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Effectiveness of a presentation on infant oral health care for parents

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Purpose. The aim of this study was to evaluate an infant oral health education programme, using a pre–post test design, for parents attending a paediatric clinic.

Methods. The subjects were parents attending the well baby appointments at 3, 6, and 9 months of age. The study participants were men and women, all with an infant between 3 and 12 months of age. A 16 question assessment in the form of a questionnaire was completed immediately before and after the introduction of a 30 min educational intervention in the form of a PowerPoint presentation and a video of infant oral hygiene for parents. The parents completed the questionnaire twice (pre–post test design) in the same visit. Recruited parents attended only one presentation. The presentation educated parents about infant oral health and provided anticipatory guidance.

Results. Forty-seven parents or caretakers participated in the study. On the pre-test 28% had a score of 70% or less, and on the post-test 87% got a score of 88% or better. On the pre-test, 72% had a score of 70% or higher, and on the post-test 87% got a score of 88% or higher. Most parents (80%) reported that the presentation was helpful and indicated that the information would change the way they care for their baby's teeth at home.

Conclusion. This study demonstrated the effectiveness of a 30 min PowerPoint and Video presentation in improving the oral health knowledge of parents caring for an infant.

Introduction

Studies from the Centers for Disease Control and Prevention and the National Institutes of Health have shown the prevalence, seriousness and societal cost of early childhood caries (ECC) has increased, despite declining caries in school age children[1]. Although ECC is preventable, more than 50% of children have caries by the time they reach kindergarten[2]. This disease affects the general population but is 32 times more likely to occur in infants who are of low socioeconomic status, whose mothers have a low education level, and who consume sugary foods[3]. The American Academy of Pediatric Dentistry (AAPD) recognises that infant oral health is the foundation upon which preventive education and dental care must be built to enhance the opportunity for a lifetime free from preventable oral disease[4]. The AAPD encourages parents and other care providers to help every child establish a dental home by 12 months of age[5]. The American Academy of Pediatrics recognises that ECC emerges within all cultural and economic paediatric populations; however, it approaches epidemic proportions in populations with low socioeconomic status[6]. The AAPD encourages both dental and nondental health care providers to use the Caries-Risk Assessment Tool in the care of infants, children, and adolescents and to provide basic preventative counselling; and recommends that nondental health care providers refer all children, especially those at moderate or high risk, to a dentist for oral health care[7].

Programmes to educate and promote preventive measures have been shown to increase knowledge and the ability to recall information related to health. In addition, significant positive change in attitude and knowledge have been found, when compared

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with the control group when mothers of an infant under 12 months of age listened to a 5-min audio-taped persuasive message about 'baby bottle tooth decay' and answered a questionnaire afterward[8]. Nevertheless, for preventive education to be effective, the health messages must be persuasive enough to result in behavioural changes[9]. A study showed that intensive anticipatory guidance with home visits improved certain scores of mother-infant interaction[10]. The authors compared several different methods for providing parents with information and found anticipatory guidance to be most effective because it can be tailored to fit parent's specific interests. Another study assessed the impact of a lecture on children's oral health knowledge of pregnant women from vulnerable African American and Hispanic of Mexican origin populations and concluded that an oral health lecture within a prenatal programme improved oral health knowledge for African American and Hispanic of Mexican origin pregnant women[11]. A study created and tested a DVD-video containing information about infant oral health care and prevention and a questionnaire was developed to test the knowledge of expectant and young mothers and early childhood educators before and after viewing the video concluded that this audio-visual aid is an effective tool in providing anticipatory guidance regarding infant oral health in high-risk populations[12].

More research is needed to find methods of educating parents of children about the importance of infant oral hygiene and how to prevent ECC. The children's vulnerability and dependence on adults gives society a responsibility to invest in special measures to ensure their well being. There are two important strategies for helping parents obtain information about infant oral hygiene. One is the development of a dental and medical home, and the other is providing anticipatory guidance at the dental and medical home. Therefore, we hypothesised that viewing a concise, educational presentation and video consisting of instructive information and a targeted approach to infant oral health care and anticipatory guidance for parents, would increase their knowledge of infant oral hygiene procedures, appropriate timing of the first dental visit and dietary practices.

Methods

This is a nonrandomised interventional study conducted in March and April 2008. Participating parents completed a pre-presentation questionnaire, viewed a 30 min PowerPoint and video presentation followed by participation in a question and answer session and then completed a post-presentation questionnaire. This research project was approved by the Institutional Review Board (IRB) and all parents/caregivers who participated were given the 'Rights of Research Patients' information and completed the appropriate IRB consent forms. The authors used the AAPD guidelines to prepare the PowerPoint and video presentation and the questionnaire.

Parents whose children had been seen for a 6-, 9-, 12-, or 15-month well child visit at the University of Nebraska Medical Center (UNMC) Pediatrics clinic were recruited at the time of the visit or by a follow-up phone call by the UNMC Paediatric clinic office staff. Parents could be either English or Spanish speaking. Parents were then scheduled for one of the 1-h weekly sessions conducted by the dental residents in the Paediatric Clinic conference room during March and April 2008. Recruited parents attended only one presentation. The presentations were offered weekly on different days and times to try to accommodate parents' schedules. All presentations were scheduled between 10 AM and 5 PM. In addition to the initial contact and scheduling, the parents received a reminder phone call the day prior to the session. For participating in the study, parents received a folder containing information on infant oral health, an infant and adult toothbrush, infant training toothpaste and a 10 dollar gift card.

The 30 min PowerPoint presentation and video were produced by the authors in both English and Spanish at a third grade reading/comprehension level. This was determined during the consent form procedure. The presentation covered: how to perform infant oral hygiene procedures (brushing), appropriate dietary practices for infants, timing

of the first dental visit and periodicity of dental screenings, importance of oral health of parents/caregivers and emergency care for infant oral trauma. The presentation also gave anticipatory guidance on appropriate feeding and proper oral hygiene for infants.

To assess the parents' knowledge of infant oral health before and after the session, a questionnaire based on information contained in the presentation was administered at the start and end of the session. The pre- and post-test questionnaires contained the same 16 True/False/Don't Know and multiple choice questions related to infant oral health. The pre-presentation questionnaire also assessed basic demographic information: age, sex, race/ethnicity, insurance status and highest level of education. The post-test questionnaire included the following questions to evaluate the presentation and its effectiveness: 1. How satisfied were you with the education component of this presentation? 2. Is there anything you would have liked to change or add about the education component of this presentation? (Yes or No), and if yes – what you like to change or add? 3. Will this information change how you care for your child's teeth at home?

Statistical differences between individual score and total scores on the knowledge-based questionnaire were evaluated by comparing correct answers of post-pre test score difference using a paired *t*-test. 'Don't know' or blank responses were scored as incorrect. An analysis of covariance was completed to examine differences in knowledge and potentially confounding factors including age, sex, and race/ethnicity.

Results

Forty-seven parents or caretakers participated in the study. Demographic, insurance and education level of the participants are presented in Table 1. There were 8 (17%) male and 39 (83%) females, with a mean age of 26.7 (SD 8.3, range 17–53). The ethnic composition was made up of 18 (38%) Caucasian, 15 (32%) African American, 11 (23%) Latino, and 3 (6%) Other. The educational level of the subjects ranged from 7 (15%) less than high school, 26 (55%) high school, 12 (26%) more than high school and 2 (4%) more than college. The financial coverage was reported as 10 (21%) having private insurance, 31 (66%) had Medicaid coverage, and 6 (13%) having no insurance.

The range on the pre-test was 9–15, with a mean 12.5 of 16 (SD 1.5). The range on the post-test was 7–16, with a mean of 14.6 of 16 (SD 1.6). This difference was significant using a dependent *t*-test (*P*-value <0.001). Fig. 1 shows mean pre–post scores. The question most commonly marked incorrect on the pre-test was 'The easiest way to clean a baby's teeth is with them laying down' (29.8% correct pre-test). This was also the 'most improved' question on the post-test (97.9% correct). The question marked incorrect most commonly on the post-test was 'Cavities in baby teeth do not need to be fixed' (55.3% correct on post test). Surprisingly, this showed very little improvement from pre-test (53.2 % correct). Regarding ethnicity, age, gender, insurance status or highest level of education obtained, there was no variable which was able to predict pre-test scores or level of infant oral health knowledge.

On the post-test, only one person (2%) stated that they did not find the presentation helpful, whereas 38 (80%) found the presentation very helpful. Six people marked that they would change the presentation (13%) and 41 would not (87%). Of the respondents, 98% said this would change how they care for their baby's teeth at home and only one person said it would not.

Table 1. Demographic, insurance and education level information of the participants.

Gender	*N* = 47	Ethnicity	*N* = 47	Insurance	*N* = 47	Education	*N* = 47	Age	
Male	8 (17%)	Caucasian	18 (38%)	Private	10 (21%)	Less than high school	7 (15%)	Mean	26.7
Female	39 (83%)	African-American	15 (31%)	Medicaid	31 (66%)	High school	26 (55%)	Range	17–53
		Latino	11 (23%)	No insurance	6 (13%)	More than high school	12 (26%)		
		Other	3 (6%)			More than college	2 (4%)		

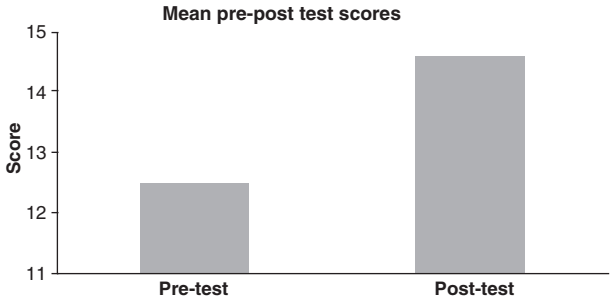

Fig. 1. Mean pre–post scores.

Discussion

The Surgeon General's report on oral health called for improved education about oral health, a renewed understanding of relationships between oral health and overall health, and an interdisciplinary approach to oral health involving primary care providers[1]. Infant oral health can improve children's dental health by reducing the risk of development and progression of caries and ensuring that dental treatment is initiated before the disease becomes extensive. The sample population in this study was evenly represented between Caucasian, African American, and Latino parents, with each corresponding to approximately one third of the total sample. The presentation and questions were created at a third grade level of reading and comprehension, however, the results showed that half of the respondents had at least a high school education, and 26% had completed post high school training. The results of this study showed a statistical significant difference between the pre- and post-tests. Nevertheless, as more than half of the respondents had high school education or more, it is possible that the questions asked did not match the level of dental IQ for the tested population. Another study concluded that a minimal increase over baseline may be due to parents being knowledgeable at baseline[13]. No variable was able to predict level of infant oral health knowledge, thus all parents may benefit from infant oral healthcare education. Some parents may respond better to a hands-on experience or a more interactive mode as opposed to a Power Point presentation.

The difference between pre and post-test scores was statistically significant, meaning that even though some of the respondents achieved a lower score compared to the pre-test, on average people performed better after the intervention. Even at post-test, only half of parents felt caries in primary teeth need to be restored, although the presentation covers in detail the consequences on the permanent dentition from an aspect of possible damage to the developing tooth, as well as an increased caries experience on permanent teeth if primary teeth are affected. It is therefore interesting that even more emphasis has to be placed on this particular point and also to consider that there may also be a financial component which contributes to the belief that caries in primary teeth should not be addressed. This lack of improvement could also be the result of a deeply ingrained belief that 'baby teeth are going to fall out anyway' and therefore decay in the primary dentition does not need not be addressed. Hamilton *et al.* (1999) found that some behaviours are so ingrained in the daily routine that they are especially difficult to change[9]. The authors found behaviours such as oral hygiene and dietary habits as especially difficult to change.

Overall, most parents in this study found the presentation to be helpful, with 80% responding that they found the presentation to be very helpful, and 98% stated that the presentation would change how they cared for their baby's teeth. The results of this investigation show similarities with others studies which showed that parents do benefit from receiving some sort of educational presentation[8,11,12]. Other investigators have shown that not all parents value information on the same topics and the areas of greatest improvement and attitude change are usually topics which the parent already had questions on[14,15]. This stresses the significance of a more tailored approach to the intervention with information specific for each parent and level of knowledge. The educational presentation in this study also covered the importance of oral health of parents/caregivers. Kim *et al.* indicated that the maternal oral health has significant implications for birth outcomes and infant oral health, including increased risks for preeclampsia, pre-term deliveries and risk for ECC in their infants[16]. Maternal oral

flora is transmitted to the newborn infant, and increased cariogenic flora in the mother predisposes the infant to the development of caries and therefore, oral health promotion should include education of women and their health care providers. The authors used a pre/post test design and found mothers knew little of the maternal-infant oral health connection and were receptive to information provided at their prenatal visits and concluded that providing mothers with anticipatory guidance at prenatal visits regarding their own oral health increased maternal interest in their own oral health and in their babies' oral health[16].

The results of this study show that educational presentations can reach a large number of individuals and may provide benefit to more than one child per family. In addition, the results show that some points of the presentation need to be improved in regard to emphasis or clarity. Ideally, one would like to see all of the answers marked correctly on the post-test. Changes can be made to the presentation and the questions asked, and more research can be conducted at different sites, however, the significance of this project is that an educational presentation has been created which has shown to improve parents' knowledge on caring for their infants' teeth.

There are several limitations to this study which merit further research. Only a small group of parents/caregivers attending the same paediatric clinic participated in this study; it remains to be seen if the results can be generalised to a larger group. Moreover, this study was completed in one sitting and a long-term follow-up must be completed to determine permanent changes in parents/caregivers practice habits. Finally, all data collected in this study was by self-reporting. Parents/caregivers may or may not have answered questions about their own and infant oral health values honestly. Follow-up studies should also determine if this is the best delivery method for the information and possible delivery method dependent differences in information retention and practice changes. More research should be done on how to best deliver information on infant oral health to parents/caregivers and long-term retention of the information.

Conclusions

This study demonstrated the effectiveness of a 30 min PowerPoint and Video presentation in improving the oral health knowledge of parents caring for an infant; All parents can benefit from preventive educational programmes; Most parents reported that the presentation was helpful and indicated that the information would change the way they care for their baby's teeth at home.

What this paper adds

- This study demonstrated the effectiveness of a 30 min PowerPoint and Video presentation in improving the oral health knowledge of parents caring for an infant.

Why this paper is important to paediatric dentists

- The role of paediatric dentists in educating parents regarding caring for their infants and the anticipatory guidance is crucial to infant oral health.

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