

Individual and maternal determinants of self-reported dental health among Turkish school children aged 10-12 years.

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Objective To assess the influence of maternal and individual characteristics on self-reported dental health of Turkish school children aged 10-12 years with different socio-economic backgrounds. **Method** A cross-sectional study of children aged 10 to 12 (n=611) using paired matches of self-administered questionnaires for children and their mothers. Clinical examinations based on World Health Organization criteria were conducted. The participation rate was 97% (n=591) for the children, 87% (n=533) for the mothers, and 95% (n=584) for the clinical examinations. Multiple linear regression, descriptive statistics, Spearman correlation coefficient and chi-square test were applied. **Results** Private school children's mothers were more likely to have had higher education (95% at least high school) than public school children's mothers (11%); they reported better dental health (above average) than did mothers of public school children (p=0.001). Among all mothers, those with above average self-reported dental health reported more regular dental visits than did those with below average scores (p=0.001). Frequency of regular dental visits and toothbrushing among children attending public schools (5%, 65%) were lower than those attending private school (43%, 79%), (p=0.001). The mean DMFS was negatively correlated with self-reported dental health ($r_s = -0.187$, p=0.001). Toothbrushing frequency and school performance were the common factors positively associated with self-reported dental health, among all children. **Conclusion** The results emphasize the important role of mothers and their socio-economic background in enhancement of children's dental health. Their active role in conjunction with the potential of self-assessment provides a good basis for establishing and improving self-care among children, in developing countries in particular.

Key words: Dental health, mothers, oral health behaviour, self-reporting, socio-economic status, children

Introduction

Self-reporting, gathering people's perceptions and statements about themselves, is presented as a measure, which enables people to improve their awareness and knowledge of oral health (Kallio, 1997). Oral health promotion based on learning by self-observation and reporting has shown to be effective in improving the gingival health status of adolescents (Kallio, 1997; Nowjack-Raymer *et al.*, 1995).

Self-reported dental health has been suggested to be important in understanding patients' compliance with treatment recommendations and their decisions on practicing oral health behaviours (Reisine, 1996). It has also been suggested as a complementary tool for clinical measures (Locker, 1996). Assessment of individuals' perception of their own dental health at a young age is vital because the critical period for establishing attitudes and beliefs that shape each individual's positive health behaviors extends through late childhood into adolescence (Nutbeam *et al.*, 1989).

Indicators of quality of life seem to relate with professionally and self-reported dental health of children; those with negative psychological and individual characteristics have reported poor dental health (Jokovic *et al.*, 2005; Tubert-Jeannin *et al.*, 2005).

Self-reported dental health among school-aged children, not as widely studied as self-reported gingival

health, has been investigated in terms of its association with socio-economic status, individual and family characteristics (Östberg *et al.*, 2003a). Little literature is available on how self-reported dental health of children is affected by maternal factors, especially from developing countries.

The present study was therefore designed to assess the influence of maternal and individual characteristics on the self-reported dental health of Turkish school children, using subjects from differing socio-economic backgrounds.

Material and Methods

A cross-sectional study was performed on Turkish school children aged 10-12 (n=611) in Kadiköy (a managerial district of Istanbul) by clinical examinations and paired matching of self-administered questionnaires for children and their mothers, in Spring 2004. Sample selection was described earlier (Cinar *et al.*, 2005).

The participation rate was 97% (n=591) for the children, 87% (n=533) for the mothers, and 95% (n=584) for the clinical examinations. Of 360 public and 251 private school children, 96% and 98% completed the questionnaires. In Table 1, the distribution of mothers according to their socio-economic status is shown. Distribution of children according to gender and school is shown in Table 2.

Table 1. Distribution of socio-economic status among Turkish mothers (n= 501) by their children's school type.

	<i>Mothers</i>		<i>p-value</i>
	<i>Public school (n= 310) %</i>	<i>Private school (n=191) %</i>	
<i>Occupation</i>			
Non-working (housewives)	85.5	41.9	0.001 ^x
Working	14.5	58.1	
<i>Age in years</i>			
Below 39	84.8	49.2	0.001 ^x
39 and above	15.2	50.8	
<i>Education</i>			
8 years or less	88.7	5.2	0.001 ^x
11 years or more	11.3	94.8	
<i>Number of children</i>			
1 or 2	43.5	93.7	0.001 ^x
3 or more	56.5	6.3	

Statistical evaluation by chi-square test: difference by school type.

^xSignificant p-values

Table 2. Distribution of oral health and dietary behaviours with self-reported dental health among the Turkish children, by gender and school type (n= 568).

	<i>Public school</i>		<i>p-value</i>	<i>Private school</i>		<i>p-value</i>
	<i>Girls (n= 161) %</i>	<i>Boys (n= 172) %</i>		<i>Girls (n= 124) %</i>	<i>Boys (n= 111) %</i>	
<i>Toothbrushing frequency</i>						
Regular	67.9	45.0	0.010 ^x	83.5	75.6	0.086
Irregular	32.1	55.0		16.5	24.4	
<i>Dental visit frequency</i>						
Regular	5.1	4.8	0.879	42.9	38.9	0.587
Irregular	94.9	95.2		57.1	61.1	
<i>Sweets consumption</i>						
6-7 days/week	10.1	16.4		12.8	9.9	
3-5 days /week	29.7	30.5	0.321	32.8	34.2	0.921
1-2 days/week	48.1	40.7		44.0	45.0	
None	12.0	12.4		10.4	10.8	
<i>Fizzy-drink consumption</i>						
6-7 days/week	15.1	21.4		18.3	17.9	
3-5 days /week	25.8	33.5	0.086	34.1	33.9	0.392
1-2 days/week	42.1	32.4		27.0	34.8	
None	17.0	12.7		20.6	13.4	
<i>Dairy product consumption</i>						
3-4 servings/day	30.4	35.5		28.2	23.4	
1-2 servings/day	55.9	49.4	0.491	50.8	57.7	0.562
None	13.7	15.1		21.0	18.9	
<i>Self-reported dental health</i>						
Below average	9.9	12.8		3.9	6.7	
Average	50.6	45.0	0.510	33.9	29.4	0.519
Above average	39.5	42.2		62.2	63.9	
<i>DMFS</i>						
Diseased	92.7	88.5	0.181	75.4	68.4	0.232
Nondiseased	7.3	11.5		24.6	31.6	

Statistical evaluation by chi-square test: difference by the school and gender.

^xSignificant p-values

Questionnaires for children were distributed and replied to in classrooms, whereas those for mothers were taken home. Questionnaires for mothers that were not delivered back within ten days were re-sent. This increased the response rate by 10%. Clinical examinations, based on World Health Organization (1987) criteria, were carried out in the classrooms by two calibrated examiners. The clinical examinations were performed under field conditions using natural light. The child was seated in a chair with a high backrest, the examiner standing in front of the chair. Plane mouth mirrors and blunt dental probes were used for the examination. The number of decayed, missing and filled surfaces of each permanent tooth (DMFS) was calculated. It was dichotomized into nondiseased or diseased (DMFS = 0 and DMFS \geq 1) for further analysis.

Self-reported dental health and school performance questions in questionnaires for children were worded as follows: "In what condition do you think your teeth are now?" and "What do you think about your own school performance?". These ratings were measured on a 5-point Likert scale (worse, poor, average, good and excellent). For further analysis, self-reported dental health was reclassified into three categories (below average, average, and above average), whereas the school performance was dichotomised as above average and at least average.

Multiple linear regression was performed to determine self-reported dental health and its relation to the independent variables (maternal and child characteristics): dichotomized socio-economic measures (Table 1), frequencies of regular toothbrushing (once a day or more often), dental visit (once in every 6 or 12 months), consumption of sweets or fizzy drinks (6-7 days/week, 3-5 days/week, 1-2 days/week, none) and servings of dairy products (3-4 servings/day, 1-2 servings /day, none). In addition to descriptive statistics, the Spearman correlation coefficient and chi-square test were applied.

Results

Public school children and their mothers responded differently by regarding oral and dietary health habits than did their private school counterparts (Table 3). The mothers of private school children were more likely to have had a higher education than did those of public school children; they reported better self-reported dental health (above average) than did mothers of public school children ($p=0.001$). Among all mothers, those with above-average self-reported dental health reported more regular dental visits ($p<0.05$). A similar trend was not seen for frequency of regular toothbrushing, sweets and fizzy-drink consumption ($p>0.05$).

Private school children reported their school performance as being above average (60%) similar to public school children (53%) ($p>0.05$). Frequency of regular dental visits and toothbrushing among children attending public school were lower than those attending private school ($p=0.001$; OR= 0.4: CI95% 0.3-0.6, $p=0.001$; OR= 0.3: CI95% 0.2-0.5). No significant differences for sweets and fizzy-drink consumption were found (Table 3).

The mean DMFS (3.77 ± 3.37) was negatively correlated with self-reported dental health ($r_s=-0.187$, $p=0.001$). As children tended to report better and better

self-reported dental health, the mean DMFS were likely to be more often zero ($p<0.05$). The mean DMFS of children attending public school was higher than that of those attending private school (4.4 ± 3.5 , 2.8 ± 2.8 , $p<0.05$). Public school children tended to report more scores below the average for self-reported dental health than did private school children ($p<0.05$).

Toothbrushing frequency and school performance were the common factors positively associated with self-reported dental health among private- and public school children, while maternal self-reported dental health remained significant only for the latter ($p<0.05$), (Table 4). Frequencies of maternal dental visit and toothbrushing and education were not explanatory factors for self-reported dental health for either type of school. However, public school children with higher maternal education reported more regular dental visits than did those with lower maternal education ($p=0.04$). No similar association was found among private school children ($p>0.05$).

Discussion

Locker (1996) simplified Kay's (1993) taxonomy of dental care need as normative (clinical measures), subjective (self-assessment), or overlaps of those two. The compatibility of subjective need with the normative is important for directing individuals to positive oral health behaviours. If the patient is in the overlap subgroup, then adoption of these behaviours with professional assistance can be enhanced by raising self-awareness of the poor condition of their dentition. On the other hand, the individuals with a poor clinical status but with positive assessment of oral health, with no overlap, require specific attention differing from those with subjective perceptions compatible with clinical needs in utilization of preventive regimes. Increasing self-awareness of dental health, leading to self-diagnosis compatible with clinical measures, would be useful in monitoring children's dental health, especially in developing countries with poorly organized dental health services.

Östberg *et al.* (2003b) found that self-reported dental health among adolescents was weakly correlated with DFT indices. In the present study, a similar association was apparent among children regardless of school type. The positive relation between toothbrushing frequency and good self-reported dental health among all Turkish children studied may show that they are aware that regular toothbrushing results in good oral health. Östberg *et al.* (2001) have shown that daily sweets consumption, weekly use of dental floss, and high satisfaction with dental visits were positively related to good self-reported dental health. The findings of the present study are in line with this, but only regarding sweets consumption.

Maternal influence on children's oral health behaviour has not been studied in terms of its relation to children's self-assessed dental health. Mothers may play an important role in raising children's awareness of their own oral health status, as suggested by Pine *et al.* (2000). Evidence also suggests that children of mothers who have high level of caries follow the same pattern (Skaret *et al.*, 2004). These assumptions are supported by our finding that poor self-reported dental health by children was positively associated with that of their mothers.

Table 3. Distribution of oral health and dietary behaviours with self-reported dental health among the Turkish children and their mothers, by school type (n= 445).

	<i>Children</i>		<i>p-value</i>	<i>Mothers</i>		<i>p-value</i>
	Public school (n= 279) %	Private school (n= 166) %		Public school (n= 279) %	Private school (n= 166) %	
<i>Toothbrushing frequency</i>						
Regular	64.9	78.9	0.002 ^x	73.5	98.8	0.001 ^x
Irregular	35.1	21.1		26.5	1.2	
<i>Dental visit frequency</i>						
Regular	5.0	42.8	0.001 ^x	4.7	25.3	0.001 ^x
Irregular	95.0	57.2		95.3	74.7	
<i>Sweets consumption</i>						
6-7 days/week	12.2	10.2	0.927	3.6	3.6	0.323
3-5 days /week	29.0	30.1		9.0	13.3	
1-2 days/week	45.5	47.0		50.9	53.6	
None	13.3	12.7		36.6	29.5	
<i>Fizzy-drink consumption</i>						
6-7 days/week	18.0	18.5	0.457	9.2	11.9	0.342
3-5 days /week	30.0	33.9		19.3	16.4	
1-2 days/week	36.8	30.5		21.3	15.7	
None	15.2	17.1		50.2	56.0	
<i>Dairy product consumption</i>						
3-4 servings/day	14.6	20.2	0.071	15.1	13.3	0.871
1-2 servings/day	52.0	54.1		70.2	72.2	
None	33.4	25.8		14.7	14.6	
<i>Self-reported dental health</i>						
Below average	9.6	5.6	0.001 ^x	28.0	6.6	0.001 ^x
Average	48.9	31.3		44.4	41.6	
Above average	41.5	63.1		27.6	51.8	

Statistical evaluation by chi-square test: difference by school type.

^xSignificant p-values

Table 4. Self-reported dental health among all the Turkish children, explained by selected variables through school differentiation (Model = 1, public school; Model = 2, private school), by multiple linear regression analysis

<i>Children's self-reported dental health-related individual and maternal factors</i>	<i>Model 1 (R² = 0.25) (n= 262)</i>			<i>Model 2 (R² = 0.27) (n= 174)</i>		
	<i>β</i>	<i>SE</i>	<i>p-value</i>	<i>β</i>	<i>SE</i>	<i>p-value</i>
Toothbrushing frequency	0.280	0.039	0.001 ^x	0.303	0.032	0.001 ^x
Dental visit frequency	-	-	0.631	0.094	0.045	0.039 ^x
Sweet consumption	0.201	0.061	0.001 ^x	-	-	0.095
Fizzy-drink consumption	-0.140	0.057	0.015 ^x	-	-	0.199
School performance	0.135	0.053	0.011 ^x	0.132	0.057	0.001 ^x
Number of children	-	-	0.210	-	-	0.948
Maternal occupation	-	-	0.621	0.256	0.110	0.021 ^x
Maternal age	-	-	0.842	-0.223	0.108	0.042 ^x
Maternal sweet consumption	-0.140	0.064	0.030 ^x	-	-	0.389
Maternal self-reported dental health	0.161	0.068	0.019 ^x	-	-	0.989
constant	0.114	0.089		0.225	0.218	

^xSignificant p-values

Defined as one of the oral health determinants, high socio-economic status (SES) is positively related to good oral health (Petersen, 2005). Professionally-assessed dental and periodontal health of adults with low SES is worse than for those with high SES levels (Petersen *et al.*, 2004). This was also the case with our children revealing that public school children had worse professional and self-assessed dental health than did that of their counterparts in private school.

The fact that only public school children were affected by maternal self-assessed oral health and behaviours, may be explained as these children had more time to observe and to model their mothers as their mothers were mostly housewives. This seems to be relevant to developing countries (Varenne *et al.*, 2004). In Turkey, women's primary social roles have traditionally been to care for the family and raise children. This seems to be a much more dominant view among females with a low educational level and those married young who mostly live in urban areas. In Turkey women with 11 or more years of education have fewer children than have those with less education (Ergocmen, 1997) who also noted that the proportion of working women in urban areas is very low. Access to health care services among Turkish women with low SES was less than that for those with high SES, and this is positively affected by level of education, especially for the less educated (Institute of Population Studies, 2004). In the present study, in line with earlier findings, private school mothers had fewer children, reported higher levels of education and employment and were more likely to have regular dental visits than the public school mothers with poorer SES.

The significant association between dental visit frequency and self-reported dental health among private school children may be explained as these children increased their self-awareness on dental health by more-frequent utilization of dental care services due to better maternal socio-economic profile.

The results emphasize the important role of mothers and their SES in enhancement of children's dental health. Children's dental care needs seem to be in the overlap group according to Kay's taxonomy (1993). Positive adoption of oral health and behaviours can be improved by empowered maternal influence. Socio-economic profile of mothers should be taken into account in provision of oral health promotion for the children. An active maternal role in conjunction with the potential of self-assessment provides a good basis for establishing and improving self-care among children, in developing countries in particular.

References

Cinar, A.B., Kosku, N. and Murtooma, H. (2005): Self-Efficacy Perspective on Oral Health among Turkish Preadolescents. *Journal of Oral Health and Preventive Dentistry* **4**, 209-215.

Ergocmen, A.E. (1997): Women's status and fertility in Turkey. In: *Fertility Trends, Women's Status, and Reproductive Expectations in Turkey: Results of Further Analysis of the 1993 Turkish Demographic and Health Survey*. pp: 79-104. Ankara, Turkey: Hacettepe University, Institute of Population and Macro International Inc.

Jokovic, A., Locker, D. and Guyatt, G. (2005): What do children's global ratings of oral health and well-being measure? *Community Dentistry and Oral Epidemiology* **33**, 205-11.

Kallio, P. (1997): *Oral self-care among Finnish adolescents*. Academic Dissertation. University of Helsinki, Finland 2000.

Kay, E.J. (1993): Patients' needs--more than meets the eye. *British Dental Journal* **174**, 212-4.

Locker, D. (1996): Applications of self-reported assessments of oral health outcomes. *Journal of Dental Education* **60**, 494-500.

Nowjack-Raymer, R., Ainamo, J., Suomi, J.D., Kingman, A., Driscoll, W.S. and Brown, L.J. (1995): Improved periodontal status through self-assessment. A 2-year longitudinal study in teenagers. *Journal of Clinical Periodontology* **22**, 603-8.

Nutbeam, D., Aaro, L. and Catford, J. (1989): Understanding Children's Health Behaviour: The implications for Health Promotion for Young People. *Social Science & Medicine* **9**, 317-325.

Östberg, A.L., Halling, A. and Lindblad, U. (2001): A gender perspective of self-perceived oral health in adolescents: associations with attitudes and behaviours. *Community Dental Health* **18**, 110-6.

Östberg, A.L., Lindblad, U. and Halling, A. (2003a): Self-perceived oral health in adolescents associated with family characteristics and parental employment status. *Community Dental Health* **20**, 159-64.

Östberg, A.L., Eriksson, B., Lindblad, U. and Halling, A. (2003b): Epidemiological dental indices and self-perceived oral health in adolescents: ecological aspects. *Acta Odontologica Scandinavica* **61**, 19-24.

Petersen, P.E. (2005): Sociobehavioural risk factors in dental caries - international perspectives. *Community Dentistry and Oral Epidemiology* **33**, 274-9.

Petersen, P.E., Kjoller, M., Christensen, L.B. and Krustup, U. (2004): Changing dentate status of adults, use of dental health services, and achievement of national dental health goals in Denmark by the year 2000. *Journal of Public Health Dentistry* **64**, 127-35.

Pine, C.M., McGoldrick, P.M., Burnside, G., Curnow, M.M., Chesters, R.K., Nicholson, J. and Huntington, E. (2000) An intervention programme to establish regular tooth-brushing: understanding parents' beliefs and motivating children. *International Dental Journal Suppl Creating A Successful*, 312-23.

Reisine, S. (1996): An overview of self-reported outcome assessment in dental research. *Journal of Dental Education* **60**, 488-93.

Skaret, E., Weinstein, P., Milgrom, P., Kaakko, T. and Getz, T. (2004): Factors related to severe untreated tooth decay in rural adolescents: a case-control study for public health planning. *International Journal of Paediatric Dentistry* **14**, 17-26.

Tubert-Jeannin, S., Pegon-Machat, E., Gremeau-Richard, C., Lecuyer, M.M. and Tsakos, G. (2005): Validation of a French version of the Child-OIDP index. *European Journal of Oral Sciences* **113**, 355-62.

Institute of Population Studies. (2004): *Turkish Population and Health Survey*. Ankara, Turkey: Institute of Population Studies, University of Hacettepe.

Varenne, B. Petersen, P.E. and Ouattara, S. (2004): Oral health status of children and adults in urban and rural areas of Burkina Faso, Africa. *International Dental Journal* **54**, 83-9.

World Health Organization. (1987): *Oral Health Surveys: Basic methods*. Geneva: WHO. 3rd ed.