that the respondents would remain anonymous. The sample included 60 primary schoolchildren on the basis of inclusion and exclusion criteria. A list of children from the class attendance register of Class II, III, IV, and V, and 15 samples from each class were selected by lottery method. Total 60 selected samples were collected in project hall and divided into control (30) and study group (30) by lottery method. Pre-test and assessment of plaque index score were conducted for the respondents. Video-assisted teaching program was administered to the experimental group. Post-test knowledge and assessment of plaque index were done for both groups after 14 days. Video-assisted teaching program

was administered to the control group after collecting the data on the day of post-test.

The tool used in the study is structured interview questionnaire and assessment of plaque index score. The tool is divided into three sections. Section A (demographic data such as age of student, gender, standard, number of siblings, educational qualification of the parents, and family income). Section B (knowledge questionnaire consists of a set of five multiple choice questions with four options to assess the practice regarding the dental hygiene among schoolchildren) and Section C consists of plaque index score to assess the practice of dental hygiene as shown in Table 1. The content validity of structured questionnaire was ensured by submitting to the experts in the field of pediatrics and periodontology for content validation. Pilot study was conducted on 10 subjects (who were not included in the study) at a different primary school in Pune. The reliability of tool was established using Cronbach's alpha. The coefficient of internal consistency of the knowledge questionnaire was α = 0.77.

RESULTS

The majority of students were from the age group of 8–10 years in both experimental (14,47%) and control group (13,43%). As per gender, 16 (53%) of students were males in the experimental group and 15 (50%) were males in the control group. Most of the students in the experimental (43%) and control group (50%) had three and more siblings in the family (Table 2).

Most of them in both experimental 19 (63%) and control group 16 (53%) had illiterate mother. It is also seen that 17 (57%) in experimental and 19 (64%) in control groups had father with less than secondary education. Again, a majority of subjects 21 (70%) in the experimental and 25 (83%) in the control group came from family with an income of Rs. 5000-10,000/per month. 8 (27%) students in the experimental group were brushing the teeth twice a day in the pre-test, whereas 16 (53%) of students started brushing the teeth twice a day in the post-test. In the control group, 8 (27%) students in pre-test and 9 (30%) in the post-test were brushing teeth twice a day. There is a significant score improvement observed in the experimental group as compared to the control group. Total 25 (83%) students in the experimental group were brushing the teeth using toothpaste and tooth brushing the pre-test, whereas in the post-test, 30 (100%) students started brushing the teeth using toothpaste and toothbrush. In the control group, 23 (77%) students in pre-test and 25 (83%) in the post-test were brushing the teeth using toothpaste and toothbrush.

All 30 (100%) students in the experimental group were brushing the teeth independently of both pre-test and post-test. In the control group, 1 (3%) student in pre-test and post-test was assisted by the parents for brushing the teeth. 17 (57%) students in experimental group were not at all rinsing the mouth after having any eatables and 11 (37%) were rinsing the mouth after the major meals in the pre-test, whereas 23 (77%) students started rinsing the mouth after every major meal and 7 (23%) were rinsing after having any eatables in the post-test. In the control group, 24 (80%) students were not at all rinsing the mouth in pre-test and no significant change seen in the post-test. 27 (90%) students in the experimental group did not have knowledge regarding the frequency of changing the toothbrush in pre-test, whereas 25 (83%) students answered correctly in the post-test. In the control group, 27 (90%) students did not have any knowledge regarding the change of toothbrush in pre-test which did not change significantly in the post-test.

In the experimental group, total 22 (73%) students in the experimental group had poor plaque index score and 6 (20%) had fair plaque index score in the pre-test. The score improved to 8 (26%) good and 12 (40%) fair in the post-test (Fig. 1). In the control group, 21 (70%) had poor plaque index score in the pre-test which did not show any improvement in the post-test (Fig. 2). In the experimental group, pre-test means rank (30.23) was significantly lower than the overall

Table 1: Distribution of students as per sociodemographic variables (n=60)

Parameters	Frequency (percentage)	
	Experimental group (n_1=30)	Control group (n_2=30)
Age		
5-6 years	2 (7)	2 (7)
6 years 1 day-8 years	8 (26)	8 (27)
8 years 1 day-10 years	14 (47)	13 (43)
>10 years	6 (20)	7 (23)
Gender		
Male	16 (53)	15 (50)
Female	14 (47)	15 (50)
Standard		
II	8 (27)	7 (23)
III	6 (20)	9 (30)
IV	7 (23)	8 (27)
V	9 30	6 (20)
Number of siblings		
None	2 (7)	1 (3)
1	5 (17)	4 (14)
2	10 (33)	10 (33)
3 & more	13 (43)	15 (50)
Education of mother		
Illiterate	19 (63)	14 (47)
<Secondary	11 (37)	16 (53)
Higher Secondary	-	-
Education of father		
Illiterate	13 (43)	10 (33)
<Secondary	17 (57)	19 (64)
Higher secondary	-	1 (3)
Graduation & above	-	-
Per capita income per month (INR)		
<5000	9 (30)	5 (17)
5001-10000	21 (70)	25 (83)

Table 2: Plaque index score (Silness and Loe plaque index)

Characteristic	Teeth																							
Index teeth	1 6				1 2				2 4				3 6				3 2				4 4			
	D	F	M	P	D	F	M	P	D	F	M	P	D	F	M	L	D	F	M	L	D	F	M	L
Score																								
Total Score																								

Plaque index = Total score of all index teeth ÷ 24
Key

1 6 – Maxillary right first molar	D – Distofacial
1 2 – Maxillary right lateral incisor	F – Facial
2 4 – Maxillary left first premolar	M – Mediofacial
3 6 – Mandibular left first molar	L - Lingual
3 2 – Mandibular left lateral incisor	P - Palatal
4 4 – Mandibular right first premolar	

Scoring criteria

| Score	Criteria
0	No plaque
1	A film of plaque seen only by running a probe across the tooth surface
2	Moderate accumulation of soft deposits on the tooth surface can be seen by naked eye
3	Abundance of soft matter within the gingival pocket and/or margin and adjacent tooth surface

Plaque index=Total score of all index teeth÷24

Interpretation as per total plaque index score	
Excellent	0
Good	0.1-0.9
Fair	1.0-1.9
Poor	2.0-3.0
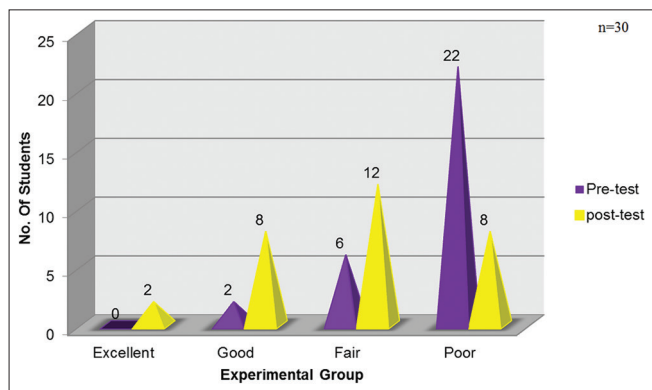
Figure 1: Comparison of pre- and post-test plaque index score in experimental group
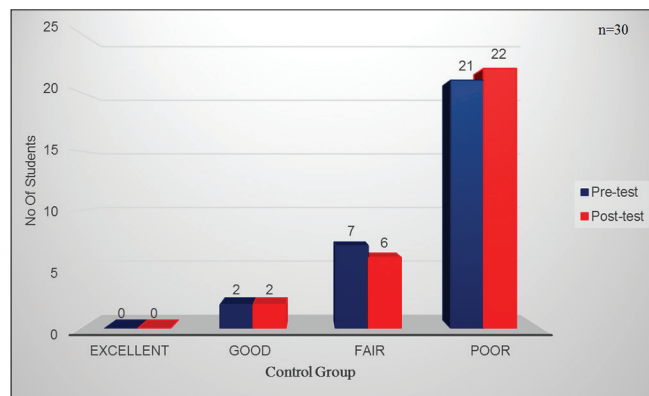
Figure 2: Comparison of pre-test and post-test plaque index score in control group

post-test means rank (44.00). In the control group, pre-test means rank (30.77) was higher than the post-test means rank (17.00), (Tables 3 and 4).

DISCUSSION

Health education has been shown to be an important means of improving the dental practices in schoolchildren. Dental hygiene education in the form of video-assisted teaching program will establish good dental habits among children and also enhance the knowledge of their parents about good dental hygiene. In a quasi-experimental study conducted by Hebbal *et al.* to assess the knowledge and plaque score in schoolchildren before and after the health education at Belgaum, the mean plaque scores of 0.627 in Group I, 0.8826 in Group II, and 1.0156 in Group III [6]. Within the group, comparison revealed a statistically improved

Table 3: Mann–Whitney U-test

Ranks			
Group	**N**	**Mean rank**	**Sum of ranks**
PlI_pre			
1	30	30.23	907.00
2	30	30.77	923.00
Total	60		
Change			
1	30	44.00	1320.00
2	30	17.00	510.00
Total	60		

Table 4: Statistic test

Test statisticsᵃ		
	PlI_pre	**Change**
Mann–Whitney U	442.000	45.000
Wilcoxon W	907.000	510.000
Z	−0.118	−6.032
Asymp. Significant (two-tailed)	0.906	0.000

oral hygiene with decreased plaque scores in all the three groups after the health education using audiovisual aids. Our study also proved that there is a significant reduction in the mean plaque index score after post-test (mean = 1.6873) when compared to pre-test (mean = 2.0320) in the experimental group, whereas no significant change observed in the control group.

An experimental study on the effectiveness of video-assisted learning package on knowledge regarding oral hygiene among children by Singh *et al.* revealed that there was a statistically significant difference in pre-test and post-test knowledge score [7]. In our study, we found that there was an improvement in the knowledge related to dental hygiene and plaque index score after video-assisted teaching program. A similar study on the effectiveness of video-assisted teaching program regarding the prevention of swine flu among children was conducted by Udaykar *et al.* (2013) where the post-test level of video-assisted teaching program (26.13) was higher than the pre-test mean score of only 13.

An experimental study conducted by Reddy *et al.* (2016) to assess the impact of oral health education on plaque score with and without periodic reinforcement among 12-year-old children at Telangana. Findings revealed that reduction of plaque index score was 61.7% in the study group and 32.6% in control group. In our study, 73% students had poor plaque index score and 20% had fair plaque index score in pre-test in the experimental group which improved to 26% (good) and 40% (fair) plaque index score. In the control group, 70% students had poor plaque index score in the pre-test which did not show significant improvement in the post-test.

A study conducted to assess the effectiveness of structured teaching program to improve the knowledge regarding dental hygiene among 60 schoolchildren at Jalandhar by Manveer Kaur (2013) revealed that overall mean score of 14.91 (standard deviation [SD] = 3.84) was as in post-test mean score of 23.01 (SD = 3.72). In our study, pre-test mean score was 2.200 (SD = 0.6540), whereas post-test 2.250 (SD = 0.626). Therefore, the video-assisted teaching program was highly effective in increasing the knowledge of students regarding the particular subject. Our study shows that nursing professionals by simple health education can make a big difference in overall oral health of the population contribute toward the achievements of the WHO oral health goals. The nursing curriculum should incorporate various educational activities such as preparation of booklets and pamphlets to be given to health-care workers to circulate in the school as well as in the community.

The strength of our study was that it was a case–control study where the controls were well matched with the cases. A limitation of our study could be that the variations in the plaque score due to midday meal consumption before the data collection were not taken into account and also because it was done in a single school, it may not be truly representative of all the schools of Taluka, District, and State.

CONCLUSION

The level of awareness among schoolchildren and their parent regarding correct dental practices is low. Community nurses can play a key role in providing expert assistance to schoolchildren by simple tools for health education. This will also contribute toward optima policy making and implementing various teaching programmers regarding various aspects of dental hygiene and oral care in hospital and community.

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