

# The influence of social indices on oral health and oral health behaviour in a group of Flemish socially deprived adolescents.

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**Aim** To investigate the impact of social indices on oral health and oral health behaviour in socially deprived adolescents and young adults in Flanders. **Method** The study design was cross-sectional and included 68 subjects aged 12 to 26, who called for help by “Habbekrats”, a non-profit organisation rendering assistance to adolescents and young adults living on the fringes of our society. The clinical oral examination was performed using criteria based on the diagnostic criteria for caries prevalence surveys published by BASCD. Information on parental occupational level, educational level, living condition and oral health behaviour was gained using questionnaires completed by the participants themselves and their social workers. **Results** The mean age was 16.2 years. Within the sample 92% and 90.8% respectively had a father or mother belonging to a low social level. For 68% of the sample the educational level was low. Concerning oral health behaviour 67% reported nutritional habits conducive to poor oral health whereas 64% reported good oral hygiene habits. The mean DMFS was 11.42 (SD=14.33) and the mean care-index equalled 0.60 (SD=0.39). Statistical analysis by means of a logistic regression model revealed that only the ‘living condition’ had a statistically significant influence on oral health behaviour ( $p \leq 0.05$ ) and care-index ( $p \leq 0.05$ ). There was no significant correlation between the parents occupation and subjects’ educational level and the oral health behaviour and oral health status of the study group. **Conclusion** From this analysis it is clear that ‘living condition’ had a significant influence on the oral health behaviour and care indices of the studied population of socially deprived adolescents.

*Key words:* Adolescents, oral health, oral health behaviour; social deprivation

## Introduction

Substantial literature has been published describing the influence of socio-economic status (SES) on oral health condition in children (Jones and Worthington, 2000; Schou and Uitenbroek, 1995; Sweeny *et al.*, 1999). Many of these studies demonstrated a significant association between social variables and oral health. Lower SES children have been reported to have higher caries experience in both the deciduous and permanent dentition, resulting in a lower percentage of caries free children and lower levels of care-index compared to children from high SES backgrounds (Bolin *et al.* 1997; Freire *et al.*, 1996 ; Jones *et al.* ,1997 ; Reisine and Psoter, 2001). They also have different oral health habits: more frequently and prolonged night-time bottle feeding is reported together with a delayed start to tooth-brushing and a lower brushing frequency. They have an increased sugar consumption and attend the dentist only in an emergency (Eckersley and Blinkhorn, 2001 ; Watt and Sheiham, 1998). These latter findings had been confirmed in a group of 7 year-old Flemish children. (Vanobbergen *et al.*, 2001a).

There are few studies on oral health status and social environment in adolescents (Faggiano *et al.*, 1999 ; Flinck *et al.*, 1999) though inequalities in oral health in adolescents from lower socio-economic classes compared with more affluent groups would appear to be evident regardless of ethnicity and earlier caries status (Källestal and Wall, 2002 ; Mandall *et al.*, 1998). Preventive meth-

ods seem to reduce these inequalities but do not benefit all children to the same extent (Ellwood *et al.*, 2004 ; Källestal and Wall, 2002; Schou and Wight,1994).

Today the point is to identify factors involved in maintaining these inequalities and their implications in terms of policy and service delivery (Locker,2000). Upgrading the social environment will lead to an improvement in oral health

The present study aims to investigate the impact of social conditions on oral health and oral health behaviour in socially deprived adolescents and young adults in different urban areas in Flanders.

The null hypothesis was that in socially deprived adolescents and young adults no additional independent social factors are associated with differences in caries prevalence or in oral health behaviour. The additional independent social factors studied were the initial social context, educational level, living conditions and age.

## Material & Methods

The study was carried out in the period 1999-2002 in five urban areas in Flanders, the northern part of Belgium. The target study population comprised subjects, aged 12 to 26 years, participating in the monthly activities organized by “Habbekrats”, a non-profit organisation rendering assistance to adolescents and young adults who are living in an unfavourable social situation. This deprived situation is characterized by influencing factors such as housing problems, poor education, unemploy-

ment, financial problems, poor medical attendance, problems with useful leisure activities, social isolation and having a history of police record. These problems lead to non-conforming behaviour such as aggression, apathy, extreme drug- and alcohol-abuse and criminality. "Habbekrats" offers their members activities for social re-education and re-integration. About 1,100 adolescents are registered on a yearly basis.

Within this population, initially, 84 subjects (7.6% of the study population) were selected by a random sampling technique. From this initial sample 68 collaborated. The study consisted of a clinical visual oral examination carried out on site by one trained and calibrated examiner. The examination was performed in daylight with an extra source of light. Hard tissues were evaluated using a plane mirror and a WHO/CPITN type E probe. Caries was diagnosed according to diagnostic criteria for caries prevalence surveys published by the British Association for the Study of Community Dentistry (BASCD)(Pitts *et al.*, 1997). Decay was recorded at the level of cavitation. No radiographs were taken. Oral health was expressed by means of the DMFT/S. Based on this index, a care-index (MFS/DMFS) was calculated.

Oral health behaviour comprises dietary habits, oral hygiene habits and dental attendance.

Criteria judging the dietary habits were the use of non-milk extrinsic sugars within the three basic meals and the frequency and quality of between-meal snacks. Each criterion was given a weight with the highest weight for between meal snacks containing sugar. The higher the score, the worse were the dietary habits. This weighting procedure was based on previous research assessing risk indicators for dental caries in children in Flanders (Vanobbergen *et al.*, 2001b). The combined factor was dichotomised for use in the regression analysis with the median as cut-off point.

Oral hygiene was dichotomised with brushing at least twice a day versus less than twice a day. A dental attendance pattern of at least two dental visits a year was compared versus less than two dental visits a year.

Information on oral health habits and social environment was obtained using structured questionnaires completed by the participants and the social workers of "Habbekrats". This questionnaire was based on a validated questionnaire used in the Signal-tandmobiel project (Vanobbergen *et al.*, 2000).

Social environment was measured using three parameters:

1. The parental occupational level was determined using the Standard Occupational Classification, published by the Office of Population Censuses and Surveys in London (1990). The scores 1 to 3 (professional, managerial, skilled non-manual) were judged high, scores 4 to 9 (skilled-manual, semi-skilled, unskilled, not working, unemployed and unclassified) low.
2. The subject's educational level was categorized high (general and technical secondary education) or low (vocational, special-care education and apprenticeship).
3. Living conditions were grouped into: living with the parents, institutionalised or living on their own.

The rationale for the latter parameter, which has not appeared elsewhere in the literature, can be found in the need for some assessment of the protective environment of the adolescents. Those living on their own have a less protective environment than those living with their parents, who, for their part, have a less protective environment than those living in an institution where very strict rules are followed.

The social determinants were used as explanatory variables in a multiple logistic regression model adjusted for age. DMFS-index and care-index, generated by the clinical examination, as well as the oral health behaviour, as intermediate, were used as response variables. A nominal level of significance 0.05 was chosen. Odds ratios were calculated together with their corresponding 95% confidence interval. To overcome the limitation of the small sample size only a small number of independent variables was considered. A between group analysis of variance for the significant statistically explanatory variables was performed using the non-parametric Kruskal-Wallis test, taking into account the asymmetric distribution of the outcome and the small sample size. The analyses were conducted using SPSS (version 10.0).

## Results

The mean age of the subjects in the sample was 16.2 years (SD=2.82), ranging from 12 to 25 years. In the studied sample 92.4 % and 89.7% respectively had a father/mother belonging to a low social level. The educational level of the subjects was low in 69.7 % of the cases. Concerning the living conditions, 52.2 % were institutionalised, 40.3 % lived at home with their parents and 7.5 % lived on their own. A total of 44 subjects (64.7%) claimed they brushed at least twice a day, the remaining 24 subjects (35.2%) brushing less frequently. 66.2 % of the study group reported nutritional habits conducive to poor oral health. A visit to the dentist less than twice a year was reported by 47% of the sample.

The mean DMFT/S in the study group was 4.8 (SEM=0.52) and 11.42 (SEM=1.78) respectively. The interquartile ranges, were 5.50 and 12.50 respectively; these express the difference between the 75th percentile (Q3) and the 25th percentile (Q1) and are not affected by outliers or extreme values. The mean care-index equaled 0.6 (SD= 0.39).

The results from the multiple logistic regression analyses, after adjustment for age, for the different outcome measures are shown in Table 1. In general the social variables studied did not influence dietary habits. As regards oral hygiene, the excess risk for having a low brushing frequency was only significant for differences in living conditions with an adjusted OR of 4.32 for adolescents living on their own or with their parents versus institutionalised (95% CI: 1.35-13.83). A significant relationship was found between the living condition and the level of dental attendance (OR = 7.97; 95% CI:1.94-32.77) and the educational level and the dental attendance (OR = 9.85; 1.67-58.15).

As far as clinical oral health measures were concerned a significant relationship ( $p$ -value<0.05) was only found between the care index and the living condition. The

adjusted OR for having a high care index for adolescents living on their own or with their parents versus institutionalised was 0.22 (95% CI: 0.06-0.79).

Living conditions versus the different outcome measures are considered in detail in Table 2. The results showed that, compared to subjects living at home with their parents or on their own, in subjects living in an institution dietary habits ( $p < 0.05$ ) and oral hygiene habits ( $p < 0.05$ ) were better and dental attendance ( $p < 0.05$ ) and care index ( $p < 0.05$ ) were higher. The care index was 73% in the group of institutionalised subjects compared

with 42% for the group living at home with their parents and 47% for those living on their own. Although DMFT/S values were lower for adolescents living with their parents or in an institution versus them living on their own, neither DMFT nor DMFS were significantly related to living condition ( $p = 0.19$  and  $p = 0.24$  for DMFT and DMFS respectively).

**Table 1.** Statistical values by multiple logistic regression analysis for the different social determinants

	<i>B</i>	<i>SE</i>	<i>Odds ratio</i>	<i>95% CI</i>	<i>p-value</i>
<i>Dietary habits (Tooth-unfriendly)</i>					
SES father (low versus high)	0.6839	1.5529	1.98	0.09-41.57	0.66
SES mother (low versus high)	-7.5164	26.5217	0.05	0.00-2.04	0.77
Educational level (low versus high)	-0.1535	0.7488	0.85	0.19-3.72	0.84
Living condition (ref.: institutionalised)	1.1126	0.5951	3.04	0.94-9.76	0.06
Age (for 1 additional year)	-0.0300	0.1274	0.97	0.75-1.24	0.81
<i>Insufficient oral hygiene</i>					
SES father (low versus high)	8.2630	25.8392	0.83	0.00-3.82	0.75
SES mother (low versus high)	-8.2056	25.8222	0.03	0.00-2.60	0.75
Educational level (low versus high)	0.5653	0.7797	1.76	0.38-8.11	0.46
Living condition (ref.: institutionalised)	1.4642	0.5933	4.32	1.35-13.83	0.01*
Age (for 1 additional year)	-0.2608	0.1338	0.77	0.59-1.00	0.05*
<i>Poor dental attendance</i>					
SES father (low versus high)	-1.1067	1.2372	0.33	0.03-3.74	0.37
SES mother (low versus high)	0.4745	1.1855	1.60	0.16-16.41	0.69
Educational level (low versus high)	2.2871	0.9061	9.85	1.67-58.15	0.01*
Living condition (ref.: institutionalised)	2.0760	0.7213	7.97	1.94-32.77	0.004*
Age (for 1 additional year)	0.0586	0.1309	1.06	0.82-1.37	0.65
<i>DMFS (high)</i>					
SES father (low versus high)	0.9813	1.3249	2.66	0.19-35.79	0.45
SES mother (low versus high)	-0.3033	1.0948	0.73	0.08-6.31	0.78
Educational level (low versus high)	-0.1573	0.7011	0.85	0.21-3.38	0.82
Living condition (ref.: institutionalised)	-0.2791	0.5238	0.75	0.27-2.11	0.59
Age (for 1 additional year)	0.1581	0.1168	1.17	0.93-1.47	0.17
<i>Care Index (high)</i>					
SES father (low versus high)	1.3366	1.5110	3.80	0.19-73.55	0.37
SES mother (low versus high)	-0.7618	1.5930	0.46	0.02-10.59	0.63
Educational level (low versus high)	-0.8452	0.8286	0.42	0.08-2.18	0.30
Living condition (ref.: institutionalised)	-1.4928	0.6432	0.22	0.06-0.79	0.02*
Age (for 1 additional year)	0.1204	0.1296	1.13	0.87-1.45	0.35

\*Significant at the 0.05 level

**Table 2.** The results of the between-groups analysis of variance across the three levels of living condition (Kruskal-Wallis)

	<i>Institutionalised</i>	<i>With their parents</i>	<i>On their own</i>	<i>p-value</i>
% with tooth-friendly dietary habits	48.4%	14.8%	25%	0.024*
% brushing at least twice a day	75.8%	48.1%	60%	0.032*
% with a good dental attendance	66.7%	44.4%	0%	0.013*
Care index	73%	42%	47%	0.026*
Mean DMF-S	10.94	8.37	28.20	0.24
	(SEM:1.86)	(SEM:2.32)	(SEM:14.79)	

\*Significant at the 0.05 level

## Discussion

The results of the present study showed a significant correlation between poor oral health behaviour and oral health care on the one hand, and living conditions on the other, regardless of other socio-economic factors and age. Unfortunately, due to the poor accessibility of the target group, the available study sample remains small. In Belgium there are no community dental services and most of the dental treatments are carried out in private practices, which are difficult to access for the population studied. Even a school setting is not the ideal environment to have access to this target group. Medical staff, linked to the school, follows children and adolescents on a yearly basis but no epidemiological data concerning oral health are registered. Furthermore, school attendance of the subjects included in this study is poor and obviously there is a frequent change of their school environment. For most of the adolescents concerned relief is limited and mostly dependant on private initiatives with unsatisfactory governmental support. "Habbekrats" is the most important relief centre in Flanders-Belgium, targeting socially deprived adolescents..

Research in this kind of special needs group demands a relationship based on mutual trust between researcher and subject. For that reason, with the support of the "Habbekrats" educational workers, only one investigator was involved in this study. Subjects had to be recruited during their leisure time in "Habbekrats" premises. The specific problems of this group made cooperation not easy to achieve. They have mostly a lower self-esteem and have a profound distrust of strangers. Talking about their oral health habits and being cooperative during a dental health examination is a real challenge for them.

From the initial sample (84), 68 collaborated sufficiently to compile a complete data set. To check the influence of this loss to follow-up, the distribution of both groups with regard to age, living condition, SES of the parents and educational level of the adolescents was compared. None of these variables were significantly different between those who collaborated and those who did not.

Together with the cross-sectional nature of the data, the small sample size imposes limitations on the ability to test causal hypotheses. Hence while the results should be interpreted with caution there was clear evidence that some of the studied variables were significantly associated with oral health and oral health behaviour.

Differences between social groups based on the occupational level of the parents were limited. This finding contrasts with earlier findings in Flanders in a representative sample of 7-year old children (Vanobbergen *et al.*, 2001a). Partly this might be due to the fact that about 90% of the subjects have parents belonging to the lowest socio-economic level. Moreover, since half of the study group were not living with their parents anymore, it was rather expected that the influence of parental occupational level was less pronounced.

It was found that oral health habits were positively influenced by institutionalisation. The unfavourable social situation and the specific problems for each adolescent lead to a disorganisation of their daily life. The latter is in agreement with Robke (2000) who also described the social environment of typical areas with welfare prob-

lems as areas of social disorganisation. Finding help is often unsuccessful and they end up in a vicious circle. Institutions probably try to "normalise" and "organise" the living conditions of the adolescents by offering them structure to their daily life. The same hypothesis probably explains the substantial difference in dental attendance and care-indices between institutionalised participants and those living with their parents or on their own. Both are probably responsible for the relative high DMF-S score of institutionalised adolescents versus those living with their parents.

## Conclusion

From this study it became obvious that, within a group of socially deprived adolescents, parental occupational level didn't influence oral health and oral health habits. Educational level of the study subjects had a positive influence on dental attendance only while the living condition influenced significantly both oral health and oral health habits.

Institutionalised subjects have in general better oral health habits and care indices than those living with their parents or living on their own. It can be supposed that daily life within institutions is more "organised" or "structured" including increased attention for oral health.

Finally, investigating oral health and deprivation, "living condition" should be further considered as one of the important determinants.

The results of this study provide, at least in the Flemish context, some evidence to support the concept of structured living conditions (offered in an institution) as a means to favour good oral health and optimal oral health habits in socially deprived adolescents. Further study in a broader international context using a larger sample is required to confirm this relationship.

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