Halitosis and Oral health-related Quality of Life: A Case Report

This chapter is based on Buunk-Werkhoven, Y.A.B., Dijkstra-le Clercq, M, de Jong, N., Spreen, M. Halitosis and Oral health-related Quality of Life: A Case Report. (accepted pending revision). International Journal of Dental Hygiene.
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Abstract

Objectives: This is a clinical case of a 36-year-old Dutch male, patient in the Dr. S. van Mesdag Forensic Psychiatric Centre in Groningen. It demonstrates a short-time ‘effect’ of a tailored oral hygiene self-care intervention in three sessions over a period of three months on halitosis and a patient’s oral health-related quality of life (OH-QoL).

Methods: Besides dental screening and professional oral hygiene care, an in-depth semi-structured interview was conducted by the dental hygienist, and questionnaires were administered including the Dutch version of the Oral Health Impact Profile-14 (OHIP-14-NL; used as a measurement of OH-QoL), and scales for expected social outcomes for having healthy teeth, attitudes towards oral hygiene behavior (OHB), and dental anxiety. Results: Clinical observations showed an improvement in patient’s OHB, while the extreme foetor-ex-ore was reduced to an acceptable level. A retrospective assessment showed that patient’s attitude toward the recommended OHB together with his self-perceived OH-QoL had moved in a more positive direction. Conclusions: This case highlights the value of professional individual oral hygiene instructions performed by a dental hygienist, and illustrates that a patient’s effective OHB may play an important role in the reduction of halitosis, and in self-perceived OH-QoL. Finally, the retrospective version of the OHIP-14-NL may be an adequate method to assess self-perceived OH-QoL within a relative short period of time.

Introduction

Oral health can be defined as “a standard of health of the oral and related tissues which enables an individual to speak and socialize without active disease, discomfort or embarrassment and which contributes to general well-being” (1, p. 8). Oral disease can lead to impairments on several dimensions in the physical, the psychological and the social domain (2). For instance, large cavities or severe gingival diseases (periodontitis) can make the extraction of teeth necessary. Tooth loss may lead to problems with biting, chewing, swallowing, speaking, smiling, and appearance, which may lead to feelings of shame or decreased self-esteem.

An additional possible effect of oral disease is halitosis, i.e., a bad breath odor. At least 50 percent of the population suffers from halitosis (3), and around 25 percent of these individuals experience such a severe problem that it affects their social functioning. For example, individuals may feel nervous and embarrassed in the presence of other people and may avoid social contacts and intimate relationships (3-4). Thus, halitosis is what Locker refers to as impairment that can lead to a decrease in the quality of life (5-7).

The present case report concerned a patient in a forensic psychiatric institution, the Dr. S. van Mesdag Forensic Psychiatric Centre. In the Netherlands, highly select populations of individuals with mental disorders who have committed serious offenses (i.e., murder -including serial-, rape or pedophilia) are imprisoned in specific institutions, and to reduce recidivism they receive forced treatment appropriate to their psychiatric needs.

Recently, two studies on the oral health and its self-reported impact on quality of life in Dutch forensic psychiatric population (8-9) showed that this population is characterized by a low level of awareness of one’s own oral hygiene and of the consequences this may have for one’s oral health and well-being. The findings underline the importance of dental screening and professional dental care in this population, and suggest that attention to structural
individual oral hygiene instruction, as part of patients’ general personal care, may improve patients’ oral health status (10-12). Therefore, the aim of this clinical case study was to demonstrate that an OHB intervention tailored to the individual may reduce halitosis and benefit patient’s OH-QoL.

Method

Overview

Over a period of three months, a 36-year-old Dutch unmarried male forensic psychiatric patient, Mr. X., from the Dr. S. van Mesdag Forensic Psychiatric Centre in Groningen participated in this case report. It was stressed that participation was voluntary. Ethical approval for this case report was obtained from the ethics committee of the institution.

The patient

The patient, Mr. X., came from a Dutch family, and was the youngest of four children. He lost his father when he was almost 12 years old. He had a significant medical history: since he was 3 years old, he visited regularly hospitals for obesity. He suffered from deafness till the age of 4 (tinnitus), which was successfully treated with surgery, but he kept having speech problems, i.e., lisping. There was family history of obesity, and his mother was pre-diabetic. His mental health history included a diagnosis of educationally subnormal impression (weakly mentally retarded). His highest level of education was secondary special education. By the age of 3 or 4 years Mr. X. went to the dentist for the first time, and his parents brushed his teeth twice a day till he was about 6 years. As far as he remembered, he had a bad oral condition.

Procedure and treatment

A dental screening was conducted by a dentist and the diagnosis was ‘pre-edentulous’, implying an aggressive process of periodontitis to a point where extraction of all teeth would become necessary. A full denture was evidently the next step, but this was complicated because of Mr. X.’s very complex oral condition; the maxilla was in an extreme Class II occlusion. In the meanwhile, it became clear that, because of his extremely foetor-ex-ore (very strong distasteful smell of breath), the co-residents and the staff avoided Mr. X. or kept him on a distance in social contacts. Therefore, a visit to the dental hygienist (the first author) was considered urgent.

The first session with the dental hygienist (three months after the dental screening), included an assessment of Mr. X.’s oral hygiene self-care with the index for OHB (13). This measure includes 8 items with respect to tooth brushing, interdental cleaning and tongue cleaning (Appendix I). Mr. X. reported to have sometimes a toothache or a broken teeth, regular gingiva bleeding, often mobility of his teeth, and a very often strong distasteful smell of breath. Mr. X.’s daily OHB included twice a day (after breakfast and before going to sleep) manual tooth brushing (horizontal/circular method) with fluoridated toothpaste, and mouth-washing several times a day. He did not use any interdental cleaning methods or tongue cleaning.

In addition, Mr. X. was educated about his clinical oral condition, and received individual oral hygiene instruction and skills training for optimal OHB which included the Bass-method. In addition to tooth brushing, daily interdental cleaning, (in this case, the use of interdental brushes), tongue cleaning, and mouthwash were also recommended (9, 13-16).
Immediately after this instruction only a professional dental polishing treatment was carried out by the dental hygienist.

Three weeks later in the second session, the dental hygienist assessed if Mr. X.’s performed the recommended oral hygiene behavior effectively. While Mr. X.’s oral health was assessed directly, a simple visual inspection. This suggested a reduction of plaque in general; the color of the gingiva was rose instead of dark red; there was less swelling of the gingiva, and the very strong distasteful smell of the breath was reduced. The difference between the observations of session 1 and 2 was presented to Mr. X. visually with a hand mirror.

**In-depth semi-structured interview**

Directly after the second session, Mr. X. was interviewed by the dental hygienist to explore his family background, his dental history and his feelings about himself. The main focus in this interview were the factors that might have played a role in his behavioral change (e.g., a change in attitudes towards oral hygiene self-care, and the influence of specific important individuals on Mr. X.’s oral health behavior). The interview took place in a separate room at Mr. X.’s department, and lasted for about 45 minutes. A checklist was used to make sure that all relevant topics were covered.

**Measures**

First, Mr. X. answered a few demographic questions and questions about his dental history, for instance, the age of his first dental visit, his perceived oral condition (i.e., condition affecting structure of the mouth such as teeth, gums, lips, tongue and cheeks), and his dental health status, including the judgement made by the dentist.

**OHIP-14-NL (OH-QoL)**

Next, Mr. X.’s indicated his perceived OH-QoL with an adapted version of the OHIP-14-NL, a validated Dutch short version of the OHIP-NL (8-9, 17), that includes 14 items organized in seven dimensions: function limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap. Responses varied from “never” to “very often. Higher sum scores (ranging from 0 to 56) represent a lower OH-QoL (18).

**Expected social outcomes (ESO)**

Furthermore, Mr. X. filled out a six-item scale on the expected social outcomes for having healthy teeth (ESO; 9, 13-15), with items such as “In social contacts fresh breath is important.” Responses varied from 1 = disagree to 5 = agree. A higher sum score (ranging from 6 to 30) indicates a higher importance of the social outcomes of good oral health.

**Dental Anxiety Scale (DAS)**

Mr. X also filled out the four-item Dental Anxiety Scale, a self-report scale measuring fear for dental treatment (DAS; 19). Items were scored on a scale of 1 to 5, and higher sum scores (ranging from 4 to 20) indicate more dental anxiety.

Finally, to measure the attitude, i.e., the feelings about OHB, Mr. X. indicated on nine dimensions, how he evaluated the recommended OHB, e.g., 1 = unimportant to 7 = important, and so on: unpleasant-pleasant unhealthy-healthy, negative-positive, annoying- not annoying, not useful-useful, boring-exciting, painful-painless, and stupid-smart. Higher sum scores (ranging from 9 to 63) indicate a more positive attitude towards an optimal OHB.
Modified OHIP-14-NL
Two months after the second session, during the third session, the dental hygienist checked-up the maintenance of Mr. X.’s optimal OHB, and used a modified OHIP-14-NL scale to assess retrospectively the perceived improvement after the intervention. The original items were preceded by the introduction “in comparison to the period before the intervention (three months ago) by the dental hygienist”, and the responses of the participant were scored “fewer” to “more”, resulting in a sum score potentially ranging from 1 (no improvement at all) to 56 (much improvement), and 28 means no changes. Similarly, patient’s perceived change in attitudes and opinions towards OHB were assessed.

Oral hygiene treatment
Finally, the dental hygienist performed a professional dental treatment, including a simple SRP and polishing. Because of insurance does not cover more extensive oral health care in this type of centre for imprisoned forensic patients, the focus of dental and oral hygiene treatment was mainly on reducing pain and other oral discontent.

Results
At the first session, the dental hygienist noted that Mr. X. was extremely obese, with a BMI over 40 kg/m2, and with a physically unhealthy and slightly neglected appearance. He was sloppily dressed and had a particular strong distasteful smell around him, which was hard to describe. However, he was calm and didn’t show anxiety or other obvious emotions.
He had positive experiences with his dental visits (twice a year), and had five different dentists till now. Mr. X.’s sum score of 4 on the Dental Anxiety Scale is indicative of no dental anxiety.
While he had - without success - tried to use orthodontic removable night braces in childhood, during adolescence he was no longer motivated for orthodontic treatment.
Mr. X. reported to have sometimes a toothache or a broken teeth, regular gingiva bleeding, often mobility of his teeth, and a very often strong distasteful smell of breath. Mr. X.’s daily OHB included twice a day (after breakfast and before going to sleep) manual tooth brushing (horizontal/circular method) with fluoridated toothpaste, and mouth-washing several times a day. He did not use any interdental cleaning methods or tongue cleaning.
When Mr. X. was educated about his clinical oral condition to increase his knowledge and awareness regarding his oral health, and was given oral hygiene instructions and demonstrations, he was sincerely motivated and willing to change his own daily oral hygiene activities as recommended.
At the second session, Mr. X. general appearance had changed, he was cheerful and he was wearing a new T-shirt and well dressed trousers. His OHB was well performed and his self-perceived oral (gingival) condition had been improved. His teeth were clean, he reported less gingival bleeding, and the breath odor was reduced to an acceptable level. The dental hygienist complimented Mr. X. on his regular oral hygiene self-care, and also reinforced that he could attain sustainable oral health benefits. Mr. X. admitted that he felt relieved and that his clinical oral condition felt better than it had 3 weeks earlier. In addition, he was very motivated to maintain the newly learned OHB, even though it cost him about 30-45 minutes per brushing moment. Mr. X. daily cleaned his tongue, brushed his teeth 4 times a day, used interdental brushes before he went to sleep, and he still used the mouthwash several times a day.
In the interview directly after the second session, Mr. X. evaluated his perceived OH-QoL very
positively; he had never eating problems or pain (OHIP-14-NL; sum score = 5). Sometimes he had trouble speaking because of the lispering. He indicated that he experienced some psychological discomfort, and that he now avoided being in a near distance of other people because of his foetor-ex-ore. Most of all, when he noted reluctant behavior of others, he tended to withdraw socially and to experience some increased tension. Eventually he admitted feeling ‘very ashamed’ of his bad breath odor. He attached a high value to the positive social outcomes of having healthy teeth (ESO; sum score = 25), and wondered if others would notice it that he had improved his OHB.

The patient valued the newly learned OHB very positively (attitude; sum score = 50), he found the recommended OHB extremely boring, a little bit annoying, and between painful-painless. In answer to the final question why he had changed his oral hygiene behavior, Mr. X. answered: “Because now at last I know what I should do and how”.

Three months after the intervention the dental hygienist assessed the maintenance of Mr. X.’s oral hygiene behavior. Mr. X. still was motivated and willing to maintain his newly learned daily oral hygiene activities. Furthermore, Mr. X. evaluated his perceived OH-QoL in comparison to the period before the intervention more positively; he reported much improvement on several items of the OHIP 14-NL (sum score = 38). He experienced less social-psychological discomfort; felt much more secure, reported less tension, and felt less ashamed. Moreover, he felt that he was able to function more normally and that life in general was more satisfying. Mr. X.’s attitudes and opinions toward oral hygiene self-care were also changed in a much more positive direction.

**Discussion**

The present case study concerned a forensic psychiatric patient, Mr. X, with serious halitosis that was negatively affecting his oral health related quality of life, and was interfering with his social interactions. A tailored oral hygiene self-care intervention by a dental hygienist of three sessions over a period of three months showed a substantial decrease in halitosis, an increase in the patient’s self-reported OH-QoL, and an obvious improvement in OHB. Indeed, a retrospective assessment showed that the patient’s attitude toward OHB as well as his self-perceived OH-QoL had moved in a more positive direction. These effects are particularly noteworthy as forensic psychiatric patients tend to have a low awareness of their own OHB, and of the consequences such behavior may have for their oral health and well-being (8-9). In general, individuals with a psychiatric diagnosis tend to experience more problems with their oral health, and the present study illustrates how such individuals may be assisted to improve their oral health by a dental hygienist (20).

While it is not completely clear why the intervention was successful, we assume that the combination of personal attention and very specific behavioral instructions may have accounted for the effects. Moreover, the patient was very motivated to change his behavior as he daily experienced the negative social consequences of his bad breath. In part the fact that he was cognitively challenged and imprisoned may have affected his motivation to change his behavior. While, of course, this case study concerns a specific patient in a quite specific setting, we feel that it underlines the importance of interventions provided by a dental hygienist tailored to individual needs (11-12, 21).

This study may assist all oral health professionals working with specific patient categories in what are referred to be “the most dignified tasks” of these professionals, i.e., educating these
persons in oral health and changing their oral hygiene behavior (22). In addition, as dentists are at times not primarily focussed on educating patients in effective oral hygiene behavior, preferring to treat rather than prevent oral diseases (23), dental hygienists may play a central role in promoting desired oral hygiene behavior by effective professional communication (24). Finally, this study suggests that questionnaires with which patients are asked to indicate changes in their attitudes and oral health-related quality of life (25) after a treatment may support the daily practice of dental hygienists, by assisting them in evaluating the effects of their interventions, and thus by providing information to foster reflection on their work.

Acknowledgments

Special thanks to Mr. X. for his invaluable information and willingness for taking part in this case report. The author is particularly grateful to Abraham P. Buunk, Arie Dijkstra, and to the dentist, Mrs. Elly Verheggen-Udding for their invaluable and enthusiastic support.

References


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## Appendix I

### Index for oral hygiene behavior (OHB)

The following questions are about your oral hygiene self-care practices.

1. **How often do you brush your teeth?**
   - □ not every day
   - □ once a day
   - □ twice a day
   - □ more than twice a day

2. **When do you brush your teeth?**
   - morning before breakfast □ Yes □ No
   - morning after breakfast □ Yes □ No
   - noon □ Yes □ No
   - after dinner in the evening □ Yes □ No
   - before going to sleep □ Yes □ No

3. **How do you brush your teeth?**
   - I brush my teeth
     - gently □ □ □ □ □ □ □ forcefully

4. **How much time do you spend on brushing your teeth?**
   - I brush my teeth for
     - □ less than one minute
     - □ one minute
     - □ two minutes
     - □ three minutes
     - □ more than three minutes

5. **I brush my teeth as follows:**
   - □ back-and-forth movement ('horizontal' method)
   - □ up-and-down movement ('vertical' method)
   - □ circular movement ('circular' method)
   - □ brushing gently, massaging the gum ('Bass' method)

6. **What do you use to clean your teeth?**
   - Mostly I use:
     - □ toothpaste with fluoride
     - □ toothpaste without fluoride
     - □ I don’t know

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115
7. Do you clean your tongue?
- never
- sometimes
- every day

8. Which of the following interdental tools do you use?

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<th>not every day</th>
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