

Dental anxiety and quality of life: the effect of dental treatment

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Abstract – Objective: The aim of the present study was to determine the association between dental anxiety and quality of life (QoL) and to test the hypothesis that treatment of highly anxious patients would significantly enhance QoL. **Material and methods:** Subjects were 35 highly anxious dental patients of a Dutch dental fear clinic who were assessed on dental trait anxiety (DAS and S-DAI) and QoL (oral health-related QoL with the use of OHIP-14, dental anxiety-related QoL with the SADAS, and general aspects of QoL using Global Assessment of Functioning, while five different aspects of life satisfaction were quantified on a VAS-scale) both prior to and after treatment (an average of six sessions of 45–60 minutes each). Also, both objective (DMFT and dentists' judgement) and subjective (patients' judgement) indices of oral health status were recorded. **Results:** Higher dental anxiety was significantly associated with lower OH-QoL as indexed by the OHIP-14 ($r = 0.51$ – 0.56 , $P < 0.01$). Treatment was associated with marked improvement on oral health status, reduction of dental anxiety, and improvements regarding a variety of aspects of QoL (all P s < 0.001). Reduction of dental anxiety, rather than improved oral health, was found to predict enhanced OH-QoL. **Conclusion:** The results underline the importance of applying effective treatment methods for dentally anxious patients, not only with the purpose to alleviate their dental anxiety and to improve their oral health, but also because it contributes to an enhancement of their QoL.

Key words: dental anxiety; oral health; quality of life

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Surveys among dental patients with an irrational or pathological level of dental anxiety show that this condition frequently leads to avoidance of dental care, resulting in a significant deterioration of oral health (1–3). It is assumed that poor oral health increases feelings of guilt, embarrassment and inferiority, thereby contributing to an increase in dental anxiety (1). Support for a relation between dental anxiety and negative affect comes from a Danish survey, showing that in 27 out of 30 dentally anxious patients, embarrassment was one of the major symptoms they experienced in daily life, causing inhibited smiling and reduced self-esteem (2). Support for a negative relationship between dental anxiety and daily functioning comes from a study by Locker (3), who found that dental anxiety has pervasive psychosocial consequences, involving psychological reactions, social

relationships and avoidance. Furthermore, a survey performed in Great Britain demonstrated that a higher level of dental anxiety was associated with a higher use of self-medication and appeared to have a profound negative effect on work and personal relationships (4). Thus, psychosocial problems caused by deterioration of the dentition may adversely affect people's general well-being and quality of life (QoL).

The concept of QoL refers to aspects of life that make life particularly fulfilling and worthwhile, and is both broad and multidimensional (5). It includes patients' subjective well-being and satisfaction, as well as daily functioning and impairment (6). Two types of QoL are distinguished: a general type and a health-related type. The general type, which involves the perception of various psycho-social aspects, has hardly been a focus of

study within the field of dentistry. In contrast, there is an increased interest within dentistry for the health-related type of QoL, which focuses on health-related physical, social, cognitive and emotional functioning. Oral health-related quality of life (OH-QoL) has been studied in different areas, including oral surgery, orthodontics and periodontology (7–9).

Also the relation between OH-QoL and dental anxiety has been explored. In a cross-sectional study involving a random probability sample of 3000 UK residents it was found that dental anxiety, albeit weakly, was negatively associated with OH-QoL ($r = -0.14$, $P < 0.001$) (10). A limitation of this study was the cross-sectional design, which makes interpretation in terms of the direction of the relationship impossible (11). In other words, it is unclear whether impaired OH-QoL adversely influences level of dental anxiety, or that dental anxiety causes impaired OH-QoL. Moreover, it is plausible that a poor clinical oral health status has a negative impact on both OH-QoL and severity of dental anxiety. To shed more light on this issue a longitudinal study may be more appropriate.

There is an increasing demand for treatments that demonstrably affect patients' functioning and well-being. However, although there is a wide array of studies showing that a combination of dental treatment and behavioral management are effective in alleviating dental trait anxiety, little is known as to what extent these treatment efforts also are effective in improving individuals' QoL. Therefore, the main aim of the present study was to determine the association between dental anxiety and quality of life (QoL) and to investigate changes in QoL. More specifically, it was hypothesized that after dental treatment patients' QoL would be enhanced. An additional aim was to determine the relative contribution of dental anxiety reduction and improved oral health to the variance in OH-QoL improvement.

Materials and methods

Subjects

Subjects were 35 adult patients (17 women and 18 men) of the dental fear clinic in the Centre for Special Dental Care within a general hospital (Medisch Centrum Alkmaar) in the Netherlands. The mean age of the patient sample was 34.1 years (range 18–55 years, $SD = 9.2$). Initially, at the time they sought treatment at the clinic, all patients

refused conventional dental treatment. They also met the DSM-IV criteria for specific phobia (i.e., dental phobia, American Psychiatric Association, 1994) and had a Dental Anxiety Scale (DAS) score of 15 or higher. Patients avoided dental treatment for 3–30 years (mean 12.1, $SD = 6.4$). Mean value of the Decayed Missing and Filled Teeth (DMFT)-index at the beginning of the study for the total sample was 19.1 ($SD = 5.3$), which is higher than among the Dutch national population, aged 25–44 ($M = 12.5$, $SD =$ not available) (12). The D/DMFT ratio was 0.52, meaning that decayed teeth contributed to 52% of the total DMFT.

Procedure

The research was approved by and carried out under the auspices of The Netherlands Institute for Dental Sciences (IOT). All patients attending the dental fear clinic during the recruitment phase (October 2005–March 2006) were asked to participate, and those who agreed to participate were enrolled consecutively. This was done at the first visit at the clinic, after an intake session lasting 45–60 minutes. If answered affirmative, consent was recorded. Two of the possible subjects refused to participate. This was due to embarrassment. Next, patients were asked to complete a series of questionnaires assessing dental anxiety, QoL and subjective oral health status. Further, the dentist assigned scores for current Global Assessment of Functioning (GAF), assessed the DMFT-index, took a photograph of the mouth and finally, recorded data on gender, age and country of birth.

With regard to dental treatment, all patients needed restorative or surgical dental treatment (e.g., fillings, root-canal treatments, extractions). These treatments were carried out using the application of behavioral management techniques and graded exposure *in vivo* to initiate desensitization of patients' anxiety-provoking stimuli ($n = 23$). When the dental status was too severe to complete oral rehabilitation within six sessions of 1 hour each, treatment under general anesthesia was offered prior to or after the use of behavioral management techniques ($n = 6$). When the oral health situation was so poor that only a complete denture could be made, no behavioral management techniques were applied ($n = 6$). When this group was offered the use of sedation, four patients preferred general anesthesia, and two nitrous oxide sedation and local anesthetics, because of the shorter waiting list for the latter. It should be noted that, because of insurance restrictions, all

rehabilitations were performed using conservative dentistry (composite restorations, endodontic treatment when necessary) and removable appliances. No crown- and bridgework was carried out.

Instruments

To assess *dental anxiety* two different self-report questionnaires were used: the Dutch version of the Dental Anxiety Scale (DAS) (13) and the Dutch Short version of the Dental Anxiety Inventory (S-DAI) (14). The DAS is a four-item scale measuring dental trait anxiety. It has been widely used in studies on dental anxiety (15). Responses are scored from 1 to 5, giving total scores ranging from 4 (not anxious at all) to 20 (extremely anxious). The S-DAI is a nine-item scale measuring dental anxiety. Responses are scored 1–5, giving total scores ranging from 9 (not anxious at all) to 45 (extremely anxious). Both questionnaires appeared to be reliable and sufficiently valid (16, 17). Cronbach's alpha in the current study for DAS and S-DAI were 0.86 and 0.73 respectively.

General Quality of life was assessed using a number of self-report instruments, including five different 100 mm Visual Analogue Scales (VAS-scales). Patients could indicate to what extent (1) their oral health status influenced their dental anxiety, (2) their oral health status determined their happiness (3), their oral health status determined their daily life (4), dental anxiety determined their happiness, and (5) dental anxiety influenced their daily life. General QoL was also captured by obtaining a GAF-score. The GAF is included in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) in the section on multi-axial assessments (18). The GAF score is widely used to assess overall psychosocial disability, with lower scores indicating greater inability of daily functioning. Based on an interview a GAF-score was assigned by the dentist using a 1–100 numerical scale ranging from 'superior functioning in daily life' (100) 'to total inability to function, or being seriously suicidal, or dangerous to other persons' (1). For training in the administration and scoring of the GAF the dentist completed an on-line GAF-assessment-training (<http://depts.washington.edu/washinst/Training/CGAS/Index.htm>) (19).

Oral health-related quality of life (OH-QoL) was assessed using the short version of the Oral Health Impact Profile (OHIP-14), which consists of 14 key questions pertaining to people's perceptions of the impact of oral conditions on their well-being.

Responses are scored 0–4, giving total scores ranging from 0 (no impact at all) to 56 (severe impact). Seven dimensions can be distinguished: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap (20). The questionnaire showed good reliability and validity (20, 21). The Dutch translation of the OHIP-14 that was used in this study is currently in a validation process. Cronbach's alpha of the OHIP-14 was 0.87 in the present study.

Dental anxiety-related QoL was indexed by the Social Attributes of Dental Anxiety Scale (SADAS; 22, 23), a 12-item scale measuring the impact of dental anxiety on psychological and social well-being. Responses are scored 1–5, giving total scores ranging from 12 (no impact at all) to 60 (severe impact). Cronbach's alpha was 0.86.

Oral health status was assessed both by the dentist and the patients themselves. The dentist used WHO criteria for decayed, missing and filled teeth; that is, for every patient the DMFT-index was calculated (24). The DMFT-score was recorded at the initial or second visit by using a mirror, light and compressed air. Additionally, an orthopantomogram was used and a photograph of the mouth was taken, of which both oral health condition and aesthetics was assessed by a panel of three dentists on a scale from 0 ('very poor') to 100 ('very good'). The recorded scores were the mean of the three individual scores. Inter-observer reliability was calculated using an intraclass correlation coefficient (ICC) (25). The ICCs (average value) for the three ratings of the series of photographs prior to and after treatment were 0.86 and 0.92 respectively for oral health condition and 0.88 and 0.89 for esthetics, which indicates a substantial concordance of ratings among the three dentists. Also, the patient was requested to rate his or her own oral health status on a VAS-scale from 0 ('very poor') to 100 ('very good').

Statistical analysis

Pearson's Product-Moment correlations were used to determine the degree of associations between the different variables. Paired sample *t*-tests were performed to detect statistical differences in means before and after treatment on the data in case of one group, whereas analysis of covariance (ANCOVA), with the appropriate pre-tests as covariates, were used to detect differences between the post-test scores in case of several groups. To be able to determine the variance of OH-QoL

accounted for by either reduction of dental anxiety or improvement of oral health status a series of linear regression analyses were performed. In addition, to derive an estimate about the size of the experimental effect for each pre- and post-test difference the standardized mean difference (Cohen's *d*, Hedges adjustment) was computed (26). Cohen defines effect sizes as small ($d = 0.20$), medium ($d = 0.50$), and large ($d = 0.80$). Sample size calculation suggested that the sample should consist of 26 participants to detect a large effect size ($d = 0.80$) with a power of 80% and a two-sided significance level of 5%. A smaller effect was considered to be of too little clinical importance. Given the number of tests for data measuring similar constructs, Bonferroni corrections were applied to reduce the likelihood of Type I errors. All statistical analyses were conducted using SPSS (version 14.0) software.

Results

Descriptive data and relationships among variables before treatment

The mean age of the recruited patients (18 male, 17 female) was 34.1 years (SD = 9.2). Mean years of avoidance was 12.1 (SD = 6.4). Independent *t*-tests indicated no differences between male and female patients. Correlations between oral health-related QoL (i.e., OHQoL; OHIP-14), general QoL (i.e., GAF-score), dental anxiety (DAS and S-DAI) and DMFT prior to treatment are displayed in Table 1.

It shows that OHIP-14 total score was significantly associated with both dental anxiety measures. Also oral health status as indexed by DMFT appeared to be significantly associated with dental anxiety and OH-QoL. Moreover, it was found that the ratings of the oral health condition of both dentists and patients were highly correlated ($r = 0.61$, $P = 0.001$). Further, both were significantly associated with OHIP-14 total scores ($r = -0.46$, $P = 0.005$ and $r = -0.52$, $P = 0.001$, respectively), DAS score ($r = -0.37$, $P = 0.005$ and $r = -0.60$, $P < 0.001$, respectively), and S-DAI scores ($r = -0.31$, $P = 0.010$ and $r = -0.51$, $P = 0.005$, respectively). The correlations between both oral health ratings and DMFT were also significant ($r = -0.67$, $P < 0.001$ and $r = -0.63$, $P < 0.001$, respectively).

Changes in dental anxiety, oral health status, and aesthetics associated with treatment

The mean number of sessions (45–60 minutes each) was (M = 5.9, SD = 1.4). In Table 2, the mean scores of the DAS, S-DAI, and oral health ratings of the dentists and the patients, as well as dentists' judgement about esthetics, before and after treatment, are shown. Changes in DMFT were not calculated as this index is not sensitive to changes because of treatment. Separate analyses of covariance (ANCOVA) with the appropriate pre-tests scores as covariates showed that there were no statistical differences between the post-test scores of patients treated with use of behavioral management strategies ($n = 29$) and those who did not

Table 1. Correlations between oral health-related quality of life (OH-QoL), general QoL, dental anxiety and DMFT prior to treatment ($n = 35$)

	OHIP-total	GAF	DAS	S-DAI	DMFT
OHIP-dimensions					
Functional limitation	0.54**	0.41	0.12	0.21	0.44**
Physical pain	0.62**	-0.01	0.40*	0.27	0.38*
Psychological discomfort	0.65**	-0.29	0.65**	0.51**	0.55**
Physical disability	0.66**	-0.14	0.41*	0.34*	0.30
Psychological disability	0.82**	-0.32	0.47**	0.45**	0.56**
Social disability	0.78**	-0.20	0.27	0.35*	0.38*
Handicap	0.78**	-0.26	0.39	0.42*	0.33
OHIP-total	-	-0.24	0.56**	0.51**	0.59**
GAF	-0.24	-	-0.19	-0.17	-0.03
DAS	0.56**	-0.19	-	0.77**	0.43**
S-DAI	0.51**	-0.17	0.77**	-	0.39*
DMFT	0.59**	-0.03	0.43**	0.39*	-

OHIP, Oral Health Impact Profile; GAF, Global Assessment of Functioning; DAS, Dental Anxiety Scale; S-DAI, Short version of the Dental Anxiety Inventory; DMFT, index of Decayed Missing and Filled Teeth.

*, $P < 0.05$.

** , $P < 0.01$.

Table 2. Before and after treatment means, standard deviations (SD), paired *t*-test results and effect-sizes (Cohen's *d*) of DAS, S-DAI, oral health status (patient and dentist rating) and aesthetics (dentist rating) (*n* = 33)

	Before		After		<i>t</i>	<i>P</i>	Cohen's <i>d</i> (adj.)
	Mean	SD	Mean	SD			
DAS (4–20)	17.39	2.61	12.55	3.71	8.59	<0.001	1.49
S-DAI (9–45)	40.42	4.32	30.70	6.14	9.18	<0.001	1.81
Oral health status (patient rating, VAS-scale 0–100)	38.79	25.98	72.97	14.24	-6.49	<0.001	1.61
Oral health status (dentist rating, VAS-scale 0–100)	38.11	19.33	73.38	18.17	-6.94	<0.001	1.85
Aesthetics (dentist rating, VAS-scale 0–100)	35.94	19.91	72.10	19.10	-7.78	<0.001	1.83

DAS, Dental Anxiety Scale; S-DAI, Short version of the Dental Anxiety Inventory.

receive behavioral interventions (*n* = 6) with regard to dental anxiety (both S-DAI and DAS), oral health ratings (of both dentists and patients), and aesthetics (dentists' ratings). A similar analysis comparing patients who underwent dental treatment using nitrous oxide sedation or general anesthetics (*n* = 12), and those who underwent dental treatment without use of pharmacological agents (*n* = 23), also failed to reveal significant effects. Accordingly, for further analyses the groups were combined. As can be seen in Table 2

there were marked changes in dental anxiety, oral health status, and esthetics on all indices after treatment.

Changes in QoL associated with treatment in a sample of highly anxious patients

Next, the data concerning QoL were analyzed. The results are shown in Table 3 (general QoL: VAS ratings, GAF and SA-DAS) and Table 4 (OH-QoL) and clearly show that patients significantly improved on all aspects of QoL after treatment.

Table 3. General quality of life measures before and after treatment, paired *t*-test results and effect-sizes (Cohen's *d*) (*n* = 33)

	Before		After		<i>t</i>	<i>P</i>	Cohen's <i>d</i> (adjusted)
	Mean	SD	Mean	SD			
VAS-scales (0–100)							
Influence of anxiety on oral health status	54.36	27.65	37.42	16.82	3.76	0.001	0.73
Influence of anxiety on happiness	82.97	14.48	71.56	12.56	3.67	0.001	0.83
Influence of anxiety on daily life	55.00	24.96	34.39	16.13	5.02	<0.001	0.97
Influence of oral health status on happiness	54.15	21.70	35.61	25.99	4.11	<0.001	0.77
Influence of oral health status on daily life	61.88	21.64	31.67	15.86	6.39	<0.001	1.57
GAF (1–100)	74.85	8.88	78.30	7.97	-3.11	<0.005	0.40
SADAS (12–60)	30.64	8.42	23.00	5.45	5.71	<0.001	1.06

VAS, Visual Analogue Scale; GAF, Global Assessment of Functioning; SADAS, Social Attributes of Dental Anxiety Scale.

Table 4. Oral health-related quality of life (OH-QoL) item-scores before and after treatment, paired *t*-test results and effect-sizes (Cohen's *d*) (*n* = 33)

	Before		After		<i>t</i>	<i>P</i>	Cohen's <i>d</i> (adjusted)
	Mean	SD	Mean	SD			
OHIP dimensions							
Functional limitation (0–4)	1.94	0.85	1.34	0.89	5.42	<0.001	0.68
Physical pain (0–4)	2.77	1.75	0.94	0.96	6.68	<0.001	1.28
Psychological discomfort (0–4)	3.01	0.88	1.76	0.70	7.72	<0.001	1.55
Physical disability (0–4)	2.33	0.82	1.25	1.02	5.18	<0.001	1.15
Psychological disability (0–4)	2.74	1.08	1.50	0.93	5.48	<0.001	1.21
Social disability (0–4)	2.34	1.05	1.12	1.06	5.40	<0.001	1.14
Handicap (0–4)	2.07	1.15	1.08	1.08	5.45	<0.001	0.88
OHIP total score (0–56)	32.21	10.40	18.82	7.94	8.01	<0.001	1.43

OHIP, Oral Health Impact Profile.

Except for GAF, all items, general QoL, as well as OH-QoL, showed large effect sizes.

Relative contribution of dental anxiety reduction and improved oral health to the variance in OHQoL improvement

To determine to what extent the improvement of quality of life was associated with a reduction of anxiety and/or an improved oral health condition a series of linear regression analyses was performed with improvement of OH-QoL (as indexed by OHIP-14 change scores) as dependent variable, and dental anxiety (DAS and S-DAI) change scores and improvement of oral health (as rated by the dentist and by the patient) as predictor variables. It appeared that in all of these four analyses using a different combination of both predictor variables, dental anxiety reduction was found to be significantly associated with improvement of OH-QoL, while improvement of oral health was not. The total amount of variance explained depended on the combination of predictor variables being used and ranged from 27% (with DAS reduction and improvement of oral health as rated by the dentist as predictor variables: $\beta = 0.59$, $P = 0.006$ and $\beta = 0.04$, $P = \text{ns}$, respectively) to 35% (with S-DAI reduction and improvement of oral health as rated by the patient: $\beta = 0.57$, $P = 0.001$ and $\beta = -0.11$, $P = \text{ns}$, respectively).

Discussion

Dental anxiety and QoL are both issues of central importance in dental care. Dental anxiety has proven to be a major barrier to access and the provision of appropriate dental care, while QoL becomes of growing importance when trying to understand the impact of dental problems, and the effectiveness of interventions, upon patients' well-being. The results of the present study highlight the importance of dental anxiety in relation to QoL. Dental anxiety appeared to be significantly correlated with the impact of oral health on QoL, or OH-QoL. This finding largely concurs with the results of a national representative sample of the UK population (10), although in that study, a much lower correlation coefficient was found than in the present study. This difference may best be explained by the level of deterioration of the dentition among the present sample of patients who avoided dental treatment for an average of 12 years. The finding that OHQoL was found to be

significantly associated with general QoL as indexed by GAF-scores is in accordance with studies showing that OH-QoL is associated with general, nondisease-specific instruments for describing and valuing health-related QoL, such as the Short Form Health Survey, SF-36 (27, 28).

The impact of anxiety on daily living when patients applied for treatment appeared to be considerable. All patients indicated that their anxiety affected their life quality in one way or another. The results further showed that dental anxiety had more impact on their sense of happiness than oral health did, with a mean score of 83 on a scale ranging from 0 to 100. This is in line with research on other types of anxiety disorders, which portray an almost uniform picture of anxiety disorders as illnesses that markedly compromise quality of life and psychosocial functioning (29). To this end, it is not likely that pathological forms of dental anxiety are an exception. The present findings suggest that for the majority of these patients, who have been avoiding dental care for a long period of time, besides the apparent functional impairments (e.g., poor oral health and endurance of dental abscesses), psychological and social dimensions of their anxiety problem (e.g., uncertainty, fear of confrontations with treatment and pain, as well as embarrassment about missing, or damaged teeth) have profound effects on their QoL (2). This is further underscored by findings within the dental context showing that the participants of the present study encountered more problems affecting daily living than for example those suffering from severe periodontal attachment loss, and patients undergoing surgical removal of a third molar (7, 9).

The results of this study demonstrate substantial differences between pre- and post-test measures on oral health, dental anxiety and QoL. The notion that, after a long period of avoidance, treatment has a positive effect on patients' oral health may not be that surprising, yet, there are not many studies showing such an improvement. One of the few exceptions is a long-term prospective study with a sample of 29 highly anxious dental patients showing a substantial general improvement in oral health over a 10-years period (30). Furthermore, most patients exhibited a clear reduction of their long-standing dental anxiety. The size of this reduction was comparable to those of earlier studies among highly anxious dental patients in which also both the DAS and the S-DAI were used (31). Conversely, as far as we are aware, regarding

the treatment of highly anxious dental patients, there have not yet been empirical attempts to determine whether after treatment also patients' QoL would be enhanced. The results of the present study provide strong support for this assertion as considerable improvement was achieved and the scores of all QoL-indices pointed in the same direction.

An important issue relates to the question concerning the source of the improvement of QoL. Quite to our surprise it was found that elevated scores on the various dimensions of OH-QoL, rather than by an improved oral health condition, could mainly be accounted for by reduction of the severity of dental anxiety. It appeared that depending on the measure of dental anxiety approximately one third of the variance in OH-QoL could be explained by dental anxiety reduction.

A number of issues are relevant to the clinical implications of the current study. First, although the results seem robust, it should be noted that the post-treatment scores were taken approximately 2 weeks after the end of treatment and one should take into account a possible relapse. Hence, it would be interesting to conduct a follow-up study 1 year after treatment. Second, this study involved a relatively small sample of dentally anxious individuals attending a specialized centre of dental care. Findings, therefore, may not generalize to the entire population of individuals with dental anxiety who seek help for their problems. Probably, only a limited proportion of them will be able to find a dentist with special training to provide dental care combined with a behavior management approach. Thus, care carried out within other settings, like the general dental practice, may lead to smaller effects on patients' dental trait anxiety or QoL. In addition, the small sample size might introduce insufficient power to detect medium to small effects. Third, it should be noted that, although the reliability of the OHIP-14 version as used in the present study seems acceptable, a Dutch version has not been validated. Therefore, the results warrant replication with use of validated versions of measures tapping both health-related type QoL and general QoL, such as the SF-36. On the other hand, a significant strength of the study is its use of multiple measures and the prospective design.

In conclusion, the present findings support the hypothesis that dental anxiety and QoL are negatively correlated and that treatment of anxious patients not only is effective in terms of alleviating

dental trait anxiety and improving oral health, but also that it can lead to substantial improvements concerning various aspects of patients' QoL. The finding that reduction of dental anxiety rather than improved oral health contributed to enhanced QoL may have significant clinical implications. This suggests that it is important that the treatment of dentally anxious patients should be focused on reduction of dental anxiety and not only be aimed to make dental treatment possible, for example by applying a pure pharmacological approach (32). Given the high prevalence rates of dental anxiety in western countries, and the variety of evidence-based treatment approaches available for alleviating patients' dental fears (32, 33), there lies a great opportunity for our dental health care system to deliver a positive contribution to many peoples' QoL, both inside and outside of the dental setting.

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