

# Initial impact of an educational program on the oral health awareness of Iraqi primary school students aged 12 years

## Abstract

**Background:** Community oral health education cannot be achieved without organizing an educational program. Educational programs that had been conducted before, reported a significant impact on improving the knowledge of population about the oral health, especially among children. This research conducted an educational program for 12 years primary schools students. The aim of the study is to determine the effectiveness of an educational program on improving the dental knowledge and promoting oral hygiene.

**Materials and methods:** A primary public school in Erbil had been chosen randomly to perform an examiner blind study. Seventy-four students (12) years (38 males and 36 females) participated in the educational program after inclusion/exclusion criteria. The program had two sessions, in the baseline, the debris accumulation was examined according to the debris index simplified (DI-S) of the Simplified Oral Hygiene Index (OHI-S Green and Vermillion), the students answered 5-items dental knowledge questionnaire, followed by the educational program for two hours, the program continued by the teachers for two hours a week. The second visit was 3 weeks after the baseline one to examine the debris and answered the same 5-items dental knowledge questionnaire.

**Results:** Significant reduction in the DI-S score for all the participants (reduction=42%) on the second visit ( $p < 0.05$ ). The differences in the results of dental knowledge questionnaire between the two visits were a statistically significant, with  $p < 0.05$ .

**Conclusion:** The results indicate a positive initial impact of the educational program on oral cleanliness and the dental knowledge of the schoolchildren.

**Keywords:** education program, di-s index, schoolchildren, dental knowledge

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**Bushra Rashid Noaman, Saya Hadi Rauf**

Department of Pedodontics, Ishik University, Iraq

**Correspondence:** Bushra Rashid Noaman, Pediatric Dentistry, Erbil, KRG, Iraq, Email bushra.rashid@ishik.edu.iq

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**Abbreviations:** DMFT, indicator to measure the prevalence of dental caries in the primary Teeth; D, decayed; M, missed; F, filled; T, tooth; DMFT, indicator to measure the prevalence of dental caries in the permanent teeth; D, decayed; M, missed; F, filled; T, tooth; SD, standard deviation; BL, baseline visit; OHI-S, simplified oral hygiene index; DI-S, debris index simplified; HPSs, health-promoting schools S, significant

## Introduction

Primary prevention of the oral diseases has a considerable challenge to many countries, mainly the developing countries including countries with transitional economies and health system. Qualitative and quantitative review study showed that the interventions of the dental health have: a limited positive, but a transient impact on reduction in plaque accumulation; no perceptible effect on decreasing dental caries incidence and a limited positive effect on dental knowledge. The same researcher suggested that efforts needed to increase dental health education, in a systematic way.<sup>1</sup> World Health Organization Global School initiative on 1995 which aims to foster health-promoting schools (HPSs), which considers the school is the further most proper setting for the use of health education programs since it provides

the chance to encourage healthy lifestyles and self-care practices in an infinite group of children, with least cost.<sup>2</sup> Oral diseases include dental caries, gingival and periodontal disease and malignant diseases which could be caused by neglecting oral hygiene due to lack of the oral hygiene knowledge. In Iraq, the prevalence of oral diseases is of significance that necessities the establishment of oral health programs as found in many Iraqi types of research. One of the studies describing the prevalence of dental caries among children in kindergartens in Baghdad,<sup>3</sup> the dmft showed the highest value in comparison to the United Kingdom and Hong Kong. In another study conducted among Iraqi adolescents in Al-Door district located nearly 200Km to the north of Baghdad, the results showed high prevalence of dental caries (DMFT for all population was 3.7), they concluded that increasing the prevalence of dental caries in Al-Door district highlights the need for a dental health program to target the specific segment of population by systematic public and school health education programmers.<sup>4</sup> Results of a study in Nasiriyah city, south of Iraq demonstrated that the prevalence of gingivitis was (99.6%) and discussed that this may be related to the poor oral cleanliness, as a strong highly significant correlation was seen between both plaque and gingival indices.<sup>5</sup> A study carried out in Erbil (North of Iraq) concluded that one in 10

oral biopsies examined was a squamous cell carcinoma and three in 20 accessions were malignant, which indicates the high prevalence of oral malignancy which indicates the need for oral health education and community oral health promotion.<sup>6</sup> Oral health education and oral health promotion measures found to have an effect on increasing knowledge towards oral health.<sup>7-9</sup> Oral health promotion will translate the knowledge and experiences in the disease prevention into action programs, which can change the attitude to oral hygiene. Health promotion needs community action to seek better health through existing human and material resources in the community to encourage social support, and participation so the communities should strive to develop effective programs. Collectively, the results suggest that public health agencies, the private sector, educators, researchers, and healthcare providers can successfully partner leading to improvement of oral health through education. Establishing good dental habits to children will lay a foundation for future improvements in the nation's oral health status.<sup>9</sup>

## Materials and methods

### Study design

A primary public school in Erbil governorate chosen randomly to start the educational program in a side blinded study. This study was conducted in full accordance with the World Medical Association Declaration of Helsinki and was approved by the Ishik University research Committee and Erbil Education Directorate (27.10.2016, No 17175). This research plan was registered at the Dental School, Ishik University under the name 'Initial impact of a dental education program on the oral health of 12 years school children'. The aim of the study was explained to school authority to obtain full cooperation, also a special consent prepared and sent to the parents to obtain permission for including their children in the study, to fill the medical history and oral habits form and to have their full cooperation.

### Tools

1. Informed consents.
2. Medical and oral habits questionnaire.
3. Inclusion/exclusion criteria.
4. 5-items dental knowledge questionnaire.
5. A form of Debris Index.<sup>10</sup>

### Educational program

1. Oral instructions
2. Educational drawings.
3. Supervised tooth brushing.

### Method

Eighty-eight students enrolled in this study. The study included two visits to complete the program evaluation; the period between the two visits was 3 weeks. The program carried out in the hall of the school, using a chair and an artificial light for the clinical examination. In the baseline visit; review of the informed consents, medical history and oral habits, inclusion/exclusion criteria, debris accumulation (DI-S) according to Green and Vermillion OHI-S<sup>10</sup> and adjacent teeth substituted for the selected teeth if they are missing. 5-items dental knowledge questionnaire and the educational program performed

after the debris assessment. Inclusion criteria included all healthy 12 years attended students and had no oral habits, who are their families agreed for their participation. Students had a systemic disease; oral habits, recent antibiotic treatment, or absent on the second visit were excluded. 5-items dental knowledge questionnaire was given to the students to evaluate their knowledge about oral health after the DI-S assessment.<sup>11</sup> The questions were about the essentials of visiting dentist, the frequency of brushing, recommended time for brushing. The effect of the bacteria on the teeth, and types of food that is risky for tooth health. These questions were written at a level that would be understandable to the 12-year-old children, in Kurdish language (Erbil population's language) and tested on 10 children before starting. The questions were based on information planned as part of the dental education program. The educational program presented by the dentists in the baseline. The program included an oral education for two hours about the following subjects:

1. The importance of the oral health.
2. How bacteria accumulate and affect oral health.
3. How visiting the dentist twice annually is essential
4. Brushing and flossing instructions.
5. Bad and good dietary habits.
6. Getting feedback.
7. Coloring game of dental educational drawings which contained the same subjects to increase their oral health knowledge. In the end of the program, the students practiced supervised brushing by the dentists using Bass tooth brushing technique.

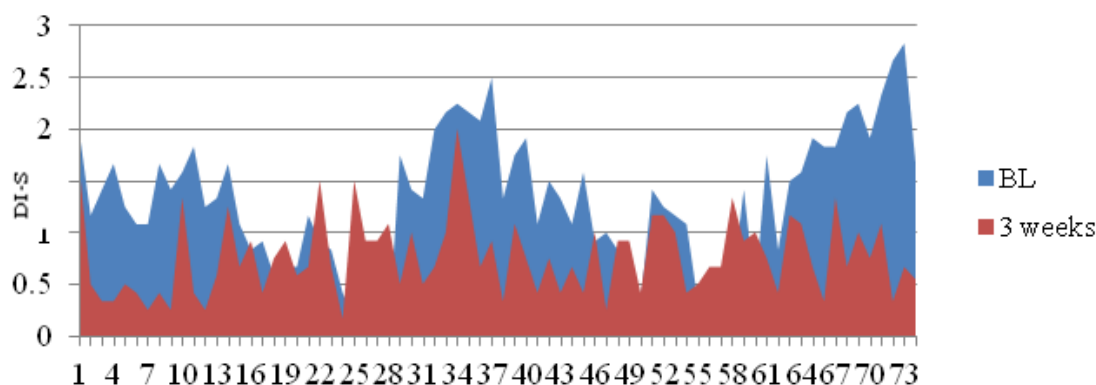
The same educational program was given to the art's and science's teachers who were present at the time of the education to repeat two hours weekly for three weeks. The second visit performed three weeks after the baseline visit, which included the debris accumulation and the 5-items dental knowledge questionnaire to the same participants.

## Results

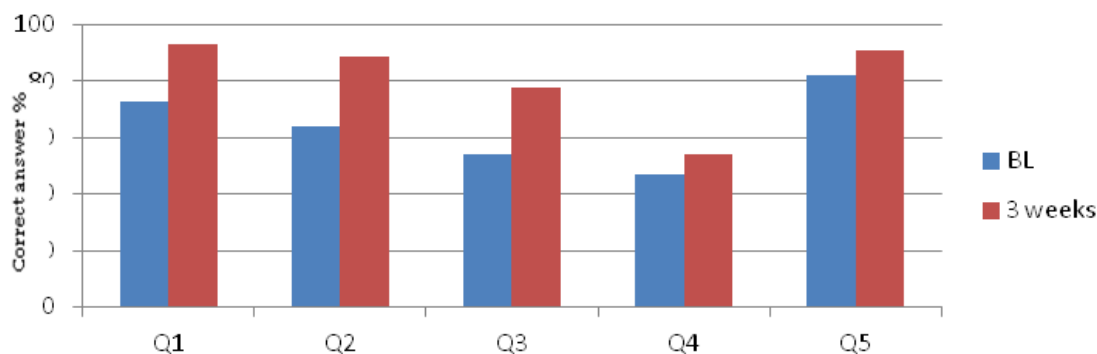
A total of 88 school children aged 12 years enrolled in this study. Fourteen subjects excluded for different causes. One subject had asthma; three were mouth breathers, four treated by antibiotic recently and two with medical different illnesses. Four subjects were absent on the second visit. A total of 74 subjects completed the study (Table 1). Of these, there were 38 males and 36 females. At the baseline, the mean DI-S score was  $1.3 \pm 0.7$ . Three weeks after the baseline, the mean DI-S for males were  $0.7 \pm 0.4$  with reduction of 0.7 and for females was higher ( $0.8 \pm 0.5$ ) with reduction of 0.4 (Table 2). The total reduction for both males and females was 0.6. This reduction of DI-S represents a 42% that was statistically significant with  $p < 0.05$ . Figure 1, demonstrates the DI-S scores at the baseline and after 3 weeks of education. In the baseline (blue area) shows that the DI-S was over 2 (2-2.8) of more than one-third of the subjects, one-third DI-S=0.7-1.8 and only 13 show DI-S= 0.3-0.6). After 3 weeks (the red area) the majority of subjects show DI-S= 0.3-0.6 score, fewer show 0.7-1.8 and only one subject had DI-S= 2. The reduction in DI-S was significant with  $p < 0.05$ . Table 2 & Figure 2 show the correct answers of the dental knowledge questionnaire at the baseline and 3 weeks after. The majority of subjects (> 60%) answered questions one, two and five correctly in the baseline prior to the program, while questions three and four < 50% answered correctly. Three weeks following the

education program, the percentage of correct answers of question one, two and five increased 13%, 27%, and 11% respectively. Regarding question three the increase in the correct answer was 38%, while

the increase in correct answers for the question four was very low (7%). For all questions, there was a significant difference with  $p < 0.05$  between the baseline correct answers (62%) and after 3 weeks (82%).



**Figure 1** Debris Index Simplified scores at the baseline visit (blue) and after 3 weeks (red). Statistically significant different after 3 weeks from baseline with  $p < 0.05$  BL: Baseline Visit; DI-S: Debris Index Simplified.



**Figure 2** A graph shows the correct answers in the baseline visit (blue) and after 3 weeks (red). BL: Baseline Visit.

**Table 1** Debris Index-Simplified in the baseline and after 3 weeks

N	Baseline DI-S score		3 weeks DI-S Score		Significance	DI-S% Reduction
	Mean	±SD	Mean	±SD		
Total 74	1.3	0.7	0.75	0.9	S	42%

Change from baseline to 3 weeks

Statistically significant difference from baseline with  $p < 0.05$

% DI reduction=  $100\% \times (\text{Baseline} - 3\text{Weeks Score}) / \text{Baseline Score}$

SD: Standard Deviation. S: Significant

DI-S: Debris Index Simplified

**Table 2** Dental knowledge questionnaire results

Question	Correct at BL	Correct at Week 3
1 Are bacteria bad or good for your teeth?	54/74 = 0.73	69/74 = 0.96
2 How many times a day should you brush your teeth?	47/74 = 0.64	66/74 = 0.91
3 How long should you brush your teeth?	33/74 = 0.45	58/74 = 0.83
4 How often should you visit your dentist?	35/74 = 0.47	39/74 = 0.54
5 Which type of this food is risky for tooth health?	61/74 = 0.82	67/74 = 0.93
Total	230/370=0.62	299/370=0.81

Statistically significantly different from baseline with  $p < 0.05$

BL: Baseline visit

## Discussion

In the current study, the oral health education program was energetic in enlightening knowledge and oral health interrelated habits of the target school children. When other effective subjects are involved, thus participation of significant persons like teachers and parents particularly in oral health education of those children would lead to a significant change in their oral health [9]. In this study, a 42% reduction in debris score was observed following the program that the teachers took part of it. The reduction in debris scores was due to increase in the dental knowledge of the participants. In the baseline, and according to Green and Vermillion<sup>10</sup> more than one-third of the participants were with poor oral hygiene (DI-S=1.9-3), one-third were with fair oral hygiene (DI-S=0.7-1.8), and the rest (14 subjects) were with good oral hygiene (0.3-0.6). After 3 weeks (the red area) the majority of subjects show good oral hygiene (DI-S=0.3-0.6). The others were with fair oral hygiene. Only one subject was with poor oral hygiene (DI-S=2). The reduction in DI-S was significant with  $p < 0.05$ . This result indicates that the educational program was valuable. The dental knowledge questionnaire results show 20% progression in correct answers which was statistically significant ( $p < 0.05$ ). The participants had good knowledge about the effect of bacteria on their teeth, the frequency of daily brushing and the effect of different food on their oral health which agree with the study of Biesbrock et al.<sup>12</sup> The participants hadn't good knowledge about the effective duration of each time of brushing and the recommended time for visiting the dentist, while the American children were better in regard to those two subjects,<sup>12</sup> which indicates the concentration on those subjects during the future educational programs in Iraq. This program involved repetition and reinforcement over a three weeks period. This was done in the school by the teachers' of Art and Science. This kind of a model presumably takes advantage of the existing trust and familiarity between teacher and student. Oral health education is effective in improving the knowledge attitude and practice of oral health and in reducing the plaque which agrees with a similar study for Biesbrock et al.<sup>12</sup> In general, the positive impacts of educational programs on oral health are thought to be temporary over time, with noticeable benefits shortly after the program that disappears at future visits, however, some programs resulted in a progression in oral health awareness which lasts for 3½ years after the program. Long-term success can be achieved by continuous reinforcement and education program repetition by dentists, teachers, and peer groups to keep up the oral health awareness, and at the same time eliminating the fear of the dentist.<sup>12</sup> That indicates the necessity of following up the of the oral health knowledge of those schoolchildren by future education programs.

## Conclusion

In conclusion and depending on the results of this study, this short duration educational program (3 weeks), reached its initial goal as it decreased significantly the DI-S scores and increased the dental knowledge of the school children. Collectively, the results suggest

- a. To meet the long-term goals which are the continuing of oral health awareness and to eliminate the fear of the dentist, it needs to continue this educational program for those school children. Then to use this program as a nucleus for wider programs in Iraq to improve oral health education which leads in turn to improve the national oral health status.
- b. Entering this type of educational programs in the schools'

education syllabus in cooperation with Ministry of Health to continue those programs every academic year which can result in a long impact.

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## Conflicts of interest

All funds provided by Kurdistan Save Children Organization.

## References

1. Kay EJ, Locker D. Is dental health education effective? A systematic review of current evidence. *J Community Dent Oral Epidemiol.* 1996; 24(4):231-235.
2. Kwan SY, Peterson PE, Pine CM, et al. Health-promoting schools: an opportunity for oral health promotion. *Bull World Health Organ.* 2005;83:677-685.
3. Ibrahim Iman T, Salih Ban A Current prevalence of dental caries in Iraqi preschool children. A comparison to national and international studies. *Journal of baghdad college of dentistry.* 2006;18(1):72-75.
4. Abdullah HA (2009) Prevalence of dental caries and associated teeth brushing behavior among Iraqi adolescents in Al-. Door district. *Tikrit Medical Journal.*15(2):102-109.
5. Al-ghalebi Sanaa N, El-samarrai, Sulafa K. Oral health status and treatment needs in relation to nutritional status among 9-10 year-old school children in Nassiryia City/Iraq. *Journal of Baghdad College of Dentistry.* 2012;24(1):133-137.
6. Yakin M, Jalal JA, Al-Khurri LE, et al. Oral and maxillofacial pathology submitted to Rizgary Teaching Hospital: a 6-year retrospective study. *Int Dent J.* 2016;66(2):78-85.
7. Freitas-Fernandes LB, Novaes AB, Feitosa AC, et al. Effectiveness of an oral hygiene program for Brazilian orphans. *Braz Dent J.* 2002;13(1): 44-48.
8. Biesbrock AR, Walters PA, Bartizek RD. Short-term impact of a national dental education program on children's oral health and knowledge. *J Clin Dent.* 2004;15(4):93-97.
9. Nakre PD, Harikiran AG. Effectiveness of oral health education programs: A systematic review. *J Int Soc Prev Community Dent.* 2013;3(2):103-115.
10. Green, Vermillion. *Simplified Oral hygiene index.* Mamalo University, Sweden. 1964.
11. Shou L. Active-involvement principle in dental health education. *Community Dent Oral Epidemiol.* 1985;13(3): 128-132.
12. Biesbrock AR, Walters PA, Bartizek RD. Initial Impact of a National Dental Education Program on the Oral Health and Dental Knowledge of Children. *J Contemp Dent Pract.* 2003;4(2):1-10.