

Impact of public preventive programmes on oral quality of life of 11 to 12-yr-old school students

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ABSTRACT

Objectives: The objective was to analyze the impact of preventive programmes on oral quality of life in school students aged 11-12 yrs.

Study design: In the school year 1996/97, a quasi-experimental study was initiated in Granada province with four groups of students aged 6-7 yrs: Sealant + Fluoride (sealants on first permanent molars applied in the health centre for a 3-yr active programme, and fluoride varnish applied every four months for 3 yrs, n=65), Sealant (only sealants, n=80), Fluoride (only fluoride varnish, n=107) and Control group (n=59). All students were examined every 6 months at school during the 3-yr active programme and received an oral health report after each examination. At 5.5 yrs (school year 2002/03), after 2.5 yrs with no programme, students were again examined and completed a questionnaire on oral quality of life scored from -6 (minimum) to +6 (maximum).

Results: Oral quality of life values (\pm standard deviation) were: 3.31 ± 0.30 (Sealant + Fluoride), 3.11 ± 0.27 (Sealant), 3.18 ± 0.23 (Fluoride) and 2.95 ± 0.32 (Control), with no statistically significant differences among them.

Conclusions: Fissure sealant and fluoride varnish programmes had no significant influence on oral quality of life after a 5.5- yr follow-up (3 yrs of active programme plus 2.5 yrs of discontinuation).

Key words: Student programmes, fissure sealant, fluoride varnish, oral quality of life.

RESUMEN

Objetivos: El objetivo es analizar el impacto de programas preventivos sobre la calidad de vida oral en escolares de 11-12 años.

Diseño del estudio: En el curso académico 1996/97 se inició un estudio cuasiexperimental en la provincia de Granada con cuatro grupos de escolares de 6-7 años de edad: Sellador + Flúor (selladores en primeros molares permanentes aplicados en el centro de salud, durante 3 años de programa activo, y barniz de flúor aplicado cuatrimestralmente durante 3 años, n=65), Sellador (sólo selladores, n=80), Flúor (sólo barniz de flúor, n=107) y grupo Control (n=59). Todos los escolares fueron explorados cada 6 meses en los colegios durante los 3 años de programa activo, entregándoseles un informe de salud oral tras cada exploración. Tras un periodo de discontinuidad de 2.5 años, en el curso escolar 2002/03 (a los 5.5 años), los escolares fueron explorados, y se les pasó un cuestionario de calidad de vida oral, cuya puntuación va de -6 (mínima) a +6 (máxima).

Resultados: Los valores de calidad de vida oral (\pm desviación estándar) fueron: 3.31 ± 0.30 (Sellador + Flúor), 3.11 ± 0.27 (Sellador), 3.18 ± 0.23 (Flúor) y 2.95 ± 0.32 (Control), sin diferencias estadísticamente significativas entre ellos.

Conclusiones: Los programas de Sellador de fisuras y Barniz de flúor no muestran influencia significativa sobre la calidad de vida oral a 5.5 años de seguimiento (3 años de programa activo y 2.5 años de discontinuidad).

Palabras clave: Programas escolares, sellador de fisuras, barniz de flúor, calidad de vida oral.

INTRODUCTION

Oral health has traditionally been assessed by using clinical indicators that are only sensitive to the physical status of teeth, e.g., the DMFT (decayed, missing, and filled teeth) index and CPI (community periodontal index). However, oral health problems may affect psychological, social, and self-esteem functions, i.e. the so-called oral quality of life (OQL) of the individual (1). Over the past two decades there has been growing interest in defining and quantifying OQL (2-5) as a part of general health promotion, mostly in adult and elderly populations. There have been very few OQOL studies in Spain, including development of a questionnaire for adolescents (6) and another for 11-yr-olds (7).

In the school year 1996/97 a quasi-experimental field trial was initiated in the province of Granada with four groups of 6 to 7-yr-old students: Sealant + fluoride group (sealants on first permanent molars during 3-yr active programme plus fluoride varnish every four months for 3 yrs); Sealant group (only sealants); Fluoride group (only fluoride varnish) and Control group. Sealant was applied at the local health centre (HC) and varnish at the schools. After 3 yrs, the programmes had a significant effect on the DMF-M1 (sum of decayed, missing and filled first permanent molars: 47.3% effectiveness in DMF-M1 in Sealant + Fluoride, 43.2% in Sealant, and 22.9% in Fluoride groups versus controls (8). After a discontinuation period of 2.5 yrs, the programmes remained significantly effective in the school year 2002/03, i.e. at 5.5 yrs after commencement of the programme, the effectiveness of preventive programmes persisted, with an effectiveness of 36.5% for Sealant + Fluoride, 31.9% for Sealant and 35.0% for Fluoride programmes versus controls (9).

It would be valuable to assess the social and psychological impact of current school preventive programmes as well as their clinical effectiveness. The aim of this study was to analyze the influence of public preventive programmes (Fissure Sealants, Fissure Sealants plus Fluoride Varnish and Fluoride Varnish) on the OQL of students aged 11-12 yrs.

MATERIAL AND METHODS

The above study was started in children in their first year of primary education (6-7 yrs old) from three rural and neighbouring primary health areas within the Santa Fe Health District, Granada (Southern Spain). Figure 1 depicts the study design and sample sizes.

During the 3-yr active programme, students were examined at schools every six months by a previously calibrated dentist following WHO criteria (10). After each examination, students received an oral health report to give to their parents. Students indicated for sealant treatment (with healthy first

permanent molars) received a first application at the HC, which they also visited for subsequent retreatment in case of sealant loss. Fluoride varnish was applied to this group every four months. Inter- and intra-observer concordance was measured in around 10% of the sample throughout the study, finding kappa coefficients of > 0.70 for the diagnosis and need for treatment, considered an adequate concordance (11). The study was approved by Ethics Committee of Virgen de las Nieves Hospital.

At 5.5 yrs of follow-up (school year 2002/03), after a 2.5 yr-interval with no active programme, all students were examined following the same procedure and also completed the OQL questionnaire proposed by the Muñoz et al (7). This questionnaire comprises six items representing two dimensions (pain and aesthetics). Each item was scored with -1, 0 or +1 (Likert scale), yielding a total score ranging from -6 (worst OQL) to +6 (Table 1).

SPSS-Windows 12.5 programme (SPSS Inc., Chicago, IL) was used for the statistical analysis; tests used are indicated below each Table.

RESULTS

Table 1 shows the score for each OQL item. There was a majority of positive scores (above 0) in both dimensions (aesthetics and pain). OQL values were positive in all four study groups. Although the Sealant + Fluoride group showed higher OQL values after 5.5 yrs, no significant differences were found among groups in total score or score for either dimension (Table 2).

DISCUSSION

The quasi-experimental nature of this investigation implies some potential study limitations. As shown in Figure 1, although selection for the Fluoride group was randomized, assignment to the Sealant group was not random. Nevertheless, no significant differences were found among groups in social level, sex, age or caries index at study commencement, suggesting that inter-group comparisons were not affected by a selection bias (8). The impact on OQL was not considered in the original study design, therefore baseline data were not available for comparison with the OQL scores measured at the end of the 5.5-yr follow-up, which were included due to increased interest in this parameter. However, given the comparability of students at the start of the study (8), selection bias would not appear to have affected the assessment of programmes based on this final OQL value.

Unlike previous reports, the OQL questionnaire was used for both descriptive (12,13) and comparative/assessment (14) purposes in the present investigation. Moreover, most pub-

Table 1. Description of oral quality of life items at 5 yrs by students followed up for 5 yrs (n=311)^a.

Question Over the past three months...?	Impact Points	Sealant (n=80)	Sealant + Fluoride (n=65)	Fluoride (n=107)	Control (n=59)
Aesthetic Dimension					
1. Have you liked how your teeth are? <i>I like them a lot/I like them</i>	+1	41 (52.6%)	30 (46.2%)	62 (58.5%)	32 (56.1%)
<i>More or less</i>	0	27 (34.6%)	26 (40.0%)	29 (27.4%)	17 (29.8%)
<i>I don't like them/I don't like them at all</i>	-1	10 (12.8%)	9 (13.8%)	15 (14.2%)	8 (14.0%)
<i>No response</i>	(+1)	2	-	1	2
2. Have you liked the colour of your teeth? <i>I like it a lot/I like it</i>	+1	40 (50.6%)	35 (53.8%)	54 (50.5%)	23 (39.7%)
<i>More or less</i>	0	31 (39.2%)	21 (32.3%)	36 (33.6%)	24 (41.4%)
<i>I don't like it/I don't like it at all</i>	-1	8 (10.1%)	9 (13.8%)	17 (15.9%)	11 (19.0%)
<i>No response</i>	(+1)	1	-	-	1
3. Have you liked how your teeth are placed (if they are bent or not)? <i>I like it a lot/I like it</i>	+1	34 (43.0%)	31 (47.7%)	54 (50.5%)	28 (48.3%)
<i>More or less</i>	0	21 (26.6%)	21 (32.3%)	28 (26.2%)	19 (32.8%)
<i>I don't like it/I don't like it at all</i>	-1	24 (30.4%)	13 (20.0%)	25 (23.4%)	11 (19.0%)
<i>No response</i>	(+1)	1	-	-	1
4. Have you felt good when you smile and show your teeth? <i>I feel very good /I feel good</i>	+1	45 (57.7%)	41 (63.1%)	70 (65.4%)	36 (62.1%)
<i>More or less</i>	0	25 (32.1%)	19 (29.2%)	29 (27.1%)	15 (25.9%)
<i>I don't like to show them / I don't like to show them at all</i>	-1	8 (10.3%)	5 (7.7%)	8 (7.5%)	7 (12.1%)
<i>No response</i>	(+1)	2	-	-	1
Pain Dimension					
5. Have you felt edgy with a tooth ache? <i>Very much so/ A lot</i>	-1	1 (1.3%)	0 (0.0%)	3 (2.9%)	4 (6.8%)
<i>A little/Very little</i>	0	12 (15.2%)	5 (7.8%)	12 (11.7%)	11 (18.6%)
<i>No</i>	+1	66 (83.5%)	59 (92.2%)	88 (85.4%)	44 (74.6%)
<i>No response</i>	(+1)	1	1	4	-
6. Can you chew food without tooth pain or anything else that bothers you? <i>I chew very well /I chew well</i>	+1	70 (88.6%)	55 (84.6%)	79 (75.2%)	49 (86.0%)
<i>Neither well nor badly</i>	0	5 (6.3%)	9 (13.8%)	20 (19.0%)	4 (7.0%)
<i>I can't chew well/I chew very badly</i>	-1	4 (5.1%)	1 (1.5%)	6 (5.7%)	4 (7.0%)
<i>No response</i>	(+1)	1	-	2	2

^a: Thirty-one patients (342-31=311) are excluded due to absence of oral quality of life questionnaire data.

Table 2. Analysis of oral quality of life (OQL) in students followed up for 5.5 yrs (n = 311).

Variables	Group				Comparison
	Sealant (n=80)	Sealant.+Fluoride (n=65)	Fluoride (n=107)	Control (n=59)	
	mean (se)	mean (se)	mean (se)	mean (se)	
Total OQL	3.11 (0.27)	3.31 (0.30)	3.18 (0.23)	2.95 (0.32)	F ^a = 0.234, p= 0.872
Aesthetic OQL	1.45 (0.25)	1.55 (0.29)	1.64 (0.22)	1.47 (0.28)	F= 0.139, p= 0.936
Pain OQL	1.66 (0.08)	1.75 (0.06)	1.53 (0.07)	1.47 (0.11)	B-F ^b = 2.082, p= 0.103

se: standard error.

^a: F-Snedecor test of measurement equality (ANOVA).

^b: B-F: Brown-Forsythe robust test of measurement equality.

lished studies on OQL have been in adult and elderly populations, with very few in children or adolescents (6,7,15).

Although the preventive programmes proved effective in reducing the DMF-M1 index (see Introduction), no statistically significant differences in OQL were found among the four groups. It should be taken into account that the treatment programmes (Sealants and Fluoride varnish) were specifically designed to prevent caries in first permanent molars, whereas OQL is a broader multidimensional measure (aesthetics and pain in the present study) that may be only marginally affected by an improvement in first-molar caries.

Mention should also be made of the effect of the discontinuation period, which was not included by Muñoz (16) who, unlike us, found that a Sealant and Fissure programme had a significant if small impact on OQL.

There is growing interest in the inclusion of patients' views in the evaluation of health programmes and, therefore, in the availability of impact measures (e.g., OQL) as well as clinical indexes (e.g., DMF-M1) (17,18).

In conclusion, public preventive programmes (Sealant, Sealant plus Fluoride varnish and Fluoride varnish) did not positively influence OQL perception in 11 to 12-yr-old school students.

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