Assessment of patients with phobic dental anxiety

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This study investigated a screening procedure for psychologic distress in adult patients with dental phobia
before treatment of dental fear. The screening procedure was performed among 191 individuals in
consecutive steps and included a medical/dental history, psychologic interviewing, and testing. Data
collected during this process were analyzed and compared with SCL-90(R) data. The screening process
was successful in selecting individuals without major psychologic distress problems. Among the excluded
patients 91% had general symptoms scores on the SCL-90(R) exceeding a normative population mean,
and 95% of included patients had a mean lower than an average for psychiatric outpatients. There were
statistically significant differences between included and excluded patients on all subdimensions of the
SCL-90. Thus, excluded patients had higher levels of psychologic distress, poorer psychosocial back-
ground, and more psychosomatic symptoms. This was accompanied by higher levels of negative attitudes
toward dentists and their performance of dentistry, whereas no significant differences were found among
the dental fear measures used. □ *Behavior; dental anxiety; negative attitudes; psychologic distress; psychometrics*

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Dental fear has previously often been regarded as a unitary phenomenon. This view has been influenced by Mowrer's two-stage theory of fear and avoidance (1), which was later elaborated by Wolpe (2) and Eysenck & Rachman (3). However, empirical findings seem to contradict simplistic views of the etiology of dental fear (4, 5). In accordance with theories of general fears and phobias put forward by several researchers (6–9), our research has shown that the acquisition of dental anxiety in many cases may be due to either previous traumatic experiences or to social-learning modeling of fearful behaviors (4, 10, 11). In addition, concomitant general anxiety and other emotional reactions may be present (4, 5).

According to Wolpe (12), the two basic modes—classical autonomic conditioning and cognitive learning—determine the stimulus-response structure of fears. Reported clinical diagnostic systems for differential diagnosis of dental fear mainly seem to agree with this view (4, 5, 13). In addition, these systems most often identify clinical groups of individuals with psychiatric conditions, complicating general anxiety and feelings of lack of control and distrust of the dentist. Still, it has been pointed out that also in individuals with general-ized emotional reactions, the dental fear reaction often is conditioned or cognitively learned in its basic structure (12, 14).

In an attempt to relate the etiologic factors associated with the development and maintenance of dental fear to the most appropriate therapeutic modality for various types of fearful individuals, we have started a series of studies among adults with dental phobia at a specialized dental fear clinic. To increase the generalizability of our results to general dental patients, a screening procedure was included to select cases without major psychologic distress and pathologic conditions for these studies. The aim of the present study was to analyze the screening process and to investigate questionnaire and interview background data on dental fear in relation to general psychopathologic traits in subgroups of patients with a low level of psychopathology (included in the experi-mental study) and higher levels of psychopathology (excluded).

Materials and methods

Patients and procedures

The subjects of the present investigation were 191 adult patients applying for treatment of severe dental anxiety at the specialized Dental Fear Research and Treatment Clinic (DFRTC) at the Faculty of Odontol-ogy, Göteborg University, Sweden. Patients were either referred from dental or medical institutions (56 patients; 29%) or self-referred via contacts made directly with the DFRTC by the patient or by relatives and friends (135; 71%). The research staff included one treatment team and one analysis team.

A screening process containing several steps was performed. The first step constituted separate intake interviews performed by a dentist and a clinical psychologist in the treatment team. The patients first saw the dentist for a 30-min interview including dental/ medical history and were offered participation in the research project. These interviews only allowed inclu-sion of patients who refused conventional dental treat-

ment, had an estimated need of a minimum of two restorations, and who were willing to enter the research project. To reach high generalizability to ordinary dental patients, individuals whose medical history showed present psychiatric conditions and treatments were excluded. Patients who did not meet the inclusion criteria were treated for dental fear in accordance with a clinic routine. At a second visit patients screened by the dentist saw the psychologist for a 1½-h visit, which included a number of questionnaires (see below) and a structured interview of dental fear and general psycho-social status. In subsequent visits (not reported here) the selected research patients were examined in a modified dental examination including roentgenograms. The project also included registration of physiologic factors and a comparison of different treatment modalities (not reported).

Instruments

Verbal questionnaires and a structured interview investigated background data including subjective health status, dental anxiety, general anxiety and fearfulness, and aspects of mood and depression.

Background. The investigated variables were sex, age, marital status, education, and years since last regular dental visit. In addition, a variable of 'summed signs of distress' based on the medical history was created. This variable included dichotomized presence of chronic pain other than dental pain, stomach problems, sleeping disturbances, psychiatric treatment, psychopharmacologic medications, and abuse of drugs and alcohol. The variable totaled 0 to 6. Number of days on sickleave during the past 12 months was also scored. In addition, several aspects of dental fear reactions were captured in the interview. In the present investigation present and previous dental contacts, self-reported origin of dental anxiety, and ranking of positive and negative dentist characteristics were investigated.

Dental anxiety. The aspect dental fear and anxiety was assessed with three well-established scales, the Dental Anxiety Scale, DAS (15, 16), the Dental Fear Survey, DFS (17, 18), and the Dental Beliefs Survey, DBS (13). The four-item DAS assesses dental anxiety traits from 4 (no fear) to 20 (extreme fear). The DFS consists of 20 items and varies from 20 to 100. Getz's DBS with 15 items explores patients' confidence in the dentist–patient interaction on a scale from 15 (highly positive beliefs) to 75 (highly negative beliefs).

In two separate questionnaires the patient was asked

they could endure dental treatments. On the basis of research by Gale (19) and Gauthier et al. (20) each patient was asked to indicate which items on a list of 17 consecutive and specific situations before and during dental treatment they thought they would be able to endure today (subjective behavioral approach test, BAT). In the present analysis these data were presented as a sum of sequential treatment situations that the patient believed he or she could presently cope with. Thus, a scale from 0 (cannot cope with anything) to 17 (can cope with all suggested dental treatment situations) was formed.

General psychopathology. Psychologic distress was investigated with the Symptom Checklist 90 (Revised), SCL-90(R) questionnaire (21). With the SCL-90 a clinical profile was derived on the basis of nine subscales, and global scores were computed in a General Symptom Index (GSI), a Positive Symptom Total (PST), and a Positive Symptom Distress Index (PSDI). The nine subdimensions were Somatization, Obsession-compulsion, Interpersonal sensitivity, Depression, Anxiety, Hostility, Phobic anxiety, Paranoid ideation, and Psychoticism. These scales have been validated in numerous studies and have been used in dentistry in conjunction with craniomandibular pain (22) and dental fear (23). However, no Swedish normative studies are known to us.

Statistical methods

Data were analyzed with simple descriptive statistics, and differences between groups were tested for statistical significance with one-way analysis of variance (including Tukey's test for multiple comparisons), Student's t test and chi-square methods including Fisher's exact test. An analysis using the Spearman rank correlation test analyzed relationships between variables.

Results

The screening procedure excluded 45 and 33 individuals in 2 steps, whereas 113 (59%) were included in an ongoing series of treatment studies (Table 1). At screening 1 (with the dentist) the main reason for exclusion was 'no show' (28 individuals) and 'not willing to enter research project' (9). Additional reasons were 'ongoing psychiatric treatment' (2), 'health problems interfering with dental treatment' (3), and 'lack of finances' (3). At

Table 1. Background data among 191 dental phobia patients. Forty-five individuals excluded at screening (dentist) did not leave complete data. Significant differences between groups are indicated by asterisks

	Excluded at screening 1, $n = 45$	Excluded at screening 2, $n = 33$	Included, $n = 113$	P
Mean age (s)	29.5 (6.6)	34.9 (9.1)	32.8 (9.5)	*
Gender				
Men	12	9	29	
Women	33	24	84	
Marital status				
Married		14	72	
Single		19	41	*
Education				
Elementary		9	41	
High-school		17	47	
College/university		7	24	
Summed signs of distress				
0–1		6	68	
2–3		14	36	
4–6		13	9	***
Sickleave (days last year)				
0		5	17	
1–15		9	40	
16–30		1	12	
31–		12	30	
Not qualified (students, housewives, etc.)		6	14	

* $P < 0.05$; *** $P < 0.001$; s = standard deviation.

reported abuse problems, and 10 psychiatric treatments for general anxiety, panic disorders, and depression. One patient was currently in therapy for an eating disorder.

Only limited data can be reported from individuals excluded at screening 1, due to the circumscribed data from the clinical interview with the dentist preceding the start of the research protocol. These patients were younger but did not differ from the other groups with regard to sex or dental anxiety scores. However, patients excluded at screening 1 more often rated the positive dentist characteristic 'understanding, takes time to listen' and the negative characteristic 'heavy-handed' as important as compared with patients excluded at screening 2, whereas 'distant, inconsiderate' was rated significantly less important (Table 2). In addition, patients excluded at screening 2 significantly more often than included patients conceived negatively of a 'distant, inconsiderate' or a 'busy' dentist. These patients also significantly less frequently than included patients rated 'heavy-handed' or being 'critical of patient' as the most negative dentist characteristics (Table 2).

Data available from patients attending screening 2 showed that excluded patients more often were single and, not surprisingly, had a higher level of psychosomatic symptoms. However, this was not paralleled by more sickleave days (Table 1). Both excluded and included patients had a substantial period of avoidance time (on average, 11.6 and 9.3 years, respectively). An equal proportion (31%) reported regular dental contacts in spite of their fear of treatment (Table 2). With regard

to the origin of their dental fear, more excluded individuals reported being unaware of any reason for their fear (18% as compared with 3%), whereas both groups mostly related their dental fear to specific treatment situations (52% and 61%). No systematic differences were found with regard to any of the dental anxiety measures (Table 2).

SCL-90 data from patients still left in the treatment study after screening 2 showed levels mostly well within reported normal ranges for healthy populations. Thus, the overall score level was low, mostly showing an average score below 1 among either of the SCL-90 subscales. Systematic differences were, however, found between groups, with consistently higher scores among excluded individuals (Table 3).

In a Spearman correlation analysis of the SCL-90 global indices and subscales related to background and psychometric variables, only weak relationships were found, with the exception of the correlations between the summed signs of distress variable and all SCL-90 dimensions. Not surprisingly, the highest correlation coefficient was found with regard to the somatization subscale. It was also shown that high SCL-90 scores significantly, but not very strongly, correlated with the patients' aspects of dentists' behaviors and attributes (DBS and DA). Thus, negative beliefs (high DBS scores) correlated significantly with the 'depression' and 'hostility' dimensions of the SCL-90.

The screening process was analyzed by using a successively increasing level of scores on the GSI scale of the SCL-90 (Table 4). Since relevant Swedish normative data are lacking, we used the means of Derogatis et

Table 2. Dental history and questionnaire data among 191 dental phobia patients. Individuals excluded at screening 1 (dentist) did not leave complete data. Significant differences between groups are indicated by asterisks

	Excluded at screening 1 n = 45		Excluded at screening 2 n = 33		Included n = 113
Years since last treatment (s)			11.6 (7.5)		9.3 (11.8)
Regular dental contacts (%)			31		31
Origin of dental anxiety (%)					
Specific situation			52		61
Always been fearful			30		36
Don't know			18		3
Most positive dentist characteristics (% yes)					
Understanding, takes time to listen	61	*	52		60
Tries to avoid pain	56		37		46
Calm, friendly, caring	26		40		31
Skillful, competent	21		43		30
Explains treatment	31		25		34
Most negative dentist characteristics (%)					
Heavy-handed	61	**	28	*	50
Busy, rushes treatment	49		70	*	45
Critical of patient	45		28	**	55
Distant, inconsiderate	42	*	70	*	45
DAS scores (s)	17.0 (2.1)		17.0 (2.2)		17.4 (2.2)
DFS scores (s)	79.0 (10.7)		78.5 (15.3)		79.2 (11.1)
DBS scores (s)	40.6 (13.2)		37.4 (13.5)		39.3 (14.1)
BAT scores (s)			6.4 (4.9)		8.0 (3.0)

** $P < 0.01$; * $P < 0.05$; s = standard deviation.

Table 3. SCL-90 profiles of patients (means and standard deviation, s). Individuals excluded at screening 1 (dentist) did not answer the SCL-90. Significant differences between groups are indicated by asterisks

	Excluded at screening 1, n = 45	Excluded at screening 2, n = 33		Included, n = 113		
		Mean	s	Mean	s	P
Global scales						
GSI		1.0	0.6	0.5	0.4	***
PST		45.2	19.0	26.2	18.4	***
PSDI		2.0	0.6	1.5	0.4	***
Individual subscales						
Somatization		1.3	0.8	0.6	0.6	***
Obsession		1.1	0.7	0.6	0.6	***
Interpersonal sensitivity		1.1	0.8	0.4	0.5	***
Depression		1.2	0.9	0.6	0.6	***
Anxiety		1.4	0.8	0.6	0.6	***
Hostility		0.8	0.7	0.5	0.5	*
Phobic anxiety		0.7	0.7	0.3	0.6	**
Paranoid ideation		0.8	0.7	0.3	0.4	***
Psychoticism		0.5	0.4	0.1	0.3	***

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

al. (21) for 'non-patient normals' and 'psychiatric out-patients' for comparisons. A differentiation of patients on the basis of a GSI score of 0.31 (mean for 'non-patient normals') showed that 30 of 33 (91%) excluded individuals were above this score. The included patients were differentiated into 63 above and 50 below this population mean score. The population mean for 'psychiatric outpatients' (a score of 1.26) of Derogatis et al. (21) showed corresponding frequencies of 15 of 33 excluded individuals with GSI scores higher than and 107 of 113 (95%) included patients with scores lower than 1.26. In conclusion, three excluded patients had

GSI means equal to or lower than non-patient normals, whereas six included patients had GSI means equal to or higher than those of psychiatric outpatients (Table 4). The former three patients had been excluded because of language problems, drug abuse, and obvious psychologic problems detected in other diagnostic evaluations but for unknown reasons not in the SCL-90. The six included with high GSI scores also had, in addition to significantly higher scores on other SCL-90 global scales and subscales, increased levels on the dental fear measures and longer avoidance time than the other included patients. Their background data showed lower

Table 4. Frequency of patients included and excluded after the completed screening procedure differentiated in accordance with Derogatis et al. (19) SCL-90 Global Symptoms Index (GSI) population means of non-patient normals (GSI = 0.31) and psychiatric outpatients (GSI = 1.26)

	Excluded	Included	Total
Non-patient normals			
GSI < 0.31	3	50	53
GSI > 0.31	30	63	93
Total	33	113	146
Psychiatric outpatients			
GSI < 1.26	18	107	125
GSI > 1.26	15	6	21
Total	33	113	146

education and more frequent dental fear among family members. However evident, none of these differences were statistically significant. The only variables showing statistically significant differences from other included patients were a higher total signs of distress score (3.5, as compared with 1.3; chi-square = 25.8; $P < 0.001$) and a higher importance rating given to the positive dentist attribute 'calm, friendly, caring' (five of six individuals rated this attribute as important compared with 27 of 100 among other included patients (Fisher's exact test; $P = 0.009$).

Discussion

Most researchers agree with a multifactorial etiology of dental fear. This presents at its extremes as an autonomically conditioned or a cognitively learned reaction, in contrast to a manifestation of an increased level of psychopathology, which includes general anxiety, mood changes and, sometimes, multiphobic reactions and widespread fear behaviors (4, 24–26). The present study is part of a series of studies of etiologic factors associated with the development and maintenance of dental fear and how they relate to different therapeutic modalities for various types of fearful individuals. To increase the generalizability of our results to the majority of anxious dental patients, who usually do not show high degrees of psychopathology, the present investigation reports on the screening of patients with regard to high or low levels of psychosocial or psychiatric conditions and psychologic distress. Only individuals with specific dental anxiety and avoidance problems without major psychopathology were included in future treatment studies.

In conclusion, it was shown that the excluded patients' higher levels of psychologic problems and poorer psychosocial background were in particular evident and statistically significant with regard to marital status and the summed signs of distress. There were statistically significant differences between included and excluded patients on all global indices and

subscales of the SCL-90(R). This was accompanied by higher levels of negative attitudes toward dentists and their performance of dentistry, whereas no significant differences were found among the dental fear measures used. In addition, average time of avoidance of dentistry and reported origin of dental fear were not significantly different. Thus, it seems that, although parallel in assessed severity, dental fear may have different features in these groups. General emotional distress seemed to make patients sensitive to the interaction with the dentist and may make these patients particularly vulnerable to dentist behaviors. This has previously been discussed by us and others (4, 5, 27).

Thus, the included group of dental phobiacs may differ from other clinical populations of odontophobiacs and, if so, may more closely reflect a dental anxiety reaction approximating that of anxious patients in a general dental practice. This was our intention, and the performed screening and selection was supported by similarities with a recent Danish epidemiologic study of dental-fearing adults (28). The present SCL-90 data also very closely corroborate the results from a follow-up study of treatment success among dental phobiacs in Israel (23). In the Israeli study patients who failed in treatment showed increased values on global SCL-90 scales very similar to excluded patients in the present study (GSI, 1.1 as compared with 1.0; PST, 47.6 versus 45.2; and PSDI, 2.0 versus 1.5). Also with regard to individual subscales there was a high resemblance in scores. Thus, those scales varied between mean scores of 1.4 ('Interpersonal sensitivity') and 0.7 ('Phobic anxiety') in the Kleinhauz study (23) as compared with 1.4 ('Anxiety') and 0.5 ('Psychoticism') in the present study. Both studies compare well with the average global and primary symptom dimension scores presented by Derogatis et al. (21). Among psychiatric and adolescent outpatients the GSI, PST, and PSDI were reported at 1.3 versus 0.9, 50.2 versus 40.5, and 2.1 versus 1.8, respectively, whereas non-patients scored 0.3, 19.3, and 1.3, respectively. Compared with the latter, our group of included patients showed a somewhat increased level of pathology, but still significantly lower than the outpatient groups discussed by Derogatis (21).

There is, unfortunately, still a lack of Swedish normatives for the SCL-90(R), but our results among included patients seem to agree with other Swedish studies of non-psychiatric clienteles (29, 30), whereas excluded patients compare with data from patients with panic disorders and depression (31).

Kleinhauz et al. (23) and our previous studies (4, 11) have shown that the initial dental fear seemed to be only weakly related to patients' general emotional reactions and to be less important as predictor of treatment outcome. In the present study, this was further supported by the finding that none of the dental fear background variables or dental anxiety measures differed among included or excluded patients. However, correlation analysis showed differences in attitudes

to dentists and their performance of dentistry, indicating a relationship between higher general emotional distress and more negative attitudes.

The analysis of the diagnostic ability of our screening process indicated that we had been fairly successful. Among all individuals only three seemed to be excluded in spite of low SCL-90 GSI scores. In all three cases this was plausibly explained and justified by other assessments. Six patients with high GSI scores were included and may indicate a weakness in the clinical interview assessments. Obviously, the collected data did not sufficiently identify the psychopathology among those patients to the treatment team. Thus, the multiscaling of psychologic status among patients will be used for a stringent and cogent selection of cases in future analyses.

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