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Optimizing oral health: Towards a tailored, effective and cost-effective dental care

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Chapter

5

**Putting your money where
your mouth is: parents'
valuation of good oral
health of their children**



Putting your money where your mouth is: parents' valuation of good oral health of their children

Introduction

Oral health is an important aspect of overall health. Not only given the intrinsic value of good oral health, but also given the increasingly recognized relationship between oral health and general health (e.g. Söder et al., 2012; Soto-Barerras et al., 2012): oral diseases and lack of oral hygiene can result in reduced general health. This stresses the importance of maintaining a good oral health. Importantly, the basis for this is laid in childhood and children's oral health can be regarded as the best predictor of oral health in adulthood (Thorstensson et al., 2009). To achieve a good oral health in children, parental investments are vital (Adair et al., 2004). Hence, it is crucial to study parents' knowledge of and willingness to invest in good oral health of their children.

Dental caries (tooth decay) is found to be one of the most prevalent infectious diseases among children and is caused by the activity of the common oral micro flora. Worldwide, 60-90% of all schoolchildren experience one or more carious lesions in their primary teeth and it is present, albeit unequally distributed, throughout all socioeconomic classes, in both developed and developing countries (Petersen, 2003; Bagramian 2009).

Considering current standards, caries is a disease that can largely be prevented by maintaining appropriate oral hygiene, adhering to a strict but simple fluoride-regime and limiting the intake of fermentable carbohydrates. Especially for children under the age of 10, parents can be considered the most important actor in caries prevention. Young children largely depend on their parents' help in maintaining their oral health. Hence, parents need to invest money, time and effort in their children's dental health. Their willingness to do so will depend, among other things, on their knowledge and attitude regarding the importance of preventing caries, their perceptions of the effectiveness of maintaining proper oral hygiene, and their preferences regarding such investments. Some previous studies investigated the association between dental knowledge and oral health. In adults, it has been shown that having more knowledge about dental topics is associated with a better oral health (Brennan et al., 2010; Zhu et al., 2005). In children, the relationship between knowledge of oral health and attitudes towards oral health behavior has been established as well (Tolvanen et al., 2010; Peng et al., 1997). If parents lack proper knowledge regarding how to preserve their children's oral health, do not

maintain effective oral hygiene habits or are not using fluoride toothpaste daily, and if they allow their children unhealthy dietary habits as well, this may result in a negative impact on the actual oral health status of their children (Daly et al., 2010). In children, however, providing a comprehensive oral health education program is not enough to improve dental health status, especially in a low SES-population (Moskovitz et al., 2009). It has been suggested that parental oral health behavior and attitudes should be considered in planning dental services for young children (Wigen & Wang, 2010). Regarding this, it should be recognized that different 'types of parents' exist. It has been shown that five different prevailing attitudes towards oral health exist among parents of children at the care-dependent-age of 6 years old (Vermaire et al., 2010).

It is still unknown how parents value oral health for their children and how this is related to their knowledge on the topic and their own oral health behavior. Caries preventive care has been valued before in 19-year-olds in Sweden in a contingent valuation study (Oscarsson et al., 2007). That study compared a high-caries risk group (DMFT > 8) with a low-risk group (DMFT = 0). The authors found that the high-risk group was willing to pay nearly € 7 more per month than the low-risk group (€ 32 vs. € 25; converted from original amounts in SEK) to receive oral health instructions and a professional fluoride application by a dental hygienist three times a year. It is not known whether this difference already existed beforehand or that it should be seen as a result of the suffered disease. Parents or caregivers of children can also be asked to provide an estimation of their willingness to pay for oral health benefits in their children, for example parents of Asthma patients who were prepared to pay \$6.00 per month for a hypothetical medicine for 20 episode-free days (Walzer & Zweifel, 2007). A study in Thailand, in which parents were asked to value both caries prevention (sealing occlusal surfaces) and cure (filling cavities), revealed that no difference in willingness to pay existed between prevention and cure. Furthermore, as expected, it was found that willingness to pay was positively affected by parent's income (Tianviwat et al., 2008).

However, money is not the only conceptualization of willingness to invest. Willingness to invest time can be regarded as a good and relevant alternative (van Helvoort-Postulart et al., 2009). This may be especially the case in preventive dentistry, where investing time (e.g. brushing children's teeth) can be considered as important as investing money (e.g. paying for toothpaste and toothbrushes or dental clinic visits). Moreover, differences in ability to pay between social-economic groups may translate in differences in willingness to pay, but need not necessarily translate into differences in willingness to invest time. A higher willingness to invest time may, in fact, compensate

for a lower willingness to pay when this is affected by limited ability to pay. The aim of the present study is to investigate the parental willingness to invest in the oral health of their child in terms of money and time and to relate this to oral health related knowledge and behavioral aspects.

Methods

290 children, aged 6.0 years (± 3 months), participating in a randomized clinical trial (RCT) on caries-preventive strategies were included in this study. Parents were asked to provide information on parental education, oral health habits, dietary habits, knowledge on dental topics, willingness to pay money and willingness to invest time as well as perceived resistance against investing in preventive oral health actions (for their child). Clinical data were retrieved from the baseline measurement of the RCT. The study was approved by the Medical Ethical Committee of the VU University Amsterdam, the Netherlands. Protocol number: 2006/156.

Procedure

Information was gathered using written questionnaires, completed by the accompanying parent, when the child visited a participating dental clinic in one of three large cities in the Netherlands ('s-Hertogenbosch, the Hague and Enschede). Parents were informed about the study and the possibility to participate in writing approximately two weeks prior to their child's planned visit to the dental clinic. After informed consent was obtained, their child was included and parents were asked to fill out the questionnaire. When the parent decided not to let their child participate, the reason of non-participation was recorded. The majority of the questionnaires (84%) were completed and returned at the same visit. When people indicated not to have enough time, they took it home and returned it within a week (14%) or after a reminder within one month (2%).

Instruments

Clinical

Children's oral health situation was assessed clinically during a visit at the dental clinic using a mirror, light, a blunt probe and compressed air. Oral hygiene was assessed using the simplified oral hygiene index (OHI-s) (Greene & Vermillion, 1964) and caries using the dmfs-index (decayed, missing and filled surfaces), with caries scored at the dentine-threshold (d3).

Dental hygiene knowledge

Parents were asked to complete the questionnaire and explicitly instructed to only consider the child who was involved in this trial in answering the questions, thus disregarding possible brothers and sisters in the same family. The questionnaire included a short dental hygiene knowledge test consisting of ten items. We used an existing questionnaire for this purpose (Kalsbeek et al., 1989). Each item was presented with three answer options, of which only one was correct, and the option “I don’t know”. (An example item is “Toothpaste often contains fluoride. This is to prevent...” with answer options “cavities”; “bad breath”; “tartar”; and “I don’t know”.)

Respondents’ answers were classified as correct (1) or wrong (0). Factor analysis and reliability analysis were conducted to analyse the responses to these ten questions, showing that five (of the ten) items formed a scale with satisfactory reliability ($\alpha = .73$). The score on dental hygiene knowledge scale was determined for each respondent by aggregating the number of correct answers to these five questions, thus ranging from 0 to 5 (with a higher score indicating a higher dental hygiene knowledge). A score between 0 and 2 was categorized as ‘poor’, a score of 3 or 4 as ‘fair’ and a score of 5 as ‘good’ dental hygiene knowledge. Parents also self-assessed their knowledge of dental hygiene as ‘sufficient’ or ‘insufficient’. Parents who assessed their knowledge to be sufficient scored higher on the dental hygiene knowledge scale than those who assessed their knowledge to be insufficient ($p < = 0.001$).

Dental hygiene burden

The questionnaire also included seven statements exploring the burden experienced by parents from undertaking activities to promote the dental hygiene of their child (an example item is “brushing my child’s teeth daily:...”). Respondents rated these statements using a Likert scale ranging from “not at all inconvenient” to “very inconvenient”. Following factor and reliability analysis all seven items were retained to form a scale with good reliability ($\alpha = .80$). The score on the dental hygiene burden scale was computed as the mean response to the seven statements, normalized to form a 0 to 5 score (with higher scores indicating higher burden). Dental hygiene burden scores were negatively associated with dental hygiene knowledge scores ($\rho = -.361$, $p = .002$). Parents who assessed their knowledge to be sufficient scored lower on the dental hygiene burden scale than those who assessed their knowledge to be insufficient ($p = .034$).

Measures of willingness to invest

Parents were asked to answer the following questions:

1. “How much are you willing to pay every month to keep your child’s mouth healthy, caries-free and pain-free until his or her 18th birthday?” Parents were able to choose one out of five options: € 0,-; € 1 to € 10,-; € 11 to € 25; € 26 to € 50; or more than € 50.
2. “How many minutes are you willing to brush your child’s teeth yourself every day to keep your child’s mouth healthy, caries-free and pain-free until his or her 18th birthday?” Parents were able to choose one out of five options: no time (0 minutes); 1 to 2 minutes; 3 to 4 minutes; 5 to 6 minutes; or more than 6 minutes a day.
3. “How many times are you prepared to visit a dental clinic every year for check-ups or oral hygiene counseling to keep your child’s mouth healthy, caries-free and pain-free until his or her 18th birthday?” Parents were able to choose one out of 5 options: no visits; 1 or 2 visits; 3 or 4 visits; 5 or 6 visits; or more than 6 visits per year.

Measures of oral health related behavior

Oral hygiene-habits and dietary habits of the parents and their children were also investigated. It was asked how many times the parents themselves brush their own teeth and their children’s teeth and how many times children brushed their own teeth. Parents had to indicate how difficult they perceived brushing their children’s teeth (on a VAS scale from 0 (not difficult at all) to 10 (extremely difficult)). Furthermore, fluoride-use as well as usual toothpaste type was asked. Concerning dietary behavior, parents were asked whether they and their child usually ate the common meals of breakfast, lunch and dinner (separately asked) as well as the usual number of in-between-meal snacks.

Analysis

Associations between the measures of willingness to invest were investigated by (i) inspecting cross-tabulation between willingness to invest time and willingness to pay measures (see Table 3) and (ii) bivariate and multivariate correlations between these measures (see Table 4). Because an ordinal regression model with willingness to pay as dependent variable did not pass the test of parallel lines, standardized linear

regression coefficients are presented in Table 4. Associations between measures of willingness to invest and measures of parental knowledge, assessment and perceptions of oral health and their oral health behaviour were investigated using bivariate correlations (see Table 5). The significance level was set at $\alpha = 0.05$.

Results

Initially, 346 parents were asked to complete the questionnaire and let their child participate in a randomized controlled trial on caries-preventive measures in children aged from 6 to 12 years old. 290 parents (84%) agreed to participate. Table 1 describes this sample.

Parents indicated to attach high importance to their child's general and oral health (VAS scale: mean scores 9.60 and 9.43, respectively). The differences between parents were much smaller for general health (range 6-10) than for oral health (range 2-10).

Table 2 describes oral health behaviour in this sample. The results indicate that every child brushed their own teeth or had them brushed by their parents on a regular basis although six children (2.1%) did not brush or were not brushed by their parents every day. All other children (284; 97.9%) brushed or were brushed at least once a day with fluoridated toothpaste.

It was also found that 9.7% of the children regularly skipped breakfast, 6.9% frequently skipped lunch and 4.1% did not have dinner on a regular basis. In total, 251 (86.6%) children usually ate all three main meals. The large majority of children (72.4%) ate 1 to 5 in-between-meal snacks per day, while 20.7% ate more than 5 per day.

Figure 1 shows the responses to the willingness to invest questions, indicating that 79.3% of the parents were willing to pay at least some amount of money in order to maintain good oral health for their child. Moreover, 83.4% of the parents were willing to spend more than two minutes per day on brushing and were willing to go to the dentist more than once a year (for a preventive visit) for this purpose. On average, parents were willing to invest a maximum of € 31.25 (± 30.96); median: 25.00 per month, 6.47 (± 4.17), median: 5.0 minutes of tooth brushing per day and 3.45 (± 1.72), median: 3.0 preventive visits to the dental clinic per year to maintain good oral health for their children. Combining the results presented in Figure 1 indicated that 11.7% of the parents was not willing either to invest any money, to brush more than 2 minutes

per day, or to go to the dentist more than once a year, in order to achieve good oral health for their child. Compared to other parents, these parents could be characterised by a lower level of education of mothers ($Z = -6.75, p = .000$) and fathers ($Z = -3.63, p = .000$); a lower socio-economic status ($Z = -5.92, p = .000$); attaching a lower importance to their children's general health ($Z = -1.46, p = .143$) and oral health ($Z = -1.33, p = .184$); having a lower dental hygiene knowledge ($Z = -11.20, p = .000$); and experiencing a higher dental hygiene burden ($Z = -9.17, p = .000$).

A statistically significant, negative correlation was found between the dental hygiene burden score and willingness to invest money ($\rho = -.22; p = .038$), brushing time ($\rho = -.29; p = .001$) and number of preventive visits ($\rho = -.28; p = .001$). Dental knowledge was correlated to socioeconomic status ($\rho = -.33; p = .001$) and oral hygiene ($\rho = -.21; p = .03$).

A weak negative correlation was found between willingness to pay and dmfs ($r = -0.164, p = .036$). No correlation was found between dmfs and outcomes of the willingness to invest questions.

Table 3 indicates how responses to the willingness to invest time questions were related to willingness to pay. On average, higher scores on one measure were associated with higher scores on the other measures. This was confirmed in the bivariate and multivariate association between the willingness to invest questions as shown in Table 4. Measures of willingness to invest were significantly, moderately and positively correlated: higher willingness to pay was associated with higher willingness to invest time (in terms of brushing and visits).

Table 5 shows the results of bivariate analyses, indicating how willingness to invest was associated with sample characteristics. These associations were all in the same directions and mostly statistically significant. For example, more knowledge regarding dental health and attaching a higher importance to children's oral health were associated with higher willingness to invest in terms of both money and time. The associations for the group of parents who were not willing to spend any money and only limited time (shown in the last column of Table 5) were consistently in the opposite direction.

Discussion

The purpose of this study was to investigate the parental willingness to invest in the oral health for their children in terms of money and time and to relate these outcomes to oral health-related knowledge and behavioral aspects. We found that, on average, parents valued their children's general health and oral health highly. Still, one fifth of the parents were unwilling to spend any money to maintain good oral health in their children. On the positive side, this implies that 80% of the parents were willing to spend at least some money and almost 10% of the parents were even willing to spend more than € 50 per month on maintaining a good oral health for their child. Besides this, clearly nearly all parents are willing to invest something on their children's oral health (by purchasing toothbrushes, spending some time brushing or going to the dentist for check-ups). The posed questions aimed to explore the maximum investments parents were willing to make. Parents valued oral health of their child very highly (9.47 on a scale from 0-10). It should be noted, however, that this valuation was not obtained using some trade-off technique (but simply on a 0 to 10 scale). The (very) high valuation does not reflect a real trade-off, and one may feel the subsequent indications of valuation (willingness to pay and willingness to invest) to be at variance with this high score. A positive relation between the investments in time and money indicates that parents with a higher financial willingness to invest also showed to be more willing to invest time.

Concerning the relationship between knowledge of and attitudes towards oral health behavior, the results of this study are in concordance with previous findings. Regarding the valuation of caries-preventive care, some notable differences compared to an earlier Swedish study were observed (Oscarsson et al., 2007). In that study, in adolescents, it was found that a high-risk group (having a DMFT > 8) valued preventive care higher than a low-risk group (having DMFT = 0). Here, in contrast, we found no difference between risk groups (based on dental hygiene, knowledge and burden-scores) concerning willingness to pay and, in fact, a lower willingness to invest in terms of time and number of preventive visits to the dental clinic among those parents in the high risk group. This may be because of the difference in defining high-risk as well as the differences in subjects (adolescents vs. parents of young children).

Before discussing the implications of our results, a few remarks should be made regarding the limitations of this study. The sample used was relatively small ($n = 290$) and not fully representative of the Dutch general population. The share of non-western

immigrants in our sample was almost 28%, while this share is just below 12% in the Dutch population (website Statistics Netherlands). This is explained by the fact that our data were collected in larger cities where the share of non-western immigrants mostly is higher. We found no statistically significant effect of ethnicity on the investigated relationships. Another issue that may have influenced our results is non-response. Some 16% of invited parents decided not to participate in this study, which is a non-negligible proportion. It needs noting, however, that a recent study on non-participation bias in the RCT on which this study is based showed that participants did not significantly differ from the total invited sample in terms of characteristics like age, gender, oral hygiene habits and dietary habits. Therefore, the external validity was not necessarily affected by non-participation bias (Vermaire et al., 2011). Furthermore, it should be noted that the results from a stated preference method may differ from revealed preferences. Still, it is common to use stated preference methods like the ones used here in valuing “goods” for which market prices do not exist or cannot be easily observed. Although parents were asked, when completing the questionnaire, to only consider the child who was in the trial, they obviously may have considered investments for possible brothers or sisters as well. This could lead to lower WTP and WTI estimates (all other things equal) when parents with more children aggregated investments across their children. However, the regression did not reveal an influence of the variable ‘only child’; hence the influence of having more children in the same household appears to be small.

As indicated before, in preventive dentistry the investment in terms of time of parents may be even more important than their willingness to pay. Because of the young age of the children included in this study (6 years), they are mostly dependent on their parents for maintaining proper oral hygiene. It was found that almost 25% of the respondents were willing to invest only a few minutes of their time to brush their children’s teeth. Moreover, parents who were unwilling invest time for good oral health in their children, often were also less willing to pay money. This positive correlation between willingness to pay (money) and willingness to give up time is in line with earlier research in the field of hypertension (van Helvoort-Postulart et al., 2009). It should be noted that in that study a larger share of respondents gave protest answers using willingness to pay questions compared to willingness to invest time (12% and 2% respectively).

A striking, and from a preventive point of view worrying, finding in this study was that almost 12% of the parents indicated to be unwilling to pay any money as well as unwilling to invest any time in brushing their children’s teeth. Moreover, they indicated

to be unwilling to visit the dentist for preventive measures more than once a year. The children of this group of parents certainly may be at higher risk of developing oral diseases because, besides the fact that their parents are unwilling to invest time and money in their oral health, they also appeared to have the worst oral hygiene habits (brushing frequency and quality) and dietary habits (least regular meals and most between-meal snacks). Also when dmfs was considered, an unfavorable outcome could be identified in children of parents with a lower willingness to pay. This trend was seen concerning and willingness to invest time as well, although not statistically significant.

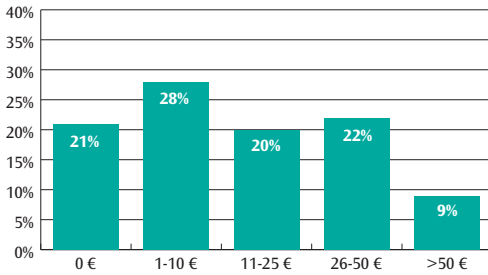
Our results indicate a clear challenge for oral health prevention: to reach those children whose parents are apparently unwilling to invest time, money and effort in their proper oral hygiene. A sometimes-proposed option would be to improve parental knowledge on dental health and risk factors (e.g. Garcia and Sohn, 2012), which, in turn, could then lead to improved willingness to invest in oral hygiene in children. A parallel can be drawn here with the impact of improvement of knowledge on the effects of vaccination on infant immunization rates (Owais et al., 2011). However, in our sample, the average level of knowledge was already at a relatively satisfactory level, which may invalidate the assumed chain of logic behind such interventions. Nevertheless, an increase in parents' knowledge on health and risk factors should be welcomed, although knowing how and why to maintain good oral health in their children seemingly does not 'automatically' translate into desired behavior. This resembles the situation for other lifestyle interventions, e.g. obesity and smoking habits, where the link between knowledge and behavior also is not as direct as sometimes hoped (Chapman and Ogden, 2009; Bledsoe, 2006). A study on parent's attitudes towards oral health in 6-year-olds children revealed 5 different "types" of parents (Vermaire et al., 2010). It would be interesting to see if different types of parents will also result in different type of risk-behavior, concerning oral health in their child. This may help identify the most effective strategy promoting oral health behavior. For example: a recent review on promoting health behaviors suggested that the technique of Motivational Interviewing can be a promising tool to establish behavioral change and is effective in numerous health domains, including oral health (Martins and McNeil, 2009), but also other ways to influence attitudes were considered recently. In a study on obesity, a strong and positive effect of peer pressure on adolescents' BMI was reported in several subgroups (Mora and Gil, 2012). Also in dentistry it was suggested that peer social networks and tooth brushing behavior are related (Dorri et al., 2010). Another approach may be to circumvent the investments required by parents completely, for instance through implementing school-based prevention programs. In the literature on such programs,

divergent operationalization of such programs and effectiveness results are reported (Divaris et al., 2012; Ersin et al., 2008; Sköld, 2005). One study interestingly compared parents' preferences on whether their child was to receive dental care in a hospital setting or in a mobile-clinic, reporting a preference for the latter (Tianviwat et al. 2009). Customizing caries-preventive care therefore may improve effectiveness. Also when cost-effectiveness is considered, it seems important to realize that targeted interventions (aimed specifically at those children at risk of oral health problems) are often to be preferred over more general interventions, which also target a large group of children who do not require such interventions (Stamm et al., 1984).

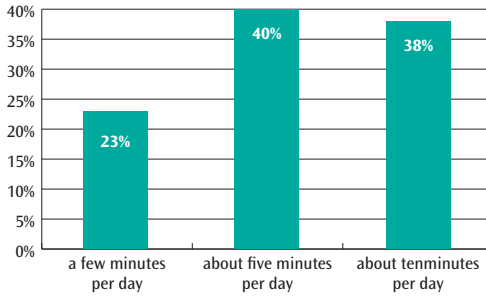
Concluding, this study revealed differences in parents' valuation of oral health in their children and the existence of a group of high-risk children, whose parents appear relatively unwilling to invest in oral health. Still, a significant share of our sample was willing to invest considerably both in terms of money and time. It may be of interest to identify the reasons for these – self reported – preferences. Information that parents are willing to invest in the oral health of their children can be useful for the dental professional in order to increase the effectiveness of their efforts to improve oral health in their pediatric patients. It would also be interesting to see to what extent stated and revealed preferences concerning this topic differ and to identify causes for such differences. Future research could investigate whether programs aimed at improving preventive dentistry could better target the children directly (e.g. through school-based prevention programs) or through parents (e.g. through motivational interviewing or using peer social networks). Perhaps differentiation in caries prevention is necessary, given the differences between parents reported in this study.

Figure 1: Frequencies of willingness to pay and willingness to invest time

willingness to pay



willingness to invest time in brushing teeth



willingness to invest time in visits to the dentist

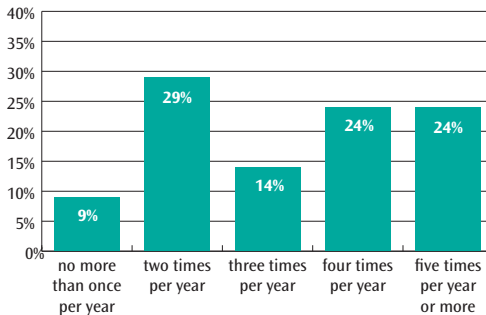


Table 1: Descriptive statistics (n = 290)

		N	(%)	mean	sd
Demographics child					
Sex	male	143	(49.3)		
	female	147	(50.7)		
Ethnicity	indigenous	207	(71.4)		
	non-western immigrant	83	(28.6)		
Only child	yes	51	(17.6)		
	no	239	(82.4)		
Is this child the oldest child?	yes	142	(49)		
	no	148	(51)		
Single parent family	yes	40	(13.8)		
	no	250	(86.2)		
Education mother	low	97	(33.4)		
	medium	109	(37.6)		
	high	84	(29.0)		
Education father	low	108	(37.2)		
	medium	88	(30.4)		
	high	94	(32.4)		
Oral health child					
Observed clinical scores ^a	ds			1.77	3.63
	ms			2.29	5.57
	fs			2.09	3.40
	dmfs			6.15	8.99
	OHI-s (0-3)			0.91	0.73
Parents' knowledge, assessment and perceptions					
Dental hygiene knowledge score (0-5)				4.05	1.33
Self-assessed knowledge	enough	247	(85.2)		
	not enough	43	(14.8)		
Dental hygiene burden score (0-5)				1.57	0.93
Importance of child's general health ^b				9.60	0.78
Importance of child's oral health ^b				9.43	1.04
Child's oral health assessed by parent ^c				7.08	1.85

Note:

^a ds: decayed surfaces, ms: missing surfaces, fs: filled surfaces, dmfs: decayed, missing and filled surfaces, OHI-s: simplified oral hygiene index (minimum score:0 [no surfaces covered with plaque]; maximum score: 3 [all surfaces covered with plaque])

^b rated on scale ranging from 0 (not at all important) to 10 (very important).

^c rated on scale ranging from 0 (could not be worse) to 10 (could not be better).

Table 2: Oral health behaviour

		N	(%)	mean	sd
How often does your child brush its' own teeth?	Never	12	4.1		
	Sometimes, not every day	50	17.2		
	Once a day	96	33.1		
	Twice a day (or more)	132	45.5		
How often do you brush your child's teeth?	Never	7	2.4		
	Sometimes, not every day	78	26.9		
	Once a day	115	39.7		
	Twice a day (or more)	90	31.0		
How often do you brush your teeth?	Never	0	0.0		
	Sometimes, not every day	3	1.0		
	Once a day	52	17.9		
	Twice a day (or more)	235	81.0		
What time of day are the child's teeth brushed?	In the morning	25	8.6		
	In the evening	58	20.0		
	Both	207	71.4		
What type of toothpaste is used?	Same as parent	28	9.7		
	Children's toothpaste	260	89.7		
	None / don't know	2	0.6		
How easy is it for you to brush your child's teeth? (0-10)				7.41	1.98
Which main meals does your child usually eat?	Breakfast (yes)	262	90.3		
	Lunch (yes)	270	93.1		
	Dinner (yes)	278	95.9		
How many in-betweens does your child usually eat?	Sometimes, not every day	20	6.9		
	One to five times a day	210	72.4		
	More than five times a day	60	20.7		
How many in-betweens do you usually eat?	Never	2	0.7		
	Sometimes, not every day	22	7.6		
	One to five times a day	203	70.0		
	More than five times a day	63	21.7		

Table 3: Cross-tabulations between willingness to pay and to invest time

Willingness to invest time	N	Willingness to pay				
		0 €	1-10 €	11-25 €	26-50 €	> 50 €
in visits to dentist						
- no more than once per year	27	55.6%	18.5%	14.8%	11.1%	-
- two times per year	84	26.2%	31.0%	16.7%	17.9%	8.3%
- three times per year	40	15.0%	50.0%	15.0%	20.0%	-
- four times per year	69	11.6%	24.6%	36.2%	21.7%	5.8%
- five times per year or more	70	12.9%	18.6%	12.9%	32.9%	22.9%
in time brushing						
- a few minutes per day	66	39.4%	30.3%	10.6%	16.7%	3.0%
- about five minutes per day	115	14.8%	40.9%	23.5%	16.5%	4.3%
- about ten minutes per day	109	15.6%	12.8%	22.0%	31.2%	18.3%

Note: rows add up to 100% for each variable separately; maximum % per row indicated in bold.

Table 4: Associations between willingness to pay and to invest time

	Bivariate ^a				Multivariate ^b		
	Willingness to pay		Willingness to invest time in brushing		Willingness to pay		
	ρ	p	ρ	p	Beta	t	p
Willingness to invest time in brushing	0.339	< 0.001			0.292	4.63	< 0.001
Willingness to invest time in visits to dentist	0.328	< 0.001	0.591	0.000	0.198	2.91	0.029

Note:

^a Spearman's correlation coefficient.

^b Standardized linear regression coefficients are presented (model with constant, statistically not significant).

Table 5: Bivariate associations of willingness to pay and willingness to invest time with parents' knowledge, assessment, perceptions of oral health and their oral health behaviour (Spearman's correlation coefficients; only statistically significant correlations shown)

	Willingness to pay		Willingness to invest time in brushing		Willingness to invest time in visits to dentist		Not willing to invest any money and only limited time (n = 31 / 11.7%)	
	ρ	ρ	ρ	ρ	ρ	ρ	ρ	ρ
Socioeconomic status	-.195	.001	-.256	.000	-.163	.005	-.348	.000
Dental hygiene knowledge score (0-5)	0.172	.001	0.177	.000	0.098	.17	-0.661	.000
Dental hygiene burden score (0-5)	-0.201	.005	-0.274	.001	-0.331	.000	0.315	.001
Importance of child's oral health	0.254	.000	0.133	.021	0.107	.107	-0.094	.286
Importance of child's general health	0.142	.055	0.146	.051	0.120	.035	-0.137	.162
How often do you brush your child's teeth?	0.127	.058	0.053	.316	0.021	.759	-0.033	.579
How many main meals does your child usually eat?	0.209	.000	0.171	.001	0.151	.012	-0.493	.000
How many in-betweens does your child usually eat?	-0.093	.031	-0.245	.000	-0.201	.001	0.268	.000
How many in-betweens do you usually eat?	-0.091	.055	-0.130*	.051	-0.149*	.035	0.206	.000