

Oral-health Workshop Targeted at 0-5-yr. old Deprived Children's Parents and Caregivers: Effect on Knowledge and Practices

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One-session oral-health workshop was targeted at 770 parents and 60 caregivers of 0-5-year-old low-income children. Lower plaque scores (Silness & Loe-modified index) were observed in test-group-(TG) children after 1 and 6-months (Median=0) than control-group-(CG) (Median=1)($p<0.05$), with a significant improvement from baseline among the TG ($p<0.05$). The questionnaire showed improvement in the TG parents/caregivers' knowledge after 1- 6-months regarding white-spot lesion visual recognition; with respect to the practices, these improved after 1-6, but decreased after 6-months.

Key words: Preschool children, parents, oral-health workshop, knowledge/practices, bacterial plaque.

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INTRODUCTION

Early childhood caries (ECC) is considered a public health problem, mainly in developing countries.¹ Its development is associated with biological^{2,4} and social factors such as unhealthy lifestyles, low educational level, cultural characteristics and health policies.^{2,3,5-7}

The Colombian Health System offers children under five years of age a number of oral-health education and preventive activities. These include: Salt fluoridation, which has been available since 1989 (180-220mgF/Kg of salt); - Health education; and the first dental appointment at the age of two.⁸ In 1999, in Colombia⁹, the mean dmft of five year olds was 3.0 with 54% of children having some caries experience. However, in Bogotá caries levels were higher with a mean dmft of 3.9 and 64% of children with caries experience. In a study conducted in 2000, in children 3 to 4 years old, a prevalence of caries experience of 73% and a dmft of 3.3 were reported in Bogotá.¹⁰ As is the case in many populations, the dmft of children from low socioeconomic backgrounds (3.7) was greater than that of children among higher socioeconomic groups (2.8). In these previ-

ous studies^{9,10} the "d" (decayed) component corresponded to more than 70%. The WHO¹¹ goal for 5 yr.-olds for the year 2000 was that at least 50% of children were free of caries. Clearly this target has not yet been met. In addition, the national study⁹ reported that 39% of the mothers did not consider primary teeth important; only 17% thought it was important for children to attend routine dental appointments and 60% consulted a dentist because of pain. Thus the adoption of more positive health behaviors is important in this population.²

The purpose of this six-month study was to evaluate the effect of an oral-health workshop targeted at low socio-economic level parents and caregivers of children aged 0-5 from Bogotá.

MATERIALS AND METHODS

A randomized controlled clinical trial was conducted on a sample of 770 pairs of 0-5 year-old children and parents (Test Group-TG n=385, Control Group-CG n=385) from 14 low-income day-care centers in the municipality of Usaquén, Bogotá. The sample size was calculated based on a power of 80%, a P value of 0.05¹² and increased by 30% to account for potential drop-outs. Random allocation was used to assign each day-care center to either TG or CG. Additionally, all caregivers working in these day-care centers were included in the study (TG: n=36, CG: n=24). Participation was subject to an informed consent. The Ethics Committee of Universidad El Bosque in Bogotá approved the study.

Figure 1 shows the three development stages of the study. The first stage included a semi-structured 7-item questionnaire on oral health knowledge and practices made to all TG and CG parents and caregivers. The questionnaire was constructed from different questionnaires from other studies within the same field^{9,13} and modified after a content assessment was done by five experts in the subject and a pilot study on 35 subjects for wording understanding.¹⁴ The knowledge questions were: 1) Why does caries occur? 2) How do you prevent caries; 3) What is most important during toothbrushing? 4) What does an initial caries lesion look like? and 5) When do pri-

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mary teeth appear? The practice questions were: 1) How do you position the child's body during toothbrushing? and 2) What amount of toothpaste do you use to brush the child's teeth? The scale of response for all questions corresponded to 2-5 closed answer options each.

The second stage included a baseline bacterial plaque examination on all TG and CG children and the application of an educational workshop to all TG parents and caregivers. The plaque exam was conducted by a trained blind examiner using the Silness & Loe modified index¹⁵, which scores plaque as: 0) free of plaque after probing; 1) presence of thin plaque after probing; and 2) presence of visible thick plaque without probing.

The workshop consisted of one 40-minute session. It was carried out with a slide presentation conducted by a moderator (RS) and targeted to the TG in groups of 35-40 parents/caregivers in the correspondent day-care center. The presentation included five topics related to¹⁶ dental caries, etiology, clinical presentation, related risk factors, and oral hygiene. The content of the workshop was based on providing education on the understanding of dental caries as a disease, which can be controlled by means of toothbrushing, diet control, training on plaque removal plus fluoridated toothpaste.¹⁶ The educational workshop material included slide presentation with related examples and interactive activities consisting of: printed pictures for plaque recognition, white/brown spot – or cavitated caries lesions. Also dummies, toothbrushes, toothpaste, were added to practice tooth brushing. After each topic a five-minute reinforcement working activity was done in sub-groups with the support of research assistants. At the end each TG parent and caregiver were given a leaflet. Further each TG and CG child received a toothbrush. The third and final stage included, both on the TG and CG groups, a one- and a six-month evaluation of the workshop's effect in terms of: 1) Children's plaque-index examination, and 2) The 7-item questionnaire to parents and caregivers.

Statistical Analysis

Responses to questions in the test and control groups were compared using a chi square test¹⁷ at baseline, one and six months time periods. The median plaque scores (Me) were calculated for individuals. The Mann-Whitney U test was used to look for differences between test and control groups and the Wilcoxon rank test to look for differences between the three time frames.¹⁸

RESULTS

Figure 1 shows the distribution of the sample. Of the 770 initial pairs of participants, 84 (10.9%) were lost due to children moving to a different day-care center. A total of 686 pairs of participants completed the study (TG: n=341; CG: n=345). Additionally all 60 caregivers completed the study (TG: n=36, CG: n=24).

Bacterial plaque Index

At the baseline examination the median plaque score was 1 for the test group and 0 for the control group but this difference was not statistically significant (p>0.05). After both one and six months in the study the test group had a lower median plaque score (0) than the control group (1) and this difference was statistically significant (p<0.05). In addition, when compared to the baseline score (1), the test group demonstrated a significant reduction in the bacterial plaque after one month and at six months with median plaque scores of 0.

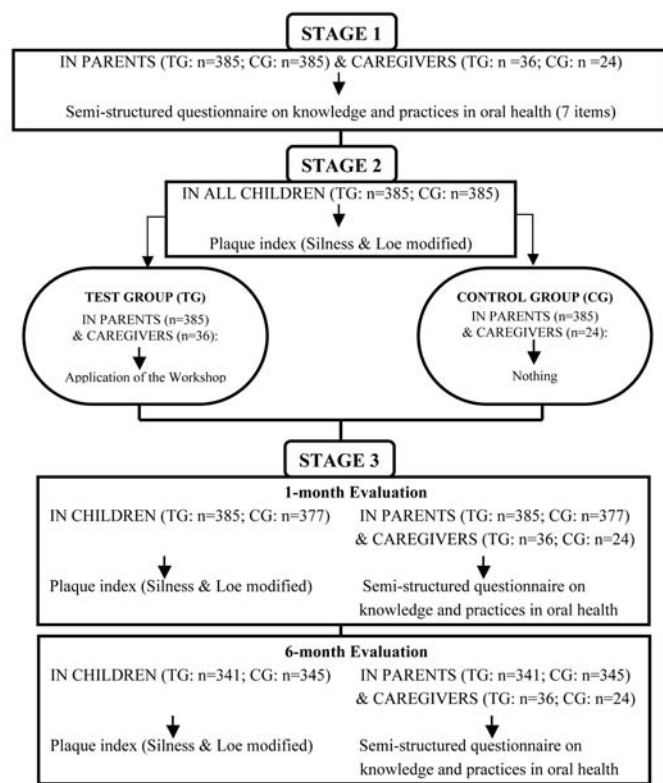


Figure 1: Development stages of the study and distribution of the sample in Test (TG) and Control Group (CG)

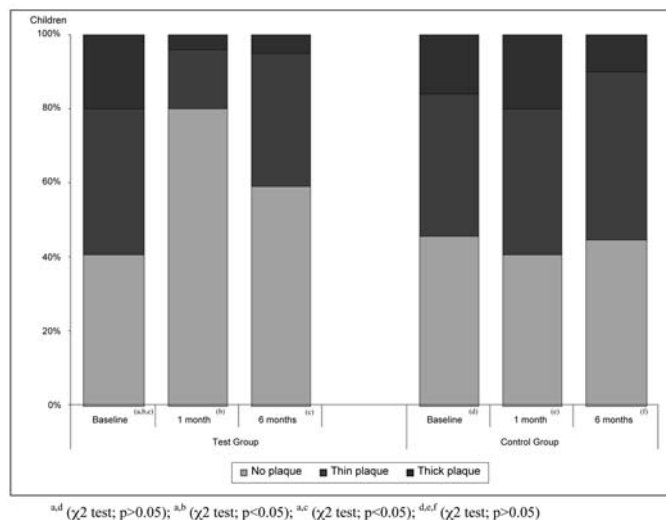


Figure 2: Percentage distribution of the children in the test and control groups according to the plaque scores.

Figure 2 shows that in the test group the percentage of individuals who were free of bacterial plaque increased from a baseline 41% to 81% at one month and 59% at six months (chi square test; p<0.05).

Knowledge on oral health

Table 1 shows that the percentage of the test group parents who knew "what a white spot lesion looked like" increased significantly during the study (chi square test; p<0.05). At baseline 20% answered this question correctly compared to 85% at one month and 66% at six months. For the control group at baseline and one and six months time frames the percentage of participants answering this question correctly were 16%, 22% and 51%, respectively.

Table 1: Parents' knowledge regarding oral health.

Questions	Answers	Test Group						Control Group					
		Base line (n=385)		1 month (n=385)		6 months (n=341)		Base line (n=385)		1 month (n=377)		6 months (n=345)	
		n	%	n	%	n	%	n	%	n	%	n	%
Why does caries occur?	Poor toothbrushing	305	79 [†]	349	91 [*]	293	86 [*]	317	82 [†]	320	85	246	71 [*]
	Unhealthy food/Sweets	30	8	13	3	12	4	36	9	30	8	40	12
	Bacterial plaque	0	0	5	1	8	2	11	3	0	0	6	1
	Infection/Illness	5	1	6	2	14	4	2	1	6	1	21	6
	Others	45	12	12	3	14	4	19	5	21	6	32	10
How do you prevent caries?	Toothbrushing	298	74 [†]	237	62 [*]	276	81 [*]	294	76 [†]	302	80 [†]	246	71 [*]
	Toothbrushing + Dental visit	15	4	107	28	35	10	23	6	17	5	32	9
	Dental visit	37	10	9	2	0	0	12	3	24	6	13	4
	Toothbrushing + Flossing	10	3	18	5	14	4	21	5	10	3	11	3
	Others	25	9	14	3	16	5	35	10	24	6	43	13
What is most important during tooth-brushing?	Quality	170	44 [†]	206	53 [†]	256	75 [*]	188	49 [†]	192	51 [†]	241	70 [*]
	Quality + 1 toothbrush/day	92	24 [†]	68	18 [†]	42	12 [*]	51	13	61	16	11	3
	Removing bacterial plaque	0	0	31	8	12	3	0	0	1	1	0	0
	The position of the child	25	6	46	12	4	2	61	16	46	12	14	4
	Others	98	26	34	9	27	8	85	22	77	20	79	23
What does an initial caries lesion look like?	White / yellow spot	77	20 [†]	327	85 [†]	225	66 [*]	60	16 [†]	83	22 [†]	176	51 [*]
	Black or brown spot	212	55	16	4	101	30	248	64	246	65	141	41
	Others	96	25	42	11	15	4	77	20	48	13	28	8
When do primary teeth appear?	During the first year of life	327	85 [†]	358	93 [†]	303	89 [†]	332	86 [†]	336	89 [†]	302	87 [†]
	After the first year of life	24	6	17	4	26	8	24	6	22	6	40	12
	Others	34	9	10	3	12	3	29	8	19	5	3	1

* = χ^2 test; p<0.05; † = χ^2 test; p>0.05

Table 2: Caregivers' knowledge regarding oral health care.

Questions	Answers	Test Group						Control Group					
		Base line (n=36)		1 month (n=36)		6 months (n=36)		Base line (n=24)		1 month (n=24)		6 months (n=24)	
		n	%	n	%	n	%	n	%	n	%	n	%
Why does caries occur?	Poor toothbrushing	25	69	32	89	27	75	19	79	18	75	18	75
	Unhealthy food/Sweets	3	8	3	8	1	3	3	13	3	13	2	8
	Bacterial plaque	0	0	0	0	5	14	0	0	0	0	0	0
	Infection/Illness	2	6	0	0	0	0	2	8	2	8	1	4
	Others	6	17	1	3	3	8	0	0	1	4	3	13
How do you prevent caries?	Toothbrushing	20	56 [†]	24	67 [†]	25	69 [*]	18	75 [†]	16	67 [†]	0	0
	Toothbrushing + Dental visit	4	11	10	27	8	22	1	4	0	0	18	75 [*]
	Dental visit	4	11	0	0	1	3	3	13	2	8	4	17
	Toothbrushing + Flossing	2	6	2	6	2	6	1	4	2	8	0	0
	Others	6	16	0	0	0	0	1	4	4	17	2	8
What is most important during tooth-brushing?	Quality	22	61 [†]	0	0 [†]	0	0	18	75	19	79	10	42
	Quality + 1 toothbrush/day	0	0	16	44	29	81 [*]	0	0	1	4	5	21
	Removing bacterial plaque	1	3	7	19	0	0	0	0	0	0	2	8
	The position of the child	5	14	8	22	2	6	4	17	4	17	2	8
	Others	8	22	5	14	5	13	2	8	0	0	5	21
What does an initial caries lesion look like?	White / yellow spot	11	31 [†]	29	81 [*]	32	89 [†]	7	29 [†]	9	38 [†]	8	33 [†]
	Black or brown spot	20	56	4	11	4	11	15	63	14	58	15	63
	Others	5	13	3	8	0	0	2	8	1	4	1	4
When do primary teeth appear?	During the first year of life	35	97	32	88	32	88	21	88	20	83	22	92
	After the first year of life	1	3	2	6	2	6	3	12	4	17	2	8
	Others	0	0	2	6	2	6	0	0	0	0	0	0

* = χ^2 test; p<0.05; † = χ^2 test; p>0.05

Table 3: Practices of the children-toothbrushing conducted by parents.

Questions	Answers	Test Group						Control Group					
		Base line (n=385)		1 month (n=385)		6 months (n=341)		Base line (n=385)		1 month (n=377)		6 months (n=345)	
		n	%	n	%	n	%	n	%	n	%	n	%
How do you locate the child's body in order to conduct the toothbrushing?	Lying down or sitting down on the floor	37	10 ^{*,†}	347	90 [*]	91	26 [*]	16	4 [†]	13	4 [†]	15	4 [*]
	In front of the child	239	62	32	8	226	67	283	74	250	66	263	76
	Behind the child	60	16	0	0	11	3	67	17	60	16	44	13
	Others	49	12	6	2	13	4	19	5	54	14	23	7
What amount of toothpaste do you use to brush the child's teeth?	The recommended amount	212	55 ^{*,†}	373	97 [*]	171	50 [†]	197	51 [†]	185	49 [†]	118	34 [*]
	Higher amount than recommended	173	45 ^{*,†}	12	3 ^{*,†}	170	50 [*]	188	49 [†]	192	51 [†]	227	66 [*]

* = χ^2 test; p<0.05; † = χ^2 test; p>0.05

Table 4: Practices of the children-toothbrushing conducted by caregivers.

Questions	Answers	Test Group						Control Group					
		Base line (n=36)		1 month (n=36)		6 months (n=36)		Base line (n=24)		1 month (n=24)		6 months (n=24)	
		n	%	n	%	n	%	n	%	n	%	n	%
How do you locate the child's body in order to conduct the toothbrushing?	Lying down or sitting down on the floor	4	11 ^{*,†}	36	100 [*]	5	14 [†]	1 [†]	4	4	4 [†]	3	13 [†]
	In front of the child	29	81	0	0	29	81	16	67	15	63	17	71
	Behind the child	3	8	0	0	2	5	5	21	4	25	3	13
	Others	0	0	0	0	0	0	2	8	1	8	1	3
What amount of toothpaste do you use to brush the child's teeth?	The recommended amount	18	50 ^{*,†}	34	94 [*]	19	53 [†]	12	50 [†]	11	46 [†]	7	29 [*]
	Higher amount than recommended	18	50	2	6	17	47	12	50	13	54	17	71

* = χ^2 test; p<0.05; † = χ^2 test; p>0.05

Regarding the question “what is most important about toothbrushing”, the correct answers (quality; quality + daily toothbrushing; removing bacterial plaque) increased from 68% at baseline to 79% at one month and 90% at six months for the test group.

Table 2 shows that the knowledge results in the caregivers were similar to those of parents.

Practices in Dental Health

Tables 3 and 4 show that at baseline 10-11% of test group parents and caregivers claimed to know how to position the child's head to promote an adequate toothbrushing. This increased at one month to over 90% (chi square test; p<0.05) but at six months it decreased significantly. A similar behavior was registered with respect to the amount of toothpaste.

DISCUSSION

This study showed a positive effect at one and six months, regarding a reduction of bacterial plaque in children and an increase in knowledge and healthy practices in parents and caregivers.

The success of this educational intervention can be related to its interactive work in small groups.^{16,19,20} Furthermore, it follows the current Latin-American trends of working with the communities²¹, taking into account the demographic, social, and cultural contexts.¹⁹

Biesbrock *et al.*²² conducted an educational program in 6-15 year-olds and after one month they showed a 3% reduction in bacterial plaque. A possible explanation for the higher plaque reduction percentage shown in the current study after one (40%) and six months (18%) could be the emphasis placed on education of bacterial plaque and the didactic technique with pictures which was used.¹⁶ The lower reduction in plaque showed after six months (18%) com-

pared to the one after a month (40%) may be due to the fact that oral health education as a single preventive measure is capable of achieving a clinical temporary effect.²³ The periodical reinforcement of the educational workshop, for example each six months, could maintain the short-time effect on plaque reduction for a longer period of time, as Sohn *et al.* suggested.¹⁹

Blinkhorn *et al.*²⁴ reported after a two-year educational program a higher adherence of parents with respect to an adequate position of the child for toothbrushing and the use of a small amount of toothpaste. The former authors reported a reinforcement of the educational concepts every four months. In the current study, these two practices showed positive changes in adults at one month but these changes fell at six months. Concerning the recommended toothbrushing position, a focus group conducted a survey at the end of this study²⁵ and showed as a possible explanation to discontinuing this practice the fact that the physical space was limited at their homes. With respect to the amount of toothpaste, the return after six months to the use of a high amount, could be explained by the fact that people seem to have an understanding that the higher the amount of toothpaste used, the better the oral health, as the last national oral health survey reported.⁹ Excessive use of toothpaste in children under the age of five was further confirmed in Colombia in 2003.¹³

The visual identification of the “white spot lesion” was the knowledge item that showed best results in parents, and even better in caregivers, from baseline (20% and 31%), to 1month (85% and 81%) and to 6 months (66% and 89%), respectively. This is in context with the current understanding of the pathology that recognizes initial enamel lesions¹⁶ and further it involves parents and caregivers in get-

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ting closer to the children's oral health by means of observing their dentition.^{26,27} Nevertheless, this item also showed an increase in parents in the control group during the study period. This situation could be related to a Hawthorne effect, in which a population that is aware of being followed and studied tends to change their conduct²⁸; the follow-up activities in the control group were a questionnaire to adults and the bacterial plaque assessment in children at baseline, and after 1 and 6 months.

Although adults referred to have knowledge about the causes and prevention of caries, the main reasons for visiting a dentist are invasive caries or emergencies.⁹ This finding was reported in similar populations throughout Colombia^{5,9} and may be associated to difficulties to access health services and to the lack of responsibility in one's own health, a concept embedded in the cultural setting of the population.^{9,13}

A greater impact in knowledge was achieved in caregivers than in parents. This was assessed by the following questions "How do you prevent caries?" and "What does an initial caries lesion look like?" Further, in the reported focus group study²⁵ the parents referred that the oral hygiene of their children was also the caregivers' responsibility. This situation, along with the fact that caregivers are in contact with the children for more than 10 hours a day, leads to consider empowering them in future proposals.

Such an educational intervention would probably have more success if it took part of an integral preventive program, including individual preventive strategies as is done in the Nexø Method.¹⁶ With that model, Ekstrand *et al.*¹⁵ reported a higher-than-this-study reduction in bacterial plaque of around 38% at 12 months in six-year-old children.

CONCLUSION

The positive results of this study, after the application of a single educational workshop stimulate the implementation of similar educational strategies in the same age and socio-economic level groups. Further, educational workshops are advised with periodic reinforcements and as part of an integral preventive program.

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