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Factors related to satisfaction with dental care among 23-year olds in Norway

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Abstract – *Objectives:* The aims of the present study were to explore (i) the prevalence and distribution of satisfaction with dental care among 23-year olds in Norway; and (ii) possible factors associated with the same variable. *Methods:* A random sample of adolescents ($n = 968$) surveyed at age 18 were resurveyed by post at the age of 23. The questionnaire included the psychometric instruments Dental Satisfaction Questionnaire (DSQ), Dental Fear Survey (DFS), Dental Beliefs Survey (DBS), and the (WHO) Five Scale Psychological General Well-Being Schedule. *Results:* The response rate was 69%. Of this group, 15% of the subjects were very satisfied, and another 15% were very dissatisfied with dental care. The following variables explained 58% of the variance of satisfaction with dental care at age 23: positive beliefs of the dentist (DBS), low dental anxiety, perception of having a dentist to go to, last treatment session not painful/unpleasant, and gender (male). Being very satisfied with dental care was associated with high DMFT at age 16 and few previous experiences of pain. Being very dissatisfied at age 23 was associated with low general well-being, previous experiences of pain and dislike of the dentist (both reported at age 18). Last dental treatment session was reported as very painful or unpleasant by 6.7% of the group. *Conclusions:* Beliefs of the dentist and pain control seems to be important aspects in young adults' evaluation of dental care.

Key words: adolescents; beliefs of the dentist; painful experiences; satisfaction with dental care

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Oral health evaluations are usually based on health care professionals' definitions and criteria, while the patients' opinions and evaluations about whether or not their expectations are fulfilled, are often lacking. More emphasis and research on the public's perceptions and concerns by use of more patient-based outcome measures, referring to questionnaires, interviews and other related methods, are important to identify optional treatment modalities and to evaluate the outcomes of public health interventions (1). Relatively few studies have investigated satisfaction with dental care measured by pre-tested multi-item instruments (2), and no population-based studies have been published where patient-based outcomes measures have been used to evaluate the Public Dental Service among young adults in Norway.

Patient satisfaction is shown to be associated with both characteristics of the health care delivery system and with individual characteristics, and is therefore both a measure of care and a reflection of the respondent (3). It is demonstrated that links exists between satisfaction with previous care and health-related behavior, treatment compliance, health status and health outcomes (4).

In spite of the increasing amount of research exploring satisfaction with care, patient satisfaction is still poorly defined theoretically (3), and it has been difficult to develop a comprehensive conceptual model (5). However, basically the concept includes an individual evaluation of the health care experience compared with a subjective standard (6). This process includes two activities, a cognitive based evaluation and an affectively based response

to the structure, process and outcome of the service (7). Empirical evidence supports a multi-dimensional concept of patient satisfaction, and the need for multi-item instruments (2) that are tested for their psychometric qualities (8). The Dental Satisfaction Questionnaire (DSQ) (9) is fulfilling these requirements, and a recent study among young adults in Norway has generally confirmed the internal structure, reliability and validity of the original DSQ instrument (10).

It has been argued that the lack of variability in responses measuring satisfaction makes the exploration of expressed dissatisfaction more valuable (11). Williams (1994) has advised researchers to pay greater attention to expressions of dissatisfaction, as this is only expressed by the patient if something 'extremely bad' has occurred. (12). In the dental setting, this 'extremely bad' event may for the patient represent subjective negative experiences like pain/unpleasantness and/or perception of a negative interpersonal relationship with the dental professional.

In Scandinavia, the use of dental services tends to drop from adolescence to young adulthood (10, 13, 14). Understanding the concept of patient satisfaction by exploring possible associated factors, and specifically factors related to why young adults are either very satisfied or very dissatisfied with the dental care given to them since birth, might provide important information for interventions aimed at reducing irregular attendance and dropout from care in this transitional age period.

The aims of the present study were to explore (i) the prevalence and distribution of satisfaction with dental care among 23-year olds in Norway; and (ii) possible factors associated with the same variable. Specifically, we wanted to explore possible characteristics and experiences during childhood and adolescence associated with dissatisfaction with dental care at age 23.

Materials and methods

Study design and sample

Respondents ($n = 968$) from a random sample of adolescents (original sample) surveyed at age 18 were resurveyed by post at age 23. The original sample consisted of 1119 individuals, and all the respondents from the 18-year-old survey (baseline) comprised the sample for the present study ($n = 968$). For further details see references (10, 15).

All the participants had been given free dental care in the Norwegian Public Dental Service from birth and up to age 18. At ages 19 and 20 they had been offered treatment at a subsidized rate, and then from age 21 they had to pay ordinary fee in the public or in the private dental service.

Measures

Baseline measures

The following data were available at baseline: (i) retrospective data collected from their dental records: caries experience (DMFT) at age 16, and (ii) survey data: dental anxiety [Dental Fear Survey (DFS) (16)], multiple fears [Geer Fear Scale (GFS) (17)], beliefs regarding the dentist [Dental Beliefs Survey (DBS) (18)], previous experiences of pain (never, ones, more than once) and dislike of the dentist (not at all, a little, much, very much). For further details, see references (15, 19).

Questionnaire at age 23

The following variables were included in the questionnaire: demographics (gender), occupation (education, job, workless, other, not specified), opinion about own dental health (excellent, very good, good, fair, poor), time since last dental appointment (less than 1, 1–2, 2–5 years and more than 5 years), usual source of care (do you have a dentist to go to if you need one?) (yes/no) and painful or unpleasant experiences last dental treatment session (not at all, insignificant, some, very much). In addition the following psychometric instruments were included: DSQ (9), DFS (16), DBS (18), and The (WHO) Five Scale Psychological General Well-Being Schedule (20) The DSQ measures overall satisfaction with dental care with 19, 5-point Likert type items (range 19–95). The different constructs of the scale are aggregated into three sub-scales: *pain management*, *quality and access* (2, 9, 10). The total sum-score form an overall dental satisfaction score were higher scores represent more satisfaction. The DFS intends to measure dental anxiety on a 5-point Likert scale (scores: 1–5), where the 20 items are aggregated into an overall score (range: 20–100) where higher scores represent higher dental anxiety. The DBS mainly assesses patients' beliefs of dentist's way of delivering care; measured on a 15-item Likert scale (scores: 1–5). The purpose of the DBS scale is thus to identify to what degree the patient perceives the interpersonal relationship as contributing to possible problems with dental care (21). A high DBS sum-score represents negative beliefs of the dentist.

Perceptions of general well-being are shown to be related to satisfaction, and may influence the patients self-reports (22). The (WHO) Five Scale Psychological General Well-Being Schedule (20) was therefore included. The scale intends to measure general well-being during the past 2 weeks, reflecting other aspects than just the absence of depressive symptoms (23). It consists of five items of positive well-being occurring in the Psychological Well-Being Scale (PGWB) and has been adopted by WHO as the five well-being index. The items are measured with a 6-point Likert format (range: 5–30), where a higher score represents greater problems. The scale is recommended for measuring the subjective quality of life dimension positive well-being (20).

The questionnaire instruments included are all pre-tested instruments with established reliability and validity (18, 20, 24, 25). The DSQ has recently been tested for reliability and validity in the same sample (10).

Statistical analyses

The data were analyzed using SPSS (version 11.0). Missing item scores were 'plugged' using the mean of the scores of the rest of the items. More than 20% missing item scores was the criterion for being excluded (no sum-score). The maximum of missed item scores was 15%. Differences between groups were analyzed with one-way ANOVA and chi-squared (cross-tabulation), and relationships between independent variables were analyzed with Pearson's correlations. Confidence intervals (95%) were calculated for differences in proportions. Multiple linear regression analyses were used to explore factors related to satisfaction with dental care, and logistic regression analyses were used to determine the individual associations for variables related to the two dependent variables *very satisfied* and *very dissatisfied* with dental care. The independent variables were dichotomized (0–1) with score 1 representing a hypothesized positive relationship to being very satisfied versus being very dissatisfied, with a DSQ sum-score of 1 SD or more above the mean versus 1 SD or more below the mean, as the criteria. Analogue analyses were used to determine the individual associations for the same independent variables related to each of the subscales of DSQ. 1 SD or more below the mean of the subscales were used as the criterion for being very dissatisfied with *pain management*, *quality and access*, respectively.

The reliability of the (WHO) Five Scale Psychological General Well-Being Schedule (20) in the present population was assessed by Cronbach's alpha.

Results

A total of 666 subjects completed and returned the questionnaire, a response rate of 68.8%.

More women responded than men, 74.6% versus 62.9% (95% CI for the difference in proportions: 10.7–13.7%).

A total of 48% were occupied with education, 40.2% of the men and 54.5% of the women (95% CI for the difference in proportions: 7.7–22.3%). Forty-two percent were employed, 3% were unemployed and 6% were occupied with anything else (not specified).

Satisfaction with dental care

The mean score of dental satisfaction was 60.6 (SD = 8.5). Men were more satisfied with dental care than women, 61.4 versus 59.9 (F (1, 653) = 4.6, $P < 0.05$). The gender difference was also significant for each of the original DSQ sub-scales (*pain management*, *quality and access*), that had recently been confirmed in the present population (For further details see reference (10)).

The mean single item scores are shown in Table 1. Women had significantly more negative opinion (less satisfied) to the following statements, compared with men: *The fees dentists charge are too high* (item 3), *Dentists always treat their patients with respect* (item 6), *Dentists always avoid unnecessary patient expenses* (item 10), *Dentists are not as thorough as they should be* (item 11), *Hours when you can get dental care are good for most people* (item 15) and *I am not concerned about feeling pain when I go for dental care* (item 19). Women had a more positive score than men of the item *I see the same dentist just about every time I go for dental care* (item 12).

Factors related to satisfaction with dental care

The results of the multivariate linear regression analyses are shown in Table 2. The following variables explained 57.5% of the variance of satisfaction with dental care at age 23: positive beliefs of the dentist (DBS), low/moderate dental anxiety, perception of having a dentist to go to, last treatment session not very painful/unpleasant, and gender (male).

Table 1. Mean Dental Satisfaction Questionnaire item scores for men and women

Items	Contents	Women	Men	*F*-value
1	There are things about the dental care I receive that could be better	2.36	2.32	0.47
2	Dentists are very careful to check everything when examining their patients	3.28	3.39	3.23
3	The fees dentists charge are too high	1.61	1.76	4.7*
4	Sometimes I avoid going to the dentist because it is so painful	4.15	4.29	2.67
5	People are usually kept waiting a long time when they are at the dentist's office	3.33	3.30	0.12
6	Dentists always treat their patients with respect	3.45	3.60	4.7*
7	There are enough dentists around here	3.62	3.62	0.00
8	Dentists should do more to reduce pain	2.88	2.90	0.11
9	Places where you can get dental care are very conveniently located	3.66	3.75	2.17
10	Dentists always avoid unnecessary patient expenses	2.76	2.92	7.2**
11	Dentists aren't as thorough as they should be	3.01	3.16	4.0*
12	I see the same dentist just about every time I go for dental care	3.64	3.30	11.0***
13	It's hard to get a dental appointment for dental care right away	2.94	2.93	0.06
14	Dentists are able to relieve or cure most dental problems that people have	3.73	3.83	3.53
15	Hours when you can get dental care are good for most people	2.94	3.12	5.7*
16	Dentists usually explain what they are going to do and how much it will cost before they begin treatment	2.86	2.98	2.06
17	Dentists should do more to keep people from having problems with their teeth	2.94	2.94	0.00
18	Dentists' offices are very modern and up to date	3.82	3.79	0.28
19	I am not concerned about feeling pain when I go for dental care	2.90	3.42	23.2***

Item no. in bold are reversed.
*$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

Table 2. Stepwise regression model of factors related to satisfaction with dental care for 23-year olds

Model	Variables included	Adjusted R^2	Standardized coefficients (β)	*F*-value	Significant
1	Beliefs of the dentist (DBS-23)	0.492	−0.519	604.56	0.000
2	Dental anxiety (DFS-23)	0.529	−0.166	349.95	0.000
3	Usual source of care	0.557	0.176	257.54	0.000
4	Pain last treatment session	0.567	−0.138	204.38	0.000
5	Gender	0.575	−0.099	169.50	0.000

Variables that did not enter the model (inclusion level = 0.05): Opinion of own dental health, Time since last dental appointment, Occupation at age 23 and General well-being

Very satisfied group

A total of 14.6% of the group was very satisfied with dental care (16.3% of men and 13.3% of the women). The gender difference was not statistically significant.

Factors related to very satisfied with dental care

A multivariate logistic regression analysis with very satisfied as the dependent variable showed the following associated variables: high DMFT (OR = 2.4) and previous experiences of pain only once or never (OR = 2.3) (Table 3). Table 3 also shows the distribution of subjects (percentage) with regard to the independent variables.

Very dissatisfied group

A total of 15.1% of the group was very dissatisfied with dental care, and more women were very dissatisfied than men, 18.8% versus 10.7% (95% CI for the difference = 2.8–13.4%).

Factors related to very dissatisfied with dental care

Table 4 shows that the following factors were associated with being very dissatisfied with dental care at age 23: low general well-being (OR = 2.9), previous experiences of pain (reported at age 18) (OR = 2.5) and dislike of the dentist (reported at age 18) (OR = 2.5). If the variable previous experiences of pain was not included as independent variable, dental anxiety came out with a significant association to the dependent variable very dissatisfied with dental care. Table 4 also shows the distribution of subjects (percentage) with regard to the independent variables.

The same analysis with the DSQ-subscale *pain management* as the dependent variable showed that the strongest association to being very dissatisfied with pain management at age 23 was high dental anxiety during adolescence (OR = 6.1), painful

Table 3. Multiple logistic regression model (enter) for factors (age 18) related to being very satisfied with dental care at age 23

Variables	*n*	% in the very satisfied group	*β*	Odds ratio	95% CI
Caries experience at age 16					
High (score 1)	103	19.4	0.856	2.4	1.21–4.57**
Low/moderate (score 0)	468	14.7			
Previous experiences of pain (12–18)					
Never or once (score 1)	387	16.5	0.820	2.3	1.05–4.92*
More than once (score 0)	159	6.3			
Gender					
Men (score 1)	301	16.3	0.377	1.5	0.84–2.54
Women (score 0)	362	13.3			
Negative beliefs of the dentist (DBS)					
Low/moderate (score 1)	485	14.8	1.055	2.9	0.63–13.04
High (score 0)	59	5.1			
Multiple fears (GFS)					
Low/moderate (score 1)	515	14.2	0.806	2.2	0.49–10.23
High (score 0)	31	6.5			
Occupation at age 18					
Not in school (score 1)	49	14.3	0.217	1.2	0.69–2.22
In school (score 0)	614	14.7			
General well-being					
High/moderate (score 1)	535	16.1	0.195	1.2	0.55–2.67
Low (score 0)	123	8.9			
Dental anxiety (DFS)					
Low/moderate (score 1)	450	15.4	0.177	1.1	0.37–3.84
High (score 0)	90	4.4			
Dislike the dentist					
No (score 1)	471	15.5	–	***	–
Yes (score 0)	52	0			

−2LL: 341.1.0; 85.0% correctly predicted; $P < 0.001$.
Nagelkerke's $R^2 = 0.12$.
*$P < 0.05$; **$P < 0.01$; *** no OR (lack of variation).

experiences during adolescence (OR = 2.5) and gender (women) (OR = 1.5).

Analyses with the subscale very dissatisfied with *access* to dental care as the dependent variable, showed that occupation reported at age18 (not in school) (OR = 6.1) had the strongest association to this variable.

For the subscale very dissatisfied with *quality* as the dependent variable, the strongest variables were low general well-being (OR = 3.5) and dislike of the dentist at age 18 (OR = 2.5).

General well-being

The mean sum-score for general well being was 13.9 (SD = 3.93), with no gender differences. The Cronbach's alpha coefficient for the overall construct of general well-being was 0.77 ($n = 658$).

Painful experiences

The correlation between previous experiences of pain (reported at age 18) and pain reported during last dental treatment (reported at age 23) was $r = 0.26$, $P < 0.01$, and these pain reports were correlated with the pain management sub-score of DSQ with $r = -0.29$, $P < 0.01$ and $r = -0.48$, $P < 0.01$, respectively.

A total of 6.7% reported last dental treatment session as being very painful or very unpleasant (age 23) (3.3% men and 10.2% women, 95% CI for the difference in proportions: 3.2–11.6%). Fifty percent of these subjects were very dissatisfied with dental care, compared with 12.5% for the rest of the group (95% CI for the difference in proportions: 22.5–52.5%) (Fig. 1). Forty-five percent of the group that reported last dental treatment as very painful/unpleasant also reported negative beliefs of the dentist (high DBS score) at age 23, compared with 14.0% for the rest of the group (95% CI for the difference in proportions: 16.2–55.2%).

Dental anxiety and beliefs of the dentist

The sum-scores (mean and SD) for DFS and DBS at ages 18 and 23 are presented in Table 5. The correlations between the dental anxiety scores at the ages 18 and 23 were for DFS and DBS, $r(531) = 0.74$, $P < 0.001$ and $r(541) = 0.48$, $P < 0.001$, respectively.

Table 4. Multiple logistic regression model (enter) for factors (age 18) related to being very dissatisfied with dental care at age 23

Variables	*n*	% in the very dissatisfied group	β	Odds ratio	95% CI
General well-being					
Low (score 1)	119	25.2	1.066	2.9	1.48–5.68**
High/moderate (score 0)	531	12.6			
Previous experiences of pain (12–18)					
More than once (score 1)	157	27.4	0.922	2.5	1.28–4.92**
Never or once (score 0)	382	9.2			
Dislike the dentist					
Yes (score 1)	74	33.8	1.006	2.7	1.15–6.49*
No (score 0)	442	6.1			
Occupation at age 18					
Not in school (score 1)	49	30.6	0.703	2.0	0.67–6.06
In school (score 0)	606	13.9			
Dental anxiety (DFS)					
High (score 1)	89	37.1	0.468	1.6	0.72–3.54
Low/moderate (score 0)	444	9.9			
Multiple fears (GFS)					
High (score 1)	31	22.6	0.420	1.5	0.51–4.52
Low/moderate (score 0)	508	14.0			
Gender					
Women (score 1)	357	18.8	0.377	1.5	0.75–2.83
Men (score 0)	298	10.7			
Caries experience at age16					
High (score 1)	102	17.6	0.206	1.2	0.57–2.65
Low/moderate (score 0)	463	13.2			
Negative beliefs of the dentist (DBS)					
High (score 1)	59	28.8	0.087	1.1	0.43–2.80
Low/moderate (score 0)	478	12.8			

−2LL: 285.0; 89.2% correctly predicted; $P < 0.001$.
Nagelkerke's $R^2 = 0.20$.
*$P < 0.05$; **$P < 0.01$.

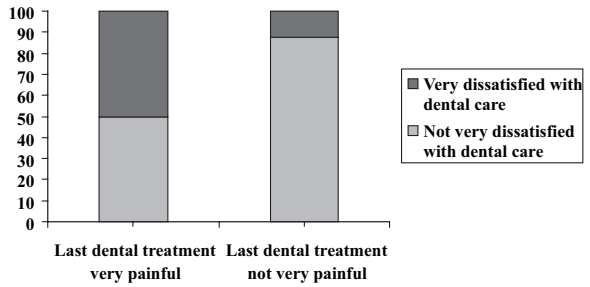

Fig. 1. Dissatisfaction with dental care according to self-reported pain/unpleasantness during last dental treatment for 23-year olds.

Discussion

Young adults in Norway are generally satisfied with dental care at age 23. This is in accordance with other surveys generally reporting high levels of patient satisfaction with health care (5). Measurements of satisfaction with care have often shown low discriminating qualities, based on lack of variation (5). In contrast, the present data are normally distributed, with 15% high scores and 15% low scores, enabling us to explore possible factors characterizing patients who are very satisfied, respectively very dissatisfied with the dental care they have received.

The complexity of the concept of satisfaction is indicated by the association found between low general well-being and being very dissatisfied with care, confirming that subjective negative self-reports may be influenced by quality of life aspects. However, not withstanding the influence of general well-being, the most important result of the present study from a perspective of a dentist, is the clear indication that aspects of a negative interpersonal relationship between the patient and the provider of care is of major importance for the group of young adults that are very dissatisfied with dental care at age 23. This is indicated by the variables painful experiences during adolescence and dislike of the dentist recorded at age 18 (Table 4), and again confirmed by the fact that positive beliefs of the dentist explained 49% of the variance of satisfaction with

Table 5. Prevalence of self-reported dental anxiety (Dental Fear Survey, DFS) and beliefs of the dentist (Dental Beliefs Survey, DBS) at age 18 and 23

	Whole group, Mean (SD)	Female, Mean (SD)	Male, Mean (SD)	
DFS (18)	43.0 (16.0)	44.7 (16.4)	40.8 (15.2)	$F(1, 540) = 8.19$, $P < 0.004$
DFS (23)	43.9 (16.4)	46.2 (17.2)	41.0 (14.9)	$F(1, 646) = 16.39$, $P < 0.000$
DBS (18)	33.8 (11.2)	32.3 (11.1)	33.9 (11.1)	NS
DBS (23)	33.0 (11.0)	32.4 (11.0)	33.7 (10.8)	NS

NS, not significant.

dental care in the analysis for the entire group (Table 2). The conclusion is additionally based on a number of circumstances.

In a previous study, the results of a factor analysis has indicated that the pain management sub-scale of the DSQ explained 24% of the total 52% explained variance of the entire scale in this population (10). Furthermore, satisfaction with pain management is shown to be only moderately correlated with pain intensity (26). The patients' subjective assessment of pain management may reflect the way the provider interacts with the patient (e.g. respect and concern). This is in accordance with the present results showing that only 50% of the subjects that reported last dental appointment as very painful/unpleasant were very dissatisfied with dental care (Fig. 1), and only 45% of the same group reported negative beliefs of the dentist. This may indicate that with a relationship perceived as positive, the patient's subjective experience and ability to tolerate pain may be quite different compared with a situation perceived as negative.

Another indirect indication of the importance of the patients' subjective assessment of pain management for satisfaction with dental care may be represented by the somewhat unexpected fact that high caries experience was associated with being very satisfied with dental care (Table 3), and not with very dissatisfied (Table 4). This is, however, in accordance with research showing that patient satisfaction is more determined by quality of life issues than by normative clinical measurements (26). The results may indicate that many treatment sessions with sufficient pain control during childhood and adolescence increases both the feeling of coping and confidence with the provider of care, and thus augments the degree of satisfaction at the age of 23.

The importance of the pain management dimension of satisfaction with dental care in this age group is not surprising. Our previous studies have shown the major importance of painful experiences for dental anxiety (27), dental avoidance (19) and dropout from dental care (10). Previous studies in the present population have shown a strong association between painful experiences and dental anxiety, and more anxiety for women compared with men (27). It is not surprising that women are reporting more pain, are less confident about being treated with respect, more concerned about painful treatment (Table 1) and less satisfied with dental care (Table 2) and pain management at age 23, compared with men.

The present results may also indicate that being very satisfied with dental care is mostly influenced by recent experiences (last treatment), while being very dissatisfied is more related to previous negative experiences (during childhood and adolescence). It cannot be precluded that previous negative beliefs of the dentist recorded at age 18 may have been modified since this age (e.g. in theory by a new dentist). However, two circumstances support the assumption that this is unlikely: Data gathered in a previous study in the same sample at age 20 shows that 81% of the patients continue to attend a public dental service (E. Skaret, unpubl. data). Also, the public dental service increasingly offers treatment to adult patients.

The perception of having a dentist to go to also appeared to have an influence on the patients' degree of satisfaction with dental care (Table 2). Access should not be a problem for this population since they have been offered completely or partially free care until age 21. The fact that they since then have had to take responsibility for themselves might nevertheless be interpreted as problematic in terms of both access and usual source of care. Perhaps the transition process ought to be started more gradually, at an earlier age, in order to make young patients more personally responsible for getting the care they need. A pilot intervention study among adolescents with dental avoidance behavior has indicated that credibility is increasing if feedback and advice are offered within the context of acknowledging the client's right to choose (28). The opportunity for adolescents to present their point of view and flexibility of dental providers to entertain individual differences may

represent another factor that may increase both the adolescents' perception of a positive relationship with the provider and satisfaction with care. There is, however, a need for more qualitative designs and more intervention studies to test these ideas.

Patient-based outcome measures may give important information in the evaluation of the dental care given to adolescents and young adults. However, it is generally difficult to translate the results of epidemiological research into clinical recommendations except on a group level. This equally applies to interpretation of results based on studying the individual importance of isolated factors by use of multivariate analyses (29). Such data, although statistically significant, only show weak associations and should not be over interpreted. Their importance lies in demonstrating associations and trends indicating the direction and nature of remedial measures best addressing the problem at hand. The present study, particularly indicating the importance of positive beliefs of the dentist and adequate pain control for satisfaction with dental care, may be a contribution in this direction.

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