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Treating highly anxious dental patients in a dental fear clinic

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Chapter 10

SELF-REPORT DATA IN PREDICTING DENTAL ANXIETY AFTER TREATMENT¹

¹ An adapted version of this chapter is submitted for publication as: Aartman, I.H.A. , Jongh, A. de, Makkes, P.C., & Hoogstraten, J. Self-report data in predicting dental anxiety after treatment.

Introduction

In order to plan treatment more efficiently, the focus in dental anxiety research has, for some years, been on variables that predict treatment outcome or success. Early identification of patients who are prone to fail or succeed in therapy could make treatment more efficient. In several studies the notion is postulated that patients suffering from dental anxiety per se are easier to treat than patients with concomitant anxieties (Berggren, 1992; Berggren, Carlsson, Gustafsson, & Hakeberg, 1995; De Jongh, 1994; Milgrom, Weinstein, Roy-Byrne, & Tay, 1993).

Thus, it may be that the presence of multiple, or sometimes called general, fears has a negative influence on treatment outcome. Yet, studies that tried to establish the relation between concomitant anxieties and treatment success do not yield conclusive results. For example, Berggren and Carlsson (1985) used a shortened version of the Geer Fear Scale (GFS) to assess general fearfulness. It was found that patients of whom the dentist had rated the behavior during treatment as adjusted to dental treatment had lower scores on the GFS than patients of whom the dentist rated behavior as poorly-adjusted during treatment. Moreover, the initial GFS score appeared to correlate statistically significant with the DAS score after treatment and with the change in DAS score due to treatment ($r=0.45$ and -0.43 respectively, both $0.001 < p < 0.01$). The patients for whom these correlation coefficients were computed ($n=33$) were treated with either behavior therapy or under general anaesthesia.

Moore, Brødsgaard, Berggren, and Carlsson (1991) used the same GFS to assess a relation between concomitant anxieties and treatment outcome of behavior therapies in a dental fear clinic. They divided a sample of patients ($n=60$) in three groups: the highest 20% GFS scores, the middle 60% scores, and the 20% lowest scores. There was neither a difference in reduction in dental anxiety assessed by a Visual Analogue Scale between the three groups, nor a relation with change in DAS scores. There were low, but statistically significant, correlations between change in GFS and change in Dental Fear Survey (DFS) scores ($r=0.31$, $0.01 < p < 0.05$), and between the initial GFS score and the change in DFS ($r=0.18$, $0.01 < p < 0.05$). In addition, Moore (1991) described that the patients with the 15% highest scores ($n=9$) on both the GFS and STAI-T (State-Trait Anxiety Inventory) needed more psychological treatment hours to reach a similar reduction in dental anxiety level than patients with low and moderate scores ($n=26$, $p=0.045$). On the other hand, two studies were not able to find support

for a relation between treatment outcome and general fears (Goodall, Skelley, & File, 1994; Hammarstrand, Berggren, & Hakeberg, 1995).

Other studies sought to determine the influence of general psychological distress and separate psychopathological dimensions, other than fears, on treatment outcome (Chapter 8 present thesis; Kleinhauz, Eli, Baht, & Shamay, 1992; Willumsen, 1999). These results showed that scores on a questionnaire measuring psychopathological dimensions such as interpersonal sensitivity, psychoticism (Kleinhauz et al., 1992) and somatization (Kleinhauz et al., 1992; Chapter 8) were negatively related to treatment outcome. Again, relations were not very strong, and Willumsen (1999) was not able to confirm this relation with regard to general psychological distress. Finally, studies with regard to the relation between treatment outcome in dental fear clinics and variables such as dental anxiety before treatment, gender, educational level, age, DMFS, and previous duration of avoidance of dental treatment indicated that none of these variables had much influence on treatment outcome (Goodall et al., 1994; Hammerstrand et al., 1995; Liddell, Di Fazio, Blackwood, & Ackerman, 1994; Moore, 1991; Schuurs, Makkes, & Duivenvoorden, 1992; Willumsen, 1999).

In conclusion, although there is evidence that concomitant anxieties and psychopathology are correlated to treatment success in dental fear clinics, the findings thus far are not impressive. To shed more light on this issue, the aim of the present study was to determine the relation between (self-report) data available at enrolment and treatment outcome at a dental fear clinic in terms of dental anxiety level after treatment, duration of treatment, being able to visit a general dental practitioner (GDP) or not, satisfaction after treatment, and dental attendance after one year. Variables considered as possible predictors were psychopathological dimensions, anxiety, the extent to which patients report negative cognitions related to dentistry, social effects of dental anxiety, age, gender, self-reported duration of anxiety, and pre-treatment duration of avoidance. In addition, the number of decayed (DT), missing (MT) and filled teeth (FT) were taken into account.

Material and methods*Subjects, procedure and instruments*

Subjects were 107 patients who were treated with a behavioral management approach at a dental fear clinic in Amsterdam, The Netherlands. These 67 women and 40 men applied for treatment between February 1997 and September 1999. Their mean age was 36.0 (range 17-62, SD=11.0) and it was on average 6.1 years (range 0-38, SD=7.9) ago that they visited a general dental practitioner. Thirty-three patients never visited a dentist regularly. For the other 74 patients, it was on average 8.2 years ago (range 0-40, SD=9.2) that they visited the dentist regularly. Mean DMFT was 14.4 (SD=6.1). All patients in the sample had (some) own teeth left after treatment. Additional information concerning the procedure and instruments are described in Chapter 9.

Data analysis

To assess the relation between dental anxiety after treatment and quantitative self-report data, post-test dental anxiety scores were adjusted for the gain to be expected on the basis of the linear regression of the matching pre-test on the post-test score. Pearson's product moment correlation coefficients were computed between these so-called residual gain scores (Steketee & Chambless, 1992) and the quantitative self-report data. Next, age, avoidance, gender, the FSS-total scale, the SCL-90 total scale and the DCQ-frequency were used as independent variables in a stepwise multiple regression analysis with the residual gain scores as the dependent variables. When one of the total scales yielded a significant result, the subscales of the FSS-III or SCL-90 were used as independent variables in a separate regression analysis. This strategy was chosen to keep the number of predictor variables as low as possible for one analysis. DT, MT, FT, and the SADAS scales were not used in a regression analysis since, due to missing values, the number of subjects per predictor would become too small for a reliable regression equation (Stevens, 1986; Tabachnick & Fidell, 1996). The relation between satisfaction and the quantitative data was also assessed by computing correlation coefficients and a subsequent stepwise multiple regression analysis. Finally, t-tests were used to assess differences between patients who were able to visit a dentist outside the clinic and those who did not and between patients who visited a GDP and those who did not at one-year follow-up. Whenever appropriate, χ^2 -tests were conducted.

Results

Dental anxiety after treatment and dental attendance at one-year follow-up

Of the 107 patients who were treated with a BM approach during the research period and who did not receive complete dentures, 79.4% (n=85) returned their questionnaire. The statistically significant correlation coefficients between the residual dental anxiety scores on the one hand, and on the other, the self-report data and DT, MT and FT are shown in Table 1. Stepwise multiple regression analyses with age, avoidance, gender, FSS-total, SCL-total, and DCQ-frequency indicated that only the FSS-total scale contributed significantly to the regression equation of the DAS ($F_{1,73}=7.35$, $p=0.008$, $R^2=0.09$, $\beta=0.30$) and the S-DAI ($F_{1,73}=7.21$, $p=0.009$, $R^2=0.09$, $\beta=0.30$). For the AS none of the variables contributed significantly. The stepwise regression analyses with the FSS-subcales as independent variables showed that for the DAS and S-DAI, the FSS-agoraphobia dimension was the only significant predictor ($F_{1,81}=19.90$, $p<0.001$, $R^2=0.20$, $\beta=0.44$; $F_{1,81}=12.56$, $p=0.001$, $R^2=0.13$, $\beta=0.37$).

Table 1 Pearson correlation coefficients between the FSS-III, SCL-90, DCQ, and SADAS and the residual DAS, S-DAI and AS scores (only statistically significant ($p<0.05$) correlations are displayed)

Variables	DAS	S-DAI	AS
FSS-total ^a	0.31	0.27	
FSS-agoraphobia	0.44	0.37	0.39
FSS-blood injury, illness and death		0.28	
SCL-total	0.23	0.25	
SCL-agoraphobia	0.28	0.25	
SCL-somatization	0.28	0.25	
SCL-interpersonal sensitivity and paranoid ideation		0.25	
DCQ-frequency		0.29	
MT	0.27	0.25	0.28

Note: 2-tailed tests

^a N varies from 67 to 84 due to missing values

Fifty patients (46.7%) received questionnaires and were contacted by telephone for the one-year follow-up assessment. Of the 43 respondents (86%), 31 patients (72.1%) had visited a GDP a year after treatment in the dental fear clinic, and 26 patients indicated to do so regularly (60.5%). The only variable for which a statistically significant difference was found between regular attenders and non-regular attenders, was avoidance of regular dental treatment before applying at the clinic ($t=3.28$, $df=27$,

$p=0.003$). Mean duration of avoidance of regular dental care was 11.7 years ($SD=8.6$) for non-regular attenders, and 2.7 years ($SD=6.1$) for patients who were regular attenders after treatment. The groups were too small to conduct a discriminant analysis.

Duration of treatment, patients' perceived ability to visit a dentist outside the clinic, and satisfaction

Only one of the variables correlated statistically significant with total duration of treatment, namely DT ($r=0.30$, $p=0.007$). Stepwise multiple regression analysis did not reveal a significant regression equation, however, DT was not included for aforementioned reason.

Patients were asked whether they perceived themselves as being able to visit a general dental practitioner or not. Fifty-five patients (67.5% of 83 useful respondents) believed they were able to do so. T-tests indicated that there were no statistically significant differences between the two groups. Also, there was no relation with gender ($\chi^2=0.37$, $df=1$, $p=0.634$).

Table 2 Pearson correlation coefficients between the FSS-III, SCL-90, DCQ, and SADAS and the satisfaction rates (only statistically significant ($p<0.05$) correlations are displayed)

Variables	Teeth	Clinic	Intake
FSS-total			0.29
FSS-blood injury, illness and death			0.34
FSS-sex and aggression			0.29
DCQ-frequency	-0.25		
DCQ-believability			0.32
DT		0.26	
MT			0.32
FT	-0.36		-0.43

Note: 2-tailed tests

Finally, the statistically significant correlation coefficients of the self-report data and DT, MT, and FT with the satisfaction rates are displayed in Table 2. Satisfaction with the dentist(s) correlated with none of the variables. A regression analysis for satisfaction with own teeth as dependent variable and age, avoidance, gender, FSS-total, SCL-total, and DCQ-frequency as independent variables showed that only the DCQ-frequency contributed significantly to the regression equation ($F_{1,74}=4.84$,

$p=0.031$, $R^2=0.06$, $\beta=-0.25$). None of the variables predicted satisfaction with the dentist(s) or satisfaction with the clinic in general significantly. The FSS-total scale and duration of avoidance contributed to the equation of satisfaction with the intake ($F_{1,66}=5.80$, $p=0.005$, $R^2=0.15$, $\beta=0.35$ and $\beta=0.25$). Stepwise regression analysis with the FSS-scales as independent variables showed that for satisfaction with the intake the FSS-blood injury dimension was the only significant predictor ($F_{1,75}=11.05$, $p=0.001$, $R^2=0.13$, $\beta=0.36$).

Discussion

The present study found indications for a relation between the presence of multiple fears, more specifically the presence of symptoms indicative of agoraphobia, and outcome of treatment in a dental fear clinic. All dental anxiety measures yielded the same results; that is, the more agoraphobic fears were present, the higher the adjusted post-treatment dental anxiety scores. Although the items of the FSS agoraphobia dimension do not assess the tendency to panic, it needs to be mentioned that agoraphobia rarely occurs without panic disorder (Emmelkamp, Bouman, & Scholing, 1995). One of the main characteristics of agoraphobia is that patients are anxious about being in places or situations from which escape might be difficult or embarrassing or in which help may not be available in the event of having an unexpected or situationally predisposed panic attack or panic-like symptoms (American Psychiatric Association, 1994). Undergoing dental treatment may be a situation where particularly patients suffering from agoraphobia and panic disorder experience symptoms such as sweating, a pounding heart, or a fear of losing control, going crazy or dying. However, treatment in a dental fear clinic is not directed at alleviating these symptoms or their cause. BM treatment at this dental fear clinic is mainly directed at graduated exposure to stimuli related to undergoing dental treatment. Therefore, treatment of patients who are afraid of dental treatment because they suffer from agoraphobia and presumably panic disorder may not be that effective in terms of dental anxiety reduction than treatment of patients whose dental anxiety does not result from such anxiety disorders. Thus, it may be better to advise patients with high scores on the agoraphobia scale of the FSS-III to seek help for those conditions first.

Besides agoraphobia, almost none of the other self-reported psychological dimensions contributed significantly to the prediction of dental anxiety after treatment.

A few were related to the adjusted post-test scores, however, they were not able to explain additional variance in the scores. In Chapter 8 where only the SCL-90 subscales were used as possible correlates of treatment success, somatization appeared to be the strongest predictor, but explained less variance in dental anxiety after treatment than agoraphobia in the present study. Apparently, agoraphobia is a stronger predictor. In addition, it is noteworthy that the relation with dental anxiety after treatment is more pronounced for the FSS-III agoraphobia scale than for the SCL-90 agoraphobia scale. Although these scales both measure the same construct and are highly correlated (see Chapter 6), the way in which these dimensions are tapped differs. The SCL-90 measures psychopathological complaints and the FSS-III asks the patient to indicate the felt degree of anxiety for specific stimuli. This may be the reason why the FSS-III agoraphobia scale was a better predictor of dental anxiety after treatment than the SCL-90 agoraphobia scale.

The results showed that satisfaction as a determinant of treatment outcome yielded mixed results. Satisfaction with the intake was predicted by fear of blood, injury, illness and death and by duration of avoidance. Since duration of avoidance did not correlate statistically significant with satisfaction with the intake, it seemed to be a confounding factor. After the variance of the FSS-total score and satisfaction was accounted for, it appeared that the longer patients avoided treatment, the more satisfied they were with the intake procedure. Although the number of filled teeth was not included in the regression analyses, this variable was negatively correlated with the patients' state of their teeth and the intake. The more teeth were filled, the less patients were satisfied with their teeth and with the intake at the clinic. In addition, frequency of negative cognitions predicted satisfaction with the oral state after treatment. None of the pre-treatment variables was related to satisfaction with the clinic in general or satisfaction with the dentists of the clinic. Nor were any of the pre-treatment variables, except number of decayed teeth, related to duration of treatment as a outcome determinant.

Seventy percent of the patients who were treated more than a year ago had visited a general dental practitioner. At the moment treatment begun, it was almost three years ago that these patients had visited a dentist regularly, while for non-attenders this was more than 14 years ago. None of the psychological constructs assessed by the self-report questionnaires were related to dental attendance. The findings suggest that

avoidance behavior before treatment is the strongest predictor of non-attendance after treatment. In Chapter 9 it was already advocated that patients should be better accompanied to a general practitioner if treatment is ever to be effective in this respect, and this seems to be especially true for long-term avoiders.

When it comes to deciding which self-report questionnaires are suitable for the assessment of dental anxiety in dental fear clinics, the DAS, S-DAI and AS are appropriate instruments, although they hardly discriminate among different types of highly anxious dental patients. The results obtained with these three instruments were not exactly the same, suggesting that the concept of dental anxiety may not be completely covered by using only one of them. The present results are in accordance with the conclusions of Schuurs and Hoogstraten (1993) and Locker, Shapiro, and Liddell (1996) who proposed to use more than one dental anxiety measure.

The DCQ and SADAS did not seem very useful in predicting treatment outcome, although too few patients filled out the SADAS to have enough power to detect small or even moderate effects with this questionnaire. Two other studies assessing the outcome of treatment of highly anxious dental patients showed that there were pre- and posttest differences with regard to the DCQ-frequency and believability scores (De Jongh, Muris, Ter Horst, Van Zuuren, Schoenmakers, & Makkes, 1995; Willumsen, 1999), and the future still has to show whether the SADAS might as well. Thus, rather than using these questionnaires as possible predictors, they might be used as additional outcome measures. The choice for these questionnaires could also be made on clinical grounds. For example, if the clinician or researcher wants to know what the effect of treatment is on patients' negative beliefs about dental treatment or on the psychological and social effects of dental anxiety, these questionnaires are appropriate. In addition, the individual scores on these instruments may give rise to issues that need to be discussed during an intake procedure, or they may reveal distortions in thinking about dental treatment that can be dealt with during treatment (De Jongh, et al., 1995).

Leaves us with the FSS-III and the SCL-90. A choice between both measures should be made on clinical grounds as well. With regard to the SCL-90, it can be very helpful to have information about general psychological distress of patients. However, it would seem that not all dimensions of the two questionnaires are useful as predictors. Therefore, shorter versions of these lengthy instruments might suffice. With regard to the FSS-III, the agoraphobia and blood injury, illness and death scales could be

selected. The first dimension for obvious reasons; the second predicted only one of the outcome measures, but it may be of interest to know whether the patient has apprehensive feelings with regard to needles and blood. From the SCL-90, the somatization scale seems most important (Chapter 8; Kleinhaus, et al., 1992), but other scales, such as depression and anger-hostility, could provide valuable information about the patient's mental state as well.

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