Treating highly anxious dental patients in a dental fear clinic
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Chapter 9

TREATMENT OUTCOME PER TREATMENT MODE IN A DENTAL FEAR CLINIC
CHAPTER 9

Introduction
Dentists working in dental fear clinics should be able to establish a trustful relationship with patients and should be skilled in applying tell-show-do procedures. Mostly they have some basic training in psychology and know the importance of providing a sense of control to these patients. Some dentists are also trained in applying relaxation exercises and gradual exposure (Milgrom, Weinstein, & Getz, 1995).

Besides the application of a behavioral approach, dental treatment can also be conducted while using some form of conscious sedation induced by a pharmacological adjunct. The most widely used, safe form of conscious sedation is nitrous oxide sedation (NOS; Stach, 1995). The combination of nitrous oxide gas (20-40%) with oxygen used in dentistry is inhaled through a nasal mask in order to reach a state of general relaxation that is helpful in reducing the aversiveness of dental procedures.

The use of intravenous sedation (IVS) is a relatively safe alternative to treat patients who have problems accepting conventional dental treatment or treatment using nitrous oxide sedation (Kaufman & Jastak, 1995; Milgrom et al., 1995; Oei-Lim, Kalkman, Makkes, Ooms, & Hoogstraten, 1997; Tolksdorf & Siefert, 1992). Intravenous administration of benzodiazepines, such as diazepam and midazolam, leads to a conscious sleep-induced, anxiety-relieving state that can be reached within a short time with a high degree of controllability (Tolksdorf & Siefert, 1992). In some cases patients can even receive dental treatment under general anaesthesia (GA).

Studies with regard to the above-mentioned, most widely used, pharmacological procedures mainly dealt with the efficacy of the drug in reducing state dental anxiety of highly anxious dental patients, enabling them to undergo dental treatment (e.g., Milgrom, Beirne, Fiset, Weinstein, Tay, & Martin, 1993). These procedures appeared to be successful in that respect (e.g., review Kaufman & Jastak, 1995). However, it is even more important to find out how successful these procedures are in the longer run; that is, not only in enabling patients to undergo treatment, but also in alleviating their anxiety after treatment and in making patients to visit a general dental practitioner on a regular basis.

In Chapter 8, it was already shown that treatment in the dental fear clinic, where the present study was conducted, was successful in reducing dental anxiety. This reduction turned out to be relatively stable after one year. Comparable results were found in other studies using behavioral and pharmacological treatment modalities (e.g., Berggren & Linde, 1984; Hakeberg, Berggren, Carlsson & Gröndahl, 1993).
Furthermore, it was found that about 38% of the patients that could have visited a dentist outside the clinic by that time had not (Chapter 8). This finding was in line with results in other studies as well (see Kent, 1997). In some of these studies there appeared to be a relation between treatment mode and treatment outcome (e.g., Hakeberg, Berggren, & Carlsson, 1990). That is, some indications were found that the BM approach led to a more successful treatment outcome in terms of dental anxiety reduction and dental attendance than the pharmacological ones.

However, it is felt that more information is needed concerning treatment outcome in dental fear clinics using both behavioral and pharmacological treatment modes. In order to answer the question which of these modalities leads to the most successful treatment outcome, patients ideally should be randomly allocated to treatment modes. However, the dentists working in the dental fear clinic in Amsterdam did not consider it a sound procedure to allocate patients randomly to a treatment mode to which patients would not have been allocated to on the basis of their own ideas as to what is good clinical practice. In other words, it was not possible to carry out a randomized clinical trial.

The main aim of the present study was to determine outcome of treatment in a dental fear clinic. Treatment outcome was assessed in several ways: dental anxiety level after treatment, duration of treatment, the patient being able to visit a general dental practitioner (GDP), satisfaction after treatment, and, finally, dental attendance after one year. Additional aims were to investigate with which treatment modality the best results could be obtained and to determine which treatment-dependent variables were related to dental anxiety after treatment.

Material and methods

Subjects

The study was conducted at a dental fear clinic in Amsterdam, The Netherlands. Subjects were 341 patients who applied for treatment between February 1997 and September 1999 and were treated till December 1999. These 208 women (61%) and 133 men had a mean age of 36.0 (range 15-76, SD=11.0) and they were on average 20.5 years very anxious of dental treatment (SD=12.9). The last time they visited a general dental practitioner was 0-40 years ago (M=7.3, SD=8.8), and it was on average 9.1 years (SD=10.0) ago that they visited a dentist regularly.
CHAPTER 9

Procedure
Patients filled out several self-report questionnaires four to eight months before they were invited for an intake at the clinic. This intake took place with a dentist experienced in the treatment of highly anxious dental patients, sometimes accompanied by a psychologist. The choice for one of five treatment possibilities (i.e., behavioral management (BM), nitrous oxide sedation (NOS), intravenous sedation (IVS), treatment under general anaesthesia (GA), or treatment under GA by a oral surgeon (OS-GA)) was made on the basis of clinical, non-standardized, criteria. The BM approach varied from simple reassurance and “tell-show-do” to graduated exposure and relaxation techniques. If necessary, treatment with a BM approach could be supported by NOS. Hence, treatment with NOS had several aspects in common with BM, whereas IVS and treatment under general anaesthesia hardly included any components of the BM approach. After treatment at the oral surgeon, patients could be treated additionally by one of the other approaches. Moreover, patients could be referred to the psychologist at the clinic for a limited number of sessions. In general, patients were treated until they were dentally fit.

Not all patients that applied for treatment visited the clinic, and some did but never received dental treatment. When it was apparent that the patient was not to receive any dental treatment (restorative or surgical), when the patient quitted treatment, or when dental treatment was finished at the clinic, the patient received post-test questionnaires to assess treatment outcome. To remind patients of the questionnaire, patients were phoned approximately two weeks after the questionnaire was sent. After four and eight weeks reminders were sent.

Follow-up questionnaires were sent to patients who received the first questionnaire a year before. These data were collected until April 2000. Therefore, not all patients received this follow-up questionnaire at the moment of data analysis. Information about dental attendance was collected at this follow-up. That is, patients were asked whether they had visited a GDP and, if they did, whether necessary treatment was already done. Patients were contacted by telephone to remind them to send their questionnaire back, and to collect dental attendance data too.

All information regarding treatment itself, such as treatment mode, time, and conducted treatment, was taken from the patient files. Number of decayed (DT), missing (MT), and filled teeth (FT) were assessed at the intake or on one of the following appointments.
**Instruments**

The Short version of the Dental Anxiety Inventory (S-DAI; Chapter 4) and the Dental Anxiety Scale (DAS; Corah, 1969) were used to assess dental anxiety before and after treatment. In addition, a 10-point Likert anxiety scale was used (AS). Patients rated how anxious they were to visit a dentist from 1 to 10. More than one dependent variable was used because it is unclear whether one of the used questionnaires covers the concept of dental anxiety completely (Schuurs & Hoogstraten, 1993).

The following questionnaires were only filled out at applying for treatment. The Fear Survey Schedule III (FSS-III) was used to assess the presence of concomitant anxieties at applying for treatment. The Dutch version of the Revised Symptom Checklist (SCL-90) was used to assess psychopathological dimensions. The Social Aspect of Dental Anxiety Scale (SADAS) assesses psychological reactions and social inhibitions due to dental anxiety. Since this questionnaire was later introduced in the clinic, not all patients filled it out. More information about these questionnaires can be found in Chapters 6, 3, and 5 respectively.

The Dental Cognitions Questionnaire (DCQ; De Jongh, Muris, Schoenmakers, & Ter Horst, 1995) assesses negative cognitions of patients related to dental treatment. Fourteen of the 38 items concern negative beliefs regarding dentistry in general and patients themselves. The other 24 items pertain to negative thinking during treatment. The patients had to indicate whether or not this thought came up during treatment or whether he or she thought this when treatment was forthcoming. In this way a total negative cognition score is obtained ranging from 0 to 38 (answer “yes” to all items). In addition, patients were asked to rate the degree to which they believed each statement at that moment by filling in a percentage ranging from 0 to 100%. In this way a mean believability score was computed for each patient as well.

After treatment, patients were asked to indicate their satisfaction with the intake, the dentists, and with the clinic in general on a 10-point scale ranging from 1 (very unsatisfied) to 10 (very satisfied). In addition, they were asked how satisfied they were with the state of their teeth. Finally, patients were asked whether they believed they would be able to visit a GDP at that moment (yes/no).

**Data analysis**

First, the patient flow in the clinic is described. Next, pre-treatment differences were assessed between treatment modalities using MANOVA. Groups of related dependent
variables were used simultaneously in order to account for an inflated Type I error rate. Differences between respondents and non-respondents were also determined using MANOVA. When appropriate, $\chi^2$-tests were used. Correlation coefficients (Pearson's product moment correlation coefficients) were computed between quantitative treatment variables and the residual gain score of the dental anxiety measures. Residual gain scores are post-treatment scores adjusted for the gain to be expected on the basis of the linear regression of the pre-test on the post-test scores (Steketee & Chambless, 1992). For the relation between dental anxiety and treatment variables with a nominal measurement level analysis of covariance was conducted with the pre-test scores of the matching dependent variables as covariates (Tabachnick & Fidell, 1996). Finally, ANOVA's were used to compare treatment modes with respect to satisfaction, treatment duration, and number of fillings and extractions.

Results

Post-treatment questionnaires were sent to 341 patients. The total sample consisted of four groups: 1) patients who received dental treatment in the clinic during the research period (n=190, including those who got a full denture), 2) patients who had only an intake (n=38), 3) patients who had an intake and some following appointments in which no dental treatment took place (n=25), and 4) patients who cancelled their appointment or did not show up for an intake (n=88). A flow chart is shown in Figure 1.

The number of patients per treatment mode are given in Figure 1 as well. Patients who underwent total extraction, thus who received a full denture, are mentioned separately and were excluded from all analyses pertaining to treatment modes (n=34). It was not considered useful to assess outcome for these patients. As can be seen, the vast majority of the remaining patients (n=156) were treated with a BM approach (68.6%), with IVS (11.5%) or under GA by an oral surgeon (extractions only; 10.9%), while few were treated with NOS (3.8%) or under GA in a hospital (dental treatment under general anaesthesia; 5.1%). Twenty-four patients, mostly from the oral surgery group, were also treated with one of the other treatment modes (see Figure 1). For data analysis, the most powerful form of sedation was chosen as the treatment mode.
The treatment modes were compared with respect to all pre-treatment variables (MANOVA). There was a statistically significant difference for DT (univariate $F_{4,109}=7.54, p<0.001$). Post-hoc analysis revealed that patients in the GA group and in the oral surgery group had more decayed teeth ($M=10.0$, $SD=6.35$ and $M=10.0$, $SD=5.29$) than patients in the BM group ($M=4.2$, $SD=3.30$). In addition, treatment modes were compared with respect to number of fillings and extractions during treatment (see Table 1). Since not all patients that were treated by the oral surgeon received additional dental treatment at the clinic, this group was excluded. There were statistically significant differences for number of extractions ($F_{3,135}=3.83$, $p=0.011$) and fillings ($F_{3,135}=10.74$, $p<0.001$) made during treatment. Post-hoc analysis revealed that BM patients received fewer fillings and underwent fewer extractions than IVS patients did. In addition, BM patients received fewer fillings than GA patients did.

The NOS and GA group were excluded from analyses in which treatment modes were compared with respect to post-treatment variables.
Table 1 Number of extraction and fillings per treatment mode

<table>
<thead>
<tr>
<th>Variable</th>
<th>BM Mean</th>
<th>SD</th>
<th>NOS Mean</th>
<th>SD</th>
<th>IVS Mean</th>
<th>SD</th>
<th>GA Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extractions</td>
<td>1.33</td>
<td>2.46</td>
<td>2.00</td>
<td>2.90</td>
<td>3.94</td>
<td>5.34</td>
<td>2.00</td>
<td>3.51</td>
</tr>
<tr>
<td>Fillings</td>
<td>3.65</td>
<td>2.69</td>
<td>6.50</td>
<td>4.32</td>
<td>6.89</td>
<td>5.39</td>
<td>8.63</td>
<td>3.16</td>
</tr>
</tbody>
</table>

Response rate
Response rate was 64.8 % (n=221) for all patients. More patients who were actually treated in the clinic or had had an intake and other visits returned their questionnaire than patients who never visited the clinic or did so but only once ($\chi^2=33.7$, df=3, $p<0.001$). There was no statistically significant relation with treatment mode (full denture patients excluded; n=156). Differences between respondents (n=120) and non-respondents (n=36) were determined for these 156 treated patients using MANOVA. There were no overall significant differences between the two groups with respect to pre-treatment and treatment variables. There was no relation with gender either.

At one-year follow-up, dental attendance data were collected for 73.7% of the patients who received the one-year follow-up questionnaire (123 of 167 patients). Eighty-three patients (49.7%) sent their questionnaire back. Fourteen percent indicated that they did not want to return the questionnaire, of 17.4% it was clear that the address was not correct anymore, and of another 19.2% reasons for not receiving a returned questionnaire were unclear. Eighty-four patients were contacted by phone additionally, leading to this total response rate. The response rate of patients who never visited the clinic was lower than the response rate of the other patients ($\chi^2=20.6$, df=3, $p<0.001$).

Table 2 Means and standard deviations for the dental anxiety measures per situation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Treated Mean</th>
<th>SD</th>
<th>No intake Mean</th>
<th>SD</th>
<th>Only intake Mean</th>
<th>SD</th>
<th>Intake &amp; other Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAS before</td>
<td>17.9</td>
<td>2.31</td>
<td>17.8</td>
<td>2.52</td>
<td>17.6</td>
<td>2.48</td>
<td>16.9</td>
<td>3.52</td>
</tr>
<tr>
<td>DAS after</td>
<td>13.1</td>
<td>4.06</td>
<td>15.5</td>
<td>3.89</td>
<td>13.1</td>
<td>3.84</td>
<td>14.8</td>
<td>4.39</td>
</tr>
<tr>
<td>S-DAI before</td>
<td>40.8</td>
<td>5.39</td>
<td>40.2</td>
<td>6.08</td>
<td>40.9</td>
<td>5.73</td>
<td>40.0</td>
<td>6.66</td>
</tr>
<tr>
<td>S-DAI after</td>
<td>32.3</td>
<td>9.34</td>
<td>35.9</td>
<td>9.44</td>
<td>34.3</td>
<td>9.20</td>
<td>36.3</td>
<td>10.57</td>
</tr>
<tr>
<td>AS before</td>
<td>9.3</td>
<td>1.40</td>
<td>9.3</td>
<td>1.27</td>
<td>9.1</td>
<td>1.04</td>
<td>9.0</td>
<td>1.94</td>
</tr>
<tr>
<td>AS after</td>
<td>5.9</td>
<td>2.59</td>
<td>7.9</td>
<td>2.03</td>
<td>6.0</td>
<td>3.08</td>
<td>6.4</td>
<td>2.89</td>
</tr>
</tbody>
</table>
**Dental anxiety after treatment**

**Dental anxiety after treatment per situation**

The pre- and post-test mean scores on the DAS, S-DAI, and AS are displayed in Table 2 per situation. An analysis of covariance, with the pre-test score included as a covariate, showed that patients who had no intake scored higher after treatment on the DAS ($F_{3,206}=6.70$, $p<0.001$), S-DAI ($F_{3,204}=3.87$, $p=0.010$), and AS ($F_{3,185}=5.83$, $p=0.001$) than patients who were treated at the clinic.

**Relation between dental anxiety after treatment and treatment variables**

Before differences in dental anxiety were tested between treatment modes, it was determined which treatment variables were related to dental anxiety after treatment. Treatment variables were: number of extractions, number of fillings made, whether or not the patient visited the psychologist of the clinic (yes/no), whether or not the psychologist of the clinic was present during the intake (yes/no), dental treatment duration, and duration of other visits, such as prolonged intake or discussion of treatment plan (excluding visits to psychologist and appointments for prosthetic procedures). None of the correlation coefficients between the residual gain scores of the dental anxiety measures and the quantitative variables reached statistical significance. Analyses of covariance showed that patients who visited the psychologist of the clinic once or more ($n=45$) had lower adjusted post-test scores than patients who did not ($n=109$) for the DAS ($F_{1,113}=7.88$, $p=0.006$), S-DAI ($F_{1,113}=7.90$, $p=0.006$), and AS ($F_{1,100}=11.86$, $p=0.001$). The mean scores for these groups are shown in Table 3. Patients who had had an intake with the psychologist of the clinic present ($n=49$) scored higher after treatment than patients who had an intake without her present ($n=107$) for the DAS ($F_{1,114}=5.34$, $p=0.023$), the S-DAI ($F_{1,114}=4.11$, $p=0.045$), but not for the AS ($F_{1,101}=2.14$, $p=0.147$).

The same analyses were conducted for patients with a BM approach alone. These revealed that the difference with respect to the psychologist present during the intake was not statistically significant in this group. There was, however, still a statistically significant difference between patients who visited the psychologist of the clinic and those patients who did not.

**Dental anxiety after treatment per treatment mode**

The pre- and post-test mean scores on the DAS, S-DAI, and AS are displayed in Table 4 per treatment mode. An analysis of covariance (GA and NOS excluded), with the
pre-test score included as a covariate, showed that patients treated with a BM approach scored lower than IVS patients on the DAS ($F_{2,105}=5.19$, $p=0.007$). For the other two dental anxiety measures, there were no statistically significant differences ($F_{2,105}=2.45$, $p=0.091$ and $F_{2,92}=1.54$, $p=0.220$, respectively). The results did not change when treatment by psychologist was included as a covariate.

Fifty-one percent of the patients had a DAS score lower than 13 after treatment. Relatively more patients treated with a BM approach scored lower than 13 than patients treated with IVS or under GA at the oral surgeon ($\chi^2=6.34$, df=2, $p=0.042$).

Table 3 Means and standard deviations for the dental anxiety measures for patients who visited the psychologist of the clinic and those who did not

<table>
<thead>
<tr>
<th>Variable</th>
<th>Psychological treatment</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Mean</td>
<td>SD</td>
<td>No</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>DAS before</td>
<td>17.9</td>
<td>2.15</td>
<td></td>
<td>17.7</td>
<td>2.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DAS after</td>
<td>11.2</td>
<td>3.87</td>
<td></td>
<td>13.4</td>
<td>3.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-DAI before</td>
<td>40.0</td>
<td>5.52</td>
<td></td>
<td>40.4</td>
<td>5.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S-DAI after</td>
<td>28.2</td>
<td>9.21</td>
<td></td>
<td>32.6</td>
<td>8.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS before</td>
<td>9.1</td>
<td>1.48</td>
<td></td>
<td>9.3</td>
<td>1.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS after</td>
<td>5.1</td>
<td>2.51</td>
<td></td>
<td>6.5</td>
<td>2.19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 Means and standard deviations for the dental anxiety measures per treatment mode

<table>
<thead>
<tr>
<th>Variable</th>
<th>BM</th>
<th>NOS</th>
<th>IVS</th>
<th>GA</th>
<th>OS-GA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>DAS before</td>
<td>17.5</td>
<td>2.49</td>
<td>19.2</td>
<td>0.98</td>
<td>17.8</td>
</tr>
<tr>
<td>DAS after</td>
<td>11.9</td>
<td>3.95</td>
<td>12.0</td>
<td>2.00</td>
<td>15.3</td>
</tr>
<tr>
<td>S-DAI before</td>
<td>40.0</td>
<td>5.80</td>
<td>44.5</td>
<td>1.22</td>
<td>39.0</td>
</tr>
<tr>
<td>S-DAI after</td>
<td>30.2</td>
<td>8.87</td>
<td>31.5</td>
<td>9.54</td>
<td>34.8</td>
</tr>
<tr>
<td>AS before</td>
<td>9.1</td>
<td>1.53</td>
<td>10.0</td>
<td>0.00</td>
<td>9.6</td>
</tr>
<tr>
<td>AS after</td>
<td>5.8</td>
<td>2.42</td>
<td>5.8</td>
<td>0.50</td>
<td>7.1</td>
</tr>
</tbody>
</table>

Duration of treatment

Duration of dental treatment and of the other visits is shown in Table 5. Since duration of treatment was not recorded for dental treatment at the oral surgeon, this group was excluded from the following ANOVA's. There were statistically significant differences between the treatment modalities with regard to duration of dental treatment ($F_{3,135}=5.68$, $p=0.001$), duration of other visits ($F_{3,135}=4.28$, $p=0.006$), and
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total duration of treatment ($F_{3,135}=5.41, p=0.002$). Post-hoc analysis showed that duration of dental treatment of patients treated with a BM approach was shorter than of patients treated with IVS and NOS. For duration of other visits, none of the post-hoc comparisons reached a statistically significant level. For total duration, the BM group had a lower mean score than the IVS group. These differences remained when DT was included as a covariate in the analysis. When number of extractions and number of fillings were included as a covariate, the difference for the total duration was not statistically significant anymore. However, for the duration of dental treatment and duration of other visits the differences were still significant.

Patient able to visit dentist outside clinic

Of the treated patients who responded after treatment, 34.7% indicated that they believed that they were not able to visit a dentist outside the clinic at that moment. There was no relation with treatment mode, whether the NOS and OS-GA groups were included ($\chi^2=4.06, df=4, p=0.398$), or excluded ($\chi^2=1.79, df=2, p=0.408$).

Satisfaction after treatment

There was a statistically significant difference in the mean satisfaction of patients with their teeth between the patient groups ($F_{3,214}=10.71, p<0.001$). Post-hoc analysis showed that patients who were treated in the clinic were more satisfied with their teeth after treatment ($M=7.0, SD=2.11$) than patients who had never visited the clinic ($M=4.9, SD=3.08$) and patients who visited the clinic and had some additional visits, but no dental treatment ($M=5.2, SD=2.72$). Patients who had only an intake had a mean satisfaction rate with their teeth of 5.6 ($SD=2.77$). Patients treated with the different modalities did not differ in their mean satisfaction rate with their teeth ($F_{2,108}=1.57, p=0.214$), the intake ($M=8.0, SD=1.68; F_{2,101}=0.18, p=0.832$), the clinic in general ($M=8.4, SD=1.69; F_{2,108}=1.17, p=0.313$), and the dentist(s) ($M=8.6, SD=1.68; F_{2,108}=0.60, p=0.551$).

Dental attendance at one-year follow-up

Of the 123 respondents, 72 patients were treated (restorative and/or surgical treatment) in the clinic. Twelve of these patients got a full denture; three were still patients of the clinic. Dental attendance in the remaining group of 57 patients was 73.7%. Four patients indicated that they did not visit the GDP regularly, leading to a regular dental
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attendance rate of 66.7%. This rate was 80.0% for the “no intake” group. The treated
group was too small to test differences among treatment modalities.

Table 5 Treatment time in minutes per treatment mode

<table>
<thead>
<tr>
<th>Variable</th>
<th>BM Mean</th>
<th>SD</th>
<th>NOS Mean</th>
<th>SD</th>
<th>IVS Mean</th>
<th>SD</th>
<th>GA Mean</th>
<th>SD</th>
<th>OS-GA Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental treatment</td>
<td>184.2</td>
<td>121.9</td>
<td>352.5</td>
<td>204.7</td>
<td>275.0</td>
<td>145.0</td>
<td>236.3</td>
<td>51.2</td>
<td>152.0</td>
<td>115.1</td>
</tr>
<tr>
<td>Other visits</td>
<td>41.5</td>
<td>47.6</td>
<td>92.5</td>
<td>54.0</td>
<td>68.3</td>
<td>68.5</td>
<td>84.4</td>
<td>58.3</td>
<td>69.0</td>
<td>48.0</td>
</tr>
<tr>
<td>Total</td>
<td>280.8</td>
<td>173.6</td>
<td>450.0</td>
<td>192.3</td>
<td>435.0</td>
<td>203.9</td>
<td>341.3</td>
<td>89.2</td>
<td>291.0</td>
<td>148.9</td>
</tr>
</tbody>
</table>

*appointments such as additional consultations, discussing the treatment plan and introducing treatment without actual dental treatment being carried out. Excluded is time spent on visits to psychologist and on prosthetic visits, which is included in the total time.

Discussion

The results showed that with regard to treatment outcome in this dental fear clinic, dental anxiety level after treatment was lower for treated patients than for patients who abandoned visiting the dental fear clinic. More than half of the patients could be considered as not highly anxious anymore. In addition, about two third of the treated patients believed they were able to visit a dentist outside the clinic at that moment and the treated patients were more satisfied with the state of their teeth after treatment than patients who were not treated at the clinic. In general, the satisfaction rates were high. Furthermore, total duration of treatment varied from a mean of 281 minutes in the BM group to 450 in the NOS group. With regard to the final, and in fact most important, outcome measure, dental attendance after treatment, it appeared that of the patients treated in the clinic, 67% visited a general dental practitioner on a regular basis; that is, at least once a year.

Next, there were some indications that the best results were obtained with the BM approach. Patients in this group had lower adjusted post-test scores on the DAS than the IVS group. Furthermore, duration of dental and total treatment in the clinic was lower in this group than in others, even when a correction was made for the number of extractions and fillings in those groups. However, with respect to the other outcome measures (i.e., the S-DAI and AS, the satisfaction rates, and the patients’ self-perceived ability to visit a GDP) the BM group did not fare any better than the other
groups. Finally, dental anxiety after treatment appeared to be related to treatment by the psychologist of the clinic, and to a lesser extent to prosthetic visits and the presence of the psychologist during the intake.

Although patients who abandoned visiting the dental fear clinic had lower dental anxiety levels after treatment than the treated patients, the scores of treated patients were still somewhat higher than the scores of patients of general dental practices reported in a review of Schuurs and Hoogstraten (1993).

It is important to note that the general goal of treatment in dental fear clinics in The Netherlands is to treat patients until they are able to visit a general dental practitioner on a regular basis. Nowadays, patients are advised to visit a dental practitioner once a year in The Netherlands. The present study found that 67% of the treated patients visited a GDP on a regular basis at one-year follow-up. About 30% of the patients that were treated in the clinic visited a GDP regularly at enrolment in the clinic. Thus, treatment at the dental fear clinic was successful in enabling more patients to visit a GDP again (67% against 30%). However, 87% of the non-edentulous Dutch general population visited a GDP at least once in 1997 (Den Dekker, 1999). Therefore, it would be more satisfactorily when a higher percentage than 67 would be achieved. It may be that some patients were released too early from the clinic. Patients frequently indicated, both in the returned questionnaires and in the telephone interviews, that they had trouble finding a GDP willing to take them as a patient, or that they would like to have a list of suitable dentists. The results suggest that if patients are to receive regular dental care rather than to keep avoiding dental treatment, it might be more effective to apply a better referral procedure for patients who leave the clinic. Indeed, in studies in which the referral procedure was part of treatment, for example by direct contact between the clinic and the GDP, a higher attendance rate was found than in the present study (Berggren, 1986; Berggren & Linde, 1984).

With regard to satisfaction with the delivered care, patients indicated that they were very satisfied with the dentist(s), the intake and the clinic in general. In addition, the treated patients were reasonably satisfied, more than patients were who did not receive treatment or did not visit the clinic, with the state of their teeth after treatment. Thus, although the percentages of dental attendance seem comparable in treated patients and in patients abandoning treatment at the clinic, the latter group is less satisfied with the state of their teeth at that moment. Satisfaction was included as a measure of outcome
in the present study, but it should be noted that the validity of satisfaction as an index of quality of care is under debate (Kistemaker & Visser, 1995).

Contrary to what was found in Chapter 8, patients treated with a BM approach did not seem to be much better off than the others. This is most likely due to a lack of power in the present study, rather than to anything else. In the period before this study was conducted about half of the patients was treated with a BM approach (Chapter 7 and 8). Nowadays, in this clinic about 75% of the patients is treated by a BM approach, when patients with complete dentures and patients treated at the oral surgeon and additionally by BM, as in Chapter 7 and 8, were taken into account. This resulted in small numbers of patients in the other modalities, which made it almost impossible to demonstrate differences among treatment modes. The NOS and GA group were, therefore, excluded from most analyses. Still interesting is the finding that duration of treatment in the BM group was shorter, even after correction for the fewer number of fillings and extractions in this group. In addition, it is noted that the scores of the NOS group resemble, as in Chapter 8, the scores of the BM group more than the data of the other groups.

Since treatment time is generally the best available determinant of costs of dental treatment (Tobi, 1999), we found evidence to suggest that with treatment of patients for whom BM is deemed sufficient, less costs are involved. Financial arrangements are made with the Dutch national health insurances for reimbursement of an hourly rate of approximately 170 US dollars (appr. 380 Dutch guilders). These are the average approximate costs involved in treatment. IVS treatment comprises higher costs, since the hours that the anaesthetist is present cost about 110 US dollars (250 Dutch guilders) extra. GA in a hospital setting, no need to mention, is even more expensive. Having said this, it is informative to mention that the total amount of money spent on dental care of the total health care budget is about 4% in The Netherlands (Den Dekker, 1999; Widström, & Eaton, 1999). Of this budget, about 0.3% is involved in treatment of highly anxious adult dental patients and adult medically compromised patients. In order to keep the costs as low as possible, the BM approach would seem the most appropriate option. However, dentists working in the fear clinic do not consider this a suitable option for about 25% of the patients.

More than treatment mode, visiting the psychologist of the clinic as part of treatment appeared to be the treatment variable related to the severity of dental anxiety after
treatment. Also, the presence of the psychologist during the intake may have had a positive effect on dental anxiety level after treatment. Although patients referred to the psychologist may have been the ones who were most suitable for effective treatment by the psychologist, it is suggested that treatment in the clinic may become more effective and efficient when every patient is referred to this person. This investment in time and money, together with a better referral procedure, may tip the scales with respect to costs and effects towards a more efficient treatment in dental fear clinics.

In conclusion, the results pointed out that treatment at the dental fear clinic was successful in a number of respects. Nevertheless, with regard to the main goal, that is, enabling patients to visit a GDP on a regular basis, improvement seems still possible.
References


