

Effectiveness of Oral Health Promotion among Teachers and Parents of Special Care School Children in Al-Kharj, Kingdom of Saudi Arabia

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ABSTRACT

Aim: The study aimed to evaluate the effectiveness of oral health promotion among teachers and parents of Special Care School Children (SCSC) in Al-Kharj Province of Saudi Arabia.

Materials and methods: Out of 936 children with special healthcare needs (CSHCN) in 18 schools that have programs to teach SCSC, 8 boys' schools were chosen randomly. Fifty-six teachers and 74 parents of SCSC were involved in the oral health promotion of 163 SCSC, all males, aged 6–15 years. Oral health promotion was done at each school according to the specific needs of the group as well as the training of teachers. Parents and teachers were given training on the use of powered toothbrushing with commercially available fluoridated (1,450 ppm) toothpaste. Plaque scores were taken at baseline, at 3 months' interval, and finally at 6 months. Oral health knowledge and attitude of teachers and parents of SCSC were evaluated at the start and then finally at 6 months.

Results: The average mean plaque score for the whole SCSC group at baseline was 1.55 that reduced to 1.35 after 3 months and finally to 1.1 after 6 months. The reduction of plaque scores was statistically significant ($p < 0.05$) using a one-sample t-test after the incorporation of the supervised toothbrushing program. There was a significant change in the knowledge and attitude of the parents as well as the teachers of the SCSC after the incorporation of oral health promotion.

Conclusion: Preventive oral health programs involving teachers and parents of SCSC resulted in significantly lower plaque scores. The program also resulted in improved oral health knowledge and attitude among teachers and parents of SCSC.

Clinical significance: Oral health care remains the most frequently cited unmet health need for CSHCN. In view of high unmet need and problems faced with access to oral health care, it is significant that preventive oral health measures are incorporated into the daily regime for SCSC. Oral health promotion in the form of better plaque control along with improved oral health knowledge and attitude of teachers as well as parents of SCSC is recommended.

Keywords: Education, Plaque, Prevention, Toothbrushing, Unmet needs.

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INTRODUCTION

Oral disease remains a major public health burden worldwide. It has been proposed that strategies for good oral health should focus on health promotion and disease prevention through effective multidisciplinary teamwork.¹ Oral health care remains the most frequently cited unmet health need for children with special healthcare needs (CSHCN).² Preventive oral health measures minimize the need for oral health interventions. This in turn minimizes disease burden as an operative intervention and surgical procedures in particular often produce major problems.³ Oral health education of parents or caregivers with regard to prevention and treatment for CSHCN must be planned from an early stage.⁴

There is a need to educate CSHCN in the least restrictive environments according to their needs and should be considered while making individual educational plans for them.⁵ In the last decade, the practice of special education services for students with special needs in Saudi Arabia has improved to assist them in obtaining high-quality education services in the least restrictive environment.⁶ While most CSHCN having multiple and severe disabilities receive their education in separate institutes; special care school children (SCSC) with mild and moderate disabilities are accommodated in schools attended by children without any special needs. This helps them to interact with their typically

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developing peers in inclusion settings where they could improve social, communication, and academic skills.⁷

All efforts have to be made to minimize the barriers to oral health care of CSHCN.^{6,8} In fact, oral health care should be an integral part of the comprehensive health care transition planning process for all CSHCN.⁹ Huebner et al. noted that the majority of the parents of CSHCN do not meet minimal recommendations and guidelines set for preventive dental care for their children, especially at home.¹⁰ Similarly, studies on school teachers have revealed that there is a definite and immediate need for organized oral health training of school teachers including basic oral health knowledge that will facilitate their role as school oral health education providers.¹¹⁻¹³ Therefore, this study aimed to evaluate the effectiveness of oral health promotion among the teachers and parents of SCSC in Al-Kharj province of Saudi Arabia.

MATERIALS AND METHODS

Ethical Approval, School Permission, and Consent

The copy of the passive consent letter written in the Arabic language to be distributed to the parents/guardians of SCSC was attached with the proposal for ethical clearance. The letter asked the parents/guardians to sign and return the letter stating their refusal in case they were not willing their ward to be a part of this study. As a source of motivation, powered toothbrushes and toothpaste were provided by the research team both at the schools and for home use. Informed consent forms in the Arabic language were also used with parents and teachers of SCSC explaining to them about supervised brushing at home for parents and school for the teachers. Participant information letters were used for the oral health questionnaire regarding oral health knowledge and attitude for the teachers and the parents of SCSC. After fulfilling all requirements and in accordance with International Guidelines for individuals who lack capacity, formal ethical approval was granted by the Ethics committee at College of Dentistry, Prince Sattam bin Abdulaziz University; Al-Kharj vide no PSAU/Dent-CFR/1430. Permission was sought and granted by respective authorities from the Ministry of Education, Special needs education program who also gave the data about special education program as well as the details of SCSC and their teachers in Al-Kharj province of Saudi Arabia.

Sampling and Questionnaires

The present study selected a region for convenience sampling in the Al-Kharj province of Saudi Arabia. Out of 936 SCSC in 18 schools that have special care education programs to teach SCSC, 8 schools were chosen randomly. One hundred and sixty-three, male-only students aged 6–15 years were involved. A study about the effectiveness of preventive measures for this group has been published already.¹⁴ Out of the parents for 163 SCSC, only 74 parents were able to complete the study. Out of the 176 total teachers present in the special needs program for all schools in Al-Kharj province of Saudi Arabia, 60 teachers were found to be present in the 8 boys' schools selected for the sample. Four teachers dropped out during the study and eventually, 56 teachers completed the study with the completion of questionnaires. A pretested questionnaire comprising of questions from the Adult Oral Health Survey, UK; 2009 was used. The questions were translated by one translator into the native Arabic language and using reverse translation the validity of the questions in the Arabic language was tested until an acceptable form of the questionnaire

was attained. A similar questionnaire has been used previously for the caregivers of a similar population in the province though with a different age group.¹⁵

Oral Health Promotion According to the Specific Need

Specific special needs education programs are in place in specific schools according to the special needs of the children. Oral health promotion was done according to the specific needs of the group as well as the training of teachers. For instance, at the school with SCSC who have a visual impairment, most of the teachers are themselves visually impaired but trained in the use of braille script. They can type and teach braille script. The teachers were asked to type oral health promotion messages in braille script with a specific braille type-writer and then read them together with the SCSC with visual impairment for reinforcement. During the training of supervised brushing with visually impaired teachers, it was made sure to incorporate things like how to locate the on/off button of the powered brush and how to keep the measure of the time. Similarly, in the school with SCSC having a hearing impairment, the teachers are trained in sign language. Oral health messages were incorporated through these teachers to the SCSC via sign language. Likewise, the particular special need was considered before incorporating any oral health promotion measure for other schools. Overall, all parents and teachers involved in the study were given training on the use of powered brushing with commercially available fluoridated (1,450 ppm) toothpaste once daily at home and the school, respectively. No intervention procedures like oral prophylaxis were carried out for any SCSC. The parents and the teachers were advised to adopt a healthy diet for the children at home and at school. Both parents and teachers were counseled for the implications of a cariogenic diet on oral health. The time of supervised brushing was assigned during the midday break at the school and before going to bed at home for teachers and parents, respectively. Plaque scores were recorded at the start of the oral health promotion campaign, at 3 months and 6 months' intervals using plaque index by Silness and Loe. The plaque scores were recorded during the midday break just before the supervised brushing session. Oral health knowledge and attitude was assessed using a self-administered questionnaire at the start of the study and finally at 6 months.

Training and Calibration of Examiners

Before the commencement of the main study, two examiners were standardized and calibrated to ensure uniform interpretations and application criteria for plaque index. The selected examiners were labeled as Examiner A and Examiner B. The overall reliability of the examiners was assessed after two weeks. It was found to be 98% for plaque index. Furthermore, calibration was done at the third week to seek the intra-examiner and inter-examiner variability. Overall κ score of 0.96 was achieved for intra-examiner variability and 0.91 for inter-examiner variability. Both examiners administered the oral health knowledge and attitude questionnaires in a self-administered way to the teachers and parents of SCSC. The questionnaires were labeled and kept for record. The same questionnaires were repeated with both parents and teachers after 6 months of the oral health promotion campaign.

Data Analysis

The data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) version #20 program. The data were analyzed as means of the overall plaque scores. Analysis of variance

(ANOVA) and Chi-square tests were used for comparisons. A *p* value of <0.05 or less was considered statistically significant.

RESULTS

Table 1 represents the 163 SCSC grouped according to their specific special healthcare needs and their medical diagnosis. The majority (29.4%) were having a "Learning Disability"; while about 3% were grouped as having "Multiple Disability". This group included those who had more than one disability at the same time like a learning disability with an associated physical disability.

The plaque scores were significantly reduced after 3 months as well as 6 months after implementation of plaque control measures like supervised brushing in the specified schools, Figure 1 shows the gradual but progressive reduction in mean plaque scores after 3 months and finally at 6 months. The average mean plaque score for the whole SCSC group at baseline was 1.55 that reduced to 1.35 after 3 months and finally to 1.1 after 6 months. The reduction of plaque scores was statistically significant (*p* < 0.05) using a one-sample *t*-test.

Figure 2 shows the oral health attitude of the teachers and the parents about toothbrushing before the commencement of the supervised toothbrushing program at the school and the home. Most among the parents as well as the teachers either reported brushing once or twice daily. About 10% among the parents and 6% among the teachers reported that they never brush their teeth.

Figure 3 represents the reported knowledge and attitude about personal oral health care. All four main questions were ascertained from both teachers and parents of SCSC. (a) "Oral health is important and related to general health". (b) "Fluoride is beneficial for teeth". (c) "I knew how to use a powered toothbrush". (d) "Had a preventive

dental health check-up before". A vast majority among both parents and teachers reported that oral health was important and related to general health. More than half of the teachers knew that fluoride was beneficial for teeth before the start of the study. However, only a little percentage among the parents and the teachers knew how to use a powered toothbrush. Only a small proportion had ever used a powered toothbrush. A vast majority of teachers and parents reported that they did not have a preventive oral health check-up for themselves.

Figure 4 represents the oral healthcare knowledge and attitude of parents (Fig. 3A) and teachers (Fig. 3B) before and after the completion (Figs 3C and D) of the study. Not many teachers and parents knew how to take care of the oral health of SCSC as shown in Figure 4. Moreover, the frequency of cleaning the teeth as well as the oral health knowledge of both teachers and parents of SCSC showed improvement after the completion of the study.

DISCUSSION

The study involved the evaluation of the effectiveness of oral health promotion among teachers and parents of SCSC. Oredugba and Akindayomi advocated that oral health promotion among parents and caregivers will improve oral hygiene conditions of such a group. They also noted that the oral hygiene of children enrolled in daycare center was better than those enrolled in public specialized schools.¹⁶ There is a clear benefit of motivating and educating the teachers as well as the parents of SCSC about oral health care. This improvement in knowledge; though has to be translated into the desired attitude, favorable for better oral health care.^{2,4}

Several conditions classify children to be in any of the groups for SCSC. Table 1 shows different types of disabilities among the group

Table 1: The sample group of the special care school children grouped as per their medical diagnosis/special need

Associated disability	Visual impaired	Hearing impaired	Hearing and speech impairment	Down syndrome	Learning disability	Attention deficit hyperactivity disorder	Autism and autism spectrum disorder (ASD)	Multiple disability	Total
Total number	8	20	21	33	48	8	20	5	163
Percentage	(4.9)	(12.3)	(12.9)	(20.2)	(29.4)	(4.9)	(12.3)	(3.1)	(100)

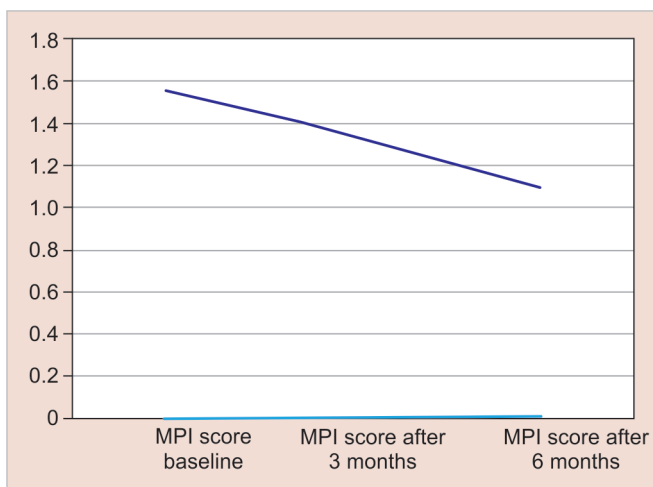


Fig. 1: Reduction in mean plaque index (MPI) score

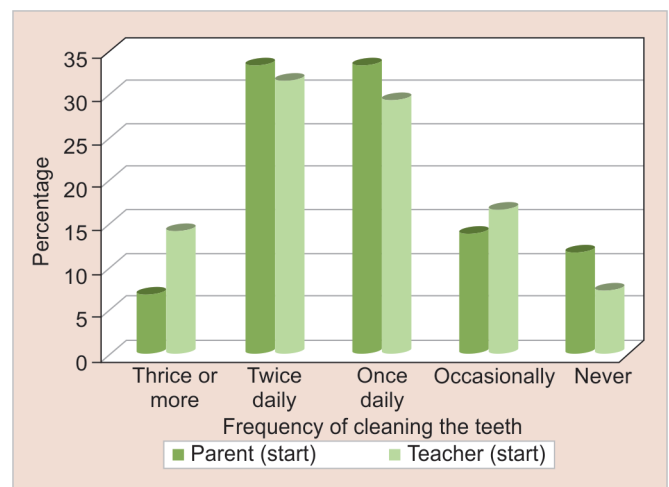
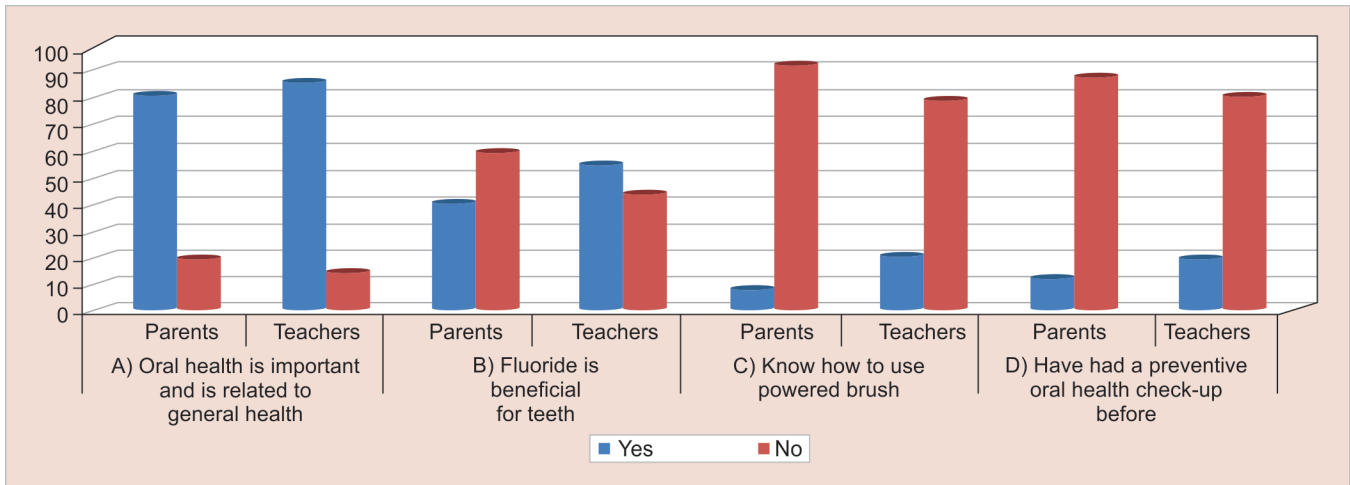
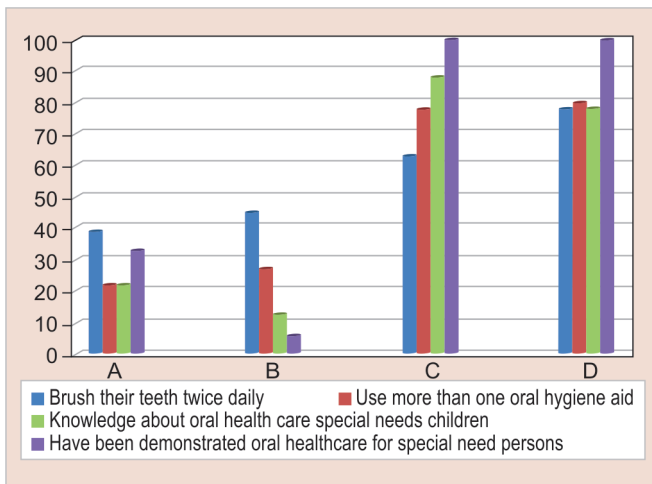


Fig. 2: Oral health attitude of the parents and the teachers for personal toothbrushing at the start of the campaign





Figs 3A to D: Oral health knowledge and attitude of the parents and the teachers about oral health at the start of the campaign



Figs 4A to D: Oral health knowledge and attitude of the parents and teachers about oral health care for SCSC at the start of the campaign and after the campaign: (A) Parents of SCSC before the campaign; (B) Teachers of SCSC before the campaign; (C) Parents of SCSC after the campaign; (D) Teachers of SCSC after the campaign

in the sample. Toothbrushing is the most effective way of controlling dental plaque. Moreover, powered toothbrushing has been advocated as being more effective than manual toothbrushing in removing the daily accumulated plaque from the teeth.¹⁷ Studies have shown better efficacy of powered toothbrushing over manual toothbrushing among special needs population,^{18–20} especially when dependent on caregivers.²¹ However, one study showed that manual toothbrushes reinforced with audio-visual instructions for brushing may be comparable to the use of powered toothbrushes among the intellectually disabled.²² However, in a recent study, it has been shown that the use of electric or manual toothbrush had no effect on the quantity of dental biofilm removed in children and teenagers with Down syndrome, nor did it influence their cooperation during the procedure.²³ The results from Figure 1 indicate the effect of the supervised powered toothbrushing over a period of 6 months. Irrespective of whether the mode of brushing is manual or powered, it is important that the plaque control measures are continuous. The reason for the reduced mean plaque index score maybe because both parents and teachers were reinforced for

toothbrushing. It is assumed that the powered brushing acted more as reinforcement than a manual brushing would have affected. However, the efforts for the prevention of oral disease and oral healthcare have to be continuous and lifelong.^{15,24} In some studies, it was found that the long-term deterioration, after successful oral health initiatives, in overall oral health indices after 6 months was mainly due to decreasing motivation over time.^{9,25,26}

For teachers and parents to be able to advocate proper oral health care for SCSC, they themselves must practice proper oral hygiene behavior.²⁷ Few children with special needs receive effective preventive care early when primary prevention could be achieved.¹⁰ Results of the present study indicate that there is a lack of proper oral health knowledge and attitude among the teachers as well as the parents of SCSC. Among other barriers for oral health care, one significant barrier is the social barrier experienced by some parents of SCSC. Al rubiyea points out such significant social barriers exhibited by Saudi society in terms of healthcare access.⁵ Similarly, Battal in 2016 noted that there are many social barriers exhibited by SCSC in Saudi Arabia.²⁸ In the present study, in terms of toothbrushing, many among the parents and the teachers brush their teeth twice daily. The vast majority among the parents as well as the teachers do realize that oral health is important and is related to general health. However, many among them lacked the knowledge about fluoride being beneficial for the teeth. The supervised toothbrushing with a fluoridated toothpaste twice daily; once at home and once at school, was recommended as an evidence-based method for effective plaque control and caries reduction.²⁹ Moreover, both the parents and the teachers did not have the requisite knowledge about the powered toothbrush and also did not exhibit the behavior of a preventive dental check-up themselves. The findings are consistent with one study that found about generalized lack of information regarding oral health and treatment needs seen among the parents of CSHCN. The level of oral health knowledge by parents and teachers in the study appeared to be low and is consistent with the findings of the study where the parents were not aware of the unique problems faced by these children.³⁰ In another study, it was found that there is a strong relationship between parental sociodemographic characteristics and levels of dental knowledge and attitude.³¹ Similarly, in studies with school teachers, it was found that the studied school teachers demonstrated incomplete oral health knowledge, inappropriate

oral practices, and unfavorable approaches to children's oral health.¹¹ Huebner et al. proposed that the barriers to optimal care could be readily addressed by the dental community in coordination with early intervention providers.¹⁰ In another study with visually impaired students, it was proposed that there could be an improvement of oral health due to repeated oral health education programs on oral health knowledge and hygiene.³²

The lack of oral health knowledge and attitude among teachers and parents of SCSC in this study are consistent with the earlier findings from other studies.^{11,12,33} Inadequate knowledge has been proposed to be the major factor preventing caregivers from favorable oral health behavior.³⁴ The parents seemed to lack knowledge about the oral health care of the SCSC when compared to the teachers. This might be related to the fact that in general the teachers were better educated than the parents of SCSC. However, Wyne in 2007 found that parents of cerebral palsy patients had satisfactory knowledge about the oral health care of their children in Riyadh city.³⁵ The frequency of cleaning the teeth as well as the oral health knowledge of both teachers and parents of SCSC showed improvement after the completion of the campaign. However, oral health-related educational programs aimed at promoting caregivers' behavior must take into consideration the caregivers' knowledge level first. Moreover, education programs should be recommended to caregivers with a lower education level.³⁴

CONCLUSION

Oral health promotion involving teachers and parents of SCSC resulted in significantly lower plaque index scores and improved oral health knowledge as well as attitude towards better oral health care of SCSC.

RECOMMENDATIONS AND LIMITATIONS

Preventive oral health programs can be implemented with the help of parents/caregivers and teachers for SCSC. These programs can be beneficial in the prevention of oral diseases and can be developed for SCSC that can be used for similar programs across Saudi Arabia. However, the program has difficulties for long-term implementation. This program needs constant motivation and means of encouragement for both parents and teachers.

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