

# Effectiveness of Oral Health Education using Child Model Video vs Conventional Education by Dentist among Orphanage Children of Puducherry, India: A Prospective Interventional Study

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## ABSTRACT

**Introduction:** Orphan children are usually abandoned by their parents and these children are more vulnerable to oral health problems due to lack of knowledge and psychological support. These children do not receive adequate preventive health care and often suffer from oral health diseases. Oral Health Education (OHE) is the paramount of health promotion and prevention of oral health disease and also, it throws some light on unattended oral health problems.

**Aim:** To assess the knowledge, attitude and oral hygiene practices among 10 to 15 year-old orphanage children and to compare the effectiveness of OHE using video (child model) vs conventional method (dentist) on knowledge, attitude and oral hygiene practices.

**Materials and Methods:** This prospective interventional study was conducted among 120 orphanage children of 10-15 years in Puducherry, India. OHE using dentist and child model OHE video intervention was given to group I and group II, respectively. Knowledge, attitude and practice scores of both the groups

was assessed at pretest, post-test and 15 days follow-up using a prevalidated questionnaire. The data thus collected were statistically evaluated using repeated measures of Analysis of Variance (ANOVA), independent t-test, percentage.

**Results:** A total of 120 children were selected for the study out of which 70 (58.33%) were females and 50 (41.7%) were males. The mean age of the study participants was 12.5 years. When compared with baseline, a significant increase in knowledge, attitude and practice scores were seen in post-test and follow-up of child model video group when compared to conventional dentist led OHE group ( $p \leq 0.001$ ). The results of the present study indicate that Knowledge, Attitude and Practice (KAP) regarding oral health were improved in OHE using child model video group.

**Conclusion:** From the results of this study it was found that incorporation of video in imparting OHE using child model can be an effective tool in improving oral health knowledge and it is evident that these children will be more confident and comfortable receiving instructions from children of their age group.

**Keywords:** Health education intervention, Oral health status, Video education

## INTRODUCTION

The orphans are ones who are abandoned and no longer have any family members to look after them both mentally and physically. The National Family Health Survey reported that about 4% of the Indian population is orphans which constitute about 25 million children [1].

According to United Nations Children's Fund (UNICEF), about 10,000 children are left either paternal or maternal orphans every day across the world [2]. Although, they contribute 2% of world's population, they are the ones who are more vulnerable to oral health problems due to lack of knowledge and psychological support. Orphan children seldom get a chance to seek dental care due to few caretakers to child ratio [3]. OHE is an important component of oral health promotion and it aims to promote oral health by improving the awareness of oral health problems. There are numerous methods to provide health education, one of the most common methods of delivery is through dentist, but the demand for them and lack of time to deliver OHE is high nowadays [4,5]. Alhayek Al et al., found that, the health education through multimedia (video) requires less effort in the explanation, and more retention of the information when compared to that of conventional method [6]. Few studies have revealed that, educating children with peer to peer based education was found to be more effective and the compliance rate is also high [7,8].

Children are capable of acquiring almost any behaviour that they observe closely that is not too complex for them to perform at their level of physical development. Acquisition of behaviour of others usually through role models deliberate promotes children's reflectivity [9]. According to literature search few studies conducted assessing the effectiveness of health education using multimedia, and there are no studies done to assess the effectiveness of child model video method of OHE [5,10,11]. Hence, the present study was planned to compare the effectiveness of OHE through child model video vs dentist-led OHE and to assess the knowledge, attitude and oral hygiene practices of 10 to 15-year-old orphanage children of Puducherry before and after intervention.

## MATERIALS AND METHODS

A prospective interventional study was conducted among 10-15 year orphanage children of Puducherry from Udhavi Karangal Samooga Thodar Kalvi Iyakkam (Orphanage), Ariyankuppam & SOS Children's home Puducherry, India, from November to December 2021. Permission to conduct the study among the children was obtained from the director of orphanages. The present study was approved by the Internal Review Board: IGIDSIECNRP59UGSEPPD. Permission and informed consent was taken from the orphanage authorities and children to conduct the study.

**Inclusion criteria:** Healthy and cooperative children of 10-15 years residing in orphanage were included in the study.

**Exclusion criteria:** Medically compromised and children with special healthcare needs were excluded in the study.

**Sample size calculation:** A total of two orphanage were randomly selected (lottery method) from the orphanages of Puducherry. Sample size was estimated based on results of a previous study conducted by Vangipuram S et al., using a sampling software, (G power version 3.1.9.1, Heinrich-Heine-Universitat-D Usseldorf, Germany) [7]. Minimum sample size was calculated to be 50 patients in each group (Power 90% and error at 5%). Anticipating 10% drop out rate, sample size was increased to 10 patients in each group and the sample size was calculated as 60.

## Study Procedure

The baseline data was collected using a pretested and validated questionnaire. A 16 item questionnaire was prepared in English and translated in native language (Tamil). The questionnaire was divided into three sections as KAP to assess the effectiveness of OHE [7]. The author formulated the questionnaire on the basis of the oral health instructions to be given in the health education. The pilot study was done on 15 children using the questionnaire to test the reliability of the questions. In multiple choice questions of knowledge, attitude and practice correct answers were given as score 1 and for wrong question score 0 was given and the mean score was calculated for KAP. The reliability test results showed 0.8 as cronbach's alpha value, which implied a good internal consistency. In the intervention period, delivery of OHE to the study groups i.e., 60 children from group I received conventional OHE by dentist, such as diagrams, images in the form of power point illustrating different procedure and oral health practice with the help of jaw model (SOS orphanage home) and 60 children from group II received OHE given by a child model in the form of video. (Udhavi Karanagal Orphanage). To avoid bias each group was selected from different orphanage. Questionnaires were administered immediately after the intervention. In the follow-up phase questionnaires were given to the same children 15 days after the intervention.

## STATISTICAL ANALYSIS

The statistical analysis was performed using Epi-Info statistical software 7.2.2. The data were analysed using repeated measures of ANOVA to compare the KAP at pretest, post-test (after intervention) for both groups. Percentage was used to calculate the mean age and sex of the study participants. Intergroup comparison at pretest, post-test (after intervention), and 15 days follow-up was done using independent t-test. A p-value  $\leq 0.05$  was considered as significant.

## RESULTS

A total of 120 children were selected for the study out of which 70 (58.33%) were females and 50 (41.7%) were males, with a mean age of 12.5 years, out of which 60 belonged to conventional dentist led OHE group and 60 to child model video group.

[Table/Fig-1] shows the mean knowledge, attitude and practice of the subjects participating in the study at pretest, post-test (after intervention) and 15 days follow-up in dentist led OHI (conventional), where a statistically significant results seen in post-test ( $3.32 \pm 0.681$ ) knowledge, when compared to pretest ( $3.10 \pm 0.865$ ) but there was a slight decrease in the follow-up knowledge when compared to that of post-test. When compared the practice scores in child model video group and conventional method there was a slight increase in follow-up ( $7.76 \pm 1.208$ ) scores with that of pretest ( $5.73 \pm 1.59$ ) and post-test ( $6.42 \pm 1.23$ ) and a statistically significant results was seen in child model video group. [Table/Fig-2] shows the mean knowledge, attitude and practice scores of the subjects participating in the study at pretest, post-test and 15 days follow-up in child model video group, where a statistically significant results was seen in post-test ( $3.38 \pm 0.640$ ) knowledge when compared to that of pretest ( $3.27 \pm 0.607$ ). When compared to pretest there was an increase in the knowledge of follow-up group ( $3.37 \pm 0.663$ ), although there was a slight decrease in the knowledge when compared to post-test. When attitude scores compared in pretest ( $1.78 \pm 0.865$ ), post-test ( $2.17 \pm 0.647$ ) and follow-up ( $2.22 \pm 0.55$ ) a statistically significant difference was found, in practice scores when compared with the pretest ( $7.73 \pm 1.91$ ), post-test ( $7.58 \pm 1.21$ ) and follow-up ( $7.88 \pm 1.01$ ) the results were statistically significant. [Table/Fig-3] shows intergroup comparison of knowledge scores between child model groups vs dentist led conventional method, where the mean knowledge scores of child model video group seems to be higher in post-test ( $3.38 \pm 0.64$ ) and follow-up ( $3.37 \pm 0.66$ ) when compared to that of conventional method and the results were statistically significant.

[Table/Fig-4] shows intergroup comparison of attitude scores between child model groups vs dentist led conventional method, where the mean attitude scores of child model video group seems to be higher in post-test ( $2.17 \pm 0.64$ ) and follow-up ( $2.22 \pm 0.55$ ) when compared to that of conventional method and the results were statistically significant. [Table/Fig-5] shows intergroup comparison of attitude scores between child model groups vs dentist led conventional method, where the mean attitude scores of child model video group seems to be higher in post-test ( $7.58 \pm 1.21$ ) and follow-up ( $7.88 \pm 1.19$ ) when compared to that of conventional method and the results were statistically significant.

Dentist led OHI (conventional) n (60)	Knowledge scores				Attitude score				Practice scores			
	Time interval	Mean	SD	p-value	Time interval	Mean	SD	p-value	Time interval	Mean	SD	p-value
	Pretest	3.10	0.865	0.001	Pretest	1.63	0.97	0.001	Pretest	5.73	1.59	0.001
	Post-test	3.32	0.681		Post-test	1.75	0.83		Post-test	6.42	1.23	
Follow-up	3.29	0.69	Follow-up		2.02	0.77	Follow-up		7.76	1.208		

**[Table/Fig-1]:** Knowledge, attitude and practice scores of the study participants at pretest, post-test and 15 days follow-up in dentist led oral health education (Conventional). SD: Standard deviation

Child model video group n (60)	Knowledge scores				Attitude score				Practice scores			
	Time interval	Mean	SD	p-value	Time interval	Mean	SD	p-value	Time interval	Mean	SD	p-value
	Pretest	3.27	0.60	0.001	Pretest	1.78	0.85	0.001	Pretest	7.73	1.91	0.001
	Post-test	3.38	0.647		Post-test	2.17	0.64		Post-test	7.58	1.21	
Follow-up	3.37	0.66	Follow-up		2.22	0.55	Follow-up		7.88	1.01		

**[Table/Fig-2]:** Knowledge, attitude and practice scores of the study participants at pretest, post-test and 15 days follow-up in child model video group. SD: Standard deviation

Time interval	n	Group	Mean±SD	p-value
Pretest	60	Dentist led OHE (conventional)	3.10±0.86	0.001
	60	Child model video	3.27±0.60	
Post-test	60	Dentist led OHE (conventional)	3.32±0.68	0.001
	60	Child model video	3.38±0.64	
Follow-up	60	Dentist led OHE (conventional)	3.29±0.69	0.001
	60	Child model video	3.37±0.06	

**[Table/Fig-3]:** Knowledge scores of the study participants at pretest, post-test and 15 days follow-up in child model video group vs dentist led oral health education.

Time interval	n	Group	Mean±SD	p-value
Pretest	60	Dentist led OHE (conventional)	1.63±0.97	0.001
	60	Child model video	1.78±0.85	
Post-test	60	Dentist led OHE (conventional)	1.75±0.83	0.001
	60	Child model video	2.17±0.64	
Follow-up	60	Dentist led OHE (conventional)	2.02±0.77	0.001
	60	Child model video	2.22±0.55	

**[Table/Fig-4]:** Attitude scores of the study participants at pretest, post-test and 15 days follow-up in child model video group vs dentist led oral health education.

Time interval	Group	n	Mean±SD	p-value
Pretest	Conventional	60	5.73±1.59	0.001
	Child model video	60	7.73±1.19	
Post-test	Conventional	60	6.42±1.23	0.001
	Child model video	60	7.58±1.21	
Follow-up	Conventional	60	7.76±1.20	0.001
	Child model video	60	7.88±1.19	

**[Table/Fig-5]:** Practice scores of the study participants at pretest, post-test and 15 days follow-up in child model video group vs dentist led oral health education.

## DISCUSSION

The present study was conducted among the orphanage children to compare the effectiveness of child model video and conventional dentist led OHE and to assess the knowledge, attitude and oral hygiene practices before and after intervention. In the present study, 10 to 15-year-old children were selected because at this age, children are in the influential phases of their life, habits, beliefs, skills, and attitude. According to Jean Piaget theory children will develop a sense of semi-logical reasoning to infer physical cause-effect relationship in this age group [12]. Orphanage children were selected as study population as they are neglected segment of the society who often faces emotional, social and psychological distress which affects their general health as well as oral health. The accessibility of OHE and dental care to this population is usually minimal [13]. For these children OHE is the only choice in preventing oral health diseases at the early stage of life. By spreading the knowledge of health education, an upliftment of this segment of the society can be done.

There are numerous methods in delivering OHE to the children. The conventional methods are the dentist led OHE, pamphlets, teachers, peer group etc., [14-16]. However, due to lack of time and resources, in this current era where e-learning is in trend, delivering OHE through video seems to be effective [17]. OHE using videos with background music, animations, narration, and various visual representations will attract the children and also it requires less manpower delivering the messages to a larger population [18]. Peer group and role model health education is a significant method in delivering oral health to improve behaviour of an individual since information by the members of the same group is likely to influence the person's beliefs and behaviour. Several studies report that health education with a peer group approach effectively improved the oral health related knowledge, behaviours and oral hygiene status of students [6,7,19]. Therefore, OHE in the form of video through role model i.e., child model brings more attraction and attention towards

children which helps in bringing oral health awareness in subjects leading to a better attitude in maintaining their oral health.

Hence, present study compared the effectiveness of dentist led OHE with the children model video. From the results of the present study, it was observed that, greater percentage of questions were answered correctly by the children after post-test and follow-up when compared to pretest in both the groups (child model video and dentist). Children's knowledge regarding brushing, dental caries and their attitude and practice in maintaining the oral health was significantly increased from pretest to post-intervention and follow-up period after health education intervention in both the groups. The findings of the present study were in accordance with study conducted by Goel P et al., who compared dentist led OHE in different socioeconomic groups of 10 to 13-year-old children and found that single-lecture technique seems to be inadequate in improving the knowledge of children in the long-term [20]. D Cruz AM et al., compared the effectiveness of interventions like power point and professional instructions found significant increase in oral hygiene knowledge in the intervention group (i.e., health education using power point) after nine months post-intervention among 13 to 15-year-old school children [21]. Vangipuram S et al., compared the effectiveness of peer-led and conventional method (dentist-led), OHE on oral health status, oral health knowledge, attitude and practices among 12-15-year-old government school children in Bengaluru and found that a statistically significant results are seen after the intervention period [7]. Therefore, continuous reinforcement of the health education is needed which is very easy and accessible through this method, which aids in proper retention of the knowledge and enhances the children to perform good oral hygiene practice regularly.

## Limitation(s)

The limitations of present study are the orphanages selected for the present study may not be representative of the entire orphanage. Though the health education delivered were standardised, certain factors such as communication skills of the dentist and knowledge retention of the children may also vary which can affect the results of the study. In the present study, the KAP scores at pretest were also significant for the study groups, so this can also be a reason for significant results.

## CONCLUSION(S)

In the present study, the child model video group was more effective when compared to that of conventional dentist-led education in improvement of knowledge, attitude and oral health practices which may be due to novel and attractive way of OHE. The child model video health education approach will be feasible and an effective alternative to traditional methods of dental health education. Implementing an easy-to-organise and economical feasible health education programs like this, especially in countries with a developing oral health care system will be effective. Hence, this study among orphanage children will bring enormous change in both attitude and daily routine thus, enhancing good oral hygiene.

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