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Research Article

A STUDY TO ASSESS THE EFFECTIVENESS AND IMPACT OF ORAL HEALTH EDUCATION USING DIFFERENT MODELS AMONG HIGH SCHOOL CHILDREN OF PIPARIA VILLAGE, VADODARA, GUJARAT

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ABSTRACT

Introduction: The oral health education can be delivered through various ways where in the education imparted in schools has a major contribution towards the healthy mouth of the children. Thus the present study was undertaken to assess the effectiveness of various health education methods on school oral health knowledge and plaque status among the high school children in Piparia Village, Vadodara, Gujarat.

Methodology: A cluster randomized control study was conducted at six schools at Piparia, Vadodara. Each of the six schools was given same education on oral health but in different ways. The score at baseline and after giving health education was calculated using sillness and loe plaque index score.

Results: The overall mean knowledge score is 6.085±1.72. The baseline plaque score is 2.005±0.49. The increase in knowledge after the oral health education was increased to 8.07±1.93 and the plaque score decreased to 1.39±0.33. There is a significant increase in the knowledge score of 1.985 after the interventions (p value=0.006) and significant decrease of 0.615 in the plaque score after the interventions. (p value=0.0054).

Conclusion: The study indicates that oral health education is effective in increasing the knowledge and awareness regarding maintenance of good oral hygiene. The oral health education should be the prime focus of the society for promoting the good oral health.

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INTRODUCTION

Improper care of oral cavity can have a deleterious effect on oral hygiene for it may result in development of dental plaque which harbors dental caries and periodontal diseases. According to the National Oral Health Survey of India conducted among 12-year-old children in 2004, it was reported that the prevalence of dental caries was 53.8% and gingivitis was 55.4%, respectively.¹

A growing emphasis on oral health and FDI's theme for World Oral Health Day this year to "Live Mouth Smart" indicates the importance of empowering people for taking care of their oral health.² The objective of this year's theme can be fulfilled by proper awareness and knowledge related to oral health.

Awareness and correct knowledge forms the foundation of the good practice. A healthy oral cavity is an indicative of the healthy oral hygiene practices.

Imparting knowledge is the most tedious aspect when evaluated in its true sense. The best method to evaluate the effect of knowledge imparted is the extent of its practice in the most precise form. Children are like the molding clay which if shown the correct guidance and path can result in an excellent example. Considering a noble and universal platform for imparting education to children, school health education can serve as a building block.³ The goal of health education is to impart knowledge which may lead to adoption of favorable oral health behaviors that contribute to better oral health. The oral

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health education can be delivered through schools which will provide an idealistic approach for preventive oral health.⁴

The need of the hour is to empower the population to take care of oral health and educate them the significance preventive oral health holds in the general well being of the population. Hence Oral health education is important in raising the awareness of the people and motivating them for the correct oral hygiene practices. The present study was carried out to assess the effectiveness of various health education methods on school oral health knowledge and plaque status among the high school children in Piparia Village, Vadodara, Gujarat.

Objectives

- To assess the baseline oral health knowledge of the high school children by a questionnaire method and baseline oral hygiene status Sillness and Loe Plaque Index among the high school children
- To assess the follow up oral health knowledge by a questionnaire and oral hygiene status by Sillness and Loe Plaque Index among the high school children.
- To evaluate the before and follow up impact of health education on the oral health knowledge and oral hygiene status by Sillness and Loe Plaque Index among the high school children.

METHODOLOGY

A cluster randomized control study was conducted at six schools at Piparia, Vadodara. The schools with no prior history of any kind of school oral health education were taken into consideration for imparting school health education. The number of schools chosen for this purpose was six that were randomly selected by the lottery method to the following six groups of the methodology by which they will receive oral health education:

Group I: Oral health Education was given by the investigator by giving a health talk without any aids

Group II: Oral health Education was given by the investigator by giving a health talk using charts and models

Group III: Oral health Education was given imparted by the investigator by giving a health talk using computer based presentation

Group IV: Oral health Education was given by distributing pamphlets and no health talk was given.

Group V: Oral health Education was given by placing charts and models and asking the children to observe them and no health talk was given.

Group VI: Oral health Education was given by personal one to one talk with children.

The ethical approval was taken from the institutional ethical board. The pilot study was undertaken in six schools with ten students in the age group 13-15 years whose parents signed the informed consent and were willing to participate in the study. The sample size was calculated using the formula when mean and standard deviation is known and the size of the sample chosen was 360 with 60 students from each school.

$N = z^2 SD^2 / e^2$ where z is z score at 95% Confidence interval, SD is standard deviation and e is the level of precision.

The questionnaire comprised of 15 knowledge based questions which were evaluated with one mark for the correct response and zero mark for the incorrect response. The questionnaire was validated and the reliability was calculated using cronbach's alpha method with the value of alpha as 0.79.

The disclosing agent was used to evaluate the plaque among the patients before and after the health education. The kappa statistics was also determined for 25 patients and was 0.82.

The study was progressed with health education given to the students from each school based on the method of health education selected by the lottery method. The baseline knowledge score and sillness and loe plaque index score was calculated before giving health education which was followed up at one week period and post education knowledge score and sillness and loe plaque index score was calculated. The data collected were entered into MS Excel and analysis was carried out using SPSS version 21. The descriptive statistics was calculated to assess the before and after health education for the knowledge score and sillness and loe plaque index score. Paired t test was done to check the pre and post effectiveness of various health education methods used in the study. The ANOVA was carried out to evaluate the effectiveness of the type of health education delivered in the six schools for the knowledge and sillness and loe plaque index score.

RESULTS

Table I shows the gender wise distribution of sample in each of the six groups

Gender	Group I	Group II	Group III	Group IV	Group V	Group VI
Male	36	27	37	21	32	23
Female	24	33	23	39	28	37
Total (360)	60	60	60	60	60	60

Table II shows the difference in the baseline knowledge score among the six groups the statistical difference in the knowledge score before the intervention

Group	N	Mean	Std. Deviation	Minimum Score obtained out of 10	Maximum Score obtained out of 10	F-test (df)	P Value
Group I	60	5.6	1.23	4	7	23.890(5)	0.021
Group II	60	6.24	2.56	4	8		
Group III	60	5.78	1.98	4	7		
Group IV	60	6.77	1.08	4	7		
Group V	60	6.23	1.97	4	8		
Group VI	60	5.89	1.71	4	7		
Total	360	6.085	1.72	4	8		

Pvalue less than 0.05

The table II shows that the minimum knowledge score is 4 and maximum is 8 among the six groups. The overall mean knowledge score is 6.085±1.72. The ANOVA shows that the difference in the knowledge scores among the six groups is significant with a p value of 0.021.

Table III shows the mean baseline plaque score among the six groups using ANOVA.

Group	N	Mean	Std. Deviation	F (df)	p Value
Group I	60	1.92	0.17	4.847(5)	0.043
Group II	60	2.21	0.28		
Group III	60	1.56	0.19		
Group IV	60	2.17	0.91		
Group V	60	2.28	0.87		

Group VI	60	1.89	0.56
Total	360	2.005	0.499

The table III shows that the baseline plaque score is 2.005±0.499. The ANOVA shows that the difference in the plaque scores among the six groups is significant with a p value of 0.043.

Table IV shows the knowledge score among the six groups and the ANOVA output for evaluating the statistical difference in the knowledge score after the intervention.

Group	N	Mean	Std. Deviation	Minimum	Maximum	F (df)	p Value
Group I	60	7.22	1.89	6	8	56.1 82(5)	0.001
Group II	60	8.91	2.12	6	9		
Group III	60	8.94	1.43	6	9		
Group IV	60	7.11	2.19	5	8		
Group V	60	6.83	2.94	5	8		
Group VI	60	9.42	1.03	7	9		
Total	360	8.07	1.93	6	9		

The table IV shows that the minimum knowledge score is 6 and maximum is 9 among the six groups after respective interventions given to the concerned groups. The overall mean knowledge score after the interventions is 8.07±1.93. The ANOVA shows that the difference in the knowledge scores among the six groups is significant with a p value of 0.001.

Table V shows the mean plaque score among the six groups with ANOVA output.

Group	N	Mean	Std. Deviation	F (df)	p Value
Group I	60	1.2	0.92	14.31(5)	0.0003
Group II	60	1.8	0.19		
Group III	60	0.89	0.20		
Group IV	60	1.71	0.11		
Group V	60	1.83	0.38		
Group VI	60	0.92	0.16		
Total	360	1.39	0.33		

The table V shows that the overall plaque score after the interventions is 1.39±0.33. The ANOVA shows that the difference in the plaque scores among the six groups is significant with a p value of 0.0003.

Table VI shows the output of the paired t test to check the knowledge score before and after the respective interventions in the six groups

Group	N	Mean Difference (pre and post the intervention)	p Value
Group I	60	-1.62	0.04
Group II	60	-2.67	0.012
Group III	60	-3.16	0.03
Group IV	60	-0.34	0.026
Group V	60	-0.6	0.017
Group VI	60	-3.53	0.001
Total	360	-1.985	0.006

The table VI shows that the mean difference in the knowledge score after the interventions in the respective groups after the paired t test. The table clearly shows that there is a significant increase in the knowledge score after the interventions with an increase in the knowledge score of 1.985 (p value=0.006). The most increase in knowledge is with the sixth group with an increase of 3.54 in the knowledge score. The least increase in the knowledge score is seen in the fourth group where oral health Education was given by distributing pamphlets and no health talk was given.

Table VII shows the output of the paired t test to check the plaque score before and after the respective interventions in the six groups

Group	N	Mean Difference (pre and post the intervention)	p Value
Group I	60	0.72	0.022
Group II	60	0.41	0.000
Group III	60	0.67	0.014
Group IV	60	0.46	0.004
Group V	60	0.45	0.001
Group VI	60	0.97	0.0001
Total	360	0.615	0.0054

The table VII shows that the mean difference in the plaque score after the interventions in the respective groups after the paired t test. The table clearly shows that there is a significant decrease in the plaque score after the interventions with a decrease in the plaque score of 0.615 (p value=0.0054). The most decrease in plaque score is with the sixth group with a decrease of 0.97 in the plaque score. The least decrease in the plaque score is seen in the second group where Oral health Education was given by the investigator by giving a health talk using charts and models.

DISCUSSION

The role of health education in maintaining good oral hygiene is important and cannot be ignored. This helps in developing positive attitude towards one's oral health. The choice of health education method is a vital decision and must be focused upon. The present study has focused on six different health education methods for the school children. This was done with an aim to understand the interest of the students as students are thought to be more interested in visuals rather than a simple didactic lecture/talk.

The present study shows that the most effective method in assessing the knowledge level was the group where personal one to one talk was given, computer based presentation group and the group to whom the health education was given through charts and models. However, there was an increase in the knowledge level in all the six groups irrespective of the mode by which the health education was imparted. The similar results were also seen in Elfaki NK *et al* (2015)⁵ where the school children showed significant increase in knowledge and awareness after the health education. The present study also showed a reduction in the mean plaque score after the health education suggesting the alteration in the behavior of the children. The study revealed that the most significant reduction is seen in the group where personal one to one talk was given. All the six groups showed significant reduction in the plaques score after the health education. This however is opposed to the common belief that the students are more interested in visuals and presentations as the group showing significant reduction in the mean plaque score were only given health talk either in person or in person. These findings are similar to study conducted by Sequirs P S, Shenoy R P (2010)⁶ where the Plaque and Gingival score reductions were highly significant in intervention schools, and were not influenced by the socioeconomic status. In their study the oral health education revealed highly significant changes in intervention schools with more in schools receiving more frequent interventions. In addition, these findings were also in congruent with the study done by Hebbal *et al* (2011)⁷. on school children of Belgaum city. In contrast, Ajithkrishnan *et al* (2010)⁸. study revealed that where there was no significant difference in the mean plaque scores of study subjects before and after oral health

education. Kalyan P *et al* (2015)⁹ in their study revealed that the widespread prevalence of oral cavity related diseases may be due to inefficiency in effective plaque removal and hence the population should be educated towards the effective use of dentifrice for healthy oral cavity.

Shahapur and Shahapur (2013)¹⁰ conducted a study among the 12–15 year old school children in Bijapur city, which revealed that the baseline plaque score were higher in males and females while both the groups showed reduction in the mean plaque score after the intervention. The same results were also reported in a study by Damle *et al* (2014)¹¹ among school children of Maharashtra. In the existing study, the study groups and control group both had prominent reduction in the mean plaque scores. This could be due to the health education was given in all the six groups where in the principal difference lied on the mode of health education. While the five study groups were given health education using different aids the control group was imparted health education simply through a health talk. This reveals that no matter whatsoever the mode of health education be the reinforced education by an expert apart from their school teachers is effective. The similar findings were also seen in study by Sequirs P S, Shenoy R P (2010)⁶, D’Cruz and Aradhya (2013)¹² in Bengaluru and Yazdani *et al* (2009)¹³ in Iran where the study group to whom the health education was given showed a long term effect in the knowledge and behavior as compared to the control group.

CONCLUSION

The study indicates that oral health education is effective in increasing the knowledge and awareness regarding maintenance of good oral hygiene. This also results in modified behavior regarding the practice of good oral hygiene habits. The oral health education should be the prime focus of the society for promoting the good oral health. Reinforced DHE may improve oral hygiene and gingival health to a significant extent, but may prove inadequate in the long run if low-cost oral hygiene aids are not made available to the general population. The study proved that the oral health education, if planned and executed properly is effective in altering the knowledge, awareness and plaque score among the school children. This will help in creating the ripple effect as the knowledge imparted to them will percolate into the society to their friends, relatives and family members. Hence, Dental health education should be reinforced at regularly intervals to instill a positive attitude towards the oral health.

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