Chapter ten

PATHWAYS TO FULL MOUTH EXTRACTION

10.1 Introduction

The use of dental health care facilities is supposed to be an important factor in keeping the natural dentition in a good condition (1, 2). People insured in the Dutch State Health Insurance Scheme are obliged to visit a dentist twice a year (3). However, the absence of a financial barrier is not a sufficient incentive for regular dental attendance for all people (4, 5). Anxiety has been shown to be an important factor inhibiting regular dental attendance (6). Dental anxiety is presumably a consequence of negative dental experiences in the past and/or a result of a social learning process (6, 7). Once present, anxiety is thought to be a self-maintaining or self reinforcing mechanism, because anxious patients have distorted beliefs about the likelihood of positive and negative events, which raise their anxiety (8). The process of not attending the dentist is described as a vicious cycle in which anxiety plays a crucial role (6, 8, 9-11) and might result in avoidance behaviour leading to deterioration of the dentition. This might increase the perceived likelihood of pain and the need for restorative treatment followed by negative experiences with dental visits, through which dental anxiety is reinforced, etc. If this vicious cycle is not broken, full mouth extraction seems the eventual consequence (9, 10). In The Netherlands an investigation has been carried out into disease and non-disease reasons for full mouth extraction (1). Dental

1) This chapter has been accepted for publication as: Bouma J, Uitenbroek DG, Westert GP, Schaub RMH, Poel ACM van de. Pathways to full mouth extraction. Community Dent Oral Epidemiol 1988; in press.

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reasons for full mouth extraction and the decision processes leading to full dentures have been published. In this chapter non-disease reasons and processes preceding full mouth extractions will be described. The non-disease factors will be described in terms of dental attendance pattern and related factors. Special attention will also be given to the role dental anxiety plays in the dental histories that finally resulted in full dentures.

10.2 Materials and methods

10.2.1 General method

A combined sociodental research project was carried out in an urban and a rural area in The Netherlands to explore the disease and non-disease reasons for full mouth extractions. This study was carried out in the city of Groningen (170,000 inhabitants) in 1982 and was repeated in a rural area (150,000 inhabitants) in 1983. These two areas were chosen because of their traditionally high and low dentist-patient ratio (1:2500 and 1:5700 respectively), which might affect the incidence of full mouth extractions. Over 90% of the dentists in both areas participated. The dentists were asked to collect the extracted teeth from all patients receiving full dentures and to fill out a short questionnaire concerning their reasons (or diagnoses) for the extractions during a one-year period. The representativeness of the populations studied (1) and the assessment of the periodontal status (12) and the caries status (13) have been described elsewhere. The dentists also asked their patients to fill out a questionnaire at home. In the rural area 76% of the 237 patients who received a questionnaire returned it. In the urban area 78% of the 134 patients did so. Finally 181 and 101 questionnaires were respectively suitable for analysis.
10.2.2 The patient's questionnaire

The patient's questionnaire dealt with behavioural aspects which were assumed to influence the decision to have full mouth extractions.

Information was collected about age, sex and socioeconomic status of the respondents. Patients were divided into three groups: regular attenders were those who had been regular attenders until the moment of full mouth extraction; symptomatic attenders were people who had never been to a dentist on a regular basis and a group once regular attenders. Dental anxiety was established with the question "Many people are anxious about the dentist. Other people do not care. How about you?" The answers were rated on a 5-point scale ranging from "very anxious" to "not anxious at all". Patients also were asked about their perception of dental visits: "How did you experience dental visits in the past?" The answers ranged from "not unpleasant" to "very unpleasant". Finally, questions were asked about deferring dental visits in case of toothache, neglect of toothbrushing and whether they had the feeling that they could have done more themselves in trying to maintain their natural dentition.

10.2.3 Scale construction

Different scales were constructed with the aid of the Mokken scaling method (14, 15) which is based on a stochastic cumulative model. Important parameters, which give relevant information about the quality of the constructed scale, are Loevinger's H coefficient and rho, a measure of reliability. An H value of ≤0.30 indicates that there is no scale, 0.30< H ≤0.40 indicates a weak scale, 0.40< H ≤0.50 a fair scale and H >0.50 a strong scale. The following scales could be identified: - the number of negative experiences with dental visits (H=0.59, rho=0.87) - fatalism regarding the possibility of keeping the natural dentition for life (H=0.51, rho=0.78) - knowledge about alternatives to extraction
10.2.4 Discriminant analysis

A discriminant analysis was carried out in order to obtain more insight into the relevant variables leading to full mouth extraction with dental attendance pattern as a dependent variable. With this method it is tried to correctly predict the classification of respondents in regular attenders, symptomatic attenders and once regular attenders. The independent variables refer to attitude, knowledge and behaviour as related to dentistry in general and full dentures in particular. Although social background variables such as age, sex and educational level would have contributed to the (high) percentage of correct classifications, they were not included in the discriminant analysis since the aim was to get the best possible prediction of attendance groups which might give insight into non-disease factors and processes preceding full mouth extraction.

10.3 Results

Only 19% of the patients examined were regular dental attenders. 38% had never visited the dentist on a regular basis, and 43% had stopped regular dental attendance in the past. In Table 10.1 it can be seen that there is a clear relationship between dental attendance pattern and domicile, sex and socioeconomic status (as represented by the variables educational level, type of insurance and social class). Regular attenders and symptomatic attenders had a comparable age at the moment of full mouth extraction, while those who had stopped regular dental visits were significantly younger.
This last group also had, on average, the lowest age when they visited the dentist for the first time, followed by the regular attenders. The symptomatic attenders were rather old at their first dental visit ($\bar{x}=19.3$ yr.).

Table 10.1

| Age, domicile, sex and socioeconomic status according to dental attendance pattern |
|---------------------------------|---------------------------------|-------------------------------|---------------------------------|
| Average age at the moment of full mouth extraction | 47.3 (14.0) | 37.5 (13.8) | 44.8 (14.8) | 42.1 (14.8) |
| Average age at first dental visit | 11.2 (6.3) | 8.9 (5.9) | 19.3 (13.0) | 13.1 (10.3) |
| Domicile: rural | 47.2 | 61.2 | 75.9 |
| Sex: male | 42.6 | 52.9 | 62.3 |
| Education: low | 51.0 | 63.6 | 87.3 |
| Insurance: "Sick-fund" | 69.8 | 80.2 | 89.4 |
| Social class: low | 33.3 | 59.4 | 70.3 |
Table 10.2

Results of the discriminant analysis with the dependent variable "Dental attendance pattern" (symptomatic, once regular, regular)

<table>
<thead>
<tr>
<th>Ranking order of independent variables</th>
<th>Wilks lambda</th>
<th>F' value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anxiety (high)</td>
<td>0.95</td>
<td>6.7</td>
</tr>
<tr>
<td>2. Deferred consulting behaviour (yes)</td>
<td>0.91</td>
<td>6.5</td>
</tr>
<tr>
<td>3. Perception of dental visits (negative)</td>
<td>0.86</td>
<td>6.9</td>
</tr>
<tr>
<td>4. Attitude towards dentists (negative)</td>
<td>0.85</td>
<td>5.6</td>
</tr>
<tr>
<td>5. Attitude towards full dentures (positive)</td>
<td>0.83</td>
<td>5.4</td>
</tr>
<tr>
<td>6. Toothbrushing (no)</td>
<td>0.76</td>
<td>6.5</td>
</tr>
<tr>
<td>7. Feelings of personal shortcomings in trying to maintain the natural dentition (yes)</td>
<td>0.73</td>
<td>6.7</td>
</tr>
</tbody>
</table>

') All F-values significant at P<0.001.

An overview is given in Table 10.2 of the eight variables with which 52% of the patients could be correctly classified according to their dental attendance pattern. The prediction of the regular attenders was most successful: 33 out of 54 regular attenders (61%) were correctly classified. For the symptomatic attenders this figure was 56% (classification based on chance 33.3%). The results for the group who stopped regular dental visits were less successful: 45% could be correctly classified. Proportional differences of the variables according to dental attendance pattern are shown in Table 10.3. Regular attenders were less anxious than symptomatic attenders and patients who stopped visiting a dentist regularly. This last group had the highest proportion of perceived negative experiences with dental visits,
<table>
<thead>
<tr>
<th></th>
<th>Regular attender (n=54)</th>
<th>Once regular attender (n=121)</th>
<th>Symptomatic attender (n=106)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td><strong>Dental anxiety</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>anxious or very anxious</td>
<td>17.0</td>
<td>40.5</td>
<td>39.6</td>
</tr>
<tr>
<td><strong>Perception of dental visits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>not so good or bad</td>
<td>6.2</td>
<td>34.5</td>
<td>15.6</td>
</tr>
<tr>
<td><strong>Deferred consulting behaviour</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>waiting ≥4 days with toothache</td>
<td>23.0</td>
<td>44.8</td>
<td>60.5</td>
</tr>
<tr>
<td><strong>Toothbrushing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>not so good or bad</td>
<td>20.8</td>
<td>39.5</td>
<td>65.1</td>
</tr>
<tr>
<td><strong>Feelings of personal shortcoming in trying to maintain dentition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>11.5</td>
<td>39.0</td>
<td>47.6</td>
</tr>
<tr>
<td><strong>Attitude towards full dentures (0'-7)</strong></td>
<td>5.3 (1.5)</td>
<td>5.6 (1.4)</td>
<td>6.0 (1.1)</td>
</tr>
<tr>
<td><strong>Attitude towards dentists (0'-7)</strong></td>
<td>5.8 (2.7)</td>
<td>4.6 (2.6)</td>
<td>5.5 (2.0)</td>
</tr>
</tbody>
</table>

1) 0: negative attitude, 7: positive attitude
followed by the symptomatic and regular attenders respectively. Feelings of personal shortcoming in trying to maintain the natural dentition, neglect of oral hygiene and deferring dental visits were clearly related to dental attendance pattern: regular attenders had the lowest percentage and symptomatic attenders the highest. Although on average all subgroups had a rather favourable attitude towards full dentures, symptomatic attenders had the most positive attitude. The patients who stopped with regular dental attendance had the most negative attitude towards the dentist, regular attenders the most positive.

In two groups (the symptomatic attenders excluded) there was a significant positive relationship between anxiety and perceived negative experiences with dental visits, in none of the three groups was a correlation found between anxiety and the (objective) number of reported negative experiences, as measured on a 6-point scale. Only in the group symptomatic attenders could a relationship be established between the (objective) number of negative experiences and the perception of dental visits in the past. Although regular attenders and those who stopped with regular dental visits were comparable as to the interrelationships between anxiety and numbers of negative experiences and perception of dental visits, one important difference was established: in the group regular attenders no significant correlation was found between anxiety and deferred consulting behaviour, while in the other group this correlation was 0.45. In the group symptomatic attenders this correlation was 0.36.

In all subgroups knowledge about the disadvantages of full dentures was extremely low (a mean score of about 1.3 in all groups on a 5-point scale). The same applies to the variable "knowledge about alternatives to extraction" (a 4-point scale). Regular attenders had the highest score (1.7) and symptomatic attenders and those who stopped attending had scores of 1.2 and 1.4 respectively. Feelings of fatalism about the possibility of keeping the natural dentition for life were moderate in all groups (a mean score of about 3.1 on a 6-point scale).
This variable and "relevance of physical appearance" did not appear to have any explanatory or discriminating value. Finally, regular attenders and those who stopped attending had a comparable score on the variable "number of bad experiences with dental visits": 3.2 and 3.3 respectively (on a 6-point scale). Symptomatic attenders had a significantly lower score: 1.6.

10.4 Discussion

In this cross-sectional study into the reasons for full mouth extraction people have been questioned about previous history, attitudes and beliefs which possibly changed in the course of their lives. Cause and effect relationships can not therefore be established in all cases. Additionally, the prediction of the three attendance groups was not always successful. Irregular dental attendance is a complicated problem, which is not as yet completely understood (4). For these reasons conclusions based on this partly retrospective study have to be drawn with care and have a tentative character.

In the group of symptomatic attenders and the group which stopped regular dental visits, anxiety was widespread. The percentage of anxious patients was much higher than is generally found in "normal" populations (6). In these attendance groups dental anxiety was also the most frequently reported reason for not going to a dentist in the case of toothache or with a cavity. Anxiety might therefore be considered as an important factor in the process leading to full mouth extraction.

A curious result found in all subgroups was the lack of correlation between anxiety and the number of negative experiences. This is not in line with other investigations in which anxiety sometimes seems to be related directly to negative experiences resulting in a vicious cycle (6). Nevertheless, alternative explanations are possible. In the group
symptomatic attenders no single relationship was found be-
tween anxiety, the number of negative experiences and the
perception of dental visits. This might lead to the conclu-
sion that in this group, anxiety was largely a result of a
social learning process: anxiety was transmitted because of
negative experiences of friends, parents, etc., and is not
in the first place a result of personal experience. The high
average age at the first dental visit (19 yr.), the high
percentage of full denture wearers in the social environment
(75%) and the relative low number of (objective) negative
experiences with dental visits (1.6) further supports this
conclusion.

In the group of regular attenders the percentage of anxious
people was low. Those who were anxious, however, went on
with regular dental visits; they obviously developed ade-
quate coping strategies instead of avoidance behaviour.
Additional support for this is found in the absence of a re-
lationship between anxiety and the number of cavities pre-
sent in the other two groups. Berggren (6) suggested that
there is strong social pressure in high social groups which
might reduce avoidance of dental care in those groups.

In the group which stopped regular dental visits, anxiety
was not related to the number of negative experiences even
though this was relatively high (3.2). Nevertheless, there
was a relationship between (high) anxiety and the (negative)
perception of dental visits, which was not related to the
number of negative experiences. Negative experiences did not
directly cause anxiety. An alternative explanation could be
that anxiety distorts the perception of the experiences with
dentistry, as has been suggested by Kent (8). Whether or not
the basis for anxiety is "real", the consequence, i.e. avoidance
behaviour, is the same. One might wonder why so
many people react with avoidance behaviour because of dental
anxiety. If avoidance means deferring dental visits this may
be understandable, although, from a purely rational point of
view, it is not an adequate reaction. If avoidance (also)
means neglect of oral hygiene, it is much more difficult to
explain this reaction, since improved oral hygiene measures
might reduce the involvement in a fear arousing situation (i.e. dental treatment). Probably not brushing (bad) teeth has the function of avoiding fear arousing stimuli. Berggren (6) gives a plausible explanation for this phenomenon when he reported that in the group he investigated, fear, pain and feelings of inferiority and shame made oral hygiene feel futile. In our group of symptomatic attenders with a high percentage of people with feelings of personal shortcomings in trying to maintain the natural dentition, the same mechanism might have occurred. Finally, a tentative typology will be given of three profiles of dental histories that finally ended in full mouth extraction.

a. The regular attenders
This group was characterized by a predominantly urban background, female, and from a higher socioeconomic status. They were significantly older at the moment of full mouth extraction than those who stopped regular dental visits, although their age was comparable with the symptomatic attenders. The number of reported negative experiences was the same as in the group who stopped with regular visits, but they had a positive perception of dental visits in the past and a very positive attitude towards the dentist. The percentage of anxious people was low and no avoidance behaviour was shown. In this group no clear non-disease factors contributing to the full clearance could be found. It is therefore suggested that because of the deterioration of the dentition (13), in spite of regular dental care, full mouth extraction was an acceptable solution at their age.

b. The symptomatic attenders
This group had a predominantly rural background, contained more males than females and had the lowest socioeconomic status. Their age at the moment of full mouth extraction was comparable with the regular attenders. The percentage of anxious people was high. They were rather old when they first went to a dentist and showed extreme avoidance behaviour. Only a small group reported a negative perception of dental visits. It is suggested that in this group dental anxiety is especially caused by social learning. Neglect of
oral hygiene was apparent as was the high percentage of people reporting feelings of personal shortcomings in trying to maintain the natural dentition. They had however a positive attitude towards dentists. Their very positive attitudes towards full dentures, the high prevalence of full dentures in their social environment, combined with their social background, leads us to the conclusion that these patients lived in a culture which supports behaviour leading eventually to full mouth extraction.

c. Once regular attenders

The social background of this group had an intermediate position as compared with the two other groups. This group had the lowest average age at the moment of full mouth extraction. Dental anxiety was widespread and they reported a relatively high number of negative experiences with dental visits. No correlation was found between anxiety and the number of negative experiences nor between the number of negative experiences and perception of dental visits in the past. This group had the highest percentage of patients with negative perception of dental visits and had the most negative attitude towards dentists. It is suggested that bad experiences do not so much lead to anxiety as anxiety leads to negative perception of experiences with dentistry leading to a reinforced vicious cycle of poor attendance. Facilitated by a positive attitude towards full dentures their bad dental condition (13) finally urges them to take full dentures at early age.
References


