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Effectiveness of Individual Versus Group Oral Hygiene Instructions Among 13 to 15 Years Old School Children in Lucknow

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ABSTRACT

Background: Prevention of dental disease through oral hygiene instruction is an important aspect. School children are considered to be an important target group to inculcating healthy lifestyle practices to last for a lifetime.

Methodology: In this prospective study total of 200 subjects aged 13 to 15 years were randomly assigned to one of four groups. The success of each form of instruction was evaluated on the basis of questionnaire and four parameters: Modified Quigley–Hein plaque index, Gingival Index, Oral Hygiene Index – Simplified and Patient Hygiene Performance Index. All participants had professional tooth cleaning at the end of the baseline examination. 1st and 2nd follow up was done after every 4 months. SPSS version 22 was used. The Chi-squire test, student "t" test, paired "t" test and ANOVA test were used. The significance level was set at $p<0.05$.

Results: At the beginning of study mean MQHI score: 1.38, mean GI score: 0.38 mean OHI-S score: 1.33 and mean PHP index: 2.32. At the end of study, all groups showed improvement in oral health status ($p<0.001$) except in control group.

Conclusion: This study demonstrated that group oral hygiene instruction and individual instruction have almost similar beneficial effects for school children.

Keywords: Group prophylaxis, individual prophylaxis, oral hygiene instruction, school children.

INTRODUCTION

Oral health is an essential component of health throughout life. Oral cavity is associated with the development of healthy personality, perception and the overall experience of pleasure.[1] The ability to chew and swallow is a critical function required to obtain essential nutrients for the body – the building blocks of general health.[2] However, oral diseases are major public health problems worldwide.

A developing country like India is beset with many barriers in providing dental health care to its vast population. These include social, cultural, technological, economic and political factors to name a few. Although oral health is very much a part of total health very little attention is paid to this facet of health. Prevention of dental disease has assumed a lesser priority by the community as well as the professional.[3]

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Oral disease can be considered a public health problem due to its high prevalence and significant social impact. Chronic oral disease typically has physical, emotional and economic impacts which in turn lead to reduced welfare and quality of life. To minimize these negative impacts of chronic oral disease, there is thus a clear need to reduce harmful oral health habits. Such a reduction can be achieved through appropriate health education programs.[4]

Oral diseases have pressurized people in developing countries excessively. In India, children from about 38-40% of the total population and 80% of them have high levels of dental diseases like dental caries, gingivitis, periodontitis etc.[5] Tooth decay is the most prevalent chronic childhood disease, affecting 50% of first graders and resulting in almost 52 million missed school hours. These are aggravated by poverty, poor living conditions, ignorance concerning health education and the lack of appropriate policies and funding to provide necessary health care.[6] In order to control the growing burden of oral disease, a number of developing countries recently introduced school-based oral health education and preventive programs which aim at improving oral health behaviour and status of child health population.[7]

About 50-60% of oral diseases can be prevented by early detection and primary prevention. Public health programs designed to prevent and control dental diseases are ordinarily based upon water fluoridation, oral hygiene practices, dietary counselling, oral health education and periodic dental visits for preventive and simple restorative treatment.[8,9] Of all the above mentioned interventions, oral health education is considered the most cost-effective approach.

School children are considered to be an important target group for various health education activities with the underlying objective of inculcating healthy lifestyle practices to last for a lifetime.[10] Dental health education programs for school children have as their major theme the improvement and maintenance of oral health through giving information and invoking changes in behavior.[11]

The three different format of oral health instructions used in school settings are individual oral health instructions, group oral health instructions and individual as well as group oral health instructions. Many oral health education programs have been developed using different methods for different age groups of rural school going children of Lucknow.

Till date very few studies have been conducted to compare the effectiveness of individual health education with group health education by assessing the increase in the knowledge level and by observing the improvement in their oral hygiene status. Hence the aim of the study is to compare effectiveness of individual versus group oral hygiene instructions among 13 to 15 years old school children in Lucknow.

MATERIALS AND METHODS

The present study was intended to evaluate and compare prospectively the effectiveness of three different methods of giving the same oral hygiene instructions in terms of its impact on 13 to 15 years old public school children's oral health knowledge. Subjects were drawn from four different public schools near the vicinity of the institution. Duration of study was 8 months.

Out of the four schools three schools were received same oral health instructions in three different group format and the other one did not received any oral health instructions and acted as control group. From each school 50 students of particular age were randomly selected who fulfilled the inclusion and exclusion criteria. 200 school children from four different public schools were taken. Students of each school constitute a group with four groups in the study. Methodologies for delivering of oral health instructions were standardized and identical in all the sessions.

A letter was sent to the selected schools explaining the purpose of the study and the procedures that was followed during the study.

Group I received individual oral hygiene instructions.

Group II received group oral hygiene instructions.

Group III received both individual and group oral hygiene instructions.

Group IV received no oral hygiene instructions (control group).

Inclusion Criteria

1. Subjects with 28 permanent teeth present.
2. Subjects who were permanent residents of that area.

Exclusion Criteria

1. Subjects who were under any medication.
2. Subjects with orthodontic braces, removable or fixed prosthesis, crowns and overhanging restorations.
3. Schools were excluded from the study where school based dental health education programme was going on at a regular interval.

Ethical clearance was obtained from the Institutional Ethical Committee to conduct the study. Written informed consent was taken from Head of each school.

A pilot study was carried out on fifty 13-15 years old school children those did not participate in the main study to check for the validity of the questionnaire and assess the operational feasibility of the study. Needful changes in the study materials were made time to time. Cronbach's alpha was applied for the reliability of the questionnaire and it was found to be 0.84.

The proforma had two parts:

1) Questionnaire personal information and oral health knowledge
2) Clinical assessment form

The pre-designed, pretested questionnaire was used in the study. This enumerated demographic information and also included variables regarding oral health knowledge & behaviour. Questionnaire in Hindi language was specially designed for this study, depending on the medium of teaching & the understanding ability of the children, to evaluate the knowledge & awareness of young children regarding their oral health & dental treatment. Questionnaire contained 20 knowledge questions, each having four response options, out of which one was correct. Every correct answer was awarded one point. Unanswered and wrong answers awarded as zero point. The possible scores thus ranged from 0 to 20.

A standardized & tailored ten minutes single lecture was prepared in Hindi depending on the medium of teaching & the understanding ability of the children. This was based on theoretical background, motivation and practical support.

Theoretical background	Relation between dental plaque and caries, and between dental plaque and inflammation of gums
Motivation	Purpose of oral hygiene measures and personal benefits
Practical support	Demonstration of a correct tooth brushing technique (modified Bass technique) and instruction on how to clean interdental space (dental floss and interdental brush)

Emphasis was placed on plaque control through the use of the toothbrush and dental floss in combination with fluoridated toothpaste. A session of oral hygiene instruction was conducted on pre-fixed dates with school authorities. Oral hygiene instructions were given in Hindi after equal interval (at baseline, after 4 months and 8 months). The first oral hygiene instruction was given to three study groups after baseline oral prophylaxis. In the case of control group oral prophylaxis was done but no oral hygiene instruction given. After questionnaire was filled oral hygiene instruction was given followed by clinical assessment was done. For the second & third time same procedure was followed except oral prophylaxis.

The children were allowed to sit on a chair with back rest under natural light and a total number of 25-30 children were examined per day. A table to place instruments was placed within the ease reach of the examiner. The recording assistant was allowed to sit close enough to the examiner, so that instructions and codes could be easily heard and the examiner could see and confirm that the finding was accurately recorded. The examiner counter checked the entries made by the recorder at the end of each examination. To assess the accumulation of plaque Modification of the Quigley-

Hein Plaque Index[12] and Oral Hygiene Index – Simplified[13] were used. To assess gingival status Gingival Index[12] was used. And to assess oral hygiene performance of students Patient Hygiene Performance Index[14] was used. Each time along with oral hygiene instructions clinical assessment was done. Single investigator conducted the study. The investigator was priory trained & calibrated in the Department. Kappa value for intra-examiner reproducibility was > 0.86.

The data from the completed forms were entered into the Microsoft Windows 7 software programme. Statistical Analyses was done by using the software Statistical Package for the Social Sciences (SPSS) version 22. Statistical tests were performed for both means and proportions. The $\chi 2$ test was used to test the significant difference in proportions. Means were compared using student "t" test and ANOVA or F test. Changes of follow up were measured by paired "t" test. Calculated values of the test criteria were compared with the tabular value at 95% level and p value <0.05 to ascertain the significance of the test.

RESULTS

Out of 200 school children, there were 109 (54.5%) males and 91 (45.5%) females. A total of 77 (51.33%) males & 73 (48.67%) females were in the test group (Group I, Group II & Group III) and 32 (64%) males & 18 (36%) females were in control group (Group IV). The male to female ratio in the study population was 1.2 : 1. It was observed that there was no statistically significant difference between male and female participants (p=0.45).

Table I shows that in between all the groups it was found that there was no statistically significant difference in the mean age of school children covered under different groups. (p=0.78).

Table II depicts that irrespective of the groups, there was a substantial improvement of knowledge scores, except in the control group, where there was a negligible improvement. There was a statistically significant difference between baseline and first follow up (p<0.001) and baseline and second follow up (p<0.001) in all the four groups.

Table III shows the overall comparison of all techniques. It was seen that amongst Group 1 & Group II there was no significant difference between them. When Group I was compared with Group III it was also found there was no significant difference between them. Comparing Group I with Group IV, Group I appeared to be more effective in between baseline to first follow up, baseline to second follow up and first follow up to second follow up (p<0.001). When Group II was compared with Group III, it was found that there was no significant difference amongst them. On comparing Group II with Group IV a significant difference between first follow up to second follow up (p<0.001) was found. When the Group III was compared with Group IV, Group III appeared to be more effective in between baseline to first follow up, baseline to second follow up and first follow up to second follow up (p<0.001).

Table IV explains the distribution of different groups and MQHPI, GI, OHI-S & PHP index at baseline, First follow up & Second follow up. Mean score of MQHPI, GI, OHI-S & PHP index were decreased significantly in all the groups at first and second follow up from baseline and the decrease was maximum for Group III (p<0.001). Margin of decrease was less in Group IV.

DISCUSSION

Health Education is defined as any educational activity which aims to achieve a health related goal (WHO, 1984). Activity can be directed at individuals, groups or even populations.

There are three main domains of learning:

a) Cognitive
b) Affective
c) Behavioural

This study is based on cognitive learning model that is if information is provided appropriate behaviour change will follow. In the present study, the effects of three instructional approaches in school oral hygiene instructions programs was assessed in terms of gains in knowledge scores as outcome measure or dependent variable. This study design was almost similar to other studies conducted for evaluation of oral health education programs by Anaise JZ et al.,[15] Tan HH et al.,[16]

Table I. Distribution of mean age of subjects in four groups

	No. of subjects	Mean age (years)	± SD
Gr I	50	13.98	0.80
Gr II	50	14.0	0.78
Gr III	50	14.04	0.83
Gr IV	50	13.88	0.82
Total	200	13.98	0.80
F = 3.50, p=0.78			

Table II. Mean number of correct answers in all the four groups at baseline, first follow up & second follow up

	Gr I		Gr II		Gr III		Gr IV	
	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD
Baseline	11.24	1.78	11.26	1.62	11.45	1.04	11.35	1.56
First follow up	13.53*	1.48	14.20*	1.25	13.39*	0.78	12.88*	0.82
Second follow up	16.55*	1.27	16.88*	1.11	16.28*	0.90	12.96*	1.07
p<0.001, *Significant								

Table III. Inter-technique comparison of mean increment of correct answers in between all groups

	Baseline to First follow up	Baseline to Second follow up	First follow up to Second follow up
	p	p	p
Gr I vs Gr II	0.15	0.89	0.69
Gr I vs Gr III	0.11	0.97	0.048
Gr I vs Gr IV	<0.001*	<0.001*	<0.001*
Gr II vs Gr III	0.15	0.89	0.43
Gr II vs Gr IV	0.99	0.66	<0.001*
Gr III vs Gr IV	<0.001*	<0.001*	<0.001*
p=<0.05, *Significant			

Table IV. Distribution of different groups in total population and MQHPI, GI, OHI-S & PHP index at baseline, First follow up & Second follow up

		Baseline		First follow up		Second follow up	
		Mean	±SD	Mean	±SD	Mean	±SD
MQHPI	Gr I	1.38	0.042	0.63*	0.047	0.60*	0.051
	Gr II	1.38	0.042	0.62*	0.046	0.60*	0.050
	Gr III	1.38	0.042	0.63*	0.046	0.59*	0.045
	Gr IV	1.38	0.042	1.20*	0.056	1.24*	0.051
GI	Gr I	0.38	0.18	0.031*	0.045	0.019*	0.0319
	Gr II	0.38	0.16	0.037*	0.048	0.021*	0.0372
	Gr III	0.38	0.16	0.031*	0.053	0.013*	0.0273
	Gr IV	0.38	0.18	0.20*	0.072	0.24*	0.067

OHI-S	Gr I	1.32	0.35	0.11*	0.14	0.081*	0.11
	Gr II	1.30	0.34	0.10*	0.14	0.081*	0.12
	Gr III	1.34	0.33	0.11*	0.14	0.087*	0.13
	Gr IV	1.36	0.33	1.02*	0.17	0.99*	0.23
PHP	Gr I	2.30	0.34	1.07*	0.39	0.81*	0.36
	Gr II	2.31	0.34	1.12*	0.32	0.72*	0.29
	Gr III	2.34	0.32	1.16*	0.45	0.69*	0.34
	Gr IV	2.35	0.34	2.04*	0.24	2.06*	0.24
p<0.001, *Significant							

Ganesh SA et al.,[2] Al-Kheraif AA et al.,[17] Ziebolz D et al.,[18] Shenoy RP et al.[19] and Chandra S et al.[20]

The overall mean age of the study population was 13.98 years. There is no statistically significant difference between in mean age of children covered under different methodologies. Similar evaluation studies of oral hygiene instructions programs which involved adolescents were those conducted by Melsen B et al.,[21] Axelsson P et al.,[22] Walsh MM,[23] van Palenstein HWH et al.,[24] Ganesh SA et al.,[2] Redmond CA et al.,[25] Brukiene V et al.,[26] Shenoy RP et al.[19] and Chandra S et al.[20]

Overall, the oral hygiene instructions program regarding oral hygiene instructions was effective in improving the knowledge and awareness levels of the most children, regardless of the methodologies used. These net gains in knowledge were very highly statistically significant in all methodologies (p<0.001). This was found to be in accordance with the findings of the studies conducted by Tan HH et al.,[16] Craft M et al.,[27,28] Schou L,[29] Horst ter et al.,[30] Buischi et al.,[31] Worthington et al.[11] and Goel et al.[10] On the contrary, studies conducted by Agerbaek N et al.[32] and Hartono et al.[33] showed very little differences in the knowledge levels of experimental & control group.

When the inter-methodology comparison was made, it was found that the first & third methodology and control group had a significant difference all throughout the study (p<0.001). And second methodology & control group had a significant difference between first & second follow up (p<0.001). Thus, for first three methodologies there was no as such difference when compared with control group. This finding was found to be in accordance with studies conducted by Al-Kheraif AA et al.[17] and Ziebolz D et al.[18]

In this study the mean score of Modified Quigley-Hein Plaque Index, Gingival Index, Oral Hygiene Index – Simplified and Patient Hygiene Index were decreased significantly in all methodologies at first and second follow up from baseline (p<0.001). Margin of decrease was less in control group. This finding was found to be in accordance with studies conducted by Anaise JZ et al.,[15] Rose C et al.,[34] Holt RD et al.,[35] Frencken JE et al.,[36] Hartono SWA et al.,[33] Ganesh SA et al.[2] and Ziebolz D et al.[18] This finding could be attributed to the effect of repetition & reinforcement in the oral hygiene instructions programs. Tan HH et al.[16] and Lachapelle D et al.[37] also concluded that repetition & reinforcement accounted for significant improvement in oral health knowledge & practice.

CONCLUSION

This study shows that there is no as such difference between all the aforementioned methodologies of oral hygiene instructions. But this is obvious that oral hygiene instruction significantly improves the oral hygiene status of the patients. Increasing the awareness and the understanding of the importance of oral hygiene is essential for successful oral health care. So in school environment Group oral hygiene instructions is preferred because of less time consuming, most efficient and cost-effective method.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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