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ORIGINAL ARTICLE

Dental implants in the functionally impaired: experience from the patients' perspective

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Abstract

Objective. Edentulousness has a great impact on the individual. Extensive tooth loss is more common among functionally impaired individuals. Such groups may have difficulties with removable prostheses. The aim of this qualitative study was to explore functionally impaired patients' experience of receiving and living with dental implants. ***Materials and methods.*** Seventeen patients with several types of functional impairment who had undergone treatment with dental implants were interviewed. Analysis of the open-ended questions was inspired by grounded theory methodology and began at the first interview, proceeding in parallel until no further relevant information could be obtained. ***Results.*** 'The implant treatment is a process of normalization' was identified as the core category. It was related to four other categories: 'The functionally impaired are also entitled to dental care', 'Edentulousness is a burden for functionally impaired individuals', 'There is interaction between implant treatment and other aspects of life' and 'It is important to understand the implications of implant treatment'. ***Conclusions.*** Normalization was the motivation for implant treatment. Edentulousness had enhanced the feeling of being different and treatment with dental implants was important for well-being. The experience of the treatment process was linked to circumstances of life. Information about procedure, alternative prosthetic constructions and hygiene routines was crucial to the experience and the outcome of the treatment.

Key Words: *edentulousness, functionally impaired, qualitative research, rehabilitation, well-being*

Introduction

Losing teeth has a major impact on the individual in terms of a concurrent decline in quality-of-life. The edentulous person experiences decreased, self-consciousness, reduced social status and impaired function [1–4]. Individuals with missing teeth change their eating habits, which imply a risk for malnourishment or over-nourishment. A relationship has been found between tooth loss and coronary heart disease, stroke and poor circulation [5]. The number of teeth has also been shown to be a predictor of mortality in a group of 70-year-old subjects [6]. Recent studies suggest a connection between tooth loss and decreased cognitive function [7,8].

Edentulousness has previously been linked to normal aging. In recent decades more and more people have begun to retain their natural teeth, even at older ages [9–11]. Single tooth loss or loss of a few teeth is a normal finding, while more extensive tooth loss is almost only found today among the very elderly or in groups with social and financial problems, chronic illness or some kind of disability [12,13]. These groups are in a vulnerable position in society. Edentulousness may be an extra burden for them.

Teeth can be replaced with fixed or removable prostheses. For some people, removable prostheses are difficult to wear, [4,14,15]. Chronic illness, high age and physical, mental or intellectual disabilities all lead to some level of functional impairment and can make it more difficult to adapt to removable prostheses. In such cases replacement of lost teeth with a fixed prosthesis supported by osseointegrated titanium implants is an alternative, but dental hygiene procedures are more complicated with fixed prostheses. This can give rise to new problems for these groups. There is very little literature concerning how patients with functional impairments perceive treatment with dental implants. The aim of this study

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was to explore functionally impaired patients' experience of receiving and living with dental implants.

Materials and methods

Grounded theory

The method used in this qualitative interview study was inspired by grounded theory (GT) [16–20], with a model or theory being inductively derived from systematically collected and analyzed data. In line with GT guidelines, the study was not based on a pre-conceived theory, but had an open-ended approach.

Ethical aspects

This study was approved by The Regional Ethical Review Board in Umeå. Requirements concerning informed consent and confidentiality were fulfilled. The informants were assured that they could withdraw at will. None of the informants has been treated by the interviewer. Since many of the informants in this study were in a position of dependence, ethical considerations were of utmost importance. The place for the interview was chosen by the informants. All questions were directed at the informant, but a representative was sometimes used as an interpreter.

Study group

Selection was made by theoretical sampling according to GT, from the VAS patient register at the Department of Oral Surgery at Sunderby Hospital in Luleå, Sweden. Seventeen individuals (seven men and 10 women) participated in the study. The mean age was 70 years, range 33–87 years. Patients who had been treated by the author were excluded. The participants were selected according to various types of functional impairments: patients with physical impairments, patients with mental and intellectual impairments and elderly patients. Some of the patients were entitled to increased financial support for dental care from the Swedish state to individuals with special needs, a sort of official acknowledgement of being functionally impaired [21]. We tried to obtain as much variation as possible according to age, sex, type of functional impairment and type of implant prostheses. Participants were selected continually in the interview process. Comparisons between patients were made before the next selection. The process proceeded until new information was not found by more data collection.

Dropouts

An information letter was sent to 23 participants. In the ensuing telephone conversation, 17 agreed to participate in the study. One person was not available by telephone, one person didn't have time and three were too sick or too tired to participate in the study.

Procedure

The participants were invited by letter and ensured confidentiality as well as the opportunity to withdraw at any time. Participants who are unable to speak were asked to appoint a representative. They were then contacted by telephone. Verbal consent was given by the participant or his or her representative. Each representative and participant filled out a form together, indicating their relationship.

Each participant was asked to choose the place for the interview. Some participants chose a dental clinic in the area where they lived, but most of the interviews took place in the participant's home.

An open interview in a conversational style was conducted by the author (AL) on the basis of an interview guide developed in co-operation between the author (AL) and the co-author (IW). The interview, lasting ~ 1 h, was tape-recorded. The participant was encouraged to speak freely about the process from the time of losing teeth until the implant treatment was completed and about their experience of living with dental implants. When a representative was used, all questions were formulated to the participant who could express him or herself with gestures, mimicry and sometimes verbal phrases, which could be interpreted by the representative. The participant had the opportunity to ask questions during the interview. Attention was paid to reactions of the participants who could not speak, to make it possible for the representative to explain in greater detail and sometimes help the participant to ask questions. Data collection and analysis were conducted simultaneously. Indications of theoretical saturation appeared around interview no. 15, after which two further interviews were conducted.

Data analysis

The interviews were transcribed verbatim and analyzed using a coding process. The first step was open coding, by which meaning units were found in the text and formulated in codes, e.g. 'It is important to give priority to dental health', 'Relatives have to work hard' and 'Equal rights for dental treatment'. Codes with similar content were then clustered into categories, e.g. 'The right to dental care'. The categories have a more abstract level than the codes (Table I). The next phase was to find relationships between categories and to describe properties of the categories, axial coding. Finally, in the phase of selective coding, the theory was generated. A core category was pointed out and tested vs other categories by constant comparison. This core category describes a process that can be related to all the other categories.

The theory was saturated with information from new interviews or recoding of previously assessed data. Notes

Table I. Examples of codes and categories.

Codes	Sub-category	Category
Codes and sub-categories describing the category 'The implant treatment is a process of normalization'.		
The new teeth are like natural teeth	Good experiences of the result of the implant treatment	The implant treatment is a process of normalization
The new teeth give confidence and quality-of-life		
The new teeth are not like natural teeth	Bad experiences of the result of the implant treatment	
Implant teeth sometimes have to be repaired		
Codes and sub-categories describing the category 'The functionally impaired are also entitled to dental care'		
The functionally impaired need both financial and other support from the community	Eligibility to dental care	The functionally impaired are also entitled to dental care
Relatives have to work hard		
High cost is an obstacle to dental treatment and/or affect choice of therapy	High costs is an obstacle	
Worry about future costs		
Codes and sub-categories describing the category 'Edentulousness is a burden for functionally impaired individuals'		
Dentures are acceptable	Experiences of dental treatment in the past	Edentulousness is a burden for functionally impaired individuals
Dentures are not acceptable		
Oral functional impairment	Incitements for implant treatment	
Impaired oral status affects intimate relations		
Codes and sub-categories describing the category 'There is interaction between implant treatment and other aspects of life'.		
The treatment process was acceptable	Experiences in connection with implant treatment	There is interaction between implant treatment and other aspects of life
The treatment process was tiresome		
I feel better after the implant treatment	There is interaction between implant treatment and health	
Chronic illness may imply difficulties to live with dental implants		
Codes and sub-categories describing the category 'It is important to understand the implications of implant treatment'		
I could not make myself heard	Limited participation	It is important to understand the implications of implant treatment
Disappointment with the esthetic appearance of the new teeth		
The importance of assistance with oral hygiene routines	Oral hygiene in connection with implant treatment	
Worry about future problems with oral hygiene		
Regular check-ups are important	Regular check-up	
Regular check-ups are not necessary		

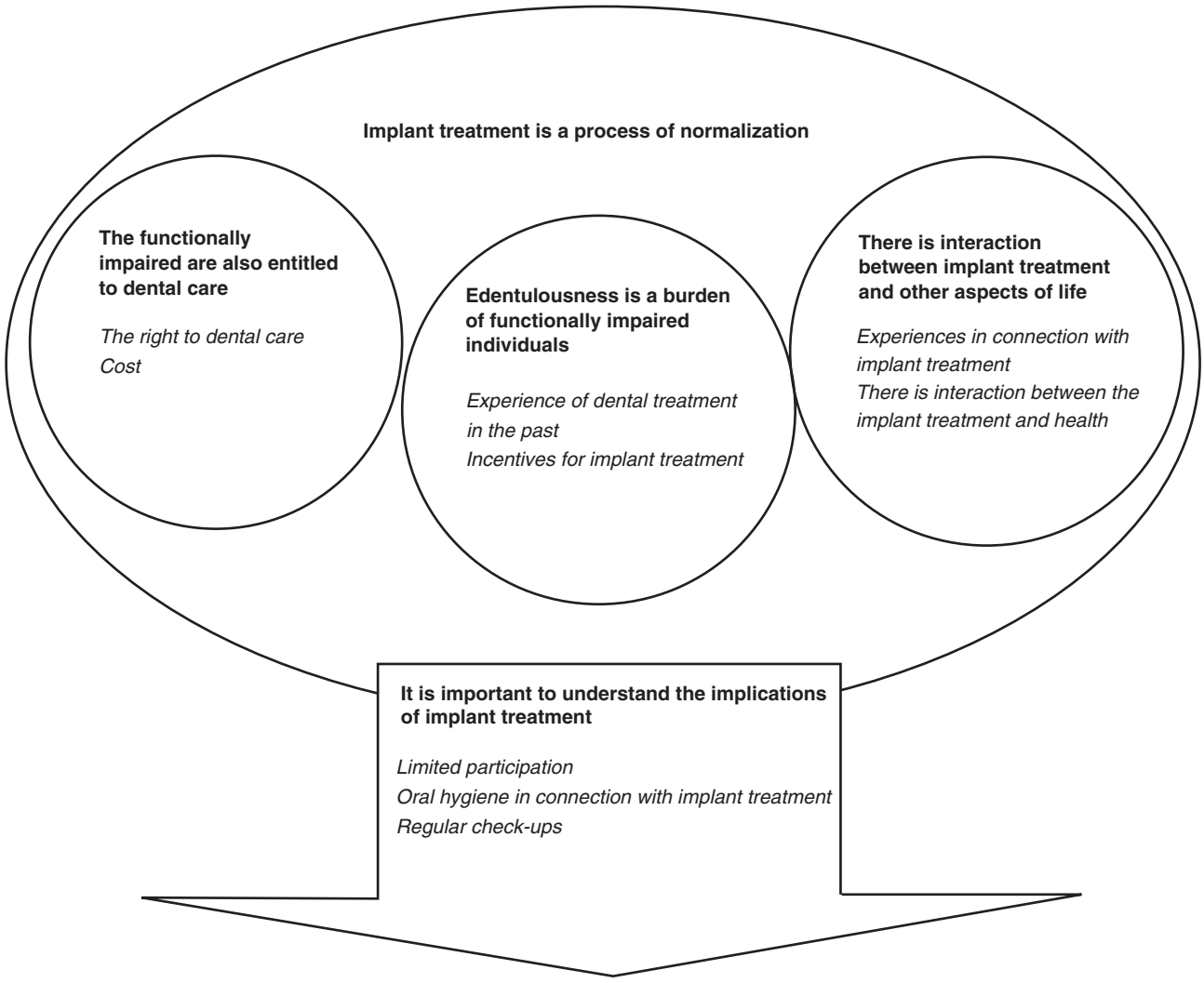

Figure 1. Model describing the implant treatment a process of normalization. The model also shows the importance of understanding the implications of implant treatment for the experience of the treatment and treatment outcome. Sub-categories for the core category are not specified.

were taken throughout the entire process. These ideas and field notes were used to develop the theory. Calibration was carried out in dialogue between the author and the co-author throughout the coding process.

Results

In the analysis process 'Implant treatment is a process of normalization' was identified as the core category. It was related to four other categories: 'The functionally impaired are also entitled to dental care', 'Edentulousness is a burden for functionally impaired individuals', 'There is interaction between implant treatment and other aspects of life' and 'It is important to understand the implications of implant treatment' (see Figure 1). Each category and the related sub-categories are described below and selected quotations from the interviews are used to further illustrate the content of the categories.

Implant treatment is a process of normalization

The core category, 'Implant treatment is a process of normalization' describes the informants' experience that treatment with dental implants had increased normality. The informants perceived it as stigmatizing to be edentulous and treatment with dental implants enhanced their perceived quality-of-life in terms of better self-image and improved functioning. According to the interviews the implant treatment influenced social activities such as eating in the company of friends, talking and laughing. An improvement in esthetic appearance seems to have been important for feeling secure socially. Informants with mental or intellectual impairments particularly expressed the importance of good oral function and good appearance to avoid stares from others.

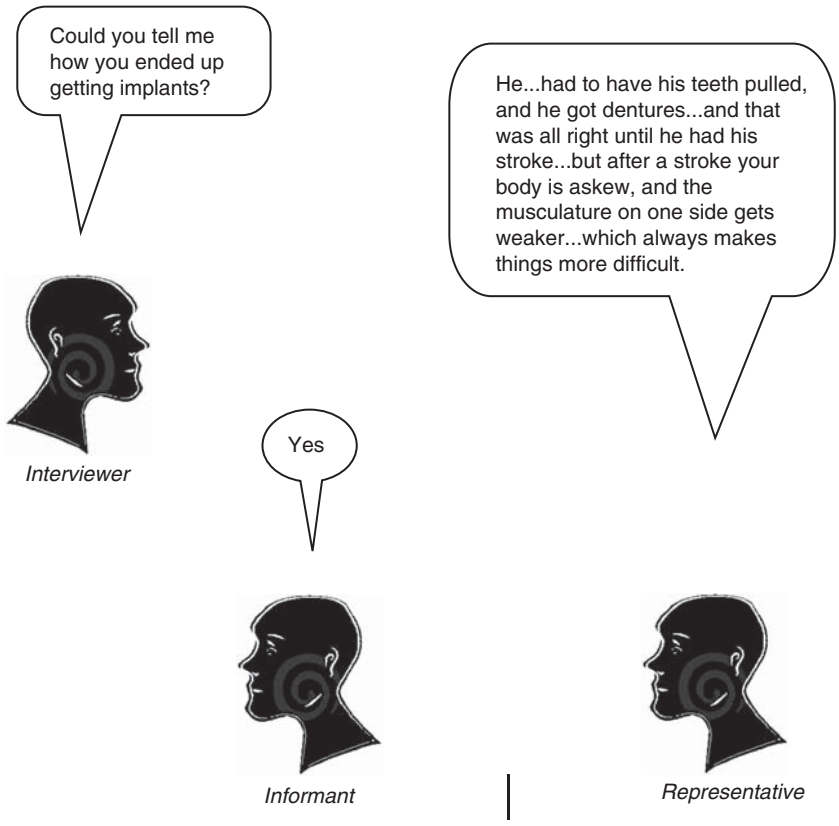

Figure 2. A man with a physical disability explained with the help of his representative.

> False teeth ... You know, they're not so great ... they make life difficult. So getting implants, that gave me quality-of-life. And they're so well made. They're so natural you can ... it's almost as if they had grown right up out of your jaw. (...) Somehow, you just want to be normal.

Another aspect of normalization is autonomy. Decreased oral function means needing specially adapted foods which, in some cases, was an obstacle to living independently before implant treatment.

The functionally impaired are also entitled to dental care

This category describes issues of justice and distribution. Equal rights to dental care were not taken for granted. In some cases the cost was a problem.

The right to dental health. The informants considered dental status one of the most important elements of well-being. To be free from pain and have good chewing ability was, according to the interviews, fundamental to well-being: 'Teeth are so ... you know; dental care is the most important aspect of healthcare'.

Some informants had not had full access to dental care earlier in life, which resulted in poor dental health. When they were finally able to have dental rehabilitation they perceived a substantial improvement in their quality-of-life.

Some relatives reported that they had to work very hard since treatment with dental implants was not automatically offered to functionally-impaired individuals. Without their contribution to the process, they assumed that only basic therapy would have been offered.

Cost. In some cases the cost had affected their choice of prosthetic therapy.

Edentulousness is a burden for functionally impaired individuals

This category describes how edentulousness enhances the feeling of being different and how impaired oral function becomes an extra burden for functionally impaired individuals.

Experience of dental treatment in the past. For some of the informants, dentures had for a time been an acceptable prosthetic alternative, especially in the upper jaw. Resorption of the jawbone and illness such as stroke had, in some cases, resulted in deterioration of prosthetic function, exemplified in the conversation in Figure 2. Some of the informants had tried removable dentures, but they had never been able to cope with them.

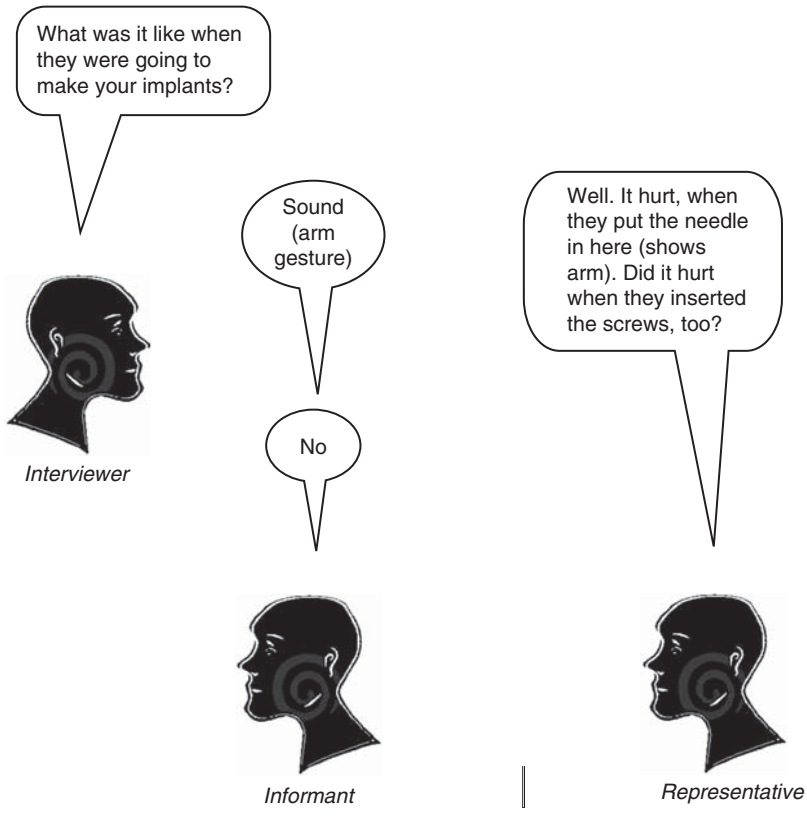

Figure 3. A woman with autism explained with the help of her representative.

Incitements for implant treatment. Difficulties with chewing and eating were a common motivating factor for implant treatment. According to the informants, living with impaired dental health and/or poorly functioning dentures implied a social handicap. Before the implant treatment many of the informants avoided social activities.

> I didn't want to go anywhere else for a meal, not even to my daughter's (. . .) To sit there and mash my food when other people are around—no thank you! (. . .) I didn't want to go out, I felt like a fool, sitting there poking at my food and mashing it up when other people were sitting there enjoying their meal.

Removable dentures and/or impaired dental health had, for some informants, been an obstacle to intimate relations.

> So let's say you meet somebody, and then you want to kiss that person but . . . you just think the whole time, what if it is obvious I have false teeth?

There is interaction between implant treatment and other aspects of life

This category deals with the impact of circumstances of life on the experience of the treatment procedure, the demand for and the outcome of implant treatment.

Experiences in connection with implant treatment. The complexity of the therapy does not seem to have been crucial to the informants' experience. Troublesome effects of the treatment, e.g. insufficient or prolonged anesthesia and hematoma, were not big issues. The onerous aspects could be associated with narcosis, as in the conversation between the interviewer and an informant with help of her representative, see Figure 3. The few informants who perceived the implant treatment as difficult to endure could not exactly explain why. Some of them presumed that previous dental experience had affected their reactions. The most frequent negative comment was that the treatment was too extended in time.

There is interaction between the implant treatment and health. Some of the informants perceived better health after the implant treatment.

> When I got teeth I could really chew my food with . . . and since then I feel like my whole body is different.

It is important to understand the implications of implant treatment

This category refers to aspects of autonomy and information. These issues seem to have been important throughout the process, but especially

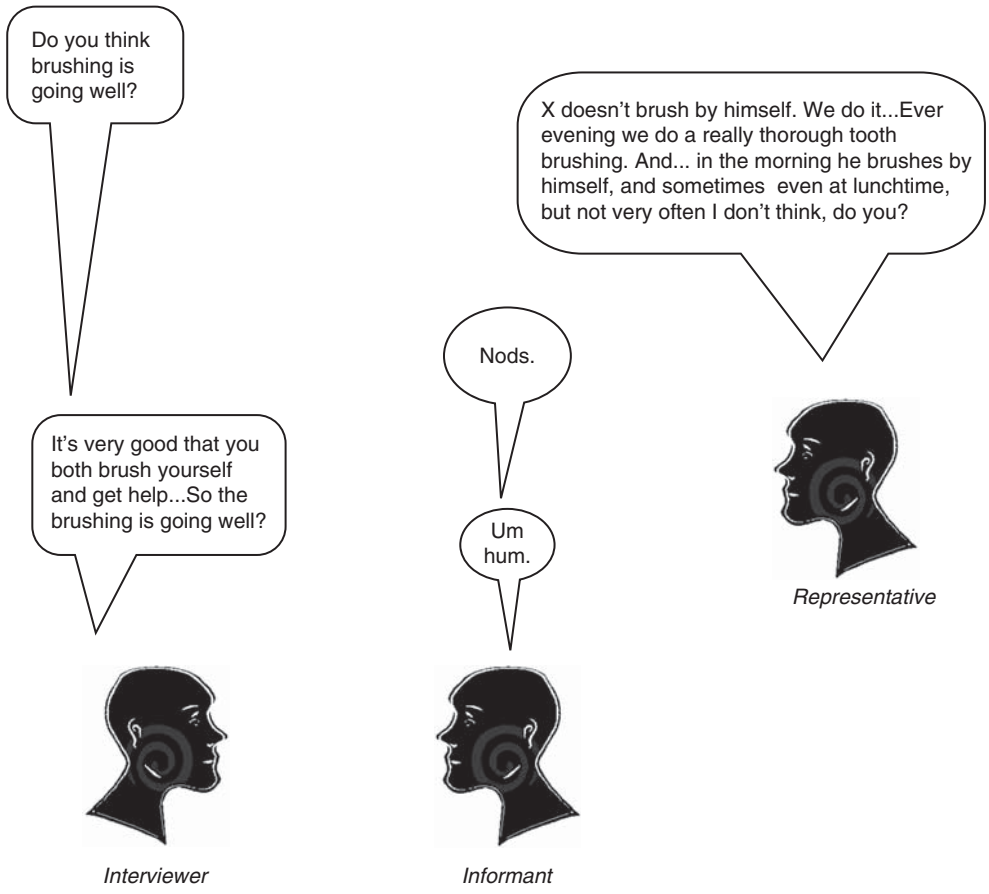

Figure 4. A man with a mental disability explained with the help of his representative.

when the informant was not satisfied with the implant treatment.

Limited participation. Generally the informants perceived that they were well treated by the dental staff, but informants who perceived that they had only received positive information about the treatment but no information about possible difficulties and risks were often disappointed. Some of the informants felt that they had received too little information about different prosthetic alternatives, e.g. fixed or removable prostheses. The experience of esthetic appearance of the new teeth was another reason for dissatisfaction. Although, if many of the informants stated that they had received information, they also felt that they had not had the opportunity to participate in the decisions.

> Yes, I was involved in the choices, but I was really very influenced. ... I didn't have ... well, how should I put it ... really any chance to make myself heard in that case ... the staff thought the darker color of the teeth was better for me ... they thought it suited me that way ... so that was what I ended up getting.

Oral hygiene in connection with implant treatment. Oral hygiene routines were managed by the informant him- or herself or with assistance. Informants who had assistance usually did not consider oral hygiene a problem, as shown in the conversation between the interviewer and an informant with the help of his representative in Figure 4. According to the interviews, oral hygiene problems arose in situations when informants who took care of their oral hygiene themselves had not received information about the complex routines in advance.

Regular check-up. Many but not all of the informants had regular contact with the dental clinic for treatment evaluation. Some of the informants stated that they had not received information about the importance of regular check-ups.

Discussion

This study was influenced by Grounded Theory, a method with several development trajectories. We have used the basic ideas of the method, often referred to as 'the constant comparative method' [6]. The results are addressed by the data, which can be expressed as internal validity or credibility. Transcription and coding were managed in connection with the interviews to minimize data changing over time and, thus, altering the researcher's

judgment or dependability. Each step of the research process has been documented to make it possible for other researchers to corroborate the results, i.e. confirmability. Regarding external validity, every reader has to estimate the transferability to a new context by following the described research process and deciding if the data might be open to alternative interpretations. All these actions are taken to give the study trustworthiness.

However, it is not possible to draw conclusions concerning objective outcome of implant treatments or to make general judgments concerning patient satisfaction. The answers to these kinds of questions require another type of design and research method. It is important to note that the individuals in this study might not be representative of functionally impaired individuals in general. In this study the purpose was to find out how treatment with dental implants can impact on the life circumstances of this special group. A questionnaire would not have given the informants opportunities to speak freely. The results may facilitate understanding of the needs of the functionally impaired.

One major task of this study was to give voice to informants who cannot speak. It can be questioned whether it is really possible to investigate the experience of individuals who cannot communicate with conventional techniques. Experience is personal and can hardly be expressed by someone else. On the other hand there are many ways of communicating and speechless individuals often communicate with the help of someone close to them who can interpret their gestures and body language [22].

The interviews were mostly held in the homes of the informants, as the dental clinic is not a neutral place. Dental anxiety is common and past experiences of dental treatment could have influenced the informants. For this reason and because some of the participants found it difficult to travel, they were free to choose the place of the interview.

The findings in this study reveal that a struggle for normality was a motivating force for the functionally impaired informants to undergo treatment with dental implants. The idea of normality is central to modern society and often implies physical health, intelligence, beauty, youth and wealth. In this context the functionally impaired may perceive themselves as inferior [23]. Feedback from the social environment affects a person's self-image [24,25] and how the individual relates to others. Disabled individuals have reported that the worst thing about their life is people's expressions of disgust, pity, horror or curiosity and that it can make them hide an impairment [24]. In personal encounters and communication the first impression is the facial expression, of which oral appearance is an important part. This gives a key to why many of the informants and their representatives in this study were of the opinion that dental rehabilitation can be very important to functionally impaired individuals. It also explains why informants who disliked the appearance of their new teeth were not completely content with the implant treatment.

The literature contains reports of connections between tooth loss and health, cognitive function and mortality [5–8]. It is not known whether treatment with dental implants prevents health deterioration. Informants in this study reported better health after treatment with dental implants. One reason may be improved nutrition owing to better chewing ability. Better health relating to psychological effects is another possible explanation.

The interviews indicate that information about different kinds of prosthetic constructions before treatment is essential to the experience of treatment outcome. There were informants with removable prostheses who would have preferred a fixed implant supported construction in spite of the fact that oral hygiene routines would have been more complicated. The opposite situation also occurred.

In conclusion, the functionally impaired patients in this study experienced that treatment with dental implants had increased their quality-of-life. However, in the interviews, a number of items arose which need to be further investigated, for example the association between occlusal function in functionally impaired individuals and health aspects, such as nutrition. Surveying the need for prosthetic therapy in the functionally impaired is also important, as well as further examination of different prosthetic alternatives for individuals in this group. The results show the importance of dental treatment based on individual assessment in a dialogue between the professional and the patient [26]. The needs of and demands for dental rehabilitation and the ability to carry out oral hygiene routines are essential to the choice of therapy. The increased financial support from the Swedish state aims to make dental treatment possible for individuals with special needs, but prosthetic therapy must be assessed. Implant treatment is not commonly approved by the authorities. It is likely that many edentulous functionally impaired individuals do not have the opportunity to receive implant treatment for financial reasons and because of general judgments about their limitations. It should also be noted that demand is dependent on available treatment options from the care provider and society [26]. At the same time it must be remembered that overtreatment can result in serious problems for the individual.

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