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Impact of School-based Oral Health Education on Knowledge, Practice of School Children

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ABSTRACT

Objective: To evaluate the effect of verbal and audiovisual methods of dental health education on knowledge, practice of old school-going children.

Study Design: Prospective longitudinal study.

Place and Duration of Study: Islamia collegiate Middle School for Boys, Peshawar Pakistan, from Dec 2019 to Feb 2020.

Methodology: The study population consists of 272 middle school children aged 10-13 years. After collecting baseline data which consists of a questionnaire regarding knowledge and attitude about oral hygiene followed by recording plaque score, and gingival score, students were randomly allocated into three groups. Group-1 participants received verbal dental health education through charts and pamphlets about oral health, hygiene, and tooth brushing demonstrations. Group-2 received verbal and audio-video sessions about oral hygiene. Group-3(Control-Group) received no intervention. After the intervention, knowledge attitude and plaque score gingival score was assessed.

Results: A statistically significant positive change in dental knowledge and practice score was found in the Audiovisual-Group as compared to the Verbal-Group. Post-intervention mean plaque score of the participants was lowered more in the Audiovisual-Group than in the Verbal-Group. In addition, the post-intervention mean gingival score of the participants was lowered more in the audiovisual group than in the verbal group.

Conclusion: Short-term oral health education programs, including A-V aids, may be useful in improving oral hygiene and gingival health.

Keyword: Gingival score, Knowledge, Oral health education, Oral hygiene, Plaque score.

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INTRODUCTION

Oral health is an integral part of general health.[1] Oral and dental diseases are a major health issue, especially in children, because of the high incidence and prevalence of oral and dental diseases in children in the world.[2] Poor oral and dental health affects children's growth, learning, nutrition and self-esteem.[3,4] Children having poor oral health are 12 times more likely to have compromised quality of life. Globally each year, >50 million hours are lost from school because of oral and dental diseases.[5,6] Health education is an essential part of public health and an effective primary preventive method.[7,8] By giving oral health education to children, we can control these diseases at primordial level.[9,10]

In some of the studies carried out in this region, published literature involved dental health education using demonstrations and charts were used, very few had used audiovisual aid for oral and dental health promotion, and very few studies compared the effectiveness of various methods of dental health education. Therefore, the present study has been undertaken to evaluate the impact of two methods of dental health education on the knowledge and practices of middle school children in the practising area of Khyber College of Dentistry regarding oral care to help policy-makers make effective oral health promotion policies for this province.

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METHODOLOGY

This was a prospective longitudinal study carried out at the Islamia Collegiate Middle School for Boys, Peshawar Pakistan, from December 2019 to February 2020. By using openEpi, the total sample size was calculated using the plaque score at baseline (1.65±0.87) & three months after oral health education (1.38±0.71) keeping a 95% confidence interval with 80% power.[11] A total of 270 children were included in this study using consecutive sampling technique. Approval for conducting the study was obtained from the ethical committee of the institution (No. 1292/B-AD/PG/KCD) and the principal of the school.

Inclusion Criteria: All children aged 10-13 years who were present in the school on the day of the examination and willing to participate in the study were included in the study.

Exclusion Criteria: Children seeking a dental checkup regularly or receiving dental health education from another source and physically or mentally compromised children were excluded from the study.

Informed consent was taken from parents and study participants. On the decided date, all the participants aged 10-13 years were sought to gather in a large hall. After taking informed consent, the oral health knowledge and practices of the participants were measured by the investigator using a questionnaire.

After filling out the questionnaires plaque score was recorded using Sillness and Loe plaque Index, and the gingival score was recorded using Loe and Silness gingival index.[12] Next, the principal investigators did a clinical examination. Finally, students were made to sit in a chair comfortably, and plaque and gingival scores were recorded.

Before taking baseline data pilot study was done, including 20 students to check the validity of this questionnaire and these twenty students were not included in the study.

After this, these 272 students were divided into three groups in three separate classrooms. Oral health education was imparted to the Verbal-Group, including information about oral diseases and their prevention Instructions on the following key messages: 1) daily twice tooth brushing i.e. after breakfast in the morning and before going to bed at night, 2) use of toothbrushes and toothpaste for cleaning teeth, 3) use of pea size toothpaste on the toothbrush, 4) rinsing the mouth with water after eating any sweets, 5) the number of sweets per day. Oral health education was supplemented with chalk, blackboards, models, posters and charts regarding oral hygiene.

The Audiovisual-Group received oral health education through verbal communication along with the video, which consisted of animated characters imparting the above-mentioned key messages of the study. The video was translated and explained in the local language for better understanding.

Children in the Group-3 received no educational session or oral hygiene instructions and served as a Control-Group. After three months of intervention, the same principal investigator checked children's oral health knowledge, plaque and gingival score. The Control-Group was also provided with a similar type of health education after the stage-3.

Statistical Package for Social Sciences (SPSS) version 22.0 was used for the data analysis. Quantitative variables were summarized as mean±SD and qualitative variables were summarized as frequency and percentages. Knowledge and practices score at baseline and after three months interval were measured by applying the chi-square test.

RESULTS

The total number of participants included in the study was 270. Mean age of the children was 11.39±1.028 years.

At three months post-intervention, the response obtained from the participants of three groups regarding knowledge was found to be significantly different from the baseline (Table-I).

Table-I: Responses for Key Questions regarding Knowledge at Base Line and Post Intervention (n=270)

Knowledge	AudioVisual-Group (n=90) n(%)	Verbal-Group (n=90) n(%)	Control-Group (n=90) n(%)	*p*-value
Using TB & TP for cleaning teeth				
At base line	0(0.0%)	1(1.1%)	3(3.3)	0.048
After 3 months	89(98.9%)	12(13.3)	4(4.3)	<0.001
We Brush to Avoid Dent. Morbidity				
At base line	2(2.2)	2(2.2%)	2(2.2%)	0.222
After 3 months	90(100.0)	19(21.1)	12(13.0)	<0.001
Not cleaning teeth affect oral health				
At base line	26(28.9%)	3(3.3%0	1(1.1%)	<0.001
After 3 months	90100.0%)	7(7.8%)	0(0.0%)	<0.001
Tooth brushing twice daily				
At base line	15(16.7%)	6(6.7%)	3(3.3%)	<0.001
After 3 months	90(100.0%)	1(1.1%)	0(0.0%)	<0.001

At three months post Intervention, the responses obtained from the participants of three groups regarding practices significantly differed from the baseline percentage of responses for key questions regarding knowledge at baseline and post-intervention (Table-II).

Table-II: Comparison of level of Practices of the Participants at Post Intervention (n=270)

Practices	Audiovisual-Group (n=90) n(%)	Verbal-Group (n=90) n(%)	Control-Group (n=90) n(%)	*p*-value
Using Pea Size Tooth Paste				
At base line	18(20.0%)	2(2.2%)	6(6.5%)	<0.001
After 3 months	80(88.9%)	2(2.2%)	0(0.0%)	<0.001
To Clean Teeth After Sweets				
At base line	2(2.2%)	2(2.2%)	2(2.2%)	1.000
After 3 months	90(100.0%)	14(15.6%)	2(2.2%)	<0.001
Taking 1-3 Sweets				
At base line	6(6.7%)	3(3.3%)	2(2.2%)	0.134
After 3 months	90(100.0%)	15(16.7%)	0(0.0%)	<0.001

DISCUSSION

Studies comparing the effects of various methods of school dental health education programs in this province are very limited; this is the reason that provision of health promotion in public health programs is diminished.[12,13]

In our study, a positive change was found in the participants at three months post-intervention period regarding oral health knowledge attitude and practices, and the same result was found with the plaque and gingival Index scores. In addition, the difference in plaque and gingival scores were found more in the Audiovisual-Group than in the Verbal-Group.

The highest increase in knowledge score regarding all four questions was found in the Audiovisual-Group, followed by the Verbal-Group, & the Control-Group also showed some improvement. This may be due to the Hawthorne effect (Hawthorne effect is a type of reactivity whereby participants shows improvement in their behaviour being experimentally measured simply because they are being observed/ studied and not in response to any particular experimental manipulation). These findings are in accordance with the studies of Al saffan *et al*.[13] This study showed a definite positive increase of 25.6% score of correct responses. There was a statistically significant difference in pre and post-intervention dental health knowledge; this study showed that dental health education is a detrimental tool. Naidu *et al*.[14] and Maharani *et al*. [15] also researched the effect of dental health education on the oral health of school children and found similar findings. The reason may be because the video shown to students conveyed that the number of micro-organisms decreased after tooth brushing.

A statistically significant improvement in dental attitude and practice score regarding all three questions about practices was seen in the Audiovisual-Group as compared to the Verbal-Group. The practice of using pea size toothpaste to clean teeth after sweets and taking less number of sweets shows improvement. Haque *et al*.[16] in Bangladesh conducted a study among adolescents and found the same findings.

The present study also found a transformation of plaque score after three months of intervention. It evaluated that the mean plaque score had lowered more in the Audiovisual-Group as compared to the verbal. These findings are similar to the results of a studies carried out in the past.17,18 In this study, before imparting dental health education to school children mean plaque score was 61.7%, and after 30 days of intervention, this score decreased to 32.6%.

LIMITATIONS OF STUDY

This study was of a shorter duration. Further research of long duration involving Parents and Teachers of the participants can be carried out in the future.

RECOMMENDATIONS

- Oral Health Education programs should be conducted annually in the schools with the provision of oral hygiene aids at concessional rates.
- Efforts should be made between school teachers, parents and dental professionals to ensure the long-term benefits of such programs.

CONCLUSION

Short-term oral health education programs, including A-V aids, may be useful in improving oral hygiene and gingival health.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

SM: Concept, data acquisition, data analysis, drafting the manuscript, critical review, approval of the final version to be published.

LAM: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

SM: Critical review, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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